Trends in Economic Activity and Transportation in the San Francisco Bay Area

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This study attempts to place the analysis of centralization, decentralization, and dispersion of urban economic activities in a wider perspective. Analyzed are trends in the diversity, geographical distribution, and differential amounts and rates of change of population, agriculture, manufacturing, wholesale trade, retail trade, and selected service trades for the six-county San Francisco Bay area. In addition to the usual physical locational aspects, the concepts utilized have been sharpened to include such control and linkage factors as changing urban functions, marketing changes, effects of World War II, and governmental activities.

The impact of evolving transportation technologies on spatial arrangement of these economic activities is dealt with in detailed analyses of the mass-transit and parking problems in the major cities of the area. While transportation inadequacies have been instrumental in spreading the economic base, the importance of the automobile and motor truck in enabling acceleration of this geographic expansion is noted.

● MUCH has been written about the decentralization of population and economic activities and about traffic congestion and parking problems in cities. We hear talk these days of the decline of the downtown shopping areas and of their possible conversion into blighted areas. Congestion plagues automobile drivers wherever they drive in the city. And if one is to believe one publication, everyone is indulging in what this source has described as "the race to the suburbs."[1]

The spectacular rise of one-stop shopping centers in large and small cities alike; the sharp shifts of people from the populated sections of cities to the outskirts and the suburbs; the surge in the use of the automobile and the truck; and the scrambling movements of business establishments and business offices within and between cities; these are all fragments of the problems of urban decentralization and dispersion which this study is going to analyze. In addition, this study will concern itself with the implication of these changes for parking facilities needed for automobiles and trucks.

What has been happening in the San Francisco-Oakland metropolitan area? To what extent are the patterns of occurrences similar for all large cities and for all metropolitan areas? What are the explanations of these occurrences? This study intends to devote much attention to answering these and other questions. Since the "laboratory" of the San Francisco-Oakland metropolitan area represents one of the more dynamic centers in which these problems arise, it seems only natural to point the study in its direction.

The background of the problem of decentralization and dispersion in this San Francisco Bay metropolitan area required consideration of two sets of materials. For perspective, this report will discuss first the concepts of the city and the metropolitan area and their functions in modern society. Included in this discussion will be such topics as: establishing the basic economic, political, and social concepts of the city and of the metropolitan area; factors causing changes in the functions of the cities and metropolitan areas; and finally, the relationships between the metropolitan area and its component segments.

The second set of background materials deals with the meaning of certain terms used in this study. The term "decentralization" has become so established that careful reconsideration of its more technical meaning is necessary. In addition, other terms are useful in connection with the types of problems to be handled. Accordingly, this report will deal with the basic meanings of *decentralization*, *centralization*, and *dispersion*. As is true in problem areas such as this, some discussion must be devoted to problems and to types of measurement possible for these.

With the background materials out of the way, the problem next turns to the analysis of decentralization and dispersion in the area. Thus, the data of manufacturing, wholesaling, retailing, and service activities will be analyzed in order to answer such questions as

[1] "The Race to the Suburbs," *Fortune*, December, 1951.

these: (1) What has been happening in the metropolitan area as a whole? (2) What has been happening to each county in the metropolitan area relevant to the areas as a whole? (3) What has been happening, similarly, to the cities and the unincorporated places? (4) What are the amounts and rates of change over time in Items 1 and 3 above, as applied to each type of activity? (5) What has been happening to the dispersion and diversification of economic activities, in Oakland, San Francisco, and the remaining incorporated and unincorporated places?

In developing answers to these questions, several factors will be analyzed. Certainly, the changing functions of the metropolitan area and its component segments are important. Technological factors need to be considered. The impacts of transportation are highly important, of course, as is the matter of deterioration and/or adjustment of mass transportation on an urban and suburban basis. The development of locational theory and management practices relative to this theory is of importance. A special analysis, to be presented separately, will be made of factors of congestion and parking. Marketing changes, such as in the varieties of goods to be marketed and in marketing methods, are closely related to the heart of the problem. Growth factors in the economy, the locational separation of various activities of the same firm, the effects of governmental activities, and effects of World War II are other important factors which need to be considered, and meaningful comparisons with other metropolitan areas are certainly in order.

Finally, the study will relate the findings to four other problem areas. Of great importance is the relationship of the study to land-use patterns within the metropolitan centers proper and the peripheral areas. A second area of relationship is to movements of people by public and private transportation media. A third area of relationship concerns movements of goods by shipper-owned and for-hire facilities. The relationship of the findings to the administration of cities is a final part of that section of the report.

Several types of data furnish the raw materials for the study. The largest single source comes from census data of wholesale and retail trade, service activities, manufactures, and agriculture. These data will be supplemented by data from chambers of commerce and city-planning boards. Other data are available from the following sources: (1) telephone and city directories; (2) Hearst newspaper studies; (3) *Sales Management* magazine; (4) Federal Reserve Board; and (5) the State Board of Equalization. Special data of traffic flows and parking are available from state and city sources and from the special studies made by private consulting firms. From a bibliography collected for this study will come other valuable quantitative and qualitative information.

HYPOTHESES

This study follows the practice of the usual research report by presenting several hypotheses at the outset for their value in pointing up the analysis which is to follow:

1. The broadening base of urban economic activity, on the one hand, and of population, on the other, are the underlying causes of shifts in location of metropolitan area economic activities and thus in the changing importance of cities in the metropolitan area.
2. Centralization, decentralization, and dispersion must be thought of in terms of control and group action patterns, as well as in physical terms.
3. That geographical shifts in location, and the growth and expansion of economic activities have varied according to: (a) type of activity, (b) type of urban community, (c) relative adequacy of urban transportation, and (d) other qualitative factors.
4. Present shifts and expansions are developing potential overcapacity, particularly at the retailing level.
5. Uneconomic overdevelopment of mass individual transportation facilities is taking place.
6. Present policies of government and other agencies may be aggravating rather than correcting basic problems by: (a) overdeveloping roads, etc., (b) overemphasis on planned economic facilities, and (c) conflicting activities which have supported central urban redevelopment on the one hand and suburban developments on the other.

TYPES OF DATA

In measuring the extent of urban decentralization and dispersion in the bay area, great reliance has been placed, first of all, on the various census data of population, manufacturers, agriculture, wholesale and retail trade, and selected service activities. These data have been supplemented by estimates of state and local chambers of commerce; by data and studies made available from city-planning boards; by city and telephone directories; by newspaper studies; by data from the Federal Reserve Bank and the California State Board of Equalization; and by estimates from *Sales Management* magazine. To these sources have been added the vast fund of descriptive and analytical materials contained in the comprehensive bibliography contained in the appendix.

Cities and Metropolitan Units: Background Materials

This section brings together necessary background materials dealing with the concepts and structure of, the city and metropolitan unit. It serves, in this way as an introduction to the specific structure of the San Francisco-Oakland Metropolitan Area and as a backdrop for the several sections dealing with geographical shifts in population and economic activities within this area.

Materials drawn from economics, marketing, sociology, and political science are included in discussing the concepts and structure of the city and the metropolitan area. The rise in importance of cities and metropolitan areas in the United States is explored. In addition, some attention is devoted to the organic nature of the metropolitan unit and to an introduction of the factors influencing the rise of cities and metropolitan units and changes in their functions.

The approach of this section is organic, and that approach is extended as well to the various analyses which stem from this section in the remaining parts of this research study. Emphasis is placed upon the existence of a complex interrelationship of functions, structures, and environment in the over-all phenomena we call "the city" and the "metropolitan unit." This organic approach stresses the objective element in the city and the metropolitan unit; the element of planning entering into their growth; and the presence of barriers by individuals and groups of individuals (mainly through institutions) to change.

THE CITY

Concept of the City

The city is a demonstration, once again, of the principle of spatial specialization in economic and social activities. It is a manifestation, as well, of the importance of natural factors and of historical relationships. It has a multitude of bases—economic, sociological, political, and geographical—and the combination and relative importance of these vary with each case.

In its economic sense, the city is the spatial unit for the performance of many types of activities: a great majority (but certainly not all) of the manufacturing activities which do not have to be tied geographically to the raw materials sources; the activities of a high percentage of the various types of wholesale middlemen, except those associated with marketing of selected agricultural, mineral, and petroleum products at the production points; the activities of many types of retail middlemen, especially those marketing shopping and specialty goods. It includes, as well, the various construction industries, the public-utility group, and the activities of many professional and business- and consumer-service categories. Many writers, in this connection, emphasize the lack of self-sufficiency among the residents of the city and the high degree of dependency of these persons upon many other specialists for the satisfaction of their wants.

Sociologically, the city stresses a concept of a huge network of persons, institutions, various social and economic customs and habits, and the restrictions to and acceptance of change into a complex organic structure. These elements may conflict, exist in harmony, or reach a temporary equilibrium arrangement. They account for the rise of specialized formal and informal institutions having various functional purposes. They create problems of integration, cöordination, and control. And there arises, also, the competition between cities and the attempt of the larger to become the metropolises to which the subdominant areas attach themselves.

Finally, the city is a political creature emphasizing, once again, the over-all combination of institutions and activities by means of which the individual and his various activities and institutions are made responsible to various levels of governmental authority. It is only one of the complexities of modern urban living that these various levels of government can and do operate at the same time in relation to the identical unit we call "the city." They may and often do compete each with the other.

The city, then, is a compact geographical area in which varying numbers of people live and work in order to get the benefits of improved economic and social standards of living through larger scale economic, social, political, and cultural institutions and functions. Many may argue that these can be performed elsewhere than in the city. This may be so, but it is a fundamental argument of this report that to do so would mean a lowering of economic living standards by losing that spatial organization and combination peculiar only to the city. These activities are changing constantly both in terms of absolute performance, and perhaps more importantly, in relation to each other. For these advantages, the city extracts payment in the form of many nonmonetary as well as monetary costs: congestion in living, traveling, and working; a faster, noisier tempo of living; a less-attractive physical en-

vironment; and the rest of the disadvantages advanced by many writers.

But for better or for worse, the city is, along with the metropolitan unit, the key geographical element in modern economic, social, and political structures, at least in the more-advanced countries. The city makes possible the more-intensive utilization of geographical space having unique characteristics by permitting vertical as well as horizontal building and by creating a base for integrating many activities. This report emphasizes viewing the whole metropolitan unit as a natural organizational unit for our type of economy.

Evolution of the Modern City

Cities merely as compact geographical accumulations of people are not new, having been known to ancient and medieval civilizations. But the ancient and medieval cities rested primarily upon governmental or military bases, or else upon the possession of some unique geographical factor, such as a port facility. The modern city, while encompassing these bases to a limited degree, is a function mainly of: (1) the breakdown of the feudal system; (2) the economic need for a geographical unit of organization associated with the rise of the factory system and large-scale, mechanized production; (3) the development of transportation and communication facilities in their local, regional, national, and international aspects; and (4) the development of modern marketing structures designed to keep pace with the tremendous increase in the volume of goods and services.

In addition, the modern city is made possible through the advances made by man in designing and constructing the business and the residential skyscrapers suited to the increasing size and needs of the city; in reducing problems of social and governmental relationships stemming from the economic bases; and in mastering problems created by the city through the piling up of masses of people so far as sanitation, health, and the like are concerned.

One author[2] characterizes the evolution of a geographical organization as divided into five stages paralleling man's economic and technological advances: the collectional economy, the cultural-nomadic economy, the settled-village economy, the town economy, and the metropolitan economy. This classification scheme suffers from the oversimplification inherent in all such schemes and from the many variations in its applicability to various types of economies at any one time. The categories are useful, however, in helping to guide the thinking of urban-structure research workers along some systematic historical lines.

In the present century, the evolution of the city has been reinforced by the development of flexible individualized forms of goods-carrying and people-carrying transportation and by revolutionary developments in communication which have made possible our form of integrated society, *viz.*, the telephone, telegraph, radio, newspaper, and television.

Data of Growth of Cities

Table 1 traces the growth since 1860 in the number of cities in the United States by population-size class. Based on the census' "old" concept of urban place, the number of cities grew from 392 in 1860 to 4,023 in 1950. As might be expected, there is an inverse relation between the number of places and the population size. Under the "new" concept of urban places, the census tabulated 4,741 in 1950 as against 4,023 under the old concept.

The urban places, as a group, accounted for but 19.8 percent of the 1860 total population and 59 percent of the 1950 total.[3] By size-groups, the following patterns are discernible: (1) The 1,000,000-or-more group rose from 2.4 to 12.3 percent by 1930, but has since declined to 11.5 percent. (2) The 500,000-to-1,000,000 group declined from 4.4 percent in 1860 to a low of 1.3 percent in 1890; then rose steadily to a peak of 5.9 percent in 1920; had some setback in 1930 and 1940; and reached an over-all peak of 6.1 percent in 1950. (3) The 250,000-to-500,000 group has had a variable pattern, reaching a peak of 6.5 percent of the 1930 total and then falling off to 5.5 percent in 1950. (4) The 100,000-to-250,000 group has risen from 3.2 percent in 1860 to 6.4 percent in 1950, with setbacks in 1870 and in the 1930-to-1940 decade. (5) The 50,000-to-100,000 group has increased steadily in relative importance from 1.4 percent in 1860 to 6.0 percent in 1950. (6) The 25,000-to-50,000 group increased steadily during the 1860-to-1950 period from 2.1 to 6.3 percent. (7) Similarly, the 10,000-to-25,000 group increased from 2.8 to 8.3 percent, and the 5,000-to-10,000 group from 3.1 to 5.2 percent. (8) The under-5,000 group rose steadily in the 1860-to-1920 period from 1.9 to 4.1 percent, and then fell off to 3.7 percent in 1950.

Thus, the total expansion in the importance of the urban places has resulted in similar steady expansion for all groups; and in six out of ten groups, a peak of relative importance in 1950.

A different picture may be had by analyzing, first of all, changes in the number of cities, by selected time

[2] N. S. B. Gras, *An Introduction to Economic History* (New York: Harper & Brothers, 1922).

[3] This becomes 64 percent under the new concept.

TABLE 1

POPULATION IN GROUPS OF URBAN PLACES CLASSIFIED ACCORDING TO SIZE, 1860–1950

Population-Size Group	1950		1940	1930	1920	1910	1900	1890	1880	1870	1860
	New Urban Concept	Old Urban Concept									
Number of Places											
1,000,000 or more	5	5	5	5	3	3	3	3	1	—	—
500,000–1,000,000	13	13	9	8	9	5	3	1	3	2	2
250,000– 500,000	23	23	23	24	13	11	9	7	4	5	1
100,000– 250,000	65	66	55	56	43	31	23	17	12	7	6
50,000– 100,000	126	128	107	98	76	59	40	30	15	11	7
25,000– 50,000	252	271	213	185	143	119	82	66	42	27	19
10,000– 25,000	778	814	665	606	465	369	280	230	146	116	58
5,000– 10,000	1,176	1,133	965	851	715	605	465	340	249	186	136
2,500– 5,000	1,846	1,570	1,422	1,332	1,255	1,060	832	654	467	309	163
Under 2,500	457	—	—	—	—	—	—	—	—	—	—
Total	4,741	4,023	3,464	3,165	2,722	2,262	1,737	1,348	939	663	392
Percent of Total Population											
1,000,000 or more	11.5	11.5	12.1	12.3	9.6	9.2	8.5	5.8	2.4	—	—
500,000–1,000,000	6.1	6.1	4.9	4.7	5.9	3.3	2.2	1.3	3.8	4.2	4.4
250,000– 500,000	5.5	5.5	5.9	6.5	4.3	4.3	3.8	3.9	2.6	4.0	0.8
100,000– 250,000	6.3	6.4	5.9	6.1	6.2	5.3	4.3	4.4	3.6	2.6	3.2
50,000– 100,000	5.9	6.0	5.6	5.3	5.0	4.5	3.6	3.2	1.9	2.0	1.4
25,000– 50,000	5.8	6.3	5.6	5.2	4.8	4.4	3.7	3.6	2.9	2.4	2.1
10,000– 25,000	7.9	8.3	7.6	7.4	6.7	6.0	5.7	5.5	4.4	4.4	2.8
5,000– 10,000	5.4	5.2	5.1	4.8	4.7	4.6	4.2	3.8	3.4	3.3	3.1
2,500– 5,000	4.3	3.7	3.8	3.8	4.1	4.1	3.8	3.6	3.2	2.8	1.9
Under 2,500 and other	5.3	—	—	—	—	—	—	—	—	—	—
Total	64.0	59.0	56.5	56.2	51.2	45.7	39.7	35.1	28.2	25.7	19.8

Source: U. S. Bureau of the Census, *U. S. Census of Population, 1950*—Vol. I, *Number of Inhabitants* (Washington, D. C.: U. S. Govt. Printing Office, 1952).

periods (see Table 2). It will be seen from this table, that the absolute increase in number of cities has had variable patterns. It will be noticed, also, that the cities in the 5,000-to-50,000 groups have had more of the increases relative to other groups. The number of very-large cities has been relatively stable since 1920. And the 2,500-to-5,000 group has been accounting for a decreasing share, proportionately, of the growth.

Similar analysis is made of absolute changes in population in each size group in Table 3. Partially because of the nature of the size-group division it will be noticed that the pattern of change varies from size group to size group. Thus, in the 1860–1900 and 1920–1940 periods, the largest size cities accounted for the most population gain. In the 1900–1920 and 1940–1950 periods, it was the cities having 500,000 to 1,000,000 persons. The 25,000-to-50,000 and 50,000-to-100,000 groups have accounted for an increasing percentage of the absolute gains. The single most important gain was in the 1920–1930 decade for all urban places, followed closely by the 1940–1950 decade.

Types of Present-Day Cities

The preceding discussion has hinted at the complicated nature of cities. It has indicated, as well, some difficulties inherent in classifying cities into types. Later sections will utilize many different groupings, but this section will serve to introduce several of the classification schemes emphasizing economic, cultural, social, and geographical characteristics.

A useful classification scheme by itself and in conjunction with other bases is the population-size categories used by the Bureau of the Census and given in Table 3.

Many writers have developed various classifications of cities which emphasize the predominant economic functions contained in each.[4] Thus Gist and Halbert[5] speak of production centers, trade and commerce centers, political capitals, cultural centers, health and recreational centers, and diversified centers. It needs no elaboration here to indicate that, in the absence of definite standards, this grouping lacks exactness, and that many of the more-important cities fall into more than one category. Too many, in fact, may have to be listed under the "diversified" heading.

Harris[6] similarly has developed a nine-fold grouping on economic functions: manufacturing cities, retail

[4] For a useful résumé see, Wilbur C. Hallenbeck, *American Urban Communities* (New York: Harper & Brothers, 1951).

[5] Noel P. Gist and L. A. Halbert, *Urban Society* (New York: The Thomas Y. Crowell Co., 1948), pp. 8–15.

[6] Chauncey Harris, "A Functional Classification of Cities in the United States," *The Geographical Review*, XXXIII (January, 1943), 86–89.

TABLE 2

ABSOLUTE INCREASES IN NUMBER OF CITIES, BY POPULATION GROUPS; SELECTED PERIODS, 1860–1950

Population-Size Group	1860–1900		1900–1920		1920–1940		1940–1950	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
1,000,000 or more	3	0.22	0	0.0	2	0.27	0	0.0
500,000–1,000,000	1	0.07	6	0.61	0	0.0	4	0.72
250,000– 500,000	8	0.59	4	0.41	10	1.35	0	0.0
100,000– 250,000	17	1.26	20	2.03	12	1.62	11	1.97
50,000– 100,000	33	2.45	36	3.65	31	4.18	21	3.76
25,000– 50,000	63	4.68	61	6.19	70	9.44	58	10.38
10,000– 25,000	222	16.51	185	18.78	200	26.95	149	26.65
5,000– 10,000	329	24.46	250	24.37	250	33.69	168	30.05
2,500– 5,000	669	49.74	423	42.95	167	22.51	148	26.48
Total	1,345	100.	985	100.	742	100.	559	100.

Source: Computed from Table 1.

TABLE 3

ABSOLUTE INCREASES IN POPULATION, BY CITY GROUPS; SELECTED PERIODS, 1860–1950

Population-Size Group	1860–1900		1900–1920		1920–1940		1940–1950	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
1,000,000 or more	6,429,474	26.85	3,716,058	15.48	5,765,334	28.45	1,493,584	10.30
500,000–1,000,000	265,889	1.11	4,578,682	19.08	233,190	1.15	2,729,986	18.82
250,000– 500,000	2,594,635	10.84	1,679,542	7.00	3,286,676	16.22	414,046	2.85
100,000– 250,000	2,279,568	9.52	3,246,697	13.53	1,273,463	6.28	1,821,461	12.56
50,000– 100,000	2,257,278	9.43	2,556,070	10.65	2,078,509	10.26	1,729,446	11.92
25,000– 50,000	2,130,334	8.90	2,274,414	9.48	2,342,052	11.56	2,078,769	14.33
10,000– 25,000	3,453,817	14.42	2,696,418	11.24	2,932,230	14.47	2,500,331	17.24
5,000– 10,000	2,227,759	9.30	1,763,430	7.35	1,714,269	8.46	1,196,781	8.25
2,500– 5,000	2,304,649	9.63	1,486,741	6.20	640,006	3.16	539,358	3.72
Total	23,943,403	100.	23,998,052	100.	20,265,729	100.	14,503,762	100.

Source: Computed from U. S. Census of Population.

cities, diversified cities, wholesale centers, transportation centers, mining towns, university towns, resort and retirement towns, and political centers.

The International City Managers' Association[7] has developed a more-detailed classification using two sets of criteria. The classification is as follows:

I. *City classification based upon the metropolitan complex*
   - A. Central cities
   - B. Independent cities
   - C. Suburbs
     1. employing
     2. balanced
     3. dormitory

II. *City classifications based upon economic functions*
   - A. Mining
   - B. Transportation
   - C. Manufacturing
   - D. Industrial
   - E. Diversified
     1. manufacturing
     2. retail
   - F. Retail
   - G. Wholesale
   - H. Resort
   - I. Educational
   - J. Governmental
   - K. Dormitory

[7] Grace K. Ohlson, "Economic Classification of Cities," in *Municipal Year Book 1949* (Chicago: International City Managers' Association).

A less complicated grouping is Leiffer's[8] four-fold classification into (1) the commercial city, (2) the industrial city, (3) the industrial suburb, and (4) the residential suburb of the metropolis. Similar in nature in its use of combination bases, is Munro's[9] five-fold classification: (1) cities depending upon a single source of commercial livelihood; (2) cities industrialized or becoming industrialized: (a) those concentrating on a single industry and (b) those having industrial diversification; (3) cities combining commerce and industry; (4) metropolitan cities; and (5) satellite cities. This scheme is particularly burdensome to use in view of the fact that the five categories are not mutually exclusive.

Thorndike[10] has attempted to classify cities on the basis of 37 statistically-measurable attributes of goodness, such as health, education, recreation, socio-economic status, creature comforts, per-capita value of taxable property, per-capita incomes, and various personal qualities. From these, he concludes that the following factors measure the relative "goodness" of a city: (1) mental health, (2) moral qualities, (3)

[8] Murray H. Leiffer, *City and Church in Transition* (Chicago: Willett, Clark & Co., 1938), pp. 27–33.

[9] William G. Munro, "City," in *Encyclopedia of the Social Sciences*, Vol. III (New York: Macmillan, 1930), pp. 474–482.

[10] E. L. Thorndike, *Your City* (New York: Harcourt, Brace and Co., 1947).

physical health and energy, (4) differences in income, (5) differences in work of previous generations, (6) differences in race and cultural homogeneity, and (7) residential factors.

Finally, attention may be directed to Goodrich's classification which is based on census data and emphasizes the manufacturing aspects[11]: (A) the principal city of the industrial area; (B) the larger satellite city in the industrial area; (C) remainder of the industrial area; (D) city of 100,000 or more inhabitants outside of the industrial area; (E) remainder of county in which city (D) is located; (F) important industrial county without a city having as many as 100,000 inhabitants; (G) remainder of the United States.

None of these classification schemes is useful for this research study. The larger cities of the San Francisco-Oakland metropolitan area are cities with diverse economic activities. To be useful, therefore, separate classifications would be necessary for each category of economic activity emphasizing sales volume, numbers of establishment, relative percentage of the metropolitan-area total accounted for, and concentration or diversification to be found within each category. In addition, population size is of underlying importance. Later sections will develop these characteristics.

THE METROPOLITAN UNIT

The concept of the metropolitan unit arose in this country at the beginning of the present century when the larger cities had begun to demonstrate their attraction and organizing characteristics in terms of the diverse considerations to be discussed later. As a result, beginning with the collection of data on a metropolitan unit for 1910-census publications, many writers and research workers have devoted many writings and efforts to the analysis of the concept and characteristics of metropolitan units.

Basic Concepts

The terms "metropolitan area," "metropolitan district," "metropolitan community," and "urbanized areas" are all to be found in the available writings. These terms all possess the common core of having the definition based on the interrelationships which prevail between the large cities which dominate the manufacturing and marketing activities and their tributary, or satellite, or hinterland areas. In this common conceptual core is emphasized the economic, cultural, and organizing domination of the metropolitan center (or centers) and the dependence of much of the remaining segments of the metropolitan unit upon this center for employment, trade, facilities, communication, and the like. Only in the development of an over-all political administration has the concept of a metropolitan unit failed to take hold. The developing ideas of the metropolitan unit have emphasized, also, the degrees of interrelationships between metropolitan units.

Various measuring devices have been utilized in order to establish the boundaries of the metropolitan unit. And these variations in criteria have led, as might be expected, to some of the variations in concepts which exist today. These criteria emphasize a wide variety of factors: (1) *population densities* per square mile around a central city containing usually not fewer than 50,000 or 100,000 inhabitants; (2) *transportation linkages* via personal and mass transportation agencies; (3) *economic linkages* in terms of manufacturing, wholesaling, retailing, and service trades activities, and in terms of retail and wholesale trading area boundaries; (4) *communication linkages* in terms of newspaper circulation, radio and television listening-viewing patterns, volume of telephone calls, etc.; and finally (5) *sociological linkages* in terms of institutional relationships—cultural, social, educational, and religious.

Keeping these basic concepts in mind, the sections which follow explore some of the principal definitions which may be useful to this study. These may be listed as follows: the census concepts of the metropolitan district, the standard metropolitan area, and the urbanized area; McKenzie's concept of the "metropolitan community"; Bogue's concept of metropolitan "dominance and subdominance"; Hallenbeck's concept; and Duffus' concept.[12]

The Census Definition of "Metropolitan District"

Beginning in 1910, the Bureau of the Census has been active in developing concepts of the metropolitan unit which could be useful in compilations of data. From its work has evolved the concept of the metropolitan district, and in the last census publications, the concept of the "standard metropolitan area," and the "urbanized area."

The concept of the metropolitan district may be examined first of all as it has evolved through the various decennial census reports since 1910:

1. *The 1910 and 1920 concepts:* (a) cities of 100,000 inhabitants, or more, together with all of the civil units which are located completely or principally within a 10-mile radius of such cities; and (b) metropolitan districts as such comprising cities of 200,000 or more inhabitants and the civil units located entirely or principally within a 10-mile radius which have a

[11] Carter Goodrich, *et al.*, *Migration and Economic Opportunity* (Philadelphia: University of Pennsylvania Press, 1936).

[12] These are representative only of the more-important concepts. The bibliography, however, contains a wide list of references which may be consulted in this connection.

population density of not less than 150 persons per square mile.

2. *The 1930 concept:* a metropolitan district includes any central city, and the contiguous or surrounding civil divisions, with a density of not less than 150 persons per square mile; *provided* that the aggregate population totals 100,000 or more persons.

3. *The 1940 concept:* the basic 1930 concept was continued in use except that such districts were defined to include one or more central cities of 50,000 inhabitants or more in addition to the requirement of a population density of 150 or more persons in the adjacent or contiguous territory. In a few cases, where special qualifications were met, the density in the adjoining and contiguous territory could fall below 150 persons per square mile.

The Census Definition of "Standard Metropolitan Area"

In order to meet the objections of users of census materials that the metropolitan district concept would not allow use of other data and to secure comparability among governmental agencies, the following concept has been used for census publications since 1947[13]:

> Except in New England, a standard metropolitan area is a county or group of contiguous counties which contain at least one city of 50,000 inhabitants or more. In addition to the county, or counties, containing such a city or cities, contiguous counties are included in a standard metropolitan area if according to certain criteria they are essentially metropolitan in character and socially and economically integrated with the central city.
>
> The criteria of metropolitan character relate primarily to the character of the county as a place of work or as a home for concentrations of nonagricultural workers and their dependents. Specifically, these criteria are:
>
> 1. The county must (a) contain 10,000 nonagricultural workers or, (b) contain 10 percent of the nonagricultural workers working in the standard metropolitan area or, (c) have at least one-half of its population residing in minor civil divisions with a population density of 150 or more per square mile and contiguous to the central city.
> 2. Nonagricultural workers must constitute at least two-thirds of the total number of employed persons of the county.
>
> The criteria of integration relate primarily to the extent of economic and social communication between the outlying counties and the central county as indicated by such items as the following:
>
> 1. Fifteen percent or more of the workers residing in the contiguous county work in the county containing the largest city in the standard metropolitan area, or
> 2. Twenty-five percent or more of the persons working in the contiguous county reside in the county containing the largest city in the standard metropolitan area, or
> 3. The number of telephone calls per month to the county containing the largest city of the standard metropolitan area from the contiguous county is four or more times the number of subscribers in the contiguous county.
>
> In New England, the city and the town are administratively more important than the county, and data are compiled locally for such minor civil divisions . . . [In all such cases] a population density criterion of 150 persons or more per square mile, or 100 persons or more per square mile where strong integration was evident has been used.

[13] U. S. Bureau of the Census, *U. S. Census of Population, 1950*, Vol. I, *Number of Inhabitants* (Washington: Government Printing Office, 1952), p. xxxiii.

The Census Concept of "Urbanized Areas"

The standard metropolitan area concept results in combining data on a full county basis. In many cases, however, the county is too broad an area for careful analysis. And the work of many research workers into urban areas, emphasizing both economic and sociological factors, indicated a need for more-carefully delineated boundaries. As a result, the Bureau of the Census has introduced, in its 1950 reports, the following concept of an "urbanized area":

> Urbanized area is an area that includes at least one city with 50,000 inhabitants or more in 1940 or later according to a special census taken prior to 1950 and also the surrounding closely settled incorporated places and unincorporated areas that meet the criteria listed below. Since the urbanized area outside of incorporated places was defined on the basis of housing or population density or of land use, its boundaries for the most part are not political but follow such features as roads, streets, railroads, streams, and other clearly defined lines which may be easily identified by census enumerators in the field. . . .
>
> The urban fringe of an urbanized area is that part which is outside the central city or cities. The following types of areas are embraced if they are contiguous to the central city or cities or if they are contiguous to any area already included in the urban fringe:
>
> 1. Incorporated places with 2,500 inhabitants or more in 1940 or at a subsequent special census conducted prior to 1950.
> 2. Incorporated places with fewer than 2,500 inhabitants containing an area with a concentration of 100 dwelling units or more with a density in this concentration of 500 units or more per square mile. This density represents approximately 2,000 persons per square mile and normally is the minimum found associated with a closely spaced street pattern.
> 3. Unincorporated territory with at least 500 dwelling units per square mile.
> 4. Territory devoted to commercial, industrial, transportational, recreational, and other purposes functionally related to the central city.
>
> Also included are outlying noncontiguous areas with the required dwelling unit density located within 1½ miles of the main contiguous urbanized part, measured along the shortest connecting highway, and other outlying areas within one-half mile of such noncontiguous areas which meet the minimum residential density rule.
>
> Although an urbanized area may contain more than one city of 50,000 or more, not all cities of this size are necessarily central cities. The largest city of an area is always a central city. In addition, the second and third most populous cities in the area may qualify as central cities provided they have a population of at least one-third of that of the largest city in the area and a minimum of 25,000 inhabitants.

McKenzie's Concept of the "Metropolitan Community"

The pioneering work of McKenzie[14] is so well known that only some of the highlights of his concept of the "metropolitan community" need be reviewed here. He stresses, first of all, the metropolitan community as a functional entity. Geographically, this unity extends as far as the central city can exert a dominant influence. Structurally, the metropolitan community possesses three characteristics: (1) it is a constellation of centers, the interrelationships of which are characterized by dominance and subdominance, or subordination; (2) the center city has the institutions and services which cater to all of the region and which tie the region economically and otherwise to other regions; and (3) the subcenter, so far as economic activities are concerned, is rarely complete.

The economic unity of the metropolitan community is attributable mainly to transportation and communication and the interdependence of the various parts of the metropolitan community needs additional attention. The size of each community within the total of the metropolitan whole influences the degree of specialization. The character of each suburban center's institutions is determined more by its distance from the metropolis and the income and occupational characteristics of the population than by its mere size. Those suburbs closer to the metropolis will tend to have more-pronounced specialization. Those suburbs which have an industrial composition are likely to be more complete in the service-trade structure designed to meet the needs of their local population than the residential suburb which must place more reliance on central city institutions.

Bogue's Hypothesis of Metropolitan Dominance

Bogue[15] has set forth a concept of metropolitan community dominance which stems directly from the work of McKenzie. His "hypothesis of metropolitan dominance" begins with the observation that, in all technologically-advanced societies, the great cities or metropolises dominate the social and economic organization and are the foci about which the life of the modern nation is organized. In developing this hypothesis, he divides cities into metropolitan centers and hinterland cities. The metropolitan center (or metropolis) can produce and distribute more-varied goods and services than small cities for the reasons to be discussed later. As the kinds of goods became more specialized and more amenable to mass production, the greater became the apparent advantages of the metropolitan center.

Bogue emphasizes three sets of assumptions in formulating his hypothesis: (1) a system of interdependency among cities; (2) considerable difference in the composition of activities between individual cities; and (3) a view of the modern metropolis as one of the forces making for intensity differentiation, as well as one of the important organizing agents. The relationship of his findings to the findings of this study will be discussed later.

Other Concepts

Three other concepts may be referred to briefly as less-important variations on the main ideas already described. The first by Hallenbeck states: ". . . the metropolitan community is the urban community as it is taking form. It consists of city of quantitative importance, together with that part of the surrounding area wherein the activities and peoples are inextricably woven together in a complex of interrelationships in the process of daily living." Hallenbeck sets forth the commuting limits between the central city and the remainder of the metropolitan community as normally 35 mi. and indicates that the larger the suburb the smaller the commuting ratio because more of the suburb's labor force will be needed to operate its own activities.

Duffus[16] states merely that a metropolitan district is "all that territory in which people's ways of living and working are directly affected by the presence of the metropolis."

Finally, Reed[17] defines a metropolitan area as: "The area within which there is a large daily movement of population to and from the center for work, trade, amusement, or other purposes. This definition includes relatively distant subcenters and often large stretches of open country."

It will be the function of later sections to relate these general concepts to the San Francisco-Oakland metropolitan area in order to measure the extent of decentralization and dispersion of agricultural, manufacturing, wholesaling, retailing, and selected service trade patterns.

Number of Metropolitan Units, 1940 and 1950

Table 4 compares the number and population of metropolitan districts, standard metropolitan areas,

[14] Roderick D. McKenzie, *The Metropolitan Community* (New York: McGraw-Hill Book Company, Inc., 1933).

[15] Don J. Bogue, *The Structure of the Metropolitan Community: A Study of Dominance and Subdominance* (Ann Arbor, Michigan: University of Michigan Press, 1949).

[16] R. L. Duffus, *Mastering a Metropolis* (New York: Harper & Brothers, 1930), p. 2.

[17] Thomas H. Reed, "Metropolitan Areas," in *Encyclopedia of the Social Sciences*, Vol. X (New York: Macmillan, 1933), pp. 396–401.

TABLE 4

NUMBER AND POPULATION OF URBANIZED AREAS, STANDARD METROPOLITAN AREAS AND METROPOLITAN DISTRICTS (1940 CONCEPT) IN THE UNITED STATES, 1940 AND 1950

Type of Metropolitan Unit	Number	Population		Increase
		1950	1940	
Total Urban Population		96,467,686	*	*
Urbanized Areas	157			
Total Population		69,249,148	*	*
In central cities		48,377,240	*	*
In urban fringes		20,871,908	*	*
Standard Metropolitan Areas	168			
Total Population		84,500,680	69,279,675	15,221,005
In central cities		49,412,792	43,391,718	6,021,074
Outside central cities		35,087,888	25,887,957	9,199,931
1940 Metropolitan Districts	140	76,203,566	62,965,773	12,237,783

Source: U. S. Bureau of the Census, *U. S. Census of Population, 1950*—Vol. I, *Number of Inhabitants* (Washington: Government Printing Office, 1952).

* Data not available.

and urbanized areas based on the census concepts. It will be noticed immediately that the standard-metropolitan-area concept yields the largest population base, while the 157 urbanized areas, by reason of the more-careful geographical determination, cover a far smaller population base. It will be noticed, also, that the central cities rank far ahead of outlying places in the urbanized area concept as compared with the standard metropolitan area.

Finally, the data for the standard metropolitan area reveal a much-greater absolute and relative increase in population of outlying places as compared with the central cities. However, since the number of central cities has remained relatively unchanged, the average increase per central city has been quite large.

FACTORS INFLUENCING THE RISE OF CITIES AND METROPOLITAN UNITS

The discussion at this point cannot be all inclusive. It serves mainly to bring together some of the basic groupings of factors which help to explain the beginnings and the growth of cities and metropolitan units in the United States. A later section will deal concretely, within the framework of the San Francisco-Oakland metropolitan area, with factors causing geographical shifts in economic activities within metropolitan centers and between the metropolitan center and the remainder of the metropolitan area. The complexity of the array of factors involved and the lack of knowledge of the timing and relative importance of each must be kept in mind at all times. The problems being dealt with are complex, and much research work remains in order to obtain increasingly better insight into all of the forces leading to our present-day urban structure.

Major Factors Influencing the Rise of the Modern City

There are several factors which have operated to influence the location and growth of the modern city. These can be grouped more or less systematically for the purposes of this section into the following six categories: (1) natural, (2) historical, (3) economic, (4) governmental, (5) sociological, and (6) accidental or unexplainable.

Natural factors are of many kinds, and the limitations of space permit only the barest discussion. Of great importance is the role of geographic factors in providing natural facilities, such as ports or other transportation breaking points, as well as providing natural transportation routes via waterways, mountain gaps, and the like. The outstanding significance of the geographical distribution of raw materials for the initial location of economic activity is almost self-apparent. And similarly, the contribution of the natural distribution of resources useful in developing large supplies of relatively low-priced power has been a key factor.

Of less importance, but often significant in the location of particular cities and activities within them, are the so-called natural amenities, such as climate and scenery. Certainly, these are of importance in building up resort centers, health spas, and the like. But frequently they may attract a single industry, such as the movie industry, which may, in turn, become the nucleus for later diversified growth. And in individual cases, these amenities may serve to attract key individuals who supply the necessary capital or man-

agerial spark which may create a whole urban development.[18]

It is sufficient at this point merely to say that these natural factors are of key importance in the early rise of cities and often exert continuing influence on the relocation of urban activities as industries move with changes in supplies or types of resources or as activities shift in location to secure the benefits of the amenities.

Historical factors frequently play an important role. These may be the direction of flow of immigration into a new country, such as the earlier development of the Atlantic seaboard cities in the United States. Modern cities may have their roots in the location of religious activities in earlier days—note the relationship of the location of Spanish missions to the later California cities. Or the growth of the city may be related to early elements of needs for military defense or as capitals for political activities.

In turn, these historical elements may crystallize economic advantages of transportation facilities, transportation costs, and the like, which may continue the city's over-all advantages for many years to come.

Economic factors are of many types and of varying degrees of importance in explaining the rise of the modern city. At the top of the list must be placed the change in the economic requirements of modern production resulting from the advances associated with the Industrial Revolution. These are, first of all, spatial in nature. Large-scale, mechanized production requires specialized building. When this requirement is considered along with other factors to be mentioned, it means locations within larger cities, except for those types associated with the extractive industries. And the interrelationships (linkages) between production activities are such that all sorts of groupings in cities are necessary for efficient, continuous operation.

Large-scale production requires, in turn, large, centralized reservoirs of professional, skilled, semi-skilled, and unskilled labor supplies. The city is the natural place for people to work, reside, and play, if they prefer or are forced to accept such sources of employment. The continuous freeing of pools of agricultural labor through technological advances in agricultural production, coupled with natural increases in the population, are related importantly to this factor.

Large, geographically compact markets are required also by large-scale production for the disposal of its ever-expanding output. This means, of course, that location of the manufacturing plant in or near the larger cities gives it accessibility at low transportation cost to that market. And the economic linkages between cities make possible expansions of markets as increases of output and the nature of managerial policies warrant.

Finally, under this heading comes the necessity for developing the auxiliary facilities needed along with the production facilities. These include necessary terminal transportation and storage facilities, banking facilities, the necessary wholesale middlemen and markets, and market news agencies.

Transportation factors, both national and local, are vital to the city's beginnings and to its continual development. Under this heading must be analyzed the quality of the facilities for carrying goods, the supply of these facilities, the relationships between the costs of carrying goods via each type and in comparison with competing cities, and the nature of changes in these relationships. In addition, the same type of analysis must be directed toward the transportation of persons within and between cities.

Closely related to transportation is the effect of communication factors of many types. The newspapers, telephone, radio, and television are the main agencies. But there are, in addition, the network of individualized communication agencies controlled by various business, governmental, and social institutions.

The city has been intensified in its beginnings by the development of diversified economic activities other than production in the sense of business specialization, e.g., wholesale middlemen, retail middlemen, and business- professional- and service-trade activities. Increasingly, these may account for a larger share of a city's economic activity than does the manufacturing segment.

Under economic factors, also, must be placed the role of inventions. Apart from their contributions, in general, to the whole area of technology and production through the development of machines, processes, and products, one must not overlook the location of the inventor as being the nucleus for the use of the invention. In addition, invention has been important to city growth through the discovery of principles of construction and structural steel which have made possible the miracle of the urban skyscraper.

Finally, under economic factors must be placed the availability of managerial ability, the availability of capital, and differences in the ability of a city to promote itself as a center of manufacturing, or retail trade, of health and pleasure facilities, and the like.

Governmental activities may be noted as the basis either for the establishment of a city as a political

[18] See in this connection, Edward Ullman, "Regional Growth and Amenities: A Hypothesis," in *Proceedings of the Western Exploratory Group of the Social Science Research Council on Regional Economic Analysis, May 21–23, 1952*, processed (Berkeley, Calif.: School of Business Administration, University of California, 1952), pp. 28–49.

center or for its later growth. But other aspects should be noted as well. Development of new forms of governmental organization has facilitated, undoubtedly, the administration of urban units in many ways through promotion of legal efficiency, regulation of economic activity, financing of necessary urban facilities, and the like. And the development of various forms of planning activities by governmental and quasi-governmental agencies has affected the development of new cities and the redevelopment of older ones.

Sociological factors include many forces which have molded urban growth. These would include all aspects of population beginnings, trends, composition, quality, and the like which underlie the human structure of urban communities. It would include, parallel to the economic side, a study of the intricate social institutions and the intertwining of both sets of factors in the modern city. It would include, as well, the structure of neighborhoods composing the city, and as will be noted below, the various kinds of linkages and blockages which affect the course of urban development. This includes all of the factors which modern sociology presently is beginning to mold into a meaningful, systematic analysis of the structure of urban society.

Included under this heading, although having both strong economic and political implications, is the development of modern water and sanitation facilities. These facilities certainly have been of value in permitting cities to grow to present-day levels and frequently, of course, are not found in the isolated nonurban sections of the country.

Finally, certain accidental or unexplainable factors need to be mentioned. In some cases, the fact that an inventor lives in a certain area at the time that he completes an important invention may be the sole reason apparently serving to explain the rise of an industry which serves as the roots of a city. Personal preferences of key management personnel may influence the location or relocation of an economic activity. These may be due to the attraction of these persons to the natural amenities described above, or to the fact that the health of members of the family may require change, or a desire to be close to transportation which may make it easier to reach other cities or to reach preferred vacation places. Smaller cities may result from the preferences of certain classes of people for a certain way of life[19]; other groups may later be attracted as well.

Not to be underestimated in this connection may be the special appeals resulting from personal acquaintanceships. The fortuitous timing of many factors may be a significant factor, although little organized information concerning such timing is available. Then, too, there are the speculative ventures of various groups—individuals, real estate men, and the like—which have both economic and noneconomic bases in terms of timing and attractiveness to individuals.

[19] Note cities such as Taos, New Mexico; Carmel, California, in this connection. Note, as well, many of the white-collar suburbs around any metropolitan center.

Major Factors Influencing the Rise of the Metropolitan Unit

The rise of the city must precede the development of the metropolitan unit by virtue of the basic characteristics of the metropolitan unit as described above. Once again, the present discussion serves only to survey an area which will be discussed more fully later.

Most present-day writers on this subject attribute the rise of the metropolitan unit to, above all else, the development of modern local transportation, which furnished the necessary mechanism by which goods and people could be integrated into the various geographical segments of an urban society. Just as a country could not develop economically so long as its means of transportation could not guarantee easy, fast, and economical linkages to other countries, so a city was constricted geographically in its earliest days by crude transportation—mainly horse-drawn vehicles both for business and personal use. The first breaking down of this restriction was attributable to the application of electric power to local transportation via the streetcar and interurban railroad. By means of these developments, it was possible for people to widen the distance between place of employment and place of residence without any substantial change in transportation time consumed. At the same time, it made possible a choice of alternative business locations, both within the city and between the city and the adjoining metropolitan subcenters, so long as transportation linkages could be maintained or improved.

A second, important local-transportation development came with improved methods of building and paving city streets and radial highways. This made possible faster movements of people by even horse and buggy but was more significant in connection with the next factor to be discussed. It made possible, also, faster movements of goods within and between cities.

But the revolutionary development which has led, transportationally speaking, to the modern metropolitan unit is the motor truck and the automobile. These agencies made possible transport of goods and people with a degree of flexibility hitherto unknown. They permitted centrifugal movements of activities and peoples, integrated with the facilities and markets

which could only be furnished by the central city (or cities). The automobile and truck made it possible to systematize the relationships between the center of the metropolitan unit and the hinterland areas upon the foundations begun with the streetcar and interurban railway systems. Further, these forms have increasingly superseded the streetcar and interurban railway as forms of mass transportation.

With improvements in transportation must come parallel developments in communication. If transportation made possible the rearrangement of people and their activities on a wider geographical basis, then communication was to become the medium for integrating economic and personal ideas and information on a systematic metropolitan community basis. In the earlier stages of the metropolitan units' development, the newspaper and the telephone were the key communication media. More recently, radio and television have become valuable auxiliary aids. Here, again, these communication media have done for the metropolitan area what the printing press and other developments did for wider geographical specialization and integration.

Although these are the key factors, certain additional elements may be noted: (1) Development of the electric power industry freed economic activities from sole dependency on central city locations. This development made possible, also, more comfortable living in the metropolitan subcenters. (2) The widening complex array of economic activities and the increasing interplay between each led to a widened base upon which the metropolitan unit could build its own variations of relationships. (3) The search for better spatial arrangements led to a search for new locations within the confines of an expanded urban structure. (4) Speculative developments aided the spilling over of the city, although frequently on a poorly conceived and executed base.

It is this complex array of factors, in which modern transportation plays such an important role, that furnishes the basis for the main problem area which this research study is investigating.

THE ORGANIC STRUCTURE OF THE METROPOLITAN UNIT

This approach[20] to the study of the metropolitan unit views it as an organic whole which functions through a great variety of economic, political, and social structures to carry on a wide variety of urban activities. In using the idea of "an organic whole," less emphasis is placed on the idea of the organic whole as a biological organism. Rather, what is emphasized is the organism as a series of institutional structures which, while in large part inherited and subject to environmental influence because of their human composition, may be modified or invented at the will of the human beings who constitute the membership.

In keeping with the biologic analogy, this organic approach emphasizes the structure (anatomy) and functioning (physiology) of the metropolitan unit through its component parts (institutions). It emphasizes the necessary linkages between the institutions and their structural arrangement, and the blockages[21] by individuals acting as individuals, but more importantly as members of institutions. Similarly, this approach calls attention to the growth and development of the organic whole and its component parts through processes of evolutionary change.

The approach outlined above implies a process which includes a function of coördination and control. This function relates the various activities of the metropolitan unit in a kind of order which gives the metropolitan unit its over-all organization. The instrumentalities of coördination and control include all of the decisions made by individuals acting as members of various social, economic, and political groups at various levels of authority, and subject to various social conventions and customs. The sections which follow will deal with the various elements of this approach.

The Functional Activity of the Metropolitan Unit

Functional activity is used here in its meaning as a series of purposeful operations carried on by the various institutions which comprise the structural organization of the metropolitan unit in order to achieve objectives noted elsewhere. The following outline gives a classification of functions which is suggestive of the possibilities so far as this study is concerned:

I. *Economic functions*
   - A. Agricultural production
     1. For local market
     2. For commercial shipment to other markets
   - B. Manufacturing production
     1. For local market
     2. For commercial shipment to other markets
   - C. Marketing activities
     1. Wholesaling
     2. Retailing

[20] See Edward A. Duddy and David A. Revzan, *Marketing: An Institutional Approach*, 2d ed. (New York: McGraw-Hill Book Company, Inc., 1953), Chap. II and Appendix C for the development of the institutional idea. See references in the bibliography for the ecological approach in sociology

[21] The concept of *blockage* has been suggested to the author by Herbert G. Blumer, chairman, Department of Sociology, University of California, Berkeley, California. The exposition of this concept here and in later sections, however, is the responsibility solely of the author.

3. Service trades
   a. business
   b. professional
   c. personal

D. Construction activities
   1. Business
   2. Residential
   3. Other

E. Auxiliary and facilitating functions
   1. Transportation
      a. intermetropolitan unit
      b. intrametropolitan unit
   2. Storage
   3. Financing
      a. business
      b. personal
   4. Risk-bearing
   5. Communication
   6. Standardization and grading
   7. Packaging

F. Institutional (not elsewhere classified)

II. *Governmental and political functions*
   A. Regulative
   B. Protective
   C. Promotive
   D. Military
   E. Institutional
   F. Economic
   G. Educational
   H. Political organization
   I. Financial
   J. Administrative
   K. Planning

III. *Social and cultural functions*
   A. Educational
   B. Communication
   C. Entertainment
   D. Recreational
   E. Fraternal and other organizational
   F. Racial and religious
   G. Ethical
   H. Combinations of (A) through (G)
   I. Private planning

Structural Organization

Structural organization implies the various ways, systematic and otherwise, in which individuals group themselves together by means of institutions. The organic approach is mainly concerned with the behavior of these individuals acting as members of groups. Individuals act, whether consciously or unconsciously, as members of a group for a particular purpose; and their decisions and acts are usually conditioned by the standards of this particular group. Collective action, rather than individual action, characterizes the metropolitan unit as a geographic accumulation of people and their groups.

Individuals, while still motivated by self-interest, nevertheless organize and coöperate consciously as groups and become motivated by the interests of such groups. Such motivation becomes quite complex, because of the variety of groups to which the ordinary individual becomes affiliated in his lifetime. Competition becomes mainly competition between groups, and stronger groups attempt to negotiate with weaker groups mainly through force in the form of coercion and persuasion.

These structures are coördinated into a system through which the processes of urban life in metropolitan units are carried on in an orderly fashion. Their basic classification parallels the main divisions already noted above for functions,[22] and they all have the common characteristic of lacking self-sufficiency.

In their interactions, these structures develop linkages which have valuable significance for purposes of this study.[23] The following schematic outline indicates the range of linkages possible in the metropolitan unit:

I. *Intermetropolitan area linkages* (linkages between a metropolitan unit and one or more other metropolitan units).
   A. Economic
      1. Simple
      2. Complex
   B. Governmental
   C. Social

II. *Intrametropolitan area linkages*
   A. Central city dominance
      1. Economic
      2. Governmental
      3. Social and cultural
   B. Subdominant city linkages
      1. Residential and marketing
      2. Residential and manufacturing, etc.
   C. Subdominant city—nonurban metropolitan area linkages
      1. Residential and marketing
      2. Residential and manufacturing
      3. Agriculture area and city, etc.

[22] Appendix B contains the detailed listing under these headings.

[23] Based, in part, upon a draft section of a study in progress: Leo Grebler, *The Core of the City: A Pilot Study of Changing Land Uses in the Central Business District of Philadelphia* (New York: Institute of Urban Land Use and Housing Studies, Columbia University, 1952).

III. *Intra-central-city linkages* (interrelations between structures within the central city).
   A. *Direct linkages:* two units within any structure having direct contacts with each other, *viz.*, a business establishment and its customers.
   B. *Semidirect linkages:* linkages of the type of Item A in which one or more types of wholesale or retail middlemen are used.
   C. *Competitive linkages:* two or more business units (or other types) competing for the same structure's patronage.
   D. *Facilitating linkages:* The interactions of two or more units involving the indirect use by either or both units of the services of a facilitating agency in order to complete the necessary interaction, e.g., the linkage between an automobile dealer and his customer, in which the customer goes to his own bank to arrange for a loan which is used, in turn, to pay the dealer for the automobile instead of obtaining the loan directly from the dealer.
   E. *Control linkages:* interrelationships between various groups, each striving for direct or indirect social, economic, or political control (or combinations of these) over other groups.

It can be seen from this classification that, when the various types of structures listed in Appendix B are combined with the various functions listed above, many thousands of linkages can and do take place. These complex patterns of linkages require, in turn, specialization of land use and structures in the metropolitan unit—buildings, transportation facilities, communication facilities, and the like.

The Economic, Governmental, Social, and Cultural Environment

It is the essence of the organic concept of the metropolitan area that the organisms being discussed cannot exist without certain environmental conditions, or at least not without taking them into account. The organism, in order to survive, must adapt itself to the environment. Much could be said about this aspect of the organic approach, and to point out how an organism, as it develops, gains more control over its own behavior and in its ability to manipulate the environmental factors. But suffice at this point merely to indicate the broad nature of this component element of the organic approach.

Coordination and Control

The functioning of a metropolitan unit as an organic entity is the result of various forces of coördination and control. Psychologically, control takes many forms. It may work through the use of persuasion and coercion as one group attempts to establish the superiority of its decisions and actions over other groups. These become forms of control which lead, in turn, to a coordination of the weaker groups by the stronger groups.

These psychological forms lead to a hierarchy of power among groups. At the bottom level of this hierarchy will be the control by each group over its individual members. This is followed by the control of the stronger groups over the weaker groups. At the top is the control by individuals as members of governmental groups over the other groups. And permeating the entire hierarchy of power based upon these groups and their control are the influences of social convention and custom.

Much of the coördination and control may represent attempts at conscious, objective planning. Much of it may represent efforts either to institute changes in the metropolitan unit along economic, governmental, social, and cultural lines or to adapt the structure to such changes. But many of these efforts are directed individually and collectively toward setting up blockages to such changes. These blockages are found affecting each of the functional aspects of the metropolitan area. Not too much is known about these blockages, or how they arise, but enough is known to be able to realize how they serve to mold the various structural aspects of the metropolitan unit. In connection with certain functions and structures, they may indeed become the dominant coördinating and controlling force. And even those forces making for change may themselves set up blockages to other types of change.

Note, for example, how these blockages have worked in the San Francisco-Oakland metropolitan area in relation to problems of how to bridge the San Francisco Bay, or how to provide for a system of rapid transit, or in any of hundreds of problem areas. And the jealousies of different geographical segments within this metropolitan area have led to serious blockages to an integrated approach to problems of economic activity, transportation, and government.

SUMMARY

Much remains to be known and studied in order to understand our present-day, complex urban society. The organic concept being attempted here, and as it is

evolving in the work of many social science research workers, is an attempt to set up one descriptive, analytical framework. For this study, it will serve as a framework for describing and analyzing the decentralization and dispersion of economic functions and structures within the San Francisco-Oakland metropolitan area. It will serve, also, as a background against which to understand the size and complexity of the problems of transporting persons and goods within the metropolitan area's boundaries.

Meaning and Measurement of Centralization, Decentralization, and Dispersion

There appear to be almost as many meanings of the concepts of centralization, decentralization, and dispersion as there are writers on the subject. This section will not attempt to survey all that have evolved in any complete fashion. Rather, its main emphasis will be centered on accomplishing three objectives: (1) to indicate a sampling of the widely varying definitions which have evolved; (2) to outline the meanings of these concepts useful to this study, and from these, to develop a systematic outline of the various types; and (3) to indicate some of the methods of measurement which may be used and the principal problems inherent in these methods.

The reader should keep in mind that this study is dealing with the many types of economic activities encompassed within the modern city and the metropolitan area. The concepts and measuring tools which will be developed, accordingly, have much wider application than those which are used for a single class of economic activity, such as retailing.

SOME VARIATIONS IN TERMINOLOGY

The variations in terminology found in the existing literature reflect, in addition to differences in various writers' objectives and ideas, differences in the class of economic activity being analyzed and in the extent of its geographical coverage. Thus, these writers may be emphasizing manufacturing activities as a group, or wholesale trade, or in increasing frequency, retailing and consumers' services trades. From the point of view of geographical coverage, they may be applying the concepts to the structure of the city itself; to the metropolitan unit (in its varying forms) and its constituent central city and subcenter cities and unincorporated parts; or to the United States as a whole.

Centralization

The general notion of centralization, depending upon the geographical coverage intended, is a peaking-up or concentration of a specified class of economic activity in a central (downtown) section of a city, or in the central city (metropolis) of a metropolitan unit, or in relatively few cities, counties, or metropolitan units of the United States as a whole. It involves, as well, the ideas of higher proportions of some or all economic activities being located in these geographical units than are found of population, income, land area, or other economic indicators and combinations. Emphasis is placed, here, on a physical aspect of the topic.

These economic activities so studied may, in turn, be measured in terms of such units as dollar sales, numbers of establishments, numbers of wage-earners, and the like. Such relationships as emerge may be a cross-sectional analysis of a single time period, or they may be studied over a succession of years, or census periods, depending upon the availability of these data for the geographical unit being studied, upon the amount of detail desired, and upon the financial and analytical resources of the research workers involved. Finally, such relationships may be measured and stated in absolute terms, in relative terms, or both.

Thus, in connection with the retail trade, Peters[24] states that centralization is the "tendency for people in outlying sections to purchase commodities in central shopping districts rather than in the section in which they reside." This definition, as the author indicates, stresses the relationship between where people live, where the retail stores are located, and where people buy. Although Peters developed this concept for use in studying metropolitan units, other writers have used the same idea, with a slight rewording, to describe centralization in a single city.

In connection with manufacturing activities, centralization may refer to the absolute or relative domination of a single manufacturing district within a city in relation to the city as a whole; to the absolute or relative domination of a city in relation to the metropolitan area as a whole; or to the domination, as noted before, of a few cities, counties or metropolitan units in relation to the United States total. The activity may be measured by itself, which is most usually the case, or it may be related, as the analytical needs warrant, to one or more factors for the necessary comparisons.

[24] William S. Peters, "Concepts and Measures of Retail Centralization and Decentralization in Metropolitan Areas," in Reavis Cox and Alderson, editors *Theory in Marketing* (Chicago: Richard D. Irwin, Inc., 1950), Chap. 17, pp. 281–296.

Similarly, writers may talk of centralization merely in terms of the "concentration of considerable proportions of population into great cities."[25]

A valuable and increasingly important aspect of centralization emphasizes the point of view of managerial control rather than the physical aspects. It involves considering the increasing concentration of the decision-making activities of a business in a centrally-located group of top executives, together with the increasing domination, through formal and informal control devices, of smaller business units by the larger units. Thus, while the activities of the business unit may spread out geographically, in the manner to be outlined below, the control element makes it necessary for such units to establish increasingly complex linkages with the larger city or key cities because of the compulsion exerted by the types of managerial control.

While the outline below will classify some of the more-obvious types, a few examples can be given at this point. Thus, a large-scale manufacturing organization may have several manufacturing plants and, in conjunction with these, sales branches or sales offices located throughout the United States. While these are permitted some degree of autonomy at the local level, they cannot operate on a coördinated basis nor can they be controlled with a high degree of uniformity, unless there is central policy guidance and control exercised by the company's top management working from a central office. This, in turn, creates a type of centralization requiring special physical facilities. It creates, also, a variety of complex linkages of the type outlined previously.

A different aspect of this type of centralization may be realized by studying the centralization of control exercised by a department store such as The Emporium in San Francisco over its branch store in the Stonestown shopping center in the same city. Not only does it control the managerial aspects of the branch store, but the parent store centralizes many physical functions such as ordering, receiving, and warehousing.

In any case, as the managerial know-how increases, and as the scale and diversity of business expands, there results a corresponding increase in the ownership, organizational, and contractual devices (formal and informal) used to achieve centralization of control. These devices serve, undoubtedly, to cast an entirely different point of view on the relation of a central city to the subcenter cities of a metropolitan area and on the relations of the super metropolitan-area cities to smaller metropolitan-area cities, than is obtained merely by considering the concepts of centralization, decentralization, and dispersion in purely physical terms.

[25] Homer Hoyt, "Forces of Centralization and Decentralization," *American Journal of Sociology*, XLVI (May, 1941), 843–852.

Decentralization

It is in the definition of the concept of decentralization that one begins to find much confusion and difference of opinion in the available writings. To some, for example, it may mean a rationalization of suburbanization, the movement of people and activities to suburban cities.[26] To others, it may mean a movement from the center of a city to the periphery contained within its own boundaries. The term has been used to denote, in addition, movements from incorporated cities to the unincorporated areas. Or it may be used to designate a movement away from the urban segment of a metropolitan area to the geographical segments which are located outside of any metropolitan area.

In connection with retail trade, Peters makes several observations. He indicates, first, that the usual meaning of decentralization implies that the percentage of retail trade done in the outlying districts of a metropolitan area is increasing relative to the central areas. This he rejects as useful, because a difference must be made between a change in the physical location of an existing structure of retail trade and changes in the structure itself. Accordingly, he introduces a fundamental distinction between locational decentralization and institutional decentralization as follows:

Locational decentralization is the "movement toward dispersion or diffusion in the location of retail sales associated with a like movement of relevant market factors, particularly population and purchasing power."

Institutional decentralization "occurs when the state or movement of dispersion or diffusion in the physical location of retail sales exceeds that of relevant market factors."

Dispersion

The term dispersion appears less frequently in the writings than do the two preceding concepts. In introducing the term in this discussion, the main distinction to be made between it and decentralization is that decentralization emphasizes the geographical spreading out of an economic activity as a whole, either within the city, or between different parts of the metropolitan area, or on some other geographic base. Dispersion, on the other hand, involves the geographical spreading out of the different types of business or kinds of operations which are subdivisions of a class of economic activity as a whole, *viz.*, the geographical breakdown of different types of wholesale middlemen's operations relative to

[26] See the writers quoted in Hallenbeck, *op. cit.*, pp. 212–223.

total wholesale trade. Thus, if in this example, one were using the percentages of a metropolitan area's total wholesale sales accounted for by each city and "other places," dispersion could be measured in one way by comparing with these percentages the percentages for each type of wholesale middleman. A different way of looking at dispersion is to compare the relative diversification of establishments and sales for each economic activity by geographical breakdowns, either of the city or of the metropolitan area.

Another useful distinction, but one which will not be developed in this study, is to limit decentralization to geographical shifts taking place within a city, and to use dispersion to denote geographical shifts taking place between segments of the metropolitan area within the framework set forth above.

Both decentralization and dispersion carry with them relationships of importance to the spatial concept of the city and the metropolitan unit. These, in turn, are of key significance to the later study of transportation and parking in the bay area. Fundamental to these relationships is the idea first to spatial expansion of economic activities, due mainly to the necessity of servicing an increasing population. It implies the pressures placed upon existing land uses so that expansion becomes necessary merely to provide the necessary space for these activities. The second aspect of these relationships is the necessity of expanding the existing space used for various types of economic, social, political, and other activities, because of the expanding diversity and size of such activities and because of increasingly complex interrelationships between their functions.

TYPES OF CENTRALIZATION, DECENTRALIZATION, AND DISPERSION

Building upon the core of the variations of the concepts of centralization, decentralization, and dispersion discussed above, the following outline classifies the various types of each which are pertinent to this and related studies.

Outline of Types of Centralization, Decentralization, and Dispersion

I. *Types of Physical Centralization*
- A. *Over-all locational centralization:* measured by the percentage of a city's total activity in a given central district of the city; or the proportion of a metropolitan area's total activity in a given central city
  1. For each principal class of economic activity
  2. For each principal class of economic activity in relation to
     - a. population distribution
     - b. purchasing-power distribution
     - c. other relevant factors
- B. *Over-all functional centralization:* measured by the percentage of each city's type of functional activity in a given central district of the city relative to the percentage for the class of economic activity; or the percentage of each metropolitan area's type of functional activity in a given central city relative to the percentage for the class of economic activity
- C. *Intracity relocations*
  1. Manufacturing and wholesale trade
     - a. from secondary districts to the primary district
     - b. from smaller secondary districts to larger secondary districts
  2. Retail and service trades
     - a. from secondary shopping districts to central shopping districts
     - b. from smaller secondary shopping districts to larger secondary shopping districts
     - c. from string street locations to
       - (1) secondary shopping districts
       - (2) central shopping districts
- D. *Intercity relocations*
  1. Manufacturing and wholesale trade
     - a. from subcenter city's primary districts to central city's primary district
     - b. from subcenter city's smaller secondary districts to
       - (1) subcenter city's more important districts
       - (2) central city's secondary or primary district
     - c. from small subcenter city's districts to large subcenter city's districts
  2. Retail and service trades
     - a. from subcenter city's central shopping districts to
       - (1) central city's secondary shopping districts
       - (2) central city's central shopping district
     - b. from subcenter city's secondary shopping district to
       - (1) central city's secondary shopping districts
       - (2) central city's central shopping district
     - c. from smaller subcenter city's districts to larger subcenter city's districts
     - d. from unincorporated places to incorporated subcenter or central city districts

II. *Types of Centralization of Control*
- A. *Through direct internal centralization*
  1. Headquarters office control over branch plant, sales branch, or sales office policies and operations
  2. Central city retail store control over branch store policies and operations
  3. Headquarters chain store (or regional) control over unit store policies and operations
  4. Linkages between centralized location of executive offices and decentralized location of manufacturing, warehousing, or accounting facilities
- B. *Through direct intercompany formal controls*
  1. Direct ownership of subsidiaries or of diversified enterprises
  2. Financial control of subsidiaries or diversified enterprises
  3. Holding company control
  4. Interlocking directorate type of control
  5. Seller-middlemen relationships
     - a. involving passage of title
     - b. involving agency contractual arrangements
     - c. involving auxiliary functional relationships
     - d. involving central market arrangements
- C. *Indirect and informal types*
  1. Patent controls, patent pooling, cross-licensing, etc.

2. Cooperative integration: viz., buying pools, wholesaler-sponsored retail chains, cooperative marketing associations
3. Price maintenance arrangements
4. Leasing and servicing arrangements
5. Exclusive franchise arrangements for dealers
6. Marketing tactics; viz., full-line forcing
7. Credit control devices
8. Group control devices; viz., trade associations
9. Communication control; viz., advertising
10. Collusive devices, both extra-legal and illegal

III. *Types of Physical Decentralization*
- A. *Over-all measure:* percentages of a city's total economic activity located in outlying districts as compared with the central district; or the percentages of a metropolitan area's total economic activity located in subcenter cities and unincorporated places compared with the central city
  1. For each principal class of economic activity
  2. For each principal class of economic activity in relation to
     a. population distribution
     b. purchasing power distribution
     c. other relevant factors
- B. *Intracity relocations*
  1. Manufacturing and wholesale trade
     a. from the primary district to secondary districts
     b. from more important to less important secondary districts
     c. opening of branches in secondary districts by primary district establishments
  2. Retail and services trades
     a. from central shopping district to secondary shopping districts
     b. from the larger secondary shopping district to the smaller secondary shopping districts
     c. opening of branches in secondary shopping districts
        (1) by central shopping district establishments
        (2) by secondary shopping district establishments
- C. *Intercity relocations*
  1. Manufacturing and wholesale trade
     a. from the central city's primary district to:
        (1) subcenter city's primary district
        (2) subcenter city's secondary district
     b. from the central city's secondary district to:
        (1) subcenter city's primary district
        (2) subcenter city's secondary district
     c. from the central city's districts to unincorporated places
     d. from the larger subcenter city's districts to the smaller subcenter city's districts
     e. from subcenter cities' districts to unincorporated places
     f. opening of branches
        (1) in subcenter cities by central city establishment
        (2) in smaller subcenter cities by larger subcenter city establishments
        (3) in unincorporated places by central city and/or subcenter city establishments
  2. Retail and service trades
     a. from central city's central shopping districts to:
        (1) subcenter city's central shopping districts
        (2) subcenter city's secondary shopping districts
     b. from central city's secondary shopping districts to:
        (1) subcenter city's central shopping districts
        (2) subcenter city's secondary shopping districts
     c. from the central city's districts to unincorporated places
     d. from large subcenter city's districts to:
        (1) smaller subcenter city's districts
        (2) unincorporated places
     e. opening of branches
        (1) in subcenter cities by the central city's establishments
        (2) in smaller subcenter cities by larger subcenter city's establishments
        (3) in unincorporated places by central city and/or subcenter city establishments

IV. *Types of Physical Dispersion*
- A. *Over-all measure:* the percentages of each component type of economic activity located in the outlying districts of a city as against the central district, compared with the percentages for the class of economic activity as a whole; or the percentages of each component type of activity located in subcenter cities or unincorporated places as against the central city, compared with the percentages for the class of economic activity as a whole.
- B. *Intracity dispersion*
  1. Manufacturing and wholesale trade
     a. types of activity predominantly located in the larger secondary districts
     b. types of activity predominantly located in the smaller secondary districts
  2. Retail and services trades
     a. types of activity predominantly located in larger secondary shopping districts
     b. types of activity predominantly located in smaller secondary shopping districts
     c. types of activity predominantly located in string street locations
- C. *Intercity dispersion*
  1. Manufacturing and wholesale trade
     a. types of activity predominantly located in subcenter cities classified by population size
     b. types of activity predominantly located in unincorporated places
  2. Retail and services trades
     a. types of activity predominantly located in subcenter cities, classified by population size
     b. types of activity predominantly located in unincorporated places.

This outline reveals the many-sided nature of centralization, decentralization, and dispersion, both in physical and in managerial-control aspects. Not all of the types are of equal importance. This report will emphasize mainly the managerial-control aspects of centralization and the intercity forms of physical centralization, decentralization, and dispersion.

RELATIONSHIP OF CONCEPTS OF CENTRALIZATION, DECENTRALIZATION, AND DISPERSION TO LINKAGES

Building upon the many forms of centralization, decentralization, and dispersion outlined above, it is necessary to keep in mind how these both result from

and lead to the types of linkages discussed previously. Some of the linkages which result from purely physical aspects of decentralization and dispersion are fairly obvious. But it is from the nonphysical aspects that the variety and complexity of linkages stem.

The widening physical location of economic activities calls for a whole series of changes in the various business linkages by which necessary goods and services, various managerial decisions, and relationships between groups are created, extended, or maintained. But in addition to these business linkages, additional linkages must be provided for with governmental groups, union groups, various agencies of communication, and others. Old linkages may be eliminated or modified and new linkages evolved. The old linkages, through the groups involved, battle for maintenance of their previous level of importance or may change functions and membership in order to obtain new offsetting types of linkages.

A whole series of decisions involving varying combinations of groups precede the various forms of physical decentralization and dispersion outlined above. Once the physical manifestations have been forthcoming, then another series of group actions are generated which attempt, in time, to create offsetting types of linkages, such as have been noted. It is important to keep in mind that physical linkages, based on the types of physical centralization, decentralization, and dispersion noted above, involve a whole series of decisions and the accompanying communication linkages by which these decisions are executed and placed into operation. These create the need for all types of physical requirements, for spatial needs, for transportation, and for group organizations which serve as bases for linkages once again.

MEASUREMENT OF PHYSICAL CENTRALIZATION, DECENTRALIZATION, AND DISPERSION

General Considerations and Problems

Many of the difficulties involved in actually measuring each of these concepts arise, first of all, from problems connected with the measurement of the geographical unit to be used. The boundaries of many cities (and other units as well) may not remain stable during the period of the investigation. A shift, accordingly, in its percentage of an economic activity may reflect nothing more than such a change in its physical boundaries. Similarly, the variations in distances between cities may create difficulties, as can the selection of criteria for determining how to classify geographic units according to size.

The availability of detailed statistical data for cities, and for districts within the city, varies with the size of the city, the nature of the census data collected to meet each community's needs, and the number of business establishments involved, governing whether or not confidential data will be released. Thus, data of manufacturing activities or of wholesale trade by types of operation or kind of product are available for only a few larger cities in each metropolitan area. Similar variations exist even for data of retail trade. And with few exceptions, data for selected services trades, by detailed type, may be had only for 1948.

Changes in the concept of the metropolitan unit have led to changes in over-all boundaries in many cases from census period to census period. As a result, the analyst must decide whether to measure the needed relationships in terms of the most-recent boundaries or to use a variable boundary basis.

Other problems of changing definitions of each component kind of economic activity, and of coverage, as well as in degrees of accuracy, are fairly self apparent. They limit, of course, the degree of accuracy of findings based on such data and make necessary the introduction of qualitative restrictions.

Measurement of Centralization and Decentralization

Several methods may be utilized in the measurement of centralization and decentralization. The changing component percentages of each class of economic activity accounted for by the subdistricts of a city, or of each component geographic unit of a metropolitan area, may be compared over time in order to detect and analyze meaningful shifts. Further refinements may be introduced by computing: (a) ratios between these percentages and corresponding percentages of population, purchasing power, or other relevant market factors; (b) per-capita comparisons between each component geographic segment; and (c) square-mile relationships in order to compensate, in part, for changing boundaries.

A somewhat different picture may result from computing first the absolute changes in the level of the class of economic activity being studied between two or more periods by the component geographic units. Then, each unit's share of the total absolute change may be computed and the necessary conclusions formulated. If mixed patterns are found, a useful variation may be introduced by computing the percentages separately for those geographic units registering increases and those suffering losses.[27]

[27] A similar plan can be used for percentage data. The changes between the component percentages may be computed for each geographic unit for two or more time periods. Then, each geographic unit's proportion of the total change in percentage points may be computed for the group of units registering increases and another set for the group of units suffering declines. See: Ralph Cassady, Jr. and W. K. Bowden, "Shifting Trade Within the Los Angeles Metropolitan Area," *The Journal of Marketing*, VIII (April, 1944), 398–404.

Again, where data are available, comparisons of the type indicated may be computed by using concentric mileage zones, and comparing the percentages of sales, for example, in relation to percentages of population, by means of Lorenz curves.[28]

Finally, further valuable computations may be made, using any of these measures, by breaking down the analysis in terms of establishments, sales volume, employment, etc., and then making the necessary cross comparisons.[29]

The Measurement of Dispersion

Since the concept of dispersion is used in this study in a different sense, two measuring devices have been developed. The first method is to compute the percentages of each kind of business comprising a general class of economic activity for each component unit of the metropolitan area.[30] Thus, if retail trade is studied, the percentages may be computed for grocery stores, drug stores, department stores, and so on. These may then be compared with the geographic unit's corresponding percentage of the over-all class of economic activity. From these comparisons functional centralization or dispersion may be inferred (intracity or intercity) depending on the nature and size of the relationship. Thus, if the central shopping district in a city accounts for 20 percent of total retail sales for that city, but food stores in the same district account for but 3 percent, one may infer a high degree of dispersion. Conversely, if department stores in that district account for 75 percent, one may infer an exceptionally high degree of functional centralization for that type of store.

Further refinements may be introduced into this measurement method by comparing changes in these relationships over time. Meaningful conclusions may be reached, also, by comparing such relationships for a group of cities or metropolitan areas.

A second type of measurement may be developed by computing the proportion of the total economic activity accounted for by each component type of operation for each component geographic unit being studied. Relationships by subdistricts with the city as a whole, or for intercity comparisons within a metropolitan area, will reveal another aspect of the dispersion process in terms of the presence or absence of diversification. Additional meaningful comparisons, similar to those mentioned for the first method, may be had by analyzing changes over time and by making comparisons with other cities and other metropolitan areas.

San Francisco-Oakland Metropolitan Area

This section is designed to give a brief introduction to the various concepts and boundaries of the San Francisco-Oakland metropolitan area; the concepts and boundaries to be used in this study and the accompanying reasons; some of the predominant physical, economic, and population characteristics; and the relative importance of the area. It serves as a descriptive transition between the conceptual materials discussed before and the analyses which follow.

VARYING CONCEPTS OF THE METROPOLITAN AREA

As this report is being written, there exist three main concepts of the San Francisco-Oakland metropolitan area: the urbanized-area concept; the standard-metropolitan-area concept, consisting of six counties; and the nine-county concept. In addition, attention will be directed to other possibilities.

Urbanized-Area Concept

The urbanized-area concept was introduced in the 1950 United States Census of Population. In general, this urbanized area covers the most-densely populated segments (meeting the criteria defined earlier) of eight counties: (1) the western segment of Alameda County centering around San Francisco Bay and the adjoining waters; (2) that part of Contra Costa County containing segments bordering on San Francisco Bay and the adjoining waters; (3) that part of Marin County most-heavily populated and most accessible to San Francisco, and the East Bay cities of Richmond, Berkeley, Oakland, etc.; (4) a part of Napa township in Napa County; (5) the city and county of San Francisco; (6) the heavily-populated peninsula sections of San Mateo County; (7) parts of Fremont and Palo Alto townships in Santa Clara County; and (8) part of Vallejo township in Solano County. As of April 1, 1950, this urbanized area had 2,022,078 inhabitants.

Standard-Metropolitan-Area Concept

The second concept, and the concept to be used in this study for the reasons to be discussed later, is the standard-metropolitan-area concept of the United States Bureau of the Census. Under this concept, using the criteria already discussed, the San Francisco-

[28] Peters, *op. cit.*, pp. 293-294. A variation of this is contained in Bogue.
[29] A geometrical model developed by Peters may be noted.
[30] The same method may be used for the subdistricts of a city.

Oakland area consists of Alameda, Contra Costa, Marin, San Francisco, San Mateo, and Solano counties. These six counties contained 2,240,767 inhabitants as of April 1, 1950, or slightly more than 10 percent over the urbanized-area base.

Nine-County Concept

The nine-county concept is used mainly by various economic and governmental groups active in the area. It adds to the census' standard metropolitan area the counties of Napa, Santa Clara, and Sonoma. As a result of adding these counties, and with them, the San Jose standard metropolitan area, this nine-county area had a population of 2,681,322 persons as of April 1, 1950.

Other Concepts

There are other valuable metropolitan-unit concepts which should be noticed. One such concept would be the retail-trading area of the San Francisco-Oakland centers for shopping and specialty goods using Reilly's "law of retail gravitation," and additional research tools which have been developed. A second concept would involve a similar determination of the wholesale trading area based upon Fetter's "law of market areas" and additional research tools.

The boundaries of the metropolitan area can be delimited, also, by determining the circulation outreach of the principal San Francisco and Oakland newspapers in terms of whether or not they account for 50 percent or more of total newspaper circulation in a given geographic unit. Similarly, the broadcasting range of radio and television stations can be measured. Commuting patterns can be analyzed.

Problem of Changes in Boundaries over Time

It should be noticed that, no matter which of the above concepts of the metropolitan area is accepted and used, another problem arises. This problem concerns the question of how to determine and account for changes in boundaries over time as a metropolitan area may either expand or contract. So far as outward form is concerned, these time shifts are of two types: changes in the boundaries of the geographic units already included and changes in the actual geographic units to be included. The analysis in later sections will deal with some aspects of this problem of shifts in boundaries over time.

WHY USE THE SIX-COUNTY STANDARD METROPOLITAN AREA CONCEPT?

In view of the many alternative concepts of the San Francisco-Oakland metropolitan unit discussed, any choice of a single concept must be, of necessity, a compromise. This section outlines the principal reasons underlying the selection for this study of the standard-metropolitan-area concept. The reasons to be discussed group themselves into those working against the use of the urbanized-area and the nine-county concepts.

There are two fundamental reasons why the urbanized-area concept was not used, despite the fact that it incorporates, in many respects, the most-useful boundaries for purposes of this study. The first of these reasons is the inability to make comparable population analyses for census periods prior to 1950. The second reason is the impossibility of securing data of manufacturing, wholesale trade, retail trade, agriculture, and selected service-trade activities for such boundaries. Thus, if the urbanized-area concept were used, many of the types of analyses most useful to this report would be impossible to make. These reasons are sufficiently important, therefore, to justify the decision not to use the urbanized-area boundaries.

Why use the six-county standard-metropolitan-area concept as against the nine-county metropolitan area? The most-important single reason is that the criteria used for the standard-metropolitan-area concept have been codified by the Bureau of the Census and are known to all. No comparable set of criteria are known to the author to have been formulated for the nine-county concept. As a result of the existence of uniform criteria for standard metropolitan areas, the use of the six-county concept possesses the following additional advantages: (1) it represents a more-homogeneous geographical grouping than the nine-county concept; (2) it includes less agricultural activity not tied directly to San Francisco and Oakland; (3) it includes far fewer geographic segments with low population densities; and (4) it permits more-comparable relationships to be made with other metropolitan areas.

It must be admitted that even the six-county standard metropolitan area includes a broader geographic coverage than is needed. But the inability to secure data of economic activity on a finer geographical base makes it impossible to adjust the data. The greatest damage is probably to include too much agricultural activity, to include such cities as Antioch and Dixon, which probably are in the orbit of such other large centers as Sacramento and Stockton, and to include too much area for computing population densities and the like.

Because this study is interested mainly in comparing changes over time, the six-county area has been kept intact for all such comparisons. It is recognized, of course, that this overlooks the expansion in boundaries during the period covered.

PHYSICAL CHARACTERISTICS

Area

The San Francisco-Oakland standard metropolitan area[31] encompassed 3,314 sq. mi. of land area in 1950, distributed by counties as follows: Alameda, 733; Contra Costa, 734; Marin, 52; San Francisco, 45; San Mateo, 454; and Solano, 827. It is especially in the western coastal section of Marin County and in the eastern sections of Solano and Contra Costa counties that much area is included which does not have true metropolitan-area characteristics for purposes of this study.

Physical Shape and Topography

The San Francisco-Oakland metropolitan area is an irregularly shaped geographic unit. This is due in part to the nature of the Pacific coastline and in part to the breaking up of the area caused by the intrusion of San Francisco Bay and adjoining waters between the various counties (see Fig. 1). Except for the land immediately adjacent to these bodies of water and river valleys, the area is marked by hills and low mountain ranges which have slopes unsuited for ordinary economic activities. These are found even in the more-important cities, although they become useful here for homemakers desiring the benefits of elevation and view. Such slopes make it virtually impossible to locate any great amount of economic activity on their sides, even in the cities.

The physical separation of the metropolitan area caused by the water bodies is, of course, one of the principal characteristics affecting the location of cities and the movements of persons and goods within its boundaries. It has led to the bridging of the San Francisco Bay at certain places (see Fig. 1). An additional bridge has just been authorized for construction which will connect Richmond and San Rafael. Several plans exist for other bridges, and intense conflicts between local interests have created much division of opinion as to which should receive highest priority. A few ferries provide connections at present for automobiles and railroad passengers (traveling via the Southern Pacific and Western Pacific lines), and some lighterage of freight cars is done as well by these railroads terminating at East Bay points.

Weather Conditions

The following quotation summarizes the pertinent characteristics of the weather in the bay area:

> Although the influence of weather on the future distribution of industry within the Bay Area will probably be slight, a study of its pattern within the Bay Area may occasionally be useful, though seldom vital to an analysis of sites.
>
> As is generally known, the climate lacks violent extremes of temperature due to the moderating effect of prevailing ocean winds. This effect, of course, diminishes as one proceeds inland, with the result that (1) average annual temperatures rise, and (2) the range between maximums and minimums also increases. . . . The low isotherm (Average Annual Temperature, 56°) near the ocean is accompanied by a very narrow band, indicating a small range between the January Monthly Average Minimum of 45° and the July Monthly Average Maxmum of 65°. On the other hand, at Antioch, where the influence of ocean winds is less pronounced, we find an Average Annual Temperature of 60° and a range of 55° between Winter Minimums and Summer Maximums. . . .
>
> The numerous deviations . . . from the basic patterns (outlined above) reflect the Area's characteristic variety of climates within short distances. They are caused by gaps in the Coast Range allowing larger quantities of ocean air to pass through them elsewhere. Areas subject to an added moderating influence through these gaps are:
>
> (1) San Francisco and the East Bay Shore (from the Golden Gate)
> (2) The Bay-side of San Mateo County (from Colma Gap)
> (3) The North Bay Area (influenced by air currents traveling through Carquinez Straits into the Central Valley)
>
> . . . .
>
> Thus, although variety exists, it generally takes place well within the limits of worker comfort. Weather is therefore seldom a determining (location) factor.[32]

Water Factors

Because fresh water has to be supplied to the bay area users from distant mountain sources and because supply conditions have changed drastically, the supply and cost of water is an important factor.

Soil Factors

Because so much of the land suitable for economic use is located adjacent to bodies of water, construction on these sites may require preliminary piling. The necessity for making actual test borings and frequent requirements as indicated for some protection pilings need to be determined in every case. Where required, it follows that these facilities will serve to increase construction costs.

Many areas, closely adjacent to cities, have such quantities of high-grade soil useful for agricultural purposes that the agricultural use demand may be strongly competitive with industrial or business use purposes.

POPULATION CHARACTERISTICS

Since the next section explores certain phases of the bay area population since 1900 in detail, this section will deal mainly with a cross-sectional view of the current situation and with a comparison of the area with other metropolitan areas in California and the United States.

[31] The expression "bay area" will be used interchangeably with the San Francisco-Oakland standard metropolitan area.

[32] Robert P. Danielson, *A Guide to Industrial Locations in the San Francisco Bay Area* (San Francisco, Calif.: San Francisco Bay Area Council, 1951), p. 40.

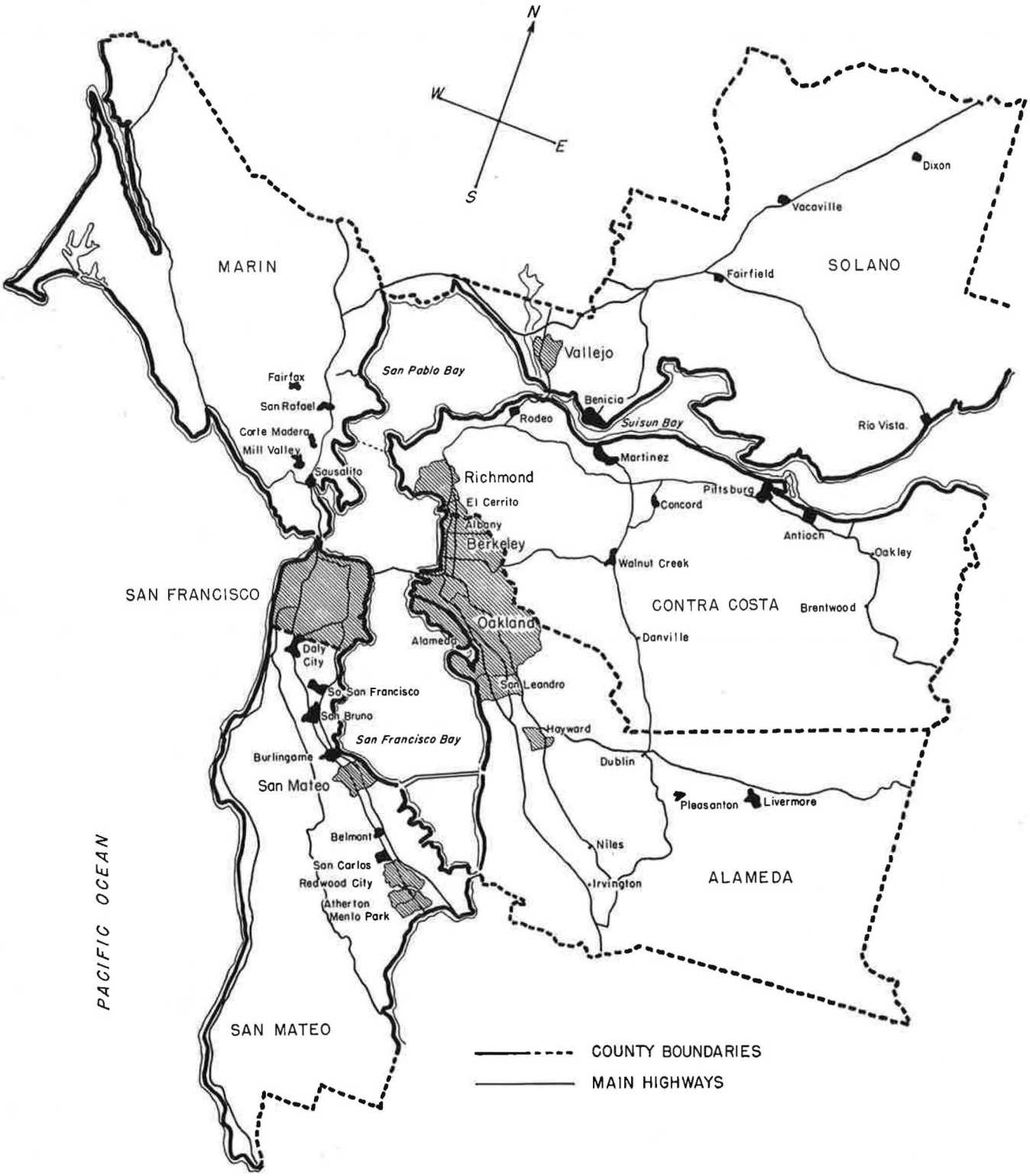

Figure 1. San Francisco-Oakland standard metropolitan area.

TABLE 5

TOTAL POPULATION OF THE SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES: APRIL 1, 1950 AND ESTIMATED DECEMBER 31, 1952

County	April 1, 1950		Dec. 31, 1952 (Est.)	
	Number	Percent	Number	Percent
Alameda	740,315	33.04	788,150	32.58
Contra Costa	298,984	13.34	335,400	13.87
Marin	85,619	3.82	96,300	3.98
San Francisco	775,357	34.60	800,000	33.08
San Mateo	235,659	10.52	283,000	11.70
Solano	104,833	4.68	115,800	4.79
Total	2,240,767	100.00	2,418,650	100.00

Source: 1950 data—*U. S. Census of Population: 1950;* 1952 estimates—Pacific Gas and Electric Co.

TABLE 6

SAN FRANCISCO-OAKLAND METROPOLITAN AREA POPULATION CLASSIFIED BY SIZE OF CITY: 1950

Population Group	Number of Places	Population	
		Number	Percent
1,000,000 or more	—	—	—
500,000 to 1,000,000	1	775,357	34.6
250,000 to 500,000	1	384,575	17.2
100,000 to 250,000	1	113,805	5.1
50,000 to 100,000	2	163,975	7.3
25,000 to 50,000	4	120,906	5.4
10,000 to 25,000	14	207,107	9.2
5,000 to 10,000	8	59,249	2.6
2,500 to 5,000	13	46,035	2.1
Under 2,500	17	25,565	1.1
Remainder of area	—	344,193	15.4
Total	61	2,240,767	100.0

Total Population

The distribution of the 1950 and 1952 population of the bay area, by counties, is shown in Table 5.[33] From this table it can be seen that the population distributes itself into three groups of counties. Alameda and San Francisco counties, containing the two central cities, account for nearly two out of every three persons. Contra Costa and San Mateo counties form a second level of importance having a combined total of about a fourth of the total. Solano and Marin counties are much lower in importance, together accounting for only about a twelfth of the total.

Rank in Importance

The San Francisco-Oakland metropolitan area ranks second in importance to the Los Angeles metropolitan area in population size within the State of California. As of April 1, 1950, the latter had 4,367,911 persons, nearly twice the number living in the bay area. Nationwide, the San Francisco-Oakland metropolitan area ranked seventh in importance in 1950, being surpassed only by New York, Northeastern New Jersey, Chicago, Los Angeles, Philadelphia, Detroit, and Boston.

So far as density of population per square mile is concerned, the bay area averaged 676 persons in 1950 compared with an over-all average of 407 persons for the 168 standard metropolitan areas. However, 36 areas had higher densities; the highest was Milwaukee with 3,645 persons per sq. mi. In California, the Los Angeles metropolitan area, with a land area 50 per cent higher than for the bay area, had a density of 900 persons per sq. mi.

Size of Cities

A breakdown of the 1950 census data of population for the bay area can be made for 61 incorporated and unincorporated places. These range in size from Colma with 297 persons, to San Francisco with 775,357 persons. Of this group, more than half (38 cities) each had fewer than 10,000 persons in 1950. Table 6 groups the 61 cities according to population size and shows the percentages for each group.

Viewed in terms of the classification in Table 6, it can be seen that the bay area consists of a nucleus of two central cities (one being twice as large as the other) accounting for over half of the total population; three subcenter cities totaling 277,780 persons; and four cities with a total of 120,906. These nine cities, containing 1,561,618 persons (nearly 70 percent of the metropolitan area total) are the key segment. It is to be expected, of course, that these nine cities will dominate most of the economic activities (except agriculture), and that the remaining 52 cities are subsidiary, both in population and economic activities. Such economic activities as are to be found in these subsidiary cities will be mainly those retail and services trade activities needed by the residents on a day-to-day basis and an occasional manufacturing activity or wholesale establishment of lesser importance. Indicating the nature of the times, will be found military establishments and related activities which may serve to build up the smaller cities' retail and services trade volume—or else to contribute to a city's manufacturing activities, as in the case of the naval shipbuilding and repair facilities at Mare Island adjacent to the cities of Vallejo and Benicia. San Francisco and Oakland also have such activities.

TRANSPORTATION CHARACTERISTICS

This section will be concerned only with those aspects of transportation affecting the metropolitan area as a whole. A more detailed analysis is presented

[33] See Table 14 for city breakdowns.

later. The discussion is subdivided by type of transportation agency.

Rail Transportation

The bay area is serviced by three transcontinental railroads and two intrastate roads. The three transcontinental railroads are the Santa Fe, the Southern Pacific, and the Western Pacific; and the two intrastate railroads are the Northwestern Pacific, connecting Marin County with northern California, and the Sacramento Northern, a freight-carrying railroad only, connecting Alameda County points with Sacramento and adjacent cities. These railroads perform, in addition to line movements, all necessary switching operations, except that in San Francisco, Oakland, Richmond, and Alameda there are special terminal switching lines. In addition to these facilities, the Key System operates interurban electric railway lines on five routes between San Francisco and selected sections of Berkeley, Oakland, and Piedmont.

The Southern Pacific Railroad provides, in addition to its longer passenger and freight hauls, regular commuting passenger-train service in the bay area between San Francisco and the suburbs in San Mateo County.

This report cannot discuss the complex freight-carrying activities of these agencies. It may be pointed out, however, that distances within the metropolitan area generally preclude the possibility of much rapid, economic shipment by rail. Freight rates covering movements to points outside the bay area vary with the city of origin and of destination for shipments within the Pacific Coast states, and to the mountain-states area up to roughly the Continental Divide. Beyond this breaking point, freight rates usually are equalized to and from all bay area cities. For less-than-carlot shipments, the freight rates quoted include truck pick-up and delivery within the geographic limits prescribed in the carriers' tariff.

Motor Transportation

So far as mass transportation is concerned, commuting service between the central cities of San Francisco and Oakland and the rest of the metropolitan area is provided by the following facilities:

1. *Routes to and from San Francisco*—(a) Pacific Greyhound buses serving cities in Marin, San Mateo, and Contra Costa counties and (b) Key System buses serving Oakland, Berkeley, Alameda, Albany, Richmond, San Leandro, and Hayward.

2. *Routes to and from Central Oakland*—(a) Pacific Greyhound buses to places in Alameda and Contra Costa counties; (b) Key System buses serving Berkeley, Alameda, Albany, Richmond, San Leandro, and Hayward; and (c) Peerless Stages buses to places in Alameda and San Mateo counties.

Water Transportation

Facilities for handling ocean-going freight vessels are maintained at San Francisco, Oakland, Richmond, Alameda, Redwood City, Pittsburg, and Antioch. Together with these port facilities, additional barge traffic is maintained at the following points: Fairfield Channel, San Rafael Creek, Newark Slough, Alviso Slough, Sausalito, Emeryville, Berkeley, and Castro Point. Danielson claims that these barges handle half as much tonnage as do the ocean-going vessels. The ocean-going vessels from San Francisco provide passenger service to many parts of the world.

Air Transportation

The bay area is serviced at present by 10 scheduled airlines, 27 nonscheduled airlines, and two air-freight lines. These link the San Francisco-Oakland metropolitan area with the leading airports in the United States and the rest of the world. Within the area are 23 usable airports operated by municipalities and private agencies. These do not include the restricted facilities under the control of the various branches of the armed services. While principally important for the transportation of persons, the civilian airlines are increasing regularly the volume of airborne freight. In some cases, as for fresh flowers, air transportation has made possible movement from the bay area's production points to an ever-widening group of markets.

ECONOMIC ACTIVITIES

The San Francisco-Oakland metropolitan area has, of course, a wide range of economic activities making up the agriculture, manufacturing, wholesale trade, retail trade, and selected service-trade categories. It is, with Los Angeles, the largest center of varied economic activity in the West. What is described here is merely the basic framework. Detailed patterns are discussed in the sections which follow.

It has been noted already that the bay area ranked seventh among the metropolitan areas of the United States, based on 1950 population data. For retail trade, based on 1948 data, it ranked sixth both in number of stores and in dollar sales. Comparable data of wholesale trade are available only for the merchant wholesaler group. The area ranked sixth both in number of establishments and sales.

For manufacturing activity, the picture is entirely different. In terms of number of establishments in 1947,

the area ranked seventh, or on a par with its population rank. So far as average number of employees is concerned, the area was thirteenth in 1947. In terms of value added by manufacture, the bay area ranked tenth.

What inferences may be drawn from these differences in rank importance for each broad category of economic activity? The most important would seem to be, first of all, the San Francisco-Oakland metropolitan area is a more-important marketing center than its population rank would indicate. This is related, in turn, to factors of differences in consumer purchasing power, number of tourists visiting the area, armed forces stationed in the area, etc. The second inference is that the area has not reached the same level of maturity and diversification in its manufacturing activities.

Related to these inferences, and as will be discussed later, the bay area, so far as manufacturing and wholesale trade activities are concerned, still reflects a situation in which many establishments are merely branches of companies located elsewhere in the United States. The result for manufacturing establishments is both a smaller size of establishment, dollarwise and employmentwise, and a lesser degree of diversification than for other important metropolitan centers. For wholesale trade, the result is a much-greater relative importance of manufacturers' sales branches and sales offices than is found for the United States as a whole.

The agriculture of the area is a resultant of the climatic, soil, and topographical features already discussed. It is a resultant, also, of the demand for dairy products, truck crops, and the like, generated by the population of San Francisco, Oakland, and other cities. And it is conditioned by the increasing competition of alternative uses of the land for urban purposes.

From the point of view of retail and service trades activities, the bay area has the usual varieties of stores handling shopping, specialty, and convenience goods, and establishments offering a wide range of repair, personal, amusement, and hotel and tourist-court (motel) services. The usual trading subcenters are found supplementary to San Francisco and Oakland. Such variations as are found are associated with a higher per-capita use of automobiles reflected in more automobile dealers and filling stations proportionately; the larger number per capita of restaurants in the cosmopolitan San Francisco center and the high per-capita demands for gardening equipment and various horticultural products associated with a high number of single-family homes and a year-round growing climate.

Shifts in the Geographic Distribution of Population

This section is concerned primarily with an analysis of the shifts which have taken place in geographic distribution of population in the bay area. Except for census-tract data for selected cities, the geographical units used throughout are the political boundaries of the cities and the six counties which constitute the metropolitan area. These political boundaries will be related, however, to changes in boundaries, as measured by square miles of land area, in order to correct for the growth accomplished through the annexation of adjoining incorporated and unincorporated places.

GROWTH IN TOTAL POPULATION

The much-publicized growth of population in the bay area is revealed in Table 7 in terms of its own data and relative to the changes in California and United States totals. The 1950 population, 2,240,767,

TABLE 7

COMPARISONS OF POPULATION GROWTH IN THE SAN FRANCISCO-OAKLAND METROPOLITAN AREA WITH CALIFORNIA AND THE UNITED STATES, BY DECADES, 1900–1950*

Year	San Francisco-Oakland Metropolitan Area				California		United States	
	Total Population	Percent Increase By Decades	Percent of California Total	Percent of United States Total	Total Population	Percent Increase By Decades	Total Population	Percent Increase By Decades
1900	542,964	—	36.56	0.71	1,485,053	—	75,994,575	—
1910	773,975	+42.5	32.55	0.84	2,377,549	+60.1	91,972,266	+21.0
1920	1,009,467	+30.4	29.46	0.95	3,426,861	+44.1	105,710,620	+14.9
1930	1,347,772	+33.5	23.74	1.10	5,677,251	+65.7	122,775,046	+16.1
1940	1,461,804	+8.5	21.16	1.11	6,907,387	+21.7	131,669,275	+7.2
1950	2,240,767	+53.3	21.17	1.49	10,586,223	+53.3	150,697,000	+14.5

* *Source:* Bureau of Census Reports.

TABLE 8

DISTRIBUTION OF SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES, BY DECADES, 1900–1950, IN DECLINING ORDER OF IMPORTANCE

County	Number of Persons						Percent of Total					
	1950	1940	1930	1920	1910	1900	1950	1940	1930	1920	1910	1900
San Francisco	775,357	634,536	634,394	506,676	416,912	342,782	34.60	43.41	47.07	50.19	53.87	63.13
Alameda	740,315	513,011	474,883	344,177	246,131	130,197	33.04	35.09	35.24	34.10	31.80	23.98
Contra Costa	298,984	100,450	78,608	53,889	31,674	18,046	13.34	6.87	5.83	5.34	4.09	3.32
San Mateo	235,659	111,782	77,405	36,781	26,585	12,094	10.52	7.65	5.74	3.64	3.43	2.23
Solano	104,833	49,118	40,834	40,602	27,559	24,143	4.68	3.36	3.03	4.02	3.56	4.45
Marin	85,619	52,907	41,648	27,342	25,114	15,702	3.82	3.62	3.09	2.71	3.25	2.89
Total	2,240,767	1,461,804	1,347,772	1,009,467	773,975	542,964	100.00	100.00	100.00	100.00	100.00	100.00

was more than four times larger than the population of 542,964 at the beginning of the century. The growth between 1940 and 1950 was by far the most rapid with the 1900-to-1910 growth second in terms of relative gains.

Relative to the state as a whole, Table 7 reveals that the area's increases did not keep pace until the 1940–1950 decade. In 1900 the bay area accounted for 36.56 percent of the state's population; by 1940 it accounted for only 21.16 percent. Between 1940 and 1950, however, population in the area expanded at exactly the rate for the state as a whole.

Compared to the United States, however, the population of the bay area has been increasing at a more-rapid rate. In 1950, the area had 1.49 percent of the United States total, compared with 0.71 percent in 1900. Thus, for the 50-year span, population in the bay area doubled in relative importance compared with the United States.

CHANGES IN COUNTY DISTRIBUTION

As has been pointed out earlier, all measurements of change in the metropolitan area have been based upon the number of counties making up its present boundaries.

When a metropolitan area has two urban centers as does the San Francisco Bay area, it may be expected that an analysis of the population distribution by counties will be highly skewed in the direction of the counties containing these centers. This is even more the case for the area under discussion when it is kept in mind that one of the counties, San Francisco, is identical in boundary with the city.

Table 8 shows the changes in the amounts of population and percentage distributions by counties in declining order of importance since 1900. A study of these data reveals immediately that there have been several stages in the pattern of population growth and shifts by counties. Despite sharp growth in absolute population, the most-important county, San Francisco, has failed to keep pace with the rate of expansion for the entire six-county area. Its percentage of the area's total has been nearly halved between 1900 and 1950 from 63.13 to 34.60. The greatest relative declines took place between 1900 and 1910 and between 1940 and 1950.

Although Alameda County, the next in importance, has only 35,000 fewer people now (1950) than has San Francisco, its population trend has shown two periods of change: from 1900 to 1910, a sharp relative growth followed by a smaller rate of growth between 1910 and 1930; and a small loss in relative importance between 1940 and 1950. In combination with San Francisco County, the two centers of the area now account for 67.6 percent of the total population as compared with 87.1 at the beginning of the century.

Two counties, Contra Costa and San Mateo, have had moderate growths in relative importance between 1900 and 1940, with the rate of growth higher for the latter county. But between 1940 and 1950, Contra Costa County nearly doubled its relative importance, while San Mateo County had approximately one half of that rate of change.

The remaining counties, Solano and Marin, have had considerably more-mixed patterns of change. Solano County is now only slightly more important percentagewise than it was in 1900. Between 1900 and 1940, it alternated decades of relative growth with decades of relative decline. Marin County, last in relative importance, was more important, relatively speaking, in 1950 than in 1900. But between 1900 and 1930, it had alternate periods of relative growth and decline.

All in all, as one looks at the county composition of bay area population between 1900 and 1950, it becomes apparent that although the two counties (San Francisco and Alameda) housing the largest cities have lost a considerable amount of their relative importance, they still account for slightly more than two out of every three persons in the area. The greatest expansion

of population away from these two centers, again relatively speaking, has been north and east into Contra Costa County, and south into the peninsula. Marin and Solano counties have yet to show any tremendous expansion of population relative to the area as a whole.

RELATIVE SHIFTS IN POPULATION BY PRINCIPAL CITIES

The discussion of shifts in population by counties is limited in usefulness because the county is primarily a political unit rather than an economic unit, and as such, too large for measuring meaningful shifts. The importance of the economic unit is better illustrated, although not completely so, by studying population shifts by cities without correction for change in physical size, and after correction for such changes.

Table A-1 (see Appendix A) measures the relative change in population in the principal cities of the metropolitan area arranged according to 1950 rank of importance, by city-size groupings. This table shows, also, the population contained in the remaining sections of each township in each county not accounted for by these cities. In studying these data, the reader is reminded once again that no correction has been made for changes in each city's physical size.

A comparison of the data for the cities shown in this table reveals immediately the inequalities of population growth in the different segments of the bay area between 1900 and 1950. As of 1950, population data compiled for 49 cities showed a range in size from 775,357 for San Francisco, 34.60 percent of the total, down to 800 for Belvedere, or 0.04 percent. These cities have been classified into six size groups on the basis of their 1950 population as follows: (1) 300,000 and over, 2 cities; (2) 75,000 to 299,999, 2 cities; (3) 25,000 to 74,999, 5 cities; (4) 10,000 to 19,999, 14 cities; (5) 5,000 to 9,999, 7 cities; and (6) under 5,000, 19 cities.

Because of the large differences in the population distribution, the first size group dominates the whole area, accounting for 51.76 percent of the 1950 total. San Francisco, although increasing in population, has had its relative importance nearly halved between 1900 and 1950 from 63.13 to 34.60 percent. Oakland, on the other hand, rose from 12.33 percent in 1900 to 21.43 percent in 1920. Between 1920 and 1940, there was a gradual decline and then, in 1950, a sharp decline to 17.16 percent.

The next size group, 75,000 to 299,999, contains Berkeley and Richmond, and accounted for 9.52 percent of the 1950 total, as compared with 2.43 percent in 1900. Richmond has had the most publicity as one of the fastest-growing cities. Not incorporated until 1905, it had 6,802 persons in 1910. By 1950, however, it had 99,545 persons or 4.44 percent of the total, with the largest increment of increase coming since 1940. Berkeley's importance rose steadily from 2.43 percent in 1900 to 6.09 percent in 1930; by 1950, however, it had declined to 5.08 percent.

The 25,000-to-74,999 group contains five cities, ranging in 1950 size from 25,544 for Redwood City to 64,430 for Alameda. The group as a whole accounted for 8.27 percent of the 1950 total as against 5.56 percent in 1900. Three cities—San Mateo, San Leandro, and Redwood City—have increased steadily in relative importance since 1900. Alameda declined from 3.03 percent in 1900 to 2.48 percent in 1940, but by 1950 had risen to 2.88 percent. Vallejo has had a bumpy trend. After a rise from 1.46 percent in 1910 to 2.09 percent in 1920, it declined to 1.19 percent in 1930, rose slightly to 1.37 percent in 1940, and then fell to 1.16 percent in 1950.

Fourteen cities in 1950 comprised the 10,000-to-19,999 group. As a group, they rose steadily from 1.19 percent of the 1900 total to 9.24 percent of the 1950 total. Eleven of these cities were not incorporated in 1900, and one city, San Pablo, was not incorporated at the time of the 1940 census. Of this group, all except San Rafael, Pittsburg, and Piedmont had steady increases in relative importance. This group represents one of the segments of the metropolitan area which has become urbanized as a result of incorporations and annexations since 1900.

The 5,000-to-9,999 group consisting of seven cities rose from 0.76 percent of the 1900 total to 2.40 percent in 1950. Only two of these cities, Martinez and Benicia were incorporated as of 1900. San Anselmo, Millbrae, Concord, and Belmont, have had increases in relative importance since their respective incorporation dates. Martinez reached a peak of relative importance in 1940; Mill Valley has been rather stable over the period; Benicia lost ground steadily between 1900 and 1940 but has since gained ground.

The final group of 19 cities, having fewer than 5,000 persons each, accounted for 1.80 percent of the 1900 total and only 2.22 percent of the 1950 total. Only eight of the group had increases in relative importance, and none of these increases were of any significance. The remaining 11 cities had mixed trends, and again no sharp shifts were registered. Nine of these cities were incorporated since 1900.

As a group, the 49 principal incorporated cities increased from 473,435 persons in 1900 to 1,868,664 persons in 1950. Relatively speaking, these cities rose from 87.20 percent of the 1900 total to 92.13 percent

of the 1920 total. Since that time their importance has declined to 83.41 percent of the 1950 total.

RELATIVE SHIFTS IN POPULATION BY "REMAINDER OF TOWNSHIPS"

The remainders of townships appearing in Table A-1 are arranged by counties and have been adjusted to the 1950 coverage basis as far as census data permit. Since the incorporated cities are carved from these townships, it may be expected that the remaining segments show sharp variations frequently. Listed, also, are those townships which have no incorporated cities. The discussion that follows is arranged by counties.

Alameda County

Eden township to the east and south of Oakland has had the most-rapid increase in its unincorporated areas from 5,112 to 73,789 between 1900 and 1950, and from 0.94 percent of the 1900 total to 3.29 percent of the 1950 total. This segment contains the fast-growing San Lorenzo Valley section, which will, in the near future, furnish the basis for a new incorporated city. Washington township, containing the unincorporated cities of Centerville, Decoto, Newark, and Niles, is also becoming the nucleus of an urbanized segment containing 0.76 percent of the 1950 total. The remaining townships have all lost ground as annexations to existing cities have sharply reduced the importance of the unincorporated parts.

Contra Costa County

Only four townships, Numbers 3, 6, 5, and 10, in order of importance, contain significant numbers of persons. Township 3 contains one of the fast-growing sections around Walnut Creek, including the unincorporated city of Saranap. In 1910, it accounted for only 0.17 percent, while in 1950 it had 1.10 percent of the area's total. Township 6 has the unincorporated sections developing around the city of Pittsburg, including Shell Point. Its growth is parallel to the growth of the unincorporated sections of Township 3. Township 5 centers around the city of Concord and includes the unincorporated cities of El Monte and Pleasant Hills. From only 0.20 percent of the 1910 total, its population has risen to 0.83 percent of the 1950 total. The remaining important township, Number 10, includes the unincorporated sections developing around the city of San Pablo, itself incorporated only in 1948. While the other townships are of lesser importance, it is interesting to note that most have unincorporated sections built around existing cities.

As a group, these unincorporated remainders of townships had 2.94 per cent of the 1900 population and 5.47 percent of the 1950 population.

Marin County

No sharp increases in relative importance characterize the unincorporated sections of the four townships in Marin County. As a group, they accounted for 1.80 percent of the 1900 total and 1.72 percent of the 1950 total. The most important of these unincorporated sections center around the existing incorporated cities found mainly in the southern part of Marin County directly north of San Francisco via the Golden Gate Bridge.

San Mateo County

The unincorporated sections of this county in the five townships have varied in importance from decade to decade, reaching 2.30 percent of the 1950 total. The bulk of this unincorporated group is found in Townships 3 and 1, clustering around such cities due south of San Francisco as Redwood City, South San Francisco, Daly City, and Menlo Park, to mention the more important.

Solano County

This county is the least-urbanized part of the bay area in terms of incorporated cities. The unincorporated sections of this county are found in 12 townships, but most of the population of these sections center around the City of Vallejo in the township of the same name. Much of this expansion is related to the expansion of government naval activities at the Mare Island shipyards. The other accumulation of any importance is found in Suisun township around the cities of Fairfield and Suisun. In this case the expansion is related to Air Force operations centering in these cities.

With nearly a sixth of the bay area's total population in 1950, the unincorporated sections of the townships in the above counties contain the nucleus of future incorporated cities and of annexations to existing incorporated cities.

ABSOLUTE SHIFTS IN POPULATION, BY PRINCIPAL CITIES, AND UNINCORPORATED REMAINDERS OF TOWNSHIPS, 1900–1950

The preceding discussion has emphasized geographical shifts in terms of shifts in relative importance. But this discussion did not emphasize that a failure of a city (or other unit) to increase in relative importance may conceal sizeable absolute population gains. To overcome this gap, the present discussion emphasizes these

absolute changes for the same city-size groupings and townships (see Table A-2 in Appendix A).

Viewing the metropolitan area as a whole, it is apparent that it has had a net gain of nearly 1.7 million persons between 1900 and 1950, and that nearly half of this absolute gain took place between 1940 and 1950 in response to World War II and postwar attractions. The next-largest absolute growth came during the prosperity period of the 1920–1930 decade. The depression of the 1930's, with its population movement back to the farms, served to reduce the amount of absolute gains.

City Patterns of Population Growth

The two largest cities in the area, San Francisco and Oakland, accounted for more than 44 percent of the net gain in population between 1900 and 1950. And even though these cities accounted for a larger part of the gains before 1930 than after, in the 1940–1950 decade they experienced a net gain of nearly a quarter million persons, or 28.7 percent of the area's total net gain. Over the five census periods, these two cities gained 750,000 persons.

Berkeley and Richmond in the next city-size group averaged 11.8 percent of the area's net gain over the 1900–1950 period. However, Berkeley's largest absolute gains took place between 1900–1910, 1920–1930, and 1940–1950.[34] Richmond, on the other hand, had three fourths of its present population added during the 1940–1950 decade.

For the five cities included in the 25,000-to-74,999 group, there was a net gain of 155,169 persons during the 50-year period, or 9.1 percent of the area's total net gain. Most of the population gain for these cities, except Vallejo, came, again during the 1940–1950 decade. Vallejo had its peak expansion between 1910 and 1920 and considerably less expansion in the 1940–50 period. It lost population in the 1920–30 period.

As a group, the 14 cities in the 10,000-to-19,999 size, gained over half of their 50-year growth in the 1940–50 decade. Individually, however, some of the 14 show sharp deviations. Albany, Burlingame, Piedmont, and Pittsburg, for example, gained more during the 1920–30 decade than during 1940–50. In some cases, the gains in the 1940–50 period represent more recent incorporation periods. Combined, the net gain of these cities between 1940 and 1950 accounted for about 13.4 percent of the total gain.

Three fifths of the total population increase in seven cities in the 5,000-to-9,999 size group came during the 1940–50 decade. Much of this was accounted for by the incorporation of Millbrae during that period. San Anselmo, Benicia, Concord, and Belmont also had substantial gains in that decade. Martinez, on the other hand, had most of its gains between 1910 and 1930, and Mill Valley gained more persons between 1900 and 1910 than between 1940 and 1950. Benicia, despite its large 1940–50 gain, lost population in the 1900–1910 and 1930–1940 decades. As a group, these cities accounted for 3.9 percent of the 1940–1950 net increase, and 2.9 percent of the 50-year gains.

The 19 cities comprising the under-5,000 group have had a less-impressive picture of gains, as their 1950 population size would indicate. As a group they gained a net of 39,813 persons during the 50-year period; 18,617 of these persons were gained in the 1940–50 period. This 1940–50 gain was only 2.4 percent of the total net increase.

It is apparent from this analysis that the largest cities of the bay area were still the most-attractive centers in terms of absolute increases in population, even between 1940 and 1950, although small centers have shown remarkable percentage gains. Of 563,171 persons gained by the 49 cities between 1940 and 1950, the four largest bay area cities accounted for 327,394 persons.

Patterns of Population Growth in Unincorporated Sections of Townships

The unincorporated sections of townships experienced a net increase in population of 302,574 persons between 1900 and 1950. Of this amount, 215,792 persons were accounted for in the 1940–50 growth period. In the analysis that follows, the growth patterns are analyzed by counties. The foregoing has emphasized the pattern of growth of these sections around existing incorporated cities.

The unincorporated townships of Contra Costa county have had the largest over-all gains, accounting for net increases of 106,629 persons over the period, with 77,842 coming during the 1940–50 decade. The four most-important townships in absolute gains, Numbers 3, 6, 5, and 10, are located around the county's most-important cities. It should be noted in passing, also, that several unincorporated sections of the townships have had declines in population, or very small gains, as the result of drainage of persons to the cities.

Alameda County, with a net gain of 72,740 persons in the unincorporated sections, ranked second in importance. Most of this gain followed the area pattern in taking place in the 1940–50 decade. And nearly all of the increase has taken place in Eden township to the

[34] Part of this decade's increase resulted from including university students, for the first time, in 1950.

east and south of the city population in East Oakland, Hayward, and San Leandro.

Solano County, with a net gain of 51,298 persons was third in importance. About 80 percent of this gain came in the last decade. And the great proportion of the gain is centered in the unincorporated parts of Vallejo township around the city of Vallejo.

Most of the increase of 43,139 persons in San Mateo County has come in the last two decades so far as the unincorporated sections are concerned. The long buildup of incorporated sections during the 1910–1920 decade caused an actual loss of population in the county's unincorporated sections. The gains in the unincorporated sections have been mainly in Township 3 (around the cities of Redwood City, Menlo Park, and Atherton), and in Township 1 (around the cities of South San Francisco, Daly City, and San Bruno).

The unincorporated parts of Marin County have lagged far behind with net gains of only 28,768 persons during the 50-year period. Better than half this gain came in the last 10 years. Most of these population gains have centered in the unincorporated sections around Mill Valley and Sausalito in Sausalito township; around San Rafael, San Anselmo, and the smaller cities of San Rafael township; and in Novato township in and around the unincorporated city of Novato.

These unincorporated sections have accounted for somewhat over a sixth of the net gain in bay area population over 50 years. But during 1940–50 these sections accounted for 215,592 persons out of a total net increase of 778,963, or almost a third.

INTRACITY POPULATION SHIFTS, 1940–1950

Census data for census tracts make it possible to analyze intracity population shifts between 1940 and 1950 for the following cities: San Francisco, Oakland, Berkeley, Richmond, Alameda, San Leandro, El Cerrito, and Albany. Tables A-3 to A-5 in Appendix A present the salient data.

San Francisco

This city was divided into 118 census tracts in 1950, which comprised 15 community areas and 28 retail-trading areas. Of this number of census tracts, 31 had actual declines in population between 1940 and 1950, while 96 had suffered declines in relative importance or had not changed their level. If the latter situation is studied, it becomes apparent that most of the drastic shifts of population on the growth side have been concentrated in relatively few census tracts.

If the areas showing the biggest absolute and relative gains are grouped by retail-trading areas, the data shown in Table 9 result. These areas of large population increases are in the southeastern part of San Francisco; in west San Francisco in the Sloat Boulevard development, just south of Golden Gate Park; in the north Van Ness Avenue area; in the Stonestown and Lake Merced areas of heavy apartment-building construction; and in south central San Francisco to the east of the Stonestown development.

TABLE 9

RETAIL TRADING AREAS IN SAN FRANCISCO ACCOUNTING FOR THE LARGEST POPULATION GAINS BETWEEN 1940 AND 1950*

Trading Area Number	Amount of Gain	Percent of Total Net Gain
5–1	37,395	26.55
14–2	21,081	14.97
14–1	15,999	11.36
5–2	12,979	9.22
9–1	8,743	6.21
15–2	8,158	5.80
6–1	7,524	5.35
15–3	5,635	4.01
Total.....	117,514	83.47

* *Source:* Appendix Table A-3.

Those retail-trading areas which have had declines in relative importance, or in which there have been actual population declines, are in the older sections of the city in the northeastern quarter; in part of the "South of Market Street" section; and in the central parts of the city. The great majority of these are older sections of the city and contain the older housing and retail shopping facilities.

Oakland

Oakland has 72 census tracts, and of this number, only seven had actual declines in population between 1940 and 1950 (see Table A-4). The magnitude of the intracity population shifts and growth is shown, also, in the fact that 47 of these census tracts have had varying losses in relative importance during the decade.

So far as patterns of gain are concerned, there is a sharp contrast with San Francisco. As Table A-4 (in the appendix) and Table 10 show, some 24 tracts have had the majority of the city's gain. These tracts are located both in the older sections of Oakland, particularly West Oakland, and in the newer developments in East Oakland. Thus, while the general pattern of urban expansion has been followed in that expansion has been rapid at the outskirts, the expansion of the older sections of Oakland is equally important. This latter expansion is tied to the location of military establishments in these older sections, the larger in-migration of Negroes, and the pattern of public housing developments.

TABLE 10

CENSUS TRACTS IN OAKLAND ACCOUNTING FOR THE LARGEST POPULATION GAINS BETWEEN 1940 AND 1950

Census Tract Numbers	Amount of Gain	Percent of Total Net Gain
14–18 (West Oakland)	17,300	20.99
21 (West Oakland)	5,231	6.35
7 (Northwest Oakland)	1,379	1.67
39–44 (Northeast Oakland)	8,422	10.22
56 (Southeast Oakland)	2,523	3.06
60–62 (Northeast Oakland)	6,969	8.46
66–72 (Southeast Oakland)	24,735	30.02
Total	66,559	80.77

Source: Appendix Table A-3.

Berkeley

Table A-5 (appendix) shows that better than a sixth of the city's net population gain of 28,258 persons took place in the Negro and other minority sections in West Berkeley. The census tracts around the University of California campus, the heaviest populated section of the city, gained three out of every ten added to the city.[35]

Most of the other important gains were also in older sections including Tract 2B (southwest Berkeley), Tract 3A (south of the university campus), and Tract 4E (the former site of the University of California Experimental Gardens in west central Berkeley). Of passing interest are the relatively small gains shown by the Berkeley Hills areas.

Richmond

Since Richmond gained a net amount of 75,903 persons between 1940 and 1950, all of its eight census tracts have increased. However, over 50,000 of this increase, 66.2 percent of the total net gain, was concentrated in two census tracts, CCC-6 and CCC-8 (see Table A-5). These are located nearby the industrial area of Richmond and include large public-housing and veteran-housing projects. They include as well the areas into which minority groups have been provided with housing. Another adjoining tract, CCC-3, accounted for 10.2 percent of the gain, while the hill areas of eastern Richmond have had an increase amounting to 16.3 percent of the total net gain.

Alameda

About 85 percent of this city's net growth between 1940 and 1950 took place in Tracts AC-10 and AC-11. These adjoin the large naval air station and include important public-housing projects.

[35] Part of this was due to change in census procedures whereby out-of-town students were counted as part of Berkeley's population in 1950.

San Leandro

With a net increase of 12,941 during the decade, 55.2 percent took place in Tract AC-20 on the southern limits of the city, while 22.7 percent took place in

TABLE 11

TOTAL NUMBER OF ANNEXATIONS BY CITIES OF THE SAN FRANCISCO-OAKLAND METROPOLITAN AREA, 1900–1948

County and City	Number of Annexations			
	Inhabited Area	Uninhabited Area	City or School	Total
Total, Metropolitan Area	99	111	10	220
Alameda				
Alameda	0	1	0	1
Albany	0	0	0	0
Berkeley	3	0	0	3
Emeryville	0	0	0	0
Hayward	2	5	1	8
Livermore	0	0	0	0
Oakland	1	1	1	3
Piedmont	0	0	0	0
Pleasanton	0	0	0	0
San Leandro	2	10	0	12
Total	8	17	2	27
Contra Costa				
Antioch	9	6	2	17
Concord	8	10	1	19
El Cerrito	2	0	0	2
Hercules	3	0	0	3
Martinez	12	5	0	17
Pinole	0	0	0	0
Pittsburg	8	6	2	16
(Black Diamond)	2	0	0	2
Richmond	5	1	0	6
Walnut Creek	0	1	0	1
Total	49	29	5	83
Marin				
Belvedere	0	0	0	0
Corte Madera	0	5	0	5
Fairfax	0	0	0	0
Larkspur	1	0	0	1
Mill Valley	3	0	1	4
Ross	1	2	0	3
San Anselmo	1	0	0	1
San Rafael	1	0	0	1
Sausalito	0	1	0	1
Total	7	8	1	16
San Francisco	0	0	0	0
San Mateo				
Atherton	3	0	0	3
Bayshore	0	0	0	0
Belmont	3	2	0	5
Burlingame	3	7	0	10
Colma	0	0	0	0
(Lawndale)	0	0	0	0
Daly City	2	1	0	3
Hillsborough	5	5	0	10
Menlo Park	0	10	1	11
Redwood City	3	10	0	13
San Bruno	0	5	0	5
San Carlos	3	1	0	4
San Mateo	8	4	0	12
South San Francisco	1	6	0	7
Total	31	51	1	83

TABLE 11—*Concluded*

County and City	Number of Annexations			
	Inhabited Area	Uninhabited Area	City or School	Total
Solano				
Benicia	0	0	0	0
Dixon	0	0	1	1
Fairfield	1	1	0	2
Rio Vista	0	0	0	0
Suisun City	0	0	0	0
Vacaville	2	2	0	4
Vallejo	1	3	0	4
Total	4	6	1	11

Source: Bollens, John C. *The Problem of Government in the San Francisco Bay Region*, Bureau of Public Administration, University of California. Berkeley, Calif.: University of California Press, 1948, pp. 62–63.

AC-17 on the northeastern sections. They represent the rapid annexations of previously uninhabited areas to the city's corporate boundaries as they become subdivided and inhabited.

El Cerrito

With a total net gain of 11,874 persons, all of the city's four census tracts have had significant increases. The largest has taken place in Tract CCC-10 adjoining the fastest-growing sections of Richmond.

Albany

Four out of every five persons added to Albany's population between 1940 and 1950 located in Census Tract AC-5 adjoining San Francisco Bay. This section of Albany includes the section in which much housing has been provided for minority and veteran groups.

In summary it may be said that the principal cities of the area have expanded by: building up existing, well-populated areas, particularly where special military or industrial establishments and minority and veteran housing are involved and by following the usual city pattern of building up the outlying, less-populated sections.

DENSITY OF POPULATION DISTRIBUTION

Because many of the cities of the bay area, unlike many cities in the eastern states, have high proportions of land zoned for residential use devoted to one-family or two-family dwelling units, sharp variations in the distribution of population per square mile may be expected. In addition, this characteristic coupled with the large population increases noted above, have led to widespread expansions of the physical size of incorporated cities through the annexation of surrounding lands in previously unincorporated sections.

General Nature of Annexations

The general pattern of annexations between 1900 and 1948 is shown in Table 11 for the principal cities of the bay area. While data were not available to indicate the acreage or mileage of the annexations, the mere number are, of themselves, quite significant, particularly when related to the preceding discussion of geographic shifts and expansion of population for the principal cities.

Thus, for the metropolitan area as a whole, there were 220 annexations, with a slightly higher number consisting of uninhabited as against inhabited areas. When this is broken down by counties, it is found that the two counties showing the sharpest relative gains in population, Contra Costa and San Mateo, have tied for the largest number of annexations with 83 for each. As broken down by cities, however, there is not always any positive correlation between the fastest-growing cities and the number of annexations, although many of this group do have high numbers of annexations. But some cities would have had larger relative declines, or else would not have maintained stability, without such annexations.

TABLE 12

DENSITY OF BAY AREA POPULATION, BY COUNTIES, 1930, 1940, AND 1950

County	1950			1940			1930		
	Population	Area (Sq. Mi.)	Population Per Square Mile	Population	Area (Sq. Mi.)	Population Per Square Mile	Population	Area (Sq. Mi.)	Population Per Square Mile
Alameda	740,315	733	1,010.0	513,011	733	699.9	474,883	732	648.7
Contra Costa	298,984	734	407.3	100,450	734	136.9	78,608	714	101.0
Marin	85,619	521	164.3	52,907	521	101.5	41,648	529	78.7
San Francisco	775,357	45	17,230.2	634,536	45	14,130.8	634,394	42	15,104.6
San Mateo	235,659	454	519.1	111,782	454	246.2	77,405	447	173.2
Solano	104,833	827	126.8	49,118	827	59.4	40,834	822	49.7
Bay Area Total	2,240,767	3,314	676.2	1,461,804	3,314	441.1	1,347,772	3,286	410.2
State of California	10,586,233	156,740	67.5	6,907,387	156,740	44.1	5,677,251	156,740	36.2

Alameda County ranks third in annexations with 27. In this case, the fast-growing Castro Valley cities, Hayward and San Leandro, account for 20 of the 27 annexations. Marin County has had 16 annexations with slightly less than half in the cities of Mill Valley and Ross. Solano County has had only 11 annexations, mainly in the cities of Vallejo and Vacaville.

TABLE 13
POPULATION PER SQUARE MILE FOR PRINCIPAL CITIES, BY COUNTIES, IN 1940

County and City	1940 Population	Area (Sq. Mi.)	Population per Square Mile
Alameda			
Alameda	36,256	6.5	5,577.9
Albany	11,493	1.6	7,183.2
Berkeley	85,547	9.4	9,100.8
Emeryville	2,521	1.0	2,521.0
Hayward	6,736	1.9	3,545.3
Livermore	2,885	1.6	1,803.1
Oakland	302,163	52.8	5,722.8
Piedmont	9,866	1.8	5,481.1
Pleasanton	1,278	1.0	1,278.0
San Leandro	14,601	2.6	5,615.8
Remainder	39,665	650.2	61.0
Contra Costa			
Antioch	5,106	1.1	4,641.8
Concord	1,373	0.3	4,576.7
El Cerrito	6,137	3.3	1,859.6
Martinez	7,381	1.3	5,677.7
Pittsburg	9,520	1.0	9,520.0
Richmond	23,642	13.2	1,791.1
Walnut Creek	1,578	0.6	2,630.0
Remainder	45,713	713.2	64.1
Marin			
Corte Madera	1,098	0.7	1,568.6
Fairfax	2,198	5.0	439.6
Larkspur	1,558	3.0	519.3
Mill Valley	4,847	2.3	2,107.4
Ross	1,751	1.5	1,167.3
San Anselmo	5,790	2.0	2,895.0
San Rafael	8,573	5.4	1,587.6
Sausalito	3,540	1.5	2,360.0
Remainder	23,652	499.6	47.3
San Francisco	634,536	44.6	14,227.3
San Mateo			
Atherton	1,908	4.5	424.0
Belmont	1,229	2.6	472.7
Burlingame	15,940	2.2	7,245.5
Daly City	9,625	1.2	8,020.8
Hillsborough	2,747	5.8	473.6
Menlo Park	3,258	1.2	2,915.0
Redwood City	12,453	4.5	2,767.3
San Bruno	6,519	1.8	3,621.7
San Carlos	3,520	2.6	1,353.8
San Mateo	19,403	7.1	2,732.8
South San Francisco	6,629	5.0	1,325.8
Remainder	28,551	415.5	68.7
Solano			
Benicia	2,419	3.1	780.3
Dixon	1,108	0.3	3,693.3
Fairfield	1,312	0.2	6,560.0
Rio Vista	1,666	3.0	555.3
Vacaville	1,614	0.7	2,305.7
Vallejo	20,072	4.8	4,181.7
Remainder	20,927	814.9	25.7

It is interesting to note that of the 49 cities for which the annexation data are given, about a third have had no annexations between 1900 and 1948. This includes San Francisco and probably helps to explain why it has lost much relative importance. An additional seven cities have had only one annexation.

Square-Mile Densities of Population Distribution

With sharp variations in the area of each of the counties and cities, wide ranges may be expected in the density of population in different parts of the metropolitan area. Table 12 shows the range, by counties, for 1930, 1940, and 1950. San Francisco, because of its small physical area, dominates the San Francisco Bay area with a density per square mile several times larger than the next county in rank, Alameda. These

TABLE 14
ESTIMATED POPULATION IN THE SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES AND PRINCIPAL CITIES, AS OF JANUARY 1, 1952 AND 1950

Counties and Cities	Population (4/1/50)		Population (1/1/52)*	
	Number (Thousands)	Percent of Total	Number (Thousands)	Percent of Total
Alameda	*740.3*	*33.04*	*776.7*	*32.82*
Oakland	384.6	17.16	395.8	16.72
Berkeley	113.8	5.08	117.8	4.98
Alameda	64.4	2.88	67.1	2.84
Hayward	14.3	0.64	15.1	0.64
San Leandro	27.5	1.23	29.1	1.23
Albany	17.6	0.78	18.5	0.78
Remainder	118.1	5.27	133.3	5.63
Contra Costa	*299.0*	*13.34*	*331.7*	*14.02*
Richmond	99.5	4.44	110.7	4.68
Pittsburg	12.8	0.57	13.5	0.57
Martinez	8.3	0.37	9.0	0.38
El Cerrito	18.0	0.80	21.9	0.93
Antioch	11.1	0.49	13.3	0.56
Remainder	149.3	6.67	163.3	6.90
Marin	*85.6*	*3.82*	*91.8*	*3.88*
San Rafael	13.8	0.62	14.9	0.63
Remainder	71.8	3.20	76.9	3.25
San Francisco	*775.4*	*34.60*	*786.8*	*33.25*
San Mateo	*235.7*	*10.52*	*263.9*	*11.14*
San Mateo	41.8	1.86	46.8	1.98
Burlingame	19.9	0.89	21.2	0.90
Redwood City	25.5	1.14	28.6	1.21
Daly City	15.2	0.68	17.0	0.72
San Bruno	12.5	0.56	14.0	0.59
San Carlos	14.4	0.64	16.2	0.68
South San Francisco	19.4	0.86	21.7	0.92
Remainder	87.0	3.89	98.4	4.14
Solano	*104.8*	*4.68*	*115.7*	*4.89*
Vallejo	26.0	1.16	26.6	1.12
Remainder	78.8	3.52	89.1	3.77
Total, Metropolitan Area	*2,240.8*	*100.00*	*2,366.6*	*100.00*

* *Source: Sales Management* Magazine, *Survey of Buying Power*, May 10, 1952. Copyright 1952; further reproduction not licensed.

two counties, then, make up the hard core of the metropolitan area in terms of population density. San Mateo and Contra Costa counties represent second levels of density far below these two levels. Marin and Solano have densities far below the average for the whole metropolitan area. As might be expected, the counties with the smaller density have had the greatest relative increases between 1930 and 1950.

Data are available to show density of population for each of the principal cities in 1940 (see Table 13). The range is from 424 persons per sq. mi. for Atherton to 14,227 persons per sq. mi. for San Francisco. Pittsburg had the second-highest density with 9,520 persons per sq. mi. followed by Berkeley with 9,101. Three cities each had between 7,100 and 8,100 persons per sq. mi.; one city had 6,560; five cities had 5,000–6,000; three cities had 4,000–5,000; three cities had 3,000–4,000; nine cities had 2,000–3,000; and nine cities had 1,000–2,000. Only seven cities had fewer than 1,000 persons per sq. mi. While changes have taken place in 1950, the general configurations in 1940 give some idea of the urban density patterns.

The remainder of the counties show sparse distribution ranging from 25.7 persons per sq. mi. for Solano County to 68.7 for San Mateo County.

ADDITIONAL GEOGRAPHIC SHIFTS, 1950–1952

By using the estimates of *Sales Management* magazine, it is possible to discuss geographic shifts of population between April 1, 1950, and January 1, 1952, for the six counties and principal cities of the bay area. Keeping in mind that the 1952 data are estimates, Table 14 shows that San Francisco and Oakland have continued to lose ground relatively, although the rate of decline is lower and both have had sizeable absolute gains in population. In addition, Berkeley, Alameda, and Vallejo also had small declines in relative importance. Seven cities—Hayward, San Leandro, Albany, Pittsburg, Martinez, San Rafael, and Burlingame—have had no change in relative importance.

Richmond continues to gain in relative importance. Other gains were registered for Martinez, El Cerrito, Antioch, San Mateo, Redwood City, Daly City, San Bruno, San Carlos, and South San Francisco. The smaller cities and unincorporated areas of each county, when considered in total, all registered increases in relative importance, with the largest gain accounted for by the group in Alameda County.

Based upon these data, the bay area gained a net amount of 125,800 persons for the period. By counties, in order of size of gain, the gains were; Alameda (36,400), Contra Costa (32,700), San Mateo (28,200), San Francisco (11,400), Solano (10,900), and Marin (6,200). For the principal cities, San Francisco had the largest absolute gain, followed closely by Oakland and Richmond. These three cities together accounted for about a fourth of the net gain. With the exception of Marin County, the smaller cities and unincorporated areas considered as a group had important absolute gains in each county. This group in Alameda had the largest gain, followed by Contra Costa, San Mateo, Solano, and Marin. Together, these groups accounted for nearly 45 percent of the net gain.

Shifts in the Geographic Distribution of Manufactures

This section traces shifts in the geographic distribution of manufacturing activity in the San Francisco-Oakland metropolitan area for selected years from 1919 to 1950. The data used are primarily from the *Census of Manufactures*, to which have been added, for 1949 and 1950, data from *County Business Patterns* issued by the United States Department of Commerce.

OVERALL IMPORTANCE OF METROPOLITAN AREA

Relative to California as a whole, the area has lost ground steadily since 1919 (see Table 15). In number of manufacturing establishments, the area had 35.5 percent of the 1919 total, 30.8 percent of the 1935 total, and 20.8 percent of the 1947 total. Since 1947, the area has had about one fifth of the state's manufacturing establishments. Similarly, the area declined in employment from 45.2 percent of the 1919 total for the state to 22.1 percent in 1950. And, in terms of value added by manufactures, the decline was from 39.4 percent of the state total in 1929 to 26.3 percent in 1947.

Compared with the United States, the bay area rose from 1.35 percent of the establishments in 1919, to 2.07 percent in 1931, and then declined to 1.48 percent in 1949, and about the same share in 1950. The area's percentage of employment was 1.26 percent in 1919, 1.13 percent in 1929, 0.97 percent in 1939, and 1.05 percent in 1950. In value added, the bay area had 1.53 percent of the 1929 total, 1.68 percent of the 1931 total, and then fell to a low for the period of 1.41 percent in 1947.

TABLE 15

NUMBER OF MANUFACTURING ESTABLISHMENTS, AVERAGE NUMBER OF WAGE EARNERS, AND VALUE ADDED BY MANUFACTURES: SAN FRANCISCO-OAKLAND METROPOLITAN AREA, CALIFORNIA, AND THE UNITED STATES; SELECTED YEARS, 1919 TO 1950

Item and Year	San Francisco-Oakland Area				California		United States	
	Amount	Percent Change	Percent of California	Percent of United States	Amount	Percent Change	Amount	Percent Change
Number of manufacturing establishments								
1919	3,651	—	35.51	1.35	10,282	—	270,231	—
1929	3,952	+8.2	32.88	1.91	12,019	+16.9	206,663	−23.5
1931	3,543	−10.4	35.25	2.07	10,050	−16.4	171,450	−17.0
1933	2,680	−24.4	31.79	1.92	8,429	−16.1	139,325	−18.7
1935	3,183	+18.8	30.77	1.90	10,345	+22.7	167,916	+20.5
1937	3,299	+3.6	30.37	1.98	10,861	+5.0	166,794	−0.7
1939	3,213	−2.6	27.80	1.85	11,558	+6.4	173,802	+4.2
1947	3,671	+14.3	20.80	1.52	17,648	+52.7	240,881	+38.6
1949 (1st Quarter)	4,077	+11.1	19.85	1.48	20,538	+16.4	274,890	+14.1
1950 (1st Quarter)	3,937	−3.4	20.03	1.49	19,653	−4.3	264,904	−3.6
Average number of wage earners								
1919	107,080	—	45.19	1.26	236,932	—	8,464,916	—
1929	94,669	−11.6	32.54	1.13	290,911	+22.8	8,369,705	−1.1
1931	71,273	−24.8	34.75	1.16	205,126	−29.5	6,163,144	−26.4
1933	67,041	−5.9	34.94	1.16	191,861	−6.5	5,787,611	−6.1
1935	79,634	+18.8	33.31	1.11	239,101	+24.6	7,203,794	+24.5
1937	89,303	+12.1	29.56	1.04	302,189	+26.4	8,569,231	+19.0
1939	76,044	−14.8	28.03	0.97	271,290	−10.2	7,808,205	−9.9
1947	131,161	+72.5	24.73	1.10	530,283	+95.5	11,916,188	+52.6
1949 (Mid-March)	152,807	+16.5	23.09	1.07	661,875	+24.8	14,324,846	+20.2
1950 (Mid-March)	147,251	−3.6	22.05	1.05	667,686	+0.9	14,008,322	−2.2
Value added by manufactures (thousand dollars)								
1919	N.A.	—	—	—	742,493	—	23,841,624	—
1929	467,044	—	34.62	1.53	1,349,191	+81.7	30,591,435	+28.3
1931	311,987	−33.2	39.44	1.68	791,123	−41.4	18,600,532	−40.2
1933	234,263	−24.9	38.44	1.67	609,381	−23.0	14,007,540	−24.7
1935	298,894	+27.6	36.99	1.61	808,130	+32.6	18,552,553	+32.4
1937	361,596	+21.0	33.13	1.44	1,091,597	+35.1	25,173,539	+35.7
1939	361,966	+0.1	32.25	1.48	1,122,545	+2.8	24,487,304	−2.7
1947	1,049,490	+71.1	26.27	1.41	3,994,981	+255.9	74,425,825	+203.9
1949	N.A.	—	—	—	4,168,034	+4.3	75,366,527	+1.3
1950	N.A.	—	—	—	5,120,976	+22.9	89,675,779	+19.0

Source: 1919–1947 data from *Census of Manufactures*, U. S. Dept. of Commerce. 1949–1950 data from *County Business Patterns*, U. S. Dept. of Commerce.

CHANGES IN COUNTY DISTRIBUTION

Data are available biennially from 1929 to 1939, and for 1947 to measure geographic shifts, by counties, for the value added by manufacture. In addition to these time periods, data of the number of manufacturing establishments and of average number of wage earners are available for 1919, 1949 and 1950 (see Table 16).

Changes in Number of Manufacturing Establishments

San Francisco dominates the metropolitan area in the number of manufacturing establishments. Between 1919 and 1939, it accounted for 61.5 to 64.6 percent of the total. By 1947, however, its share had fallen to 54.2 percent, with a slight recovery in 1949 and 1950. In absolute terms, it had 196 fewer establishments in 1950 than in 1919.

Second in importance is Alameda County. Its proportion of the metropolitan area total rose from 24 percent in 1919 to 29.3 percent in 1935. By 1939, however, it had declined to 27.8 percent, and then rose to an over-all peak of 32.3 percent in 1947. It has since declined, relatively, accounting for only 31.2 percent in 1950. As of the first quarter of 1950, it had 354 more manufacturing establishments than in 1919. These data and those which follow in this chapter show that Alameda County is a much stronger competitor to San Francisco in the area of manufactures than for any of the other economic activities analyzed, or for population. Together, these two metropolitan counties had 88.6 percent of the bay area manufacturing establishments in 1919, 91 percent of the 1939 total, and 86.2 percent of the 1947 total.

The remaining counties, obviously, are of much-less importance. Within this group, however, San Mateo

TABLE 16

NUMBER OF ESTABLISHMENTS, AVERAGE NUMBER OF WAGE EARNERS, AND VALUE ADDED BY MANUFACTURES SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES; SELECTED YEARS, 1919–1950

Item and Year	Alameda		Contra Costa		Marin		San Francisco		San Mateo		Solano		Total	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Number of establishments														
1919	875	23.97	163	4.46	66	1.81	2,360	64.64	117	3.20	70	1.92	3,651	100
1929	1,116	28.24	113	2.86	50	1.27	2,526	63.91	98	2.48	49	1.24	3,952	100
1931	999	28.18	108	3.05	38	1.07	2,263	63.83	97	2.74	40	1.13	3,545	100
1933	763	28.47	82	3.06	30	1.12	1,698	63.35	76	2.84	31	1.16	2,680	100
1935	931	29.25	120	3.77	37	1.16	1,959	61.54	95	2.99	41	1.29	3,183	100
1937	959	29.07	120	3.64	47	1.43	2,030	61.53	105	3.18	38	1.15	3,299	100
1939	893	27.79	115	3.58	42	1.31	2,032	63.24	97	3.02	34	1.06	3,213	100
1947	1,186	32.31	168	4.58	57	1.55	1,990	54.21	228	6.21	42	1.14	3,671	100
1949‡	1,293	31.71	200	4.90	63	1.54	2,233	54.77	240	5.90	48	1.18	4,077	100
1950‡	1,229	31.22	201	5.11	57	1.45	2,164	54.96	242	6.14	44	1.12	3,937	100
Average no. of wage earners														
1919	35,909	33.53	13,434	12.55	583	0.54	48,550	45.34	6,837	6.39	1,767	1.65	107,080	100
1929	30,711	32.44	13,029	13.76	785	0.84	45,482	48.04	3,790	4.00	872	0.92	94,669	100
1931	21,053	29.54	11,507	16.14	450	0.63	34,502	48.41	3,056	4.29	705	0.99	71,273	100
1933	19,837	29.59	11,809	17.61	342	0.51	30,996	46.23	3,329	4.97	728	1.09	67,041	100
1935	25,893	32.51	14,057	17.65	339	0.43	34,399	43.20	4,002	5.02	944	1.19	79,634	100
1937	30,031	33.63	14,696	16.46	365	0.41	39,082	43.76	4,241	4.75	888	0.99	89,303	100
1939	26,846	35.30	13,316	17.51	253	0.33	31,440	41.35	3,447	4.53	742	0.98	76,044	100
1947	54,038	41.20	20,089	15.32	594	0.45	47,781	36.43	7,652	5.83	1,007	0.77	131,161	100
1949*	51,657	33.80	26,337	17.24	507	0.33	63,803	41.75	9,224	6.04	1,279	0.84	152,807	100
1950*	50,240	34.12	26,111	17.73	641	0.44	60,464	41.06	8,640	5.87	1,155	0.78	147,251	100
Value added by manufacture†														
1929	152,242	32.60	70,116	15.01	2,642	0.57	221,801	47.49	16,258	3.48	3,985	0.85	467,044	100
1931	86,556	27.74	49,796	15.96	1,216	0.39	158,465	50.79	12,968	4.16	2,986	0.96	311,987	100
1933	66,598	28.43	46,776	19.97	753	0.32	107,641	45.95	10,260	4.38	2,235	0.95	234,263	100
1935	92,296	30.88	60,977	20.40	942	0.31	128,033	42.84	12,632	4.23	4,014	1.34	298,894	100
1937	118,465	32.76	73,147	20.23	1,191	0.33	146,955	40.64	17,064	4.72	4,774	1.32	361,596	100
1939	122,020	33.71	81,457	22.50	1,142	0.32	136,843	37.81	15,175	4.19	5,329	1.47	361,966	100
1947	409,206	38.99	155,142	14.78	3,333	0.32	410,326	39.10	60,228	5.74	11,255	1.07	1,049,490	100

Source: Census of Manufactures, and *County Business Patterns*, Department of Commerce.
* Employment as of Mid-March for years shown.
† In thousands of dollars.
‡ First quarter.

and Contra Costa counties rank far ahead of Marin and Solano counties. Between 1919 and 1939, San Mateo County had 2.5 to 3.2 percent; by 1947, its share had risen to 6.2 percent, and in 1950, it was 6.1 percent. Its establishments more than doubled in number. Contra Costa County had 4.5 percent of the 1919 total, reached a low point in 1929 of 2.9 percent, and then returned to the 1919 level in 1947. By 1950, a new peak of 5.1 percent had been reached. Marin County has fluctuated between 1.1 and 1.8 percent, while Solano County has been stabilized in the 1929–1950 period at 1.1 to 1.3 percent, after accounting for 1.9 percent in 1919.

Changes in Average Numbers of Wage Earners

With the exception of 1947, San Francisco ranked first in importance in number of wage earners. This county rose from 45.3 percent of the 1919 total to 48.4 percent in 1931. After that year, it declined to 41.3 percent in 1939 and 36.4 percent in 1947. In 1949 and 1950, another reversal increased its share to 41.8 and 41.1 percent, respectively. The absolute level of employment in these years set new records for the period. However, the county does not account for as large a share of the employment as it does of establishments.

Alameda County, after accounting for 33.5 percent of the 1919 total, slipped to 29.5 percent in 1931 and then rose steadily until 1947 when it surpassed San Francisco County with 41.2 percent and had a peak of employment for the period. By 1949, it was down to 33.8 percent, and rose slightly to 34.1 percent in 1950. The county is somewhat more important for employment than for number of establishments. Together, these metropolitan centers had 78.9 percent of the 1919 total, 76.7 percent of the 1939 total, and

75.2 percent of the 1950 total. Obviously, they have lost little ground in manufacturing activity as measured by employment.

Contra Costa County is over three times as important in employment as for number of establishments due to its large petroleum and sugar plants, to mention a few activities. Its share rose steadily from 12.6 percent in 1919 to 17.7 percent in 1935 and then slipped to 15.3 percent in 1947 but was back to 17.7 percent in 1950. Its employment in that year was nearly twice the 1919 level. Between 1919 and 1939, San Mateo County also had a higher percentage of wage earners than of manufacturing establishments. This proportion ranged from a high of 6.4 percent in 1919 to only 4 percent in 1929. In 1949, it was back to 6 percent, but in 1950 it slipped to 5.9 percent, slightly less than its proportion of establishments.

Solano County had 1.65 percent of the 1919 total, then fluctuated between 0.92 and 1.19 percent during the 1929–1939 period. By 1947, it was down to 0.77 percent, with only slight changes since. Its share of employment is less than its share of establishments. Marin County had 0.54 percent of the 1919 total, 0.84 percent of the 1929 total, 0.33 percent in 1949, and only 0.44 percent in 1950. These percentages were far less than its percentages of manufacturing establishments.

Changes in Value Added by Manufacture

Data are available for all counties only since 1929. Based on 1947 data, San Francisco County was only slightly ahead of Alameda County. It rose from 47.5 percent of the 1929 total to a peak of 50.8 percent in 1931. From 1931, the decline was steady to a low of 37.8 percent in 1939, with recovery to 39.1 percent in 1947. Alameda County had 32.6 percent of the 1929 total, 27.7 percent of the 1931 total, and 33.7 percent in 1939. By 1947, it had increased sharply to 39 percent. Together, they accounted for 80 percent of the 1929 total, 72 percent of the 1939 total, and 78 percent of the 1947 total. Once again, the metropolitan centers had demonstrated strong attractive powers. And again, Alameda County had a larger percentage of value added than of establishments in 1947, while the reverse is true for San Francisco County.

Value added by manufacture in Contra Costa County rose from 15 percent of the 1929 total to a peak of 22.5 percent in 1939 with a subsequent decline to a low point of 14.8 percent in 1947. These proportions were several times larger than the county's share of manufacturing establishments. The percentage in San Mateo County has risen from 3.5 percent in 1929 to 5.7 percent in 1947. Solano County had an increase from 0.85 percent of the 1929 total to 1.47 percent in 1939 and then declined to 1.07 percent in 1947. After accounting for 0.57 percent of the 1929 total and 0.39 percent of the 1931 total, Marin County has had slightly less than 0.33 percent of the remaining years' total value.

CHANGES IN CITY DISTRIBUTION

Because of census restrictions on the release of data, the analysis which follows, by cities, deals with only 11 cities. The remainder of the cities, and the unincorporated places are lumped together.[36]

Changes in Number of Manufacturing Establishments

The pattern for San Francisco has been discussed under the county distribution. Of the remaining cities for which data are available, Oakland and Berkeley are of key importance (see Table 17). Oakland had 16.2 percent of the establishments in 1919, 18.7 percent in 1929, 17.1 percent in 1939, and reached a peak of 19.1 percent in 1947. Berkeley had 3.1 percent of the 1919 total and between 1929 and 1939 fluctuated between 4.2 and 4.8 percent. In 1947, it reached a peak of 5.1 percent. Of the remaining cities, Richmond and Alameda each accounted for between 1 and 2 percent in 1947.

The smaller cities and unincorporated areas of Alameda and San Mateo counties had significant proportions of the establishments. These areas in Alameda County rose steadily from 3.2 percent in 1919 to 5.7 percent in 1947. In San Mateo County, the percentage varied between 2.5 in 1929 and 3.2 in 1919 and then rose sharply to a peak of 6.2 percent in 1947. These areas in Contra Costa County had 3.4 percent of the 1919 total and then declined to 2 percent in 1929 and 1931. After that year the percentage rose steadily once again to 2.8 percent in 1947.

Changes in Number of Wage Earners

In addition to San Francisco, Oakland, and Berkeley —Richmond, Alameda, and San Leandro have important concentrations of wage earners in manufacturing plants. Oakland had 21.8 percent of the 1919 total and 18.2 percent of the 1931 total (see Table 18). By 1939, it had 21 percent of the wage earners but declined to 19.5 percent in 1947. Richmond had a variable pattern with 4 percent of the 1919 total, 5.5 percent of the 1933 total, 4.9 percent in 1939, and 5.8 percent in 1947. The pattern has been even more variable for Alameda with 6.3 percent of the 1919

[36] The data of absolute amounts of establishments, wage earners, and value added, by cities, are shown in Appendix A in Tables A-6 to A-8.

TABLE 17

PERCENTAGE OF SAN FRANCISCO-OAKLAND METROPOLITAN AREA TOTAL MANUFACTURING ESTABLISHMENTS ACCOUNTED FOR BY COUNTIES AND PRINCIPAL CITIES; SELECTED YEARS, 1919–1947

County and City	1919	1929	1931	1933	1935	1937	1939	1947
Total, Metropolitan Area	100.	100.	100.	100.	100.	100.	100.	100.
Alameda								
Alameda	1.42	1.29	1.07	1.34	1.45	1.30	1.15	1.31
Albany	*	*	*	*	*	*	0.06	0.14
Berkeley	3.10	4.38	4.74	4.22	4.46	4.82	4.20	5.09
Oakland	16.24	18.67	18.51	18.62	18.66	18.19	17.09	19.10
San Leandro	*	*	*	*	*	*	0.50	0.98
Remainder	3.21	3.92	3.86	4.29	4.27	4.27	4.79	5.69
Total	23.97	28.24	28.18	28.47	29.25	29.07	27.79	32.31
Contra Costa								
Richmond	1.10	0.91	1.10	1.01	1.16	1.49	1.43	1.74
Remainder	3.36	1.95	1.95	2.05	2.61	2.15	2.15	2.84
Total	4.46	2.86	3.05	3.06	3.77	3.64	3.58	4.58
Marin	1.81	1.27	1.07	1.12	1.16	1.43	1.31	1.55
San Francisco	64.64	63.91	63.83	63.35	61.54	61.53	63.24	54.21
San Mateo								
Burlingame	*	0.30	0.31	0.30	0.25	0.24	0.19	0.46
Redwood City	*	*	*	*	*	*	0.34	0.87
San Mateo	*	0.41	0.34	0.30	0.32	0.33	0.16	0.49
Remainder	3.20	1.77	2.09	2.24	2.42	2.61	2.33	4.39
Total	3.20	2.48	2.74	2.84	2.99	3.18	3.02	6.21
Solano								
Vallejo	0.88	*	*	*	0.57	0.48	*	*
Remainder	1.04	1.24	1.13	1.16	0.72	0.69	1.06	1.14
Total	1.92	1.24	1.13	1.16	1.29	1.15	1.06	1.14

Source: Computed from Table A-6.
* Included under "Remainder" for county in which located.

total, only one percent in 1937, and up to 5.7 percent in 1947. Finally, among the important cities, Berkeley had 2.2 percent of the 1919 total, 3.6 percent of the 1929 total, 3 percent of the 1933 total, and 4.7 percent in 1947.

Heavy concentrations of manufacturing wage earners are found in the smaller cities and unincorporated areas of Contra Costa and Alameda counties, with an important secondary group in San Mateo County. In Contra Costa County areas, the percentage rose from 8.5 in 1919 to 12.5 in 1935, with a decline in 1937 offset by recovery to 12.6 in 1939. By 1947, however, these areas had only 9.5 percent. In Alameda County, these areas had 3.2 percent in 1919, 7.4 percent in 1929, 5.8 in 1933, and 9 percent in 1947. After having 6.8 percent in 1919, these areas of San Mateo County varied between 3.8 percent in 1929 and 4.8 percent in 1947.

It is apparent that most of the cities, except for San Francisco and some of the smaller areas, had higher concentrations of wage earners than of manufacturing establishments.

Changes in Value Added by Manufacture

Table 19 indicates that the distribution of value added by manufacture parallels closely the pattern for wage earners. The same cities dominate, and the smaller cities and unincorporated areas in Contra Costa, Alameda, and San Mateo counties have significant proportions. Oakland shows sharp cyclical fluctuations in the value added, falling from 19.6 percent of the 1929 total to 13 percent in 1931 and then rising steadily to 19.8 percent in 1947. Berkeley establishments accounted for 4.2 percent of the 1929 total, 3.9 percent of the 1933 total, and 5.2 percent in 1933 and 1947. Richmond rose from 3.1 percent in 1929 to 5.7 percent in 1933 and then declined to 4.8 percent in 1947. Alameda establishments, after producing only 0.58 to 0.82 percent between 1929 and 1930, rose sharply to 3 percent in 1947.

The smaller cities and unincorporated areas of

TABLE 18

PERCENTAGE OF SAN FRANCISCO-OAKLAND METROPOLITAN AREA NUMBER OF MANUFACTURING PLANT WAGE EARNERS ACCOUNTED FOR BY COUNTIES AND PRINCIPAL CITIES; SELECTED YEARS, 1919–1947

County and City	1919	1929	1931	1933	1935	1937	1939	1947
Total, Metropolitan Area	100.	100.	100.	100.	100.	100.	100.	100.
Alameda								
Alameda	6.34	1.23	1.07	1.09	1.05	0.99	1.14	5.66
Albany	*	*	*	*	*	*	*	0.01
Berkeley	2.16	3.63	3.59	2.97	3.42	3.85	3.61	4.70
Oakland	21.80	20.17	18.18	18.99	19.95	20.07	20.95	19.51
San Leandro	*	*	*	0.72	0.43	0.74	0.89	2.28
Remainder	3.23	7.41	6.70	5.82	7.66	7.98	8.71	9.04
Total	33.53	32.44	29.54	29.59	32.51	33.63	35.30	41.20
Contra Costa								
Richmond	4.02	3.92	5.40	5.45	5.14	5.23	4.87	5.80
Remainder	8.53	9.84	10.74	12.16	12.51	11.23	12.64	9.52
Total	12.55	13.76	16.14	17.61	17.65	16.46	17.51	15.32
Marin	0.54	0.84	0.63	0.51	0.43	0.41	0.33	0.45
San Francisco	45.34	48.04	48.41	46.23	43.20	43.76	41.35	36.43
San Mateo								
Burlingame	*	0.05	0.06	0.05	0.05	0.06	0.06	0.09
Redwood City	*	*	*	*	*	*	0.29	0.83
San Mateo	*	0.11	0.10	0.11	0.07	0.09	0.06	0.09
Remainder	6.39	3.84	4.13	4.81	4.90	4.60	4.12	4.82
Total	6.39	4.00	4.29	4.97	5.02	4.75	4.53	5.83
Solano								
Vallejo	0.45	*	*	0.38	0.33	0.25	*	*
Remainder	1.20	0.92	0.99	0.71	0.86	0.74	0.98	0.77
Total	1.65	0.92	0.99	1.09	1.19	0.99	0.98	0.77

Source: Computed from Table A-7.
* Included in "Remainder" for county in which located.

Contra Costa County, after rising from 12 percent of the 1929 total to 16.9 percent in 1939, dropped sharply to a low of 9.9 percent in 1947. The same areas in Alameda County had 8 percent of the 1929 total, 9.5 percent in 1931, and then declined to 6.2 percent in 1933. After recovering to 8.7 percent by 1935, the percentages have ranged between 9.3 and 9.6 percent. In San Mateo County, after ranging from 3.3 percent in 1929 to 4.6 percent in 1937, the smaller cities and unincorporated areas rose to a peak of 5 percent in 1947.

The five important cities, as a group, accounted for three fourths of the 1929 total value added, 67 percent of the 1939 total, and 71.9 percent of the 1947 total. On the other hand, the less-important cities and unincorporated areas had 24.8 percent of the 1929 total, 33 percent of the 1939 total, and 28.1 percent of the 1947 total. From these proportions, it is apparent that there has always been a significant proportion of decentralization and dispersion of manufacturing activities in the bay area. They indicate, also, that the leading cities, despite shifts between census years, have been able to attract postwar industries in the bay area.

ABSOLUTE CHANGES IN GEOGRAPHIC DISTRIBUTION

Sharp changes, due in part to cyclical influences, characterize the absolute changes in number of manufacturing establishments, average number of wage earners, and value added by manufacture, when analyzed by geographic units (see Table 20). These changes have been measured for four periods: 1919 to 1929, 1929 to 1939, 1939 to 1947, and 1919 to 1947, cumulatively.[37]

Absolute Changes in Number of Establishments

There was an overall net gain of 20 manufacturing establishments in the bay area between 1919 and 1947.

[37] The 1919-to-1929 period for value added by manufacture was available for only part of the units covered. Accordingly, the cumulative period from 1929 to 1947 was used instead of 1919 to 1947.

TABLE 19

PERCENTAGE OF SAN FRANCISCO-OAKLAND METROPOLITAN AREA TOTAL VALUE ADDED BY MANUFACTURING ACCOUNTED FOR BY COUNTIES AND PRINCIPAL CITIES; SELECTED YEARS, 1929-1947

County and City	1929	1931	1933	1935	1937	1939	1947
Total, Metropolitan Area	100.	100.	100.	100.	100.	100.	100.
Alameda							
Alameda	0.82	0.68	0.58	0.67	0.75	0.77	3.00
Albany	*	*	*	*	*	*	0.01
Berkeley	4.22	4.63	3.88	5.16	4.63	4.17	5.15
Oakland	19.60	12.97	17.28	16.17	17.42	18.70	19.78
San Leandro	*	*	0.46	0.23	0.41	0.53	1.71
Remainder	7.96	9.46	6.23	8.65	9.55	9.54	9.34
Total	32.60	27.74	28.43	30.88	32.76	33.71	38.99
Contra Costa							
Richmond	3.06	4.75	5.72	N.A.	5.70	5.60	4.84
Remainder	11.95	11.21	12.85	N.A.	14.53	16.90	9.94
Total	15.01	15.96	19.97	20.40	20.23	22.50	14.78
Marin	0.57	0.39	0.32	0.31	0.33	0.32	0.32
San Francisco	47.49	50.79	45.95	42.84	40.64	37.81	39.10
San Mateo							
Burlingame	0.05	0.07	0.06	0.05	0.05	0.06	0.07
Redwood City	*	*	*	*	*	0.20	0.57
San Mateo	0.09	0.12	0.09	0.10	0.10	0.08	0.15
Remainder	3.34	3.99	4.23	4.08	4.57	3.85	4.95
Total	3.48	4.16	4.38	4.23	4.72	4.19	5.74
Solano							
Vallejo	*	*	*	*	*	*	*
Remainder	0.85	0.96	0.95	1.34	1.32	1.47	1.07
Total	0.85	0.96	0.95	1.34	1.32	1.47	1.07

Source: Computed from Table A-8.
* Included in "Remainder" for county in which located.

This gain was the resultant of a gain of 301 establishments between 1919 and 1929; a loss of 739 establishments from 1929 to 1939; and a gain of 458 establishments between 1939 and 1948.

For the period as a whole, the net gain of 20 establishments was the resultant of sharply varying patterns for the important geographical units. Among the cities, Oakland with a net gain of 108 establishments and Berkeley with 74 were the dominant gainers. The smaller cities and incorporated areas of Alameda and San Mateo counties, respectively, had gains of 133 and 111. San Francisco, on the other hand, had a net loss of 370 establishments, with small losses also shown for the City of Alameda, and in Marin County, and the smaller segments of Contra Costa County.

Between 1919 and 1929, San Francisco, Oakland, and Berkeley, in order, had net increases of 166, 145, and 60 establishments, while the smaller units of Alameda County gained 38 and of Solano, 11 establishments. At the same time, Richmond lost 4 establishments, and the city of Alameda, 2 establishments, while the smaller segments of Contra Costa County declined by 46 establishments, of San Mateo County by 19 establishments, and all of Marin County by 16 establishments.

Most of the net loss of 739 establishments between 1929 and 1939 was centered in San Francisco (494 establishments), and Oakland (189 establishments). Smaller losses were registered in Berkeley, Alameda, San Mateo, Burlingame, and the smaller units of Contra Costa, Marin, and Solano counties. Small gains were recorded for Richmond and for the smaller cities and unincorporated segments of Alameda and San Mateo counties.

All geographic units, except San Francisco, participated in the net gain of 458 establishments between 1939 and 1947. Outstanding were the gains of 152 for Oakland and of 52 for Berkeley and of 107 for the smaller segments of San Mateo County and of 78 for Alameda County. San Francisco, in the meantime, lost 42 establishments.

TABLE 20

ABSOLUTE CHANGES IN NUMBER OF MANUFACTURING ESTABLISHMENTS, AVERAGE NUMBER OF WAGE EARNERS, AND VALUE ADDED BY MANUFACTURERS: SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES AND PRINCIPAL CITIES, 1919–1947

County and City	No. of Establishments				Average No. of Wage Earners				Value Added by Manufacture (Thousand dollars)		
	1919 to 1929	1929 to 1939	1939 to 1947	1919 to 1947	1919 to 1929	1929 to 1939	1939 to 1947	1919 to 1947	1929 to 1939	1939 to 1947	1929 to 1947
Total Area	*+301*	*−739*	*+458*	*+20*	*−12,411*	*−18,625*	*+55,117*	*+24,081*	*−105,078*	*+687,524*	*+582,446*
Alameda											
Alameda	−2	−13	+11	−4	−5,621	−299	+6,651	+631	−1,013	+28,686	+27,673
Berkeley	+60	−38	+52	+74	+1,116	−689	+3,416	+3,843	−4,592	+39,022	+34,430
Oakland	+145	−189	+152	+108	−4,251	−3,161	+9,666	+2,254	−23,906	+139,901	+115,995
Remainder	+38	+17	+78	+133	+3,558	+284	+7,559	+11,401	−711	+79,577	+78,866
Total	+241	−223	+293	+311	−5,198	−3,865	+27,192	+18,129	−30,222	+287,186	+256,964
Contra Costa											
Richmond	−4	+10	+18	+24	−590	−12	+3,909	+3,307	+5,985	+30,572	+36,557
Remainder	−46	−8	+35	−19	+185	+299	+2,864	+3,348	+5,356	+43,113	+48,469
Total	−50	+2	+53	+5	−405	+287	+6,773	+6,655	+11,341	+73,685	+85,026
Marin	−16	−8	+15	−9	+202	−532	+341	+11	−1,500	+2,191	+691
San Francisco	+166	−494	−42	−370	−3,068	−14,042	+16,341	−769	−84,958	+273,483	+188,525
San Mateo											
Burlingame	*	−6	+11	*	*	−2	+69	*	−11	+557	+546
San Mateo	*	−11	+13	*	*	−57	+74	*	−165	+1,294	+1,129
Remainder	−19	+16	+107	+111	−3,047	−284	+4,062	+815	−907	+43,202	+42,295
Total	−19	−1	+131	+111	−3,047	−343	+4,205	+815	−1,083	+45,053	+43,970
Solano	+11	−15	+8	+4	−895	−130	+265	−760	+1,344	+5,926	+7,270

Source: Computed from Tables A-6, A-7 and A-8.
* Data not available.

Absolute Changes in Number of Wage Earners

Manufacturing establishments in the bay area gained a net of 24,081 wage earners between 1919 and 1947. This was the result of a net increase of 55,117 between 1939 and 1947, offsetting declines of 12,411 from 1919 to 1929 and 18,625 from 1929 to 1939.

For the period as a whole, increases were noted for all geographical units except San Francisco, with a loss of 769, and Solano County, with a loss of 760. Among the cities with significant gains were Berkeley (3,843), Richmond (3,307), and Oakland (2,254). The smaller cities and unincorporated areas of Alameda County gained 11,401, and of Contra Costa County, 3,348 wage earners.

Between 1919 and 1929, with an overall net loss of 12,411 wage earners, the largest contractions in employment took place in Alameda (5,621), Oakland (4,251), San Francisco (3,068), and in San Mateo County (3,047). Notable, in contrast, was a gain of 1,116 for Berkeley and 3,558 for the smaller cities and unincorporated sections of Alameda County.

The net effect of the depression of the 1930's was to reduce employment further between 1929 and 1939 by 18,625. Most of this contraction, 14,042 wage earners took place in San Francisco, associated with a loss of 494 manufacturing establishments. A large part of the remaining decline, 3,161 wage earners, was lost by Oakland manufacturing plants. A few small-sized increases were noted for the outlying sections of Alameda and Contra Costa counties.

World War II and the postwar expansion resulted in a net gain of 55,117 wage earners between 1939 and 1947. The largest part of this increase, 16,341, was accounted for by San Francisco, a striking example of the strong attraction of this city, despite a net loss of 42 establishments. Other significant gains, in order, were Oakland (9,666); Alameda (6,651); the outlying sections of Alameda County (7,559); the outlying sections of San Mateo County (4,062); Richmond (3,909); Berkeley (3,416); and the outlying sections of Contra Costa County (2,864).

Absolute Changes in Value Added by Manufacture

With complete data available only since 1929, the bay area had a net increase of $582.4 million in value added between 1929 and 1947, with no adjustment for

price-level changes. A loss of $105.1 million between 1929 and 1939 was reversed by a gain of $678.5 million between 1939 and 1948.

The period 1929 to 1939 was generally one of contraction for all geographic units except in Contra Costa and Solano counties. San Francisco, with a loss of nearly $85 million occasioned by a contraction of 494 establishments and of 14,042 wage earners, was the main cause of the overall decline. Oakland, with a loss of $23.9 million, and Berkeley with $4.6 million, were also important contributors. Richmond, with an increase of $6 million, and the outlying sections of Contra Costa County with $5.4 million, and of Solano County with $1.3 million, were important exceptions.

TABLE 21

NET CHANGES, 1947–1950, BY COUNTIES, IN NUMBER OF MANUFACTURING ESTABLISHMENTS AND WAGE EARNERS

County	Establishments		Wage Earners	
	Number	Percent	Number	Percent
Alameda	+43	+16.17	−3,798	−23.60
Contra Costa	+33	+12.41	+6,022	+37.42
Marin	0	0	+47	+0.30
San Francisco	+174	+65.41	+12,683	+78.82
San Mateo	+14	+5.26	+988	+6.14
Solano	+2	+0.95	+148	+0.92
Total, Metropolitan Area	+266	100.00	+16,090	100.00

Source: Table 16.

All geographic units experienced sharp increases in value added between 1939 and 1947 to account for the overall net increase of $687.5 million. Far ahead was San Francisco with $273.5 million, nearly 40 percent of the total increase. This was especially remarkable in view of the decrease by 42 in the number of its manufacturing establishments. Second, in size of gain, was Oakland with $139.9 million, followed by the smaller cities and unincorporated sections of Alameda County with $79.6 million. Other important increases were the "remainder" of San Mateo County with $43.2 million, the remainder of Contra Costa County with $43.1 million; Berkeley with $39 million; Richmond with $30.6 million; and Alameda with $28.7 million.

Thus, San Francisco, despite net losses in number of establishments and with only a small gain in number of wage earners between 1929 and 1947, dominated the bay area in terms of net increases in the value added by manufacture.

Changes, 1947–1950

Table 21 contains the data of absolute changes in number of establishments and wage earners for 1947–1950. San Francisco and Contra Costa had significant gains both in establishments and employment. Especially significant were San Francisco's gains. Alameda gained in establishments but lost ground in terms of employment.

Shifts in Geographic Distribution of Agriculture

It is sometimes forgotten that metropolitan areas, while predominantly of urban structure so far as economic activities are concerned, do have some agricultural activity as well. This is true especially for the San Francisco-Oakland metropolitan area, due to the size of some of the counties included and the soil and topographical features. The analysis that follows is based completely upon county data.

SCOPE OF METROPOLITAN AREA'S AGRICULTURAL ACTIVITY

Number of Farms and Acreage

Tables 22 and 23 contain some of the basic data needed to show the scope of agricultural activity in the bay area as a whole since 1900. The number of farms has fluctuated sharply ranging from a low of 6,350 in 1910 to a high of 8,877 in 1935. There has been a steady decline since 1935. The acreage devoted to these farms has likewise fluctuated. In 1910, nearly 77 percent of the land area was devoted to farms. By 1925, this proportion had shrunk to 62.6, but within 5 yrs. there was a sharp rise, once again, to 75.1 percent. After declining to 64 percent of the total acreage in 1945, the proportion of land in farms rose once again to 68.1 percent in 1950.

Value of Products Sold

The characteristics of agricultural activity in a metropolitan area are revealed clearly by the data of value of products sold shown in Table 23. Farms in the bay area produced products having a value of $34.8 million in 1929, $30.7 million in 1939, and $83.1 million in 1949. These values are uncorrected for changes in price levels.

A further glance at this table shows that the bay area farms have derived increasing shares of their income from crops, although livestock and livestock products are of great significance. For the crops, it will be noticed that each of four categories are of fairly equal importance, although horticultural specialities

TABLE 22

NUMBER OF FARMS AND PROPORTION OF ACREAGE IN FARMS, SAN FRANCISCO-OAKLAND METROPOLITAN AREA, SELECTED YEARS, 1900–1950

Item	1950	1945	1940	1935	1930	1925	1920	1910	1900
No. of farms	6,989	7,235	7,397	8,877	7,639	8,366	7,227	6,350	6,766
Percent of land area in farms	68.1	64.0	66.9	69.7	75.1	62.6	73.8	77.0	N.A.

Source: U. S. Censuses of Agriculture.
N.A. = not available.

TABLE 23

VALUE OF PRODUCTS SOLD SAN FRANCISCO-OAKLAND METROPOLITAN AREA, SELECTED YEARS, 1900–1950

Type of Product	Value (Thousand Dollars)			
	1949	1944	1939	1929
Total, all farm products	83,135	73,275	30,732	34,762
All crops sold	45,207	44,017	16,480	17,586
Field crops sold	10,842	6,652	3,427	
Vegetables sold	11,244	10,377	4,534	
Fruits and nuts sold	10,257	15,666	4,815	
Horticultural spec. sold	12,865	11,320	3,705	
All livestock + products sold	37,912	29,246	14,222	17,143
Dairy products sold	14,183	11,141	5,621	
Poultry + poultry products sold	7,528	6,387	2,516	
Other livestock + products sold	16,201	11,720	6,086	
Forest products sold	17	192	29	33

Source: U. S. Censuses of Agriculture.

predominate. The natural characteristics of the area are such that fresh flowers, fruits, nuts, truck crops, and certain field crops can all be produced in some quantities.

The farms in this area also produce significant quantities of milk products and eggs for market. Other livestock products also rank in significance above any single category of agricultural products, while a significant poultry industry around Hayward (in Alameda County) accounted for better than 9 percent of the 1949 value of all farm products.

DISTRIBUTION OF FARMS AND ACREAGE, BY COUNTIES

Number of Farms

Alameda and Contra Costa counties account for the largest percentage of farms in the area, followed by Solano County (see Table 24). Farms in San Mateo and Marin counties are of less significance, while a few farms are found even in San Francisco County. Since 1900, there has been a reduction in the proportion of farms found in Alameda and San Francisco counties, while those in Contra Costa County have increased in relative importance. Trends in Marin and San Mateo counties have been mixed, while there has been a narrow range of movement for farms in Solano County.

It is interesting to note that the proportion of farms in Alameda and Contra Costa counties exceeds their proportion of the bay-area's land area, while the reverse is true for the remaining four counties. Also, of interest, is the fact that the two counties having some of the more-important urban centers are important, also, for their proportions of farms.

TABLE 24

COUNTY DISTRIBUTION OF NUMBER OF FARMS AND PERCENTAGE OF FARM ACREAGE IN THE SAN FRANCISCO-OAKLAND METROPOLITAN AREA, 1900–1950

County	1950	1945	1940	1935	1930	1925	1920	1910	1900
Percentage distribution of farms:									
Alameda	32.77	36.74	33.08	34.09	34.39	37.64	38.44	38.14	41.19
Contra Costa	29.90	24.40	26.17	25.90	24.74	23.16	23.18	23.07	22.33
Marin	8.60	8.54	8.49	8.37	9.03	9.10	9.93	7.84	6.83
San Francisco	0.79	0.46	1.23	2.79	1.47	0.20	1.02	2.47	4.49
San Mateo	9.37	11.73	11.21	9.64	11.01	11.70	8.63	10.47	8.14
Solano	18.57	18.13	19.82	19.21	19.36	18.19	18.79	18.00	17.01
Percent of land area in farms:									
Alameda	68.1	50.4	53.0	60.9	67.4	47.9	76.8	66.5	N.A.
Contra Costa	72.0	70.0	64.8	81.3	83.0	63.1	82.1	88.9	N.A.
Marin	76.5	74.2	66.6	77.2	78.1	78.3	85.7	77.8	N.A.
San Francisco	0.5	0.9	1.4	3.6	4.7	0.5	4.8	7.6	N.A.
San Mateo	33.9	46.0	43.0	34.5	65.2	58.9	40.9	56.2	N.A.
Solano	82.0	77.8	98.3	85.0	82.0	70.2	77.6	90.3	N.A.

N.A. = not available.

TABLE 25

VALUE OF FARM PRODUCTS SOLD BY BAY AREA COUNTIES, BY TYPE OF PRODUCT, SELECTED YEARS, 1909–1949

Farm Product	Year	Counties											
		Alameda		Contra Costa		Marin		San Francisco		San Mateo		Solano	
		Value	Percent	Value	Percent	Value	Percent	Value	Percent	Value	Percent	Value	Percent
Total, all farm products sold	1929	8,497	24.44	6,986	20.10	4,631	13.32	579	1.67	4,250	12.23	9,819	28.25
	1939	8,096	26.28	5,394	17.55	3,710	12.07	868	2.82	4,280	13.93	8,404	27.35
	1944	19,305	26.35	13,158	17.96	8,326	11.36	1,391	1.90	12,169	16.61	18,926	25.83
	1949	23,156	27.85	17,251	20.75	12,315	14.81	2,162	2.60	10,176	12.24	18,075	21.74
Total, all crops sold	1909	4,277	30.26	4,032	28.53	534	3.78	324	2.29	1,395	9.87	3,570	25.26
	1919	8,633	25.41	10,045	29.57	1,452	4.27	151	0.44	2,445	7.20	11,246	33.10
	1924	1,599	15.80	3,607	35.64	882	8.71	5	0.05	708	7.00	3,320	32.80
	1929	3,810	21.66	4,362	24.80	431	2.45	237	1.35	1,920	10.92	6,826	38.81
	1939	4,447	26.98	3,875	23.51	229	1.39	857	5.20	2,710	16.44	4,362	26.47
	1944	12,773	29.02	10,628	24.15	441	1.00	1,371	3.11	8,312	18.88	10,492	23.84
	1949	12,935	28.61	12,117	26.80	480	1.06	2,151	4.76	6,803	15.05	10,721	23.72
Value of field crops sold	1939	792	23.11	707	20.63	107	3.12	1	0.03	218	6.36	1,602	46.75
	1944	1,182	17.77	2,197	33.03	170	2.56	17	0.26	365	5.49	2,721	40.90
	1949	1,897	17.50	2,100	19.37	214	1.97	—	—	511	4.71	6,120	56.45
Value of vegetables sold	1909	811	29.88	1,126	41.49	43	1.58	191	7.04	459	16.91	84	3.10
	1919	1,682	21.53	3,312	42.39	461	5.90	151	1.93	1,454	18.61	754	9.65
	1939	1,348	29.73	701	15.46	56	1.24	45	0.99	1,271	28.03	1,113	24.55
	1944	4,455	42.93	2,065	19.90	33	0.32	104	1.00	3,073	29.61	647	6.23
	1949	3,570	31.75	4,043	36.85	44	0.39	—	—	2,176	19.35	1,311	11.66
Value of fruits and nuts sold	1909	807	27.75	499	17.16	32	1.10	1	0.03	73	2.51	1,496	51.44
	1919	2,766	31.72	1,588	18.21	76	0.87	—	—	45	0.52	4,245	48.68
	1939	945	19.63	2,208	45.86	9	0.19	—	—	51	1.06	1,602	33.27
	1944	2,293	14.64	6,270	40.02	41	0.26	—	—	125	0.80	6,937	44.28
	1949	1,895	18.48	5,048	49.21	20	0.19	—	—	57	0.56	3,237	31.56
Value of horticultural specialities sold	1939	1,363	36.79	260	7.02	57	1.54	811	21.89	1,169	31.55	45	1.21
	1944	4,842	42.77	95	0.84	197	1.74	1,250	11.04	4,749	41.95	187	1.65
	1949	5,513	43.32	826	6.42	202	1.57	2,151	16.72	4,060	31.56	53	0.41
Value of all livestock and livestock products sold	1929	4,683	27.32	2,619	15.28	4,192	24.45	342	1.99	2,322	13.54	2,985	17.41
	1939	3,625	25.49	1,517	10.67	3,473	24.42	11	0.08	1,560	10.97	4,036	28.38
	1944	6,529	22.32	2,528	8.64	7,885	26.96	20	0.07	3,853	13.17	8,431	28.83
	1949	10,220	26.96	5,133	13.54	11,832	31.21	11	0.03	3,363	8.87	7,353	19.40
Value of dairy products sold	1909	544	16.13	487	14.44	1,280	37.96	158	4.69	542	16.07	361	10.71
	1924	1,190	19.19	777	12.53	2,485	40.07	—	—	1,121	18.08	629	10.14
	1939	1,248	22.20	530	9.43	2,518	44.80	—	—	630	11.21	695	12.36
	1944	1,845	16.56	660	5.92	5,990	53.77	—	—	1,270	11.40	1,376	12.35
	1949	2,458	17.33	701	4.94	8,513	60.02	—	—	1,137	8.02	1,374	9.69
Value of poultry and poultry products sold	1909	340	30.41	166	14.85	365	32.65	112	10.02	58	5.19	77	6.89
	1939	1,140	45.31	204	8.11	458	18.20	11	0.44	367	14.59	336	13.35
	1944	3,336	52.23	398	6.23	1,157	18.12	20	0.31	785	12.29	691	10.82
	1949	4,038	53.64	818	10.87	1,410	18.73	11	0.15	564	7.49	687	9.13
Value of other livestock and livestock products sold	1939	1,237	20.33	783	12.87	497	8.17	—	—	564	9.27	3,005	49.38
	1944	1,349	11.51	1,471	12.55	738	6.30	—	—	1,798	15.34	6,364	54.30
	1949	3,724	22.99	3,613	22.30	1,910	11.79	—	—	1,662	10.26	5,292	32.66
Forest products sold	1929	4	12.12	5	15.15	8	24.24	—	—	8	24.24	8	24.24
	1939	3	10.34	2	6.90	7	24.14	—	—	10	34.48	7	24.14
	1944	2	1.04	2	1.04	—	—	180	93.75	5	2.60	3	1.56
	1949	1	5.88	2	11.76	3	17.65	—	—	10	58.82	1	5.88

Acreage Proportions

Four of the six metropolitan area counties have high proportions of total acreage in farms. Solano County leads with 82 percent in 1950, followed by Marin County with 76.5 percent, Contra Costa County with 72 percent, and Alameda County with 68.1 percent. The trends of this percentage in each of these four counties has shown sharp variation during the 1910–1950 period.

Farms in San Mateo County in 1950 accounted for only 33.9 percent of the total acreage, a sharp decline from preceding census periods. San Francisco County,

being predominantly urban, had only 0.5 percent of its area in farms in 1950 as compared with 7.6 percent in 1910.

DISTRIBUTION OF VALUE OF FARM PRODUCTS, BY COUNTIES

Total Value

Table 25 compares the six counties in terms of the percentage of the area's total value of farm products accounted for between 1909 and 1949. One amazing relationship is immediately apparent, namely, that the second-most-urban county in the metropolitan area, Alameda, was highest in 1949 in proportion of agricultural-products value with 27.9 percent. This represented a displacement of Solano County which has lost ground steadily since 1929. In third place in 1949 was Contra Costa County with slightly more than a fifth of the area's total. This was about equal to its 1929 percentage, but well above its 1939 and 1944 positions. Marin County, with 14.8 percent of the 1949 total, has shown some gain over the period, while San Mateo, with 12.2 percent, has lost ground since 1944. San Francisco County contributes but a small percentage of the metropolitan area's total value of farm products sold.

Principal Categories of Farm Products, by Counties

Table 25 also shows variations in type of farming in each county as illustrated by the value of the principal categories of farm products sold. Thus Solano County accounts for the largest share of the value of field crops sold (other than fruits, nuts, and vegetables) with 56.5 percent of the 1949 total. Contra Costa and Alameda counties account for the greater part of the remainder.

Contra Costa and Alameda counties account for nearly seven out of every ten dollars received from vegetables sold by San Francisco Bay area farms. The former has had a particularly sharp rise in importance between 1939 and 1949. Although San Mateo County has lost ground in this category, it accounted for nearly a fifth of the 1949 value. Solano County accounted for 11.7 percent of the 1949 total, compared with 24.6 percent in 1939.

Of such fruits and nuts as are produced in the area, Contra Costa farms accounted for nearly half of the value, while Solano County was in second place with 31.6 percent of the 1949 total, and Alameda County in third place with 18.5 percent.

Alameda and San Mateo counties produce about three fourths of the total value of all horticultural products sold, while about a sixth come from San Francisco County.

Marin County increasingly has become the leading producer of dairy products in the bay area. In 1909, it accounted for 38 percent of the total value of such products sold by bay area farms, but by 1939 this proportion had reached 44.8 percent, and by 1949, 60 percent. Far behind is Alameda County with 17.3 percent of the 1949 total; Solano County with 9.7 percent; and San Mateo County with 8 percent. Contra Costa County which accounted for a seventh of the 1909 total value, accounted for only 4.9 percent of the 1949 total.

Alameda County dominates the poultry and poultry-products production in the area, accounting for 53.6 percent in 1949 of the total value of such products sold. Marin County is the most important of the remaining counties with 18.7 percent, although it accounted for 32.7 percent of the 1909 total value.

While Solano farms are still the most-important source for the area of other livestock and livestock products sold, with 32.7 percent of the 1949 total value, Alameda and Contra Costa counties together account for an additional 45.3 percent.

OTHER DATA

Distance to Trading Center Visited Most Frequently

Close relationship of farming in the area to the urban structure is revealed by the data in Table 26. For the six counties as a whole, the range of average distance from farm to trading center varied from less than 1 mi. in San Francisco County to 7 mi. in Marin. In all counties except San Francisco, there were, however, several farms 10 mi. or further from the most-frequently visited trading center.

Apart from San Francisco County, farms in Alameda and Contra Costa were closest to trading centers, on the average, followed by farms in Solano, San Mateo, and Marin counties in increasing distance terms. When type of road is introduced, then the average farm is only 0.2 to 0.4 mi. from trading centers over unimproved roads.

Kind of Road on Which Farms are Located

The data in Table 27 do not need any detailed analysis. By comparing the kind of roads on which farms are located from 1925, 1930, 1940, and 1950, they reveal clearly how the shift away from dirt and gravel roads to hard-surfaced roads has paralleled the increased use of automobiles and trucks by farmers.

TABLE 26

NUMBER OF FARMS REPORTING DISTANCE TO TRADING CENTER VISITED MOST FREQUENTLY; BY COUNTIES, SAN FRANCISCO-OAKLAND METROPOLITAN AREA, 1950

Distance	Alameda		Contra Costa		Marin		San Francisco		San Mateo		Solano		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Distance to trading center over all roads:														
Under 1 mile	355	17	264	13	33	5	63	91	186	31	97	7	998	15
1 to 4.9 miles	1,267	61	1,280	63	268	46	5	7	203	34	618	47	3,641	55
5 to 9.9 miles	241	12	356	18	121	21	1	2	63	11	474	36	1,256	19
10 miles and over	204	10	124	6	164	28	—	—	139	24	128	10	759	11
Total	2,067	100	2,024	100	586	100	69	100	591	100	1,317	100	6,654	100
Average distance	4		3		7		Less than 1		6		5		—	
Distance to trading center over dirt or unimproved roads:														
0.0 to 0.2 miles	1,637	83	1,558	89	385	76	53	91	473	91	1,029	83	5,135	85
0.3 to 0.9 miles	148	8	95	5	41	8	5	9	12	2	66	5	367	6
1.0 to 4.9 miles	163	8	83	5	83	16	—	—	19	4	130	10	478	8
5 miles and over	17	1	14	1	1	*	—	—	16	3	22	2	70	1
Total	1,965	100	1,750	100	510	100	58	100	520	100	1,247	100	6,050	100
Average distance	0.2		0.2		0.2		0.1		0.4		0.3		—	

* Less than one percent.

TABLE 27

NUMBER OF BAY AREA FARMS, BY COUNTIES, REPORTING KIND OF ROAD ON WHICH LOCATED; 1925, 1930, 1940, AND 1950

Year	Kind of Road	Alameda		Contra Costa		Marin		San Francisco		San Mateo		Solano		Total	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
1950	Hard surfaced	1,752	86	1,694	85	454	78	60	86	506	88	1,041	82	5,507	84
	Gravel, shell, or shale	156	8	166	8	48	8	—	—	37	6	123	10	530	8
	Dirt or unimproved	133	6	141	7	82	14	10	14	32	6	103	8	501	8
	Total	2,041	100	2,001	100	584	100	70	100	575	100	1,267	100	6,538	100
1940	Hard surface	1,681	71	1,373	72	432	72	64	72	552	67	1,012	70	5,114	71
	Gravel, shell, or shale	347	15	243	13	73	12	2	2	36	4	243	17	944	13
	Improved dirt	203	9	153	8	48	8	10	11	112	14	85	6	611	8
	Unimproved dirt	132	5	132	7	49	8	13	15	124	15	96	7	546	8
	Total	2,363	100	1,901	100	602	100	89	100	824	100	1,436	100	7,215	100
1930	Concrete	414	16	356	19	90	13	—	—	87	10	207	14	1,154	15
	Brick	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Asphalt	115	4	13	1	46	7	8	7	44	5	12	1	238	3
	Macadam	429	16	387	20	15	2	18	16	288	34	179	12	1,316	17
	Gravel	833	32	676	36	264	38	3	3	151	18	606	41	2,533	33
	Sand-clay	—	—	—	—	—	—	3	3	3	0	1	0	7	0
	Improved dirt	103	4	65	3	125	18	6	5	55	6	151	10	505	7
	Unimproved dirt	317	12	295	16	138	20	30	25	148	18	202	14	1,130	15
	All other	416	16	98	5	12	2	44	36	65	8	121	8	756	10
	Total	2,627	100	1,890	100	690	100	112	100	841	100	1,479	100	7,639	100
1925	Concrete or brick	486	15	314	16	30	4	—	—	149	15	139	9	1,118	13
	Macadam	791	25	265	14	11	1	4	24	202	21	148	10	1,421	17
	Gravel	1,004	32	640	33	391	51	12	70	413	42	501	33	2,961	35
	Improved dirt	430	14	55	3	122	16	—	—	48	5	150	10	805	10
	Unimproved dirt	405	13	567	29	183	29	1	6	123	13	488	32	1,767	21
	All other	33	1	97	5	24	3	—	—	44	4	96	6	294	4
	Total	3,149	100	1,938	100	761	100	17	100	979	100	1,522	100	8,366	100

Source: Census of Agriculture.

Shifts in Geographic Distribution of Wholesale Trade

Wholesaling activities in the United States usually fall into one of three important patterns: (1) a high concentration of the most-important activities in the larger cities, because of scale of operations, size of trading area needed, types of commodities handled, and for other reasons to be noted elsewhere; (2) a significant amount of wholesaling of agricultural commodities away from urban centers at local assembling and producing points, because of the fundamental nature of the marketing functions performed; and (3) a small proportion of wholesaling activities in the smaller urban centers, particularly where benefits of cheaper warehousing space may be obtained or where branches of central establishments can be opened.

OVERALL IMPORTANCE OF THE METROPOLITAN AREA

The San Francisco-Oakland metropolitan area had wholesale sales ranging from a low of slightly more than a billion dollars in 1933 to a high of slightly more than $5 billion in 1948. This volume of business was done by a range of 3,449 to 5,086 wholesale establishments. Table 28 indicates these changes relative to the volume of wholesale sales and number of establishments in California and the United States. Compared with the United States as a whole, the area increased its share of wholesale sales from 2.85 percent in 1929 to 3.19 percent in 1933; since that year, its share of the United States total has declined steadily to 2.65 percent in 1948. The share of the establishments has been well stabilized, ranging from 2.08 percent in 1948 to 2.19 percent of the 1929 total. A comparison of the percentage of sales in relation with the percentage of establishments indicates that the area has somewhat higher-than-average sales per establishment.

The metropolitan area has lost ground when its wholesale trade data are compared with the totals for California. In 1929, the area had 47.46 percent of the state's total sales, and 38.15 percent of the establishments. By 1948, these were down to 37.08 percent of the sales, and 27.55 percent of the establishments. As was true in comparison with the United States, the wholesale establishments in the area had higher average sales than they did for the state as a whole.

CHANGES IN COUNTY DISTRIBUTION

Sales Volume

The data of Table 29 reveal something of the pattern of wholesaling discussed above. San Francisco County dominates the sales structure of the area, accounting for 90.4 percent of the 1929 sales, 87 percent of the 1939 sales, and 80.8 percent of the 1948 volume. Alameda County has the only other significant amount of wholesale sales volume, with 8 percent of the 1929 total, 10.6 percent of the 1939 total, and 15.9 percent of the 1948 total. These two counties together, with the larger metropolitan centers contained in them, accounted for 98.4 percent of the 1929 sales and 96.7 percent of the 1948 total. Such spreading out of wholesale sales as has taken place has been mainly from San Francisco to Oakland.

TABLE 28

CHANGES IN WHOLESALE SALES AND NUMBER OF ESTABLISHMENTS: SAN FRANCISCO-OAKLAND METROPOLITAN AREA COMPARED WITH CALIFORNIA AND THE UNITED STATES; 1929, 1933, 1935, 1939, AND 1948

Year	San Francisco-Oakland Metropolitan Area				California		United States	
	Amount	Percent Change	Percent of California Total	Percent of United States Total	Amount	Percent Change	Amount	Percent Change
	Sales (thousands of dollars)							
1929	1,973,947	—	47.46	2.85	4,159,323	—	69,291,548	—
1933	1,026,413	−48.0	45.59	3.19	2,255,256	−45.78	32,151,373	−53.6
1935	1,306,106	+27.2	43.90	3.05	2,975,253	+31.93	42,802,913	+33.1
1939	1,584,191	+21.3	41.25	2.87	3,840,129	+29.07	55,265,640	+29.1
1948	5,006,634*	+216.0	37.08	2.65	13,502,920	+251.63	188,688,801	+241.4
	Number of establishments							
1929	3,720	—	38.15	2.19	9,751	—	169,702	—
1933	3,449	−7.3	31.21	2.10	11,052	+13.34	164,170	−3.3
1935	3,839	+11.2	31.09	2.17	12,342	+11.67	176,756	+7.7
1939	4,277	+11.5	29.67	2.13	14,414	+16.79	200,573	+13.5
1948	5,086	+18.9	27.55	2.08	18,547	+28.67	243,366	+21.3

* Excludes sales of 34 administration and auxiliary units.

TABLE 29

WHOLESALE SALES AND ESTABLISHMENTS FOR SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES; 1929, 1933, 1935, 1939, AND 1948

Year	Alameda		Contra Costa		Marin		San Francisco		San Mateo		Solano		Total	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
	Sales (Thousands of dollars)													
1929	158,670	8.04	3,465	0.17	1,119	0.05	1,784,175	90.39	22,234	1,13	4,284	0.22	1,973,947	100
1933	92,606	9.02	5,628	0.55	1,932	0.19	911,747	88.83	11,520	1.12	2,980	0.29	1,026,413	100
1935	130,069	9.96	9,779	0.75	2,335	0.18	1,149.864	88.04	10,246	0.79	3,813	0.29	1,306,106	100
1939	167,295	10.56	14,542	0.92	3,809	0.24	1,377,614	86.96	15,882	1.00	5,049	0.32	1,584,191	100
1948	795,814	15.90	71,735	1.43	14,443	0.29	4,044,429	80.78	61,721	1.23	18,492	0.37	5,006,634	100
	Number of establishments													
1929	466	12.52	35	0.94	11	0.30	3,134	84.79	21	0.56	33	0.89	3,720	100
1933	572	16.58	51	1.48	33	0.96	2,696	78.17	52	1.50	45	1.30	3,449	100
1935	648	16.87	86	2.24	34	0.89	2,942	76.68	75	1.95	52	1.35	3,837	100
1939	670	15.66	72	1.68	42	0.98	3,359	78.53	79	1.85	55	1.28	4,277	100
1948	1,066	20.96	129	2.53	42	0.83	3,673	72.22	100	1.97	76	1.49	5,086	100

Contra Costa County, of the remaining four counties, has shown the largest gain, from 0.2 percent of the 1929 total to 1.4 percent of the 1948 total. San Mateo County actually lost ground between 1929 and 1935 but regained slightly more by 1948 than had been lost. Together, the four counties had only 1.6 percent of the 1929 total and 3.3 percent of the 1948 total. It is obvious that wholesale sales are very highly concentrated and that little decentralization and dispersion have taken place.

Changes in Number of Establishments

San Francisco County had 84.8 percent of the 1929 establishments, 76.7 percent of the 1935 total, and 72.2 percent of the 1948 total. Obviously the average sales of San Francisco wholesale establishments are well above the average for the area. Most of the decline in the importance of San Francisco County has been taken by Alameda County. This county had 12.5 percent of the 1929 establishments, 16.9 percent of the 1935 total, and 21 percent of the 1948 total. Unlike the San Francisco establishments, the average sales size of Alameda establishments was below the area average. Together, these two counties had 97.3 per cent of the 1929 establishments and 93.2 percent of the 1948 establishments.

Of the less-important counties, increases were registered by three of four counties, but with differing patterns for each. Contra Costa County increased from 0.94 percent in 1929 to 2.24 percent in 1935, declined in 1939, but increased once again to 2.53 percent in 1948. San Mateo County rose from 0.56 percent of the 1929 total to 1.95 percent of the 1935 total, declined in 1939, and then recovered to 1.97 percent in 1929. Solano County rose fairly steadily from 0.89 to 1.49 percent. Marin County had 0.30 percent of the 1929 total, nearly 1 percent of the 1933 total, slightly more in 1939, and then a decline to 0.83 percent in 1948. In all cases the proportion of establishments was well above the percentages of wholesale sales.

CHANGES IN CITY DISTRIBUTION

The geographical shifts of wholesale sales and number of establishments by cities merely confirm the general picture already described above (see Table 30). Data are available for 25 of the more-important cities; the information for the less important is merged with the unincorporated areas of the counties.

Changes in Sales Distribution

Only San Francisco, Oakland, and Berkeley had 1 percent or more of the metropolitan-area wholesale sales in 1948. The trend for San Francisco has been described in the section dealing with changes in county distribution. Oakland has had nearly a doubling in relative importance from 6.54 percent of the 1929 total to 12.76 percent of the 1948 total. And Berkeley, with only 0.14 percent of the 1929 total, had 1.06 percent of the 1948 total. The remaining cities each had well below 1 percent of the 1948 totals.

Of the remaining 22 cities, South San Francisco, which had 1.02 percent of the 1929 total, accounted for only 0.60 percent of the 1948 total. This percentage represented a slight recovery from the 1935 low point. Richmond has gained sharply from a low of 0.04 percent in 1929 to a high of 0.85 percent in 1948. The remaining cities had percentages ranging from 0.01 percent for Antioch and San Bruno to 0.34 percent for San Rafael.

TABLE 30

PERCENTAGE OF SAN FRANCISCO-OAKLAND METROPOLITAN AREA'S WHOLESALE ESTABLISHMENTS AND SALES ACCOUNTED FOR BY PRINCIPAL CITIES; 1948, 1939, 1935, 1933, AND 1929

County and City	Sales					Number of Establishments				
	1948	1939	1935	1933	1929	1948	1939	1935	1933	1929
Total, Metropolitan Area	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
Alameda										
Alameda	0.28	0.31	0.12	†	0.16	0.32	0.35	0.31	*	0.37
Albany	*	†	†	†	*	0.08	0.02	0.05	*	*
Berkeley	1.06	0.56	0.28	0.20	0.17	1.61	0.79	0.94	1.02	0.70
Hayward	0.18	0.06	0.18	0.17	0.14	0.39	0.16	0.44	*	0.30
Oakland	12.76	8.54	8.63	7.27	6.54	16.20	12.90	13.92	13.60	10.49
Piedmont	*	*	†	*	*	*	*	0.05	*	*
San Leandro	0.34	†	†	†	0.01	0.34	0.10	0.05	0.06	0.11
Remainder	1.27	1.04	0.74	1.38	1.02	1.89	1.34	1.15	1.91	0.56
Total	15.90	10.56	9.96	9.02	8.04	20.96	15.66	16.87	16.58	12.52
Contra Costa										
Antioch	0.01	†	*	*	*	0.12	0.04	*	*	*
El Cerrito	0.05	†	*	*	*	0.20	0.02	*	*	*
Martinez	0.04	0.04	0.04	*	*	0.15	0.16	0.28	0.29	0.05
Pittsburg	0.10	0.03	0.05	0.08	0.02	0.22	0.21	0.24	*	0.19
Richmond	0.85	0.50	0.23	0.05	0.04	0.65	0.35	0.50	0.18	0.19
Remainder	0.37	0.35	0.43	0.41	0.11	1.19	0.89	1.22	1.02	0.51
Total	1.43	0.92	0.75	0.55	0.17	2.53	1.68	2.24	1.48	0.94
Marin										
San Rafael	0.24	0.18	0.16	0.10	0.03	0.47	0.57	0.60	0.41	0.14
Sausalito	0.02	*	*	*	*	0.10	0.41	*	*	*
Remainder	0.02	0.07	0.02	0.08	0.02	0.26	*	0.29	0.55	0.16
Total	0.29	0.24	0.18	0.19	0.05	0.83	0.98	0.89	0.96	0.30
San Francisco	80.78	86.96	88.04	88.83	90.39	72.22	78.53	76.68	78.17	84.79
San Mateo										
Burlingame	0.10	0.10	0.07	*	0.03	0.26	0.18	0.15	*	0.08
Daly City	0.02	†	*	*	*	0.05	0.02	*	*	*
Menlo Park	†	*	*	*	*	0.04	*	*	*	*
Millbrae	†	*	*	*	*	0.02	*	*	*	*
Redwood City	0.20	0.14	0.12	0.13	0.04	0.36	0.42	0.47	0.46	*
San Bruno	0.01	*	*	*	*	0.05	*	*	*	*
San Carlos	0.02	*	*	*	*	0.15	*	*	*	*
San Mateo	0.14	0.12	0.03	0.02	0.03	0.39	0.42	0.39	0.29	0.11
South San Francisco	0.60	0.55	0.46	0.82	1.02	0.27	0.21	0.21	0.34	0.21
Remainder	0.13	0.09	0.09	0.16	0.01	0.36	0.59	0.73	0.41	0.16
Total	1.23	1.00	0.79	1.12	1.13	1.97	1.85	1.95	1.50	0.56
Solano										
Vallejo	0.18	0.17	0.13	0.08	0.04	0.65	0.47	0.63	0.41	0.21
Remainder	0.19	0.15	0.16	0.21	0.17	0.84	0.81	0.72	0.89	0.68
Total	0.37	0.32	0.29	0.29	0.22	1.49	1.28	1.35	1.30	0.89

* Included in "Remainder."
† Withheld to avoid disclosure of data; included in "Remainder."

The only evidence of sizeable concentration of wholesale sales in the smaller cities and unincorporated areas of each county is found in Alameda County. This county's areas accounted for 1.02 percent of the 1929 totals, rose to a peak of 1.38 percent in 1933, reached a low of 0.74 percent in 1935, and then rose steadily to 1.27 percent in 1948. In Contra Costa, Marin, San Mateo, and Solano counties these areas combined had 0.31 percent of the 1929 total and 0.71 percent of the 1948 total.

Changes in Distribution of Wholesale Establishments

As was the case for wholesale sales, only San Francisco, Oakland, and Berkeley had over 1 percent of

the total number of wholesale establishments. The pattern for San Francisco will not be repeated here, since it was discussed in the preceding section. The percentage of total establishments in Oakland rose in varying pattern from 10.49 in 1929 to 16.20 in 1948. Together, these two cities dominate the wholesale trade plant of the area. Berkeley has reached a peak of 1.61 percent in 1948 after fluctuating between 0.70 and 1.02 percent in preceding census periods.

Of the remaining cities, the range was from 0.02 percent for Millbrae to 0.65 percent for Richmond and Vallejo. Small increases in relative importance characterize many of the 22 cities, but they do not approximate gains registered either in population or in retail sales.

The smaller cities and unincorporated areas of the five counties had 2.07 percent of the total establishments in 1929 but 4.54 percent of the 1948 total. The largest concentrations in 1928 were in Alameda County, with 1.89 percent, followed by Contra Costa County, with 1.19 percent, and Solano County, with 0.84 percent.

When the percentages of establishments are related to percentages of sales, it is evident that only San Francisco, Richmond and South San Francisco show higher shares of sales indicating larger-than-average sales per establishment. Especially to be noted, is that the smaller cities and unincorporated areas have had an expansion of establishments beyond the expansion

TABLE 31

CHANGES IN WHOLESALE SALES AND NUMBER OF WHOLESALE ESTABLISHMENTS, FOR SELECTED CITIES AND FOR COUNTIES, SAN FRANCISCO-OAKLAND METROPOLITAN AREA; 1929–39, 1939–48, AND 1929–48

(Based on unadjusted data)

County and City	Sales Changes (Thousand Dollars)						Establishment Changes					
	1929–48		1939–48		1929–39		1929–48		1939–48		1929–39	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Total, Metropolitan Area	+3,032,687	100	+3,422,443	100	−389,756	100	+1,366	100	+809	100	+557	100
Alameda												
Alameda	+10,639	+0.35	+8,877	+0.26	+1,762	+0.45	+2	0.15	+1	0.12	+1	+0.18
Berkeley	+49,256	+1.62	+43,800	+1.28	+5,456	+1.40	+56	4.10	+48	5.93	+8	+1.44
Hayward	+5,900	+0.19	+7,700	+0.23	−1,800	−0.46	+9	0.66	+13	1.61	−4	−0.72
Oakland	+509,900	+16.81	+503,753	+14.72	+6,147	+1.58	+434	31.77	+272	33.62	+162	+29.08
Remainder	+61,449	+2.03	+64,389	+1.88	−2,940	−0.75	+99	7.24	+62	7.66	+37	+6.64
Total	+637,144	+21.01	+628,519	+18.36	+8,625	+2.21	+600	43.92	+396	48.95	+204	+36.62
Contra Costa												
Pittsburg	+4,948	+0.16	+4,824	+0.14	+124	+0.03	+4	0.29	+2	0.25	+2	+0.36
Richmond	+41,643	+1.37	+34,682	+1.01	+6,961	+1.79	+26	1.90	+18	2.22	+8	+1.44
Remainder	+21,679	+0.72	+17,687	+0.52	+3,992	+1.02	+64	4.69	+37	4.57	+27	+4.85
Total	+68,270	+2.25	+57,193	+1.67	+11,077	+2.84	+94	6.88	+57	7.04	+37	+6.65
Marin												
San Rafael	+11,252	+0.37	+9,228	+0.27	+2,024	+0.52	+19	1.39	0	0	+19	+3.41
Remainder	+2,072	+0.07	+1,406	+0.04	+666	+0.17	−8	−0.59	0	0	−8	−1.44
Total	+13,324	+0.44	+10,634	+0.31	+2,690	+0.69	+11	0.80	0	0	+11	+1.97
San Francisco	+2,260,254	+74.53	+2,666,815	+77.92	−406,561	−104.31	+539	39.46	+314	38.81	+225	+40.39
San Mateo												
Burlingame	+4,902	+0.16	+3,810	+0.11	+1,092	+0.28	+10	0.73	+5	0.62	+5	+0.90
Redwood City	+8,898	+0.29	+7,281	+0.21	+1,617	+0.41	+15	1.10	0	0	+15	+2.69
San Mateo	+6,415	+0.21	+5,164	+0.15	+1,251	+0.32	+16	1.17	+2	0.25	+14	+2.51
South San Francisco	+10,067	+0.33	+21,487	+0.63	−11,420	−2.93	+6	0.44	+5	0.62	+1	+0.18
Remainder	+9,205	+0.30	+8,097	+0.24	+1,108	+0.28	+32	2.34	+9	1.11	+23	+4.13
Total	+39,487	+1.30	+45,839	+1.34	−6,352	−1.63	+79	5.78	+21	2.60	+58	+10.41
Solano												
Vallejo	+8,226	+0.27	+6,323	+0.19	+1,903	+0.49	+25	1.83	+13	1.61	+12	+2.15
Remainder	+5,982	+0.20	+7,120	+0.21	−1,138	−0.29	+18	1.32	+8	0.99	+10	+1.80
Total	+14,208	+0.47	+13,443	+0.40	+765	+0.20	+43	3.15	+21	2.60	+22	+3.95

of sales, proportionately, indicating smaller-than-average sales per establishment.

ABSOLUTE CHANGES IN WHOLESALE SALES AND NUMBER OF ESTABLISHMENTS

Although the preceding discussion has sufficiently indicated the much-higher proportions of wholesale sales and establishments found in San Francisco and Oakland than of population and retail sales, a study of absolute changes in wholesale sales and establishments will help to further verify this conclusion (see Table 31).

Sales Changes

Total wholesale sales in the San Francisco Bay area increased by slightly more than $3 billion between 1929 and 1948. This over-all increase was made up of an increase of $3.4 billion between 1939 and 1948, and a decline of $389.8 million between 1929 and 1939. For the over-all period, San Francisco accounted for three fourths of the net increase, and Oakland had 16.8 percent. The remainder of the increase was spread widely among the incorporated and unincorporated areas.

A decline of $406.6 million of sales for San Francisco between 1929 and 1939 coupled with smaller declines in South San Francisco, Hayward, and unincorporated areas, were offset by increases totaling $34 million in the remaining cities and unincorporated areas.

Between 1939 and 1948, finally, San Francisco accounted for 77.9 percent of the total net increase, while Oakland accounted for an additional 14.7 percent. The remaining 7.3 percent was once again widely distributed among the remaining cities and unincorporated areas.

It is apparent from the foregoing that wholesale trade is a highly centralized activity relative to other economic activities and to population distribution. Such decentralization and dispersion as has taken place has resulted mainly in an increase in importance of Oakland, although it continues to rank far behind San Francisco. Such increase in importance as has taken place in the smaller cities and unincorporated areas has been mainly of smaller-than-average size establishments. San Francisco and Oakland together, in 1948, accounted for 93.5 percent of the area's wholesale sales and 88.4 percent of the establishments.

Shifts in Geographic Distribution of Retail Trade

This section deals only with retail sales of tangible goods and the establishments which handle such goods. The next section will deal with selected service trades including those which service the ultimate consumer. As has been indicated, the data used are primarily census data for 1929, 1933, 1935, 1939, and 1948. Supplementary materials on a county basis are available for 1949–1951 from the State Board of Equalization sales-tax reports, and from estimates of the California State Chamber of Commerce. Similar estimates for selected cities are available from *Sales Management* magazine.

OVERALL IMPORTANCE OF THE METROPOLITAN AREA

Relative to the State of California, the San Francisco Bay area has lost ground steadily, both in sales and in number of establishments, between 1929 and 1948 (see Table 32). In 1929, the area accounted for 30.86 percent of the sales and 24.17 percent of the establishments. By 1948, these percentages were down to 21.48 and 20.74, respectively. The area, however, has lost more importance in sales than in establishments but continues to account for a larger percentage of sales.

Compared with the United States, the area declined from 2.02 percent of sales in 1929 to a low of 1.71 in 1935. By 1951, this percentage was up once more to 1.95. Between 1929 and 1939, the area had 1.27 to 1.35 percent of the establishments, but in 1948 the percentage increased to 1.42. As for California, the area accounted for a higher proportion of sales than of establishments.

CHANGES IN COUNTY DISTRIBUTION

Sales Changes

As was the case for population distribution, the two counties containing the largest cities also dominate the retail trade of the metropolitan area. However, the pattern of change varies sharply between San Francisco County and Alameda County (see Table 33). Retail sales in San Francisco County dropped sharply from 64 percent of the 1929 total to 43.7 percent in 1948. Since 1948, the decline has been more gradual to 40.9 percent in 1951. Alameda County, on the other hand, increased from 26.7 percent in 1929 to 34.3 percent in 1935. After a slight decline in 1939, and recovery by 1948, there has been a small decline to 32.6 percent in 1951. In 1951, these two counties together accounted for nearly three out of every four dollars of retail trade in the area.

TABLE 32

CHANGES IN RETAIL ESTABLISHMENTS AND SALES: SAN FRANCISCO-OAKLAND METROPOLITAN AREA COMPARED WITH CALIFORNIA AND THE UNITED STATES; 1929, 1933, 1935, 1939, 1948, 1949–1951

Year	San Francisco-Oakland Metropolitan				California		United States	
	Amount	Percent Change	Percent of Calif. Total	Percent of U.S. Total	Amount	Percent Change	Amount	Percent Change
				Sales (thousands of dollars)				
1929	990,957		30.86	2.02	3,210,863	—	49,114,653	—
1933	453,529	−54.23	26.79	1.81	1,692,879	−47.28	25,037,225	−49.02
1935	565,431	+24.67	24.28	1.71	2,329,009	+37.58	33,161,276	+32.45
1939	749,526	+32.56	23.51	1.78	3,187,809	+36.87	42,041,790	+26.78
1948	2,366,588	+215.74	21.48	1.81	11,019,804	+245.69	130,520,548	+210.45
1949	2,512,926	+6.18	—	1.92	N.A.	—	130,721,000	+1.54
1950	2,731,611	+8.70	—	1.90	N.A.	—	143,689,000	+9.92
1951	2,934,247	+7.42	—	1.95	N.A.	—	150,589,000	+4.80
				Number of establishments				
1929	20,708	—	24.17	1.34	85,691	—	1,543,158	—
1933	19,440	−6.12	21.71	1.27	89,554	+4.51	1,526,119	−1.11
1935	21,937	+12.84	21.75	1.33	100,874	+12.64	1,653,961	+8.38
1939	23,938	+9.12	21.29	1.35	112,428	+11.45	1,770,355	+7.04
1948	25,119	+4.93	20.74	1.42	121,111	+7.72	1,769,540	−0.05

Source: U. S. Department of Commerce. California State Board of Equalization; and California State Chamber of Commerce. N.A. = not available.

TABLE 33

RETAIL SALES AND ESTABLISHMENTS FOR SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES; 1929, 1933, 1935, 1939, 1948, 1949–51

Year	Alameda		Contra Costa		Marin		San Francisco		San Mateo		Solano		Total	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
							Sales (thousands of dollars)							
1929	264,733	26.72	28,588	2.89	15,286	1.54	634,394	64.02	31,440	3.17	16,516	1.67	990,957	100
1933	146,030	32.20	15,931	3.51	8,839	1.95	254,075	56.02	20,009	4.41	8,645	1.91	453,529	100
1935	193,690	34.26	23,728	4.20	11,740	2.08	298,371	52.77	24,513	4.34	13,389	2.37	565,431	100
1939	250,580	33.43	34,397	4.59	18,448	2.46	383,554	51.17	43,542	5.81	19,005	2.54	749,526	100
1948	808,445	34.16	192,732	8.14	66,481	2.81	1,033,188	43.66	177,369	7.49	88,373	3.73	2,366,588	100
1949	830,332	33.04	219,099	8.72	76,518	3.04	1,089,241	43.35	203,546	8.10	94,190	3.75	2,512,926	100
1950	899,863	32.94	252,016	9.23	85,423	3.13	1,146,523	41.97	241,404	8.84	106,382	3.89	2,731,611	100
1951	957,767	32.64	291,450	9.93	93,420	3.18	1,199,622	40.88	269,085	9.17	122,873	4.19	2,934,247	100
							Number of establishments							
1929	7,408	34.17	1,213	5.60	581	2.68	10,849	50.04	1,037	4.78	591	2.73	21,679	100
1933	7,276	34.87	1,150	5.51	606	2.90	10,087	48.34	1,230	5.89	518	2.48	20,867	100
1935	7,965	35.79	1,430	6.42	598	2.69	10,251	46.06	1,371	6.16	642	2.88	22,257	100
1939	7,911	33.05	1,476	6.17	778	3.25	11,339	47.37	1,696	7.09	738	3.08	23,938	100
1948	8,554	34.05	2,632	10.48	778	3.10	10,258	40.84	1,922	7.65	975	3.88	25,119	100
1949	10,078	32.92	3,259	10.64	1,022	3.34	12,321	40.24	2,703	8.83	1,235	4.03	30,618	100
1950	9,817	32.49	3,242	10.73	1,048	3.47	12,070	39.95	2,852	9.44	1,185	3.92	30,214	100
1951	9,791	32.45	3,280	10.87	1,081	3.59	11,905	39.45	2,916	9.66	1,202	3.98	30,175	100

Source: Data for 1929, 1933, 1935, 1939, and 1948, Bureau of the Census, U. S. Department of Commerce; 1949–1951 data, estimates of California State Chamber of Commerce, and State Board of Equalization.

With such large losses in relative importance for San Francisco County, and with the mixed pattern as indicated for Alameda County, it is only natural to expect increases in relative importance for the remaining counties. Retail sales in Contra Costa have mounted steadily from 2.89 percent of the 1929 total to 9.93 percent in 1951. San Mateo County has had a somewhat less-rapid rate of growth from 3.17 percent to 9.17 percent during the same period. Sales in Solano County rose from 1.67 percent to 3.73 percent in 1948, then shot up during the next 2 yrs., with a rise to 4.19 percent in 1951. Marin County had an increase

from 1.54 percent in 1929 to 2.81 percent in 1949, with a higher rate of increase thereafter to 3.18 percent in 1951.

Changes in Number of Establishments

The pattern of changes in the size of each county's retail plant is different than that for sales, reflecting, among other things, changes in the volume of sales per establishment. San Francisco County had about half of the 1929 retail stores. By 1939, its percentage had fallen to 47.37 percent, a much-smaller rate of decline than for sales. By 1948, it had only 40.84 percent of the stores and then declined only slightly to 39.45 percent in 1951. Since the percentage of stores in San Francisco County was below the percentage of sales, it is obvious that the county has above-average-sales-volume stores. Alameda County, on the other hand, had a higher percentage of stores than of sales between 1929 and 1939; after that, its percentages have been about identical. Relative to the area as a whole, Alameda County did not begin to lose ground steadily until after 1948.

Contra Costa has increased its share of the retail plant from 5.60 percent of the 1929 total to 10.87 percent of the 1950 total. Most of this growth took place between 1939 and 1948. And year by year this county has had a higher percentage of stores than of sales. San Mateo has increased steadily from 4.78 percent of the 1929 total to 9.66 percent of the 1951 total. It, too, has a higher proportion of stores than sales. In Solano County, there was an increase from 2.73 percent in 1929 to 4.03 percent in 1949, followed by a small decline in 1950 and 1951. For the first time in 1951, the county had a higher proportion of sales than of retail establishments. Marin County had a variable pattern between 1929 and 1948, ranging between a low of 2.68 percent in 1929 and 3.25 percent in 1939. Since 1948, there has been a steady growth to a peak of 3.59 percent in 1951. Once again, this county has had a higher proportion of stores than of sales.

CHANGES IN CITY DISTRIBUTION

Because of restrictions placed upon the release of census data on a city basis, comparisons can be made for only 34 cities in 1948; this number is reduced to as few as 25 cities for 1933, 1935, and 1939. Fortunately, however, many of the cities for which sales data are not available rank as of small importance.

Sales Changes

Table 34 immediately impresses the reader with the sharp variations in the distribution of sales among the 34 cities. In 1948, for example, Piedmont with only 0.03 percent of the area's total sales, contrasted sharply with 43.66 percent for San Francisco. The two largest metropolitan centers accounted for slightly more than two thirds of the total sales. An additional three cities accounted for only 9.5 percent more of the sales, while 13 other cities added only 2.26 percent more of sales.

San Francisco is the only city which has suffered a sharp steady reduction in relative importance between 1929 and 1948, declining from 64 to 43.66 percent of the metropolitan area total retail sales. Oakland rose steadily from 20.35 percent in 1929 to 25.07 in 1935; since then it has declined to 23.17 percent in 1948. Berkeley rose from 3.28 percent in 1929 to 4.63 percent in 1933, stabilized its relative share between 1933 and 1939, and then declined slightly to 4.36 percent in 1948. An additional four cities—Burlingame, Martinez, San Anselmo, and Livermore—also showed mixed trends, and all except San Anselmo reached their peaks in 1939.

The remainder of the cities, and especially Richmond, Vallejo, Alameda, San Mateo, San Rafael, Redwood City, Hayward, and San Leandro, have gained percentagewise most of the ground lost by San Francisco.

Changes in Number of Retail Establishments

The range in relative importance of retail establishments, based on 1948 data, was nearly as great as for retail sales. The spread was from 40.84 percent for San Francisco to 0.03 percent for Piedmont. San Francisco and Oakland accounted for 62 percent of the establishments, while an additional three cities added 9.3 percent of the establishments, and the remaining 29 cities had only about 17 percent.

Without developing all of the details of Table 34, it is apparent that changes in the percentages of retail establishments, by cities, vary considerably from the percentages of retail sales. Six cities[38] have had steady declines in their shares of the retail establishments of the area. In 1939, they had about four out of every five establishments; by 1948, this had declined to 67.58 percent, with most of the decline registered for San Francisco. Nine cities[39] increased steadily in importance over the period, accounting for only 6.09 percent of the retail establishments in the area in

[38] San Francisco, Oakland, Berkeley, Martinez, Vacaville, and Sausalito.
[39] Richmond, Vallejo, San Mateo, Redwood City, San Leandro, Albany, San Bruno, Antioch, and Fairfield.

TABLE 34

SAN FRANCISCO-OAKLAND METROPOLITAN AREA RETAIL SALES AND ESTABLISHMENTS BY PRINCIPAL CITIES, IN DECLINING ORDER OF IMPORTANCE (1948 SALES); 1929, 1933, 1935, 1939, AND 1948

Cities and Counties	Percent of Area's Sales					Percent of Area's Establishments				
	1948	1939	1935	1933	1929	1948	1939	1935	1933	1929
San Francisco (San Francisco)	43.66	51.17	52.77	56.02	64.02	40.84	47.37	46.06	48.34	50.04
Oakland (Alameda)	23.17	24.13	25.07	22.91	20.35	21.17	21.53	23.62	23.47	23.35
Berkeley (Alameda)	4.36	4.58	4.53	4.63	3.28	4.49	4.74	5.19	5.03	5.14
Richmond (Contra Costa)	3.01	1.27	1.27	0.99	0.96	3.00	1.46	1.71	1.47	1.55
Vallejo (Solano)	2.08	1.63	1.52	1.10	0.92	1.84	1.61	1.49	1.11	1.24
Alameda (Alameda)	1.66	1.28	1.48	1.36	0.92	1.67	1.49	1.75	1.72	1.67
San Mateo (San Mateo)	1.48	1.11	0.85	0.96	0.81	1.29	1.28	1.00	1.09	0.82
Burlingame (San Mateo)	1.34	1.57	1.24	1.23	0.84	0.96	0.94	0.89	1.06	0.80
San Rafael (Marin)	1.32	1.26	1.14	0.96	0.76	0.96	0.94	1.00	0.95	0.84
Redwood City (San Mateo)	1.28	0.96	0.78	0.78	0.56	1.13	0.96	0.93	0.85	0.80
Hayward (Alameda)	1.17	1.15	1.05	1.01	0.67	1.00	0.93	0.86	0.98	0.77
San Leandro (Alameda)	1.13	0.58	0.50	0.43	0.34	1.35	0.89	0.89	0.73	0.73
Pittsburg (Contra Costa)	0.75	0.58	0.59	0.56	0.42	1.10	0.69	0.78	0.78	0.76
Albany (Alameda)	0.59	0.37	0.26	0.24	0.10	0.63	0.46	0.49	0.43	0.32
Daly City (Marin)	0.57	0.44	0.29	0.27	0.15	0.58	0.62	0.55	0.49	0.36
San Bruno (San Mateo)	0.52	0.21	0.13	0.14	0.07	0.45	0.25	0.20	0.23	0.22
Martinez (Contra Costa)	0.51	0.63	0.56	0.59	0.41	0.66	0.63	0.59	0.74	0.70
San Carlos (San Mateo)	0.48	*	*	*	0.04	0.45	*	*	*	*
El Cerrito (Contra Costa)	0.47	0.37	0.29	0.11	0.12	0.61	0.46	0.57	0.24	0.39
South San Francisco (San Mateo)	0.44	0.36	0.27	0.27	0.25	0.51	0.43	0.49	0.49	0.45
Antioch (Contra Costa)	0.42	0.24	0.25	0.21	0.13	0.61	0.38	0.33	0.34	0.23
San Anselmo (Marin)	0.29	0.25	0.18	0.25	0.20	0.35	0.37	0.24	0.45	0.34
Menlo Park (San Mateo)	0.28	*	*	*	0.09	0.32	*	*	*	*
Livermore (Alameda)	0.27	0.27	0.27	0.30	0.21	0.37	0.35	0.38	0.32	0.32
Fairfield (Solano)	0.26	*	*	*	0.10	0.25	*	*	*	0.18
Emeryville (Alameda)	0.24	*	*	*	0.09	0.31	*	*	*	*
Vacaville (Solano)	0.17	*	*	*	0.17	0.20	*	*	*	0.34
Benicia (Solano)	0.16	*	0.07	0.08	0.09	0.23	*	0.16	0.19	0.22
Millbrae (San Mateo)	0.16	*	*	*	*	0.27	*	*	*	*
Sausalito (Marin)	0.14	0.13	0.14	0.16	0.14	0.22	0.24	0.20	0.32	0.36
Fairfax (Marin)	0.12	*	*	*	*	0.14	*	*	*	*
Belmont (San Mateo)	0.11	*	*	*	*	0.20	*	*	*	*
Corte Madera (Marin)	0.06	*	*	*	0.02	0.07	*	*	*	*
Piedmont (Alameda)	0.03	0.06	0.06	0.08	0.05	0.03	0.06	0.03	0.03	0.04
Remainders of counties										
Contra Costa	2.99	1.49	1.22	1.06	0.85	4.51	2.56	2.45	1.95	1.97
Alameda	1.55	1.01	1.03	1.23	0.69	2.97	2.62	2.58	2.15	1.53
Solano	1.07	0.91	0.77	0.73	0.15	1.37	1.47	1.24	1.18	0.39
Marin	0.88	0.82	0.61	0.58	0.43	1.35	1.70	1.25	1.19	1.07
San Mateo	0.85	1.14	0.77	0.76	0.37	1.48	2.59	2.11	1.68	0.95
Total Metropolitan Area	100	100	100	100	100	100	100	100	100	100

* Included in "Remainders of counties."

1929, and 10.55 percent in 1948. The remaining 12 cities[40] for which some comparisons could be made had mixed patterns, but in all cases their 1948 importance was equal to or above their 1929 importance. Thus, as a group, they had 8.37 percent of the 1948 establishments and 6.96 percent of the 1929 total.

In the larger cities, as of 1948, San Francisco and Oakland had percentages of sales far above those for establishments, indicating the influence of larger-sized firms. Berkeley had a lower proportion, while Richmond had a parity. Among the remaining larger cities, Vallejo, San Mateo, Burlingame, San Rafael, Redwood City, and Hayward had retail-sales importance which outstripped the percentage of retail establishments.

[40] Alameda, Burlingame, San Rafael, Hayward, Pittsburg, Daly City, El Cerrito, South San Francisco, San Anselmo, Livermore, Benicia, and Piedmont.

CHANGES IN DISTRIBUTION IN UNINCORPORATED AREAS

Another interesting aspect of the geographic distribution of retail sales and establishments in the metropolitan area is the sharp trend towards increased importance of the unincorporated segments.[41] As a group, they accounted for 7.34 percent of the 1948 sales as against only 2.49 percent of the 1929 sales; and 11.68 percent of the 1948 establishments as against 5.91 percent of the 1929 total. A comparison of these

[41] These data do include some sales and establishments data for smaller incorporated cities not revealed in census reports as follows: (1) for retail sales, three cities in 1929, nine cities in 1933 and 1935, and ten cities in 1939; (2) for retail establishments, seven cities in 1929, nine cities in 1933 and 1935, and ten cities in 1939.

two sets of percentages confirms that these unincorporated areas tend to have the smaller-sized establishments.

The increased concentration is most noticeable for the unincorporated areas of Contra Costa County, but substantial increases are shown also for Alameda and Solano unincorporated segments. These developments, associated with population gains discussed earlier, presage possible drives for annexation of some of these areas to existing cities, or else for separate incorporations within the next decade. In a few instances, the increased importance of the unincorporated areas may measure the development of retail sales in and around military establishments.

RELATIONSHIP OF GEOGRAPHIC DISTRIBUTION OF RETAIL SALES AND ESTABLISHMENTS TO POPULATION DISTRIBUTION

It can be assumed as a basis for analyzing geographic shifts of retail sales that, if a city has the same proportion of sales and population, a one-to-one ratio, it has not lost ground relative to the metropolitan area as a whole. If it has a higher percentage of sales than of population, it may be rated as an important retail-trading center; and conversely, if it has a smaller percentage of sales than of population, it may be rated as a less-important trading center. Shifts in these relationships tend to measure changes from less to greater importance as trading centers, or vice versa.

How have the changes in the relative importance of retail sales and retail establishments in the area's cities kept pace with, or lagged behind, population shifts? One method of measuring the assumption stated above is by dividing each city's percentages of retail establishments and sales by the corresponding percentage of population. The resulting ratios are shown in Table 35.

Sales-Population Ratios

Of the 24 cities with complete data listed in Table 35, only ten had ratios in which sales were relatively above population by ratios exceeding unity in 1948. In order

TABLE 35

RATIOS OF METROPOLITAN AREA PERCENTAGES OF RETAIL STORES AND SALES TO POPULATION, BY PRINCIPAL CITIES, 1929–1948

City (in order of 1948 sales importance)	Ratios of Retail-Sales Percentages to Population Percentages					Ratios of Retail Establishment Percentages to Population Percentages				
	1948	1939	1935	1933	1929	1948	1939	1935	1933	1929
San Francisco	1.22	1.17	1.17	1.22	1.35	1.14	1.08	1.02	1.06	1.06
Oakland	1.32	1.17	1.20	1.09	0.96	1.20	1.04	1.13	1.12	1.11
Berkeley	0.84	0.78	0.76	0.77	0.54	0.87	0.81	0.87	0.84	0.85
Richmond	0.73	0.79	0.81	0.65	0.64	0.73	0.91	1.10	0.96	1.03
Vallejo	1.75	1.21	1.23	0.93	0.83	1.55	1.19	1.20	0.94	1.12
Alameda	0.74	0.51	0.58	0.53	0.35	0.75	0.60	0.69	0.67	0.64
San Mateo	0.82	0.85	0.72	0.86	0.84	0.72	0.98	0.85	0.98	0.85
Burlingame	1.47	1.45	1.19	1.21	0.88	1.05	0.87	0.86	1.04	0.84
San Rafael	2.16	2.14	1.93	1.63	1.27	1.57	1.59	1.69	1.61	1.40
Redwood City	1.16	1.14	1.01	1.07	0.85	1.03	1.14	1.21	1.16	1.21
Hayward	1.88	2.50	2.39	2.40	1.63	1.61	2.02	1.95	2.33	1.88
San Leandro	0.94	0.59	0.54	0.47	0.41	1.13	0.91	0.96	0.79	0.88
Pittsburg	1.29	0.89	0.87	0.81	0.60	1.90	1.06	1.15	1.13	1.09
Albany	0.75	0.48	0.36	0.35	0.16	0.80	0.60	0.68	0.63	0.52
Daly City	0.84	0.68	0.47	0.44	0.26	0.85	0.95	0.89	0.80	0.63
San Bruno	0.96	0.48	0.35	0.42	0.27	0.83	0.57	0.54	0.70	0.85
Martinez	1.31	1.26	1.12	1.20	0.85	1.69	1.26	1.18	1.51	1.46
San Carlos	0.81	N.A.	N.A.	N.A.	N.A.	0.76	N.A.	N.A.	N.A.	N.A.
El Cerrito	0.62	0.90	0.83	0.33	0.43	0.80	1.12	1.63	0.73	1.39
South San Francisco	0.54	0.80	0.59	0.59	0.54	0.63	0.96	1.07	1.07	0.98
Antioch	0.87	0.70	0.81	0.70	0.50	1.27	1.12	1.06	1.13	0.88
San Anselmo	0.60	0.74	0.58	0.83	0.77	0.73	1.09	0.77	1.50	1.31
Menlo Park	0.50	N.A.	N.A.	N.A.	N.A.	0.57	N.A.	N.A.	N.A.	N.A.
Livermore	1.42	1.35	1.29	1.36	0.91	1.95	1.75	1.81	1.45	1.39
Fairfield	2.00	N.A.	N.A.	N.A.	1.25	1.92	N.A.	N.A.	N.A.	2.25
Emeryville	1.85	N.A.	N.A.	N.A.	0.50	2.38	N.A.	N.A.	N.A.	N.A.
Vacaville	1.21	N.A.	N.A.	N.A.	1.25	1.43	N.A.	N.A.	N.A.	2.83
Benicia	0.52	N.A.	0.37	0.40	0.41	0.74	N.A.	0.84	0.95	1.00
Millbrae	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Sausalito	0.64	0.52	0.54	0.62	0.52	1.00	0.96	0.77	1.23	1.33
Fairfax	0.67	N.A.	N.A.	N.A.	N.A.	0.78	N.A.	N.A.	N.A.	N.A.
Belmont	0.48	N.A.	N.A.	N.A.	N.A.	0.87	N.A.	N.A.	N.A.	N.A.
Corte Madera	0.75	N.A.	N.A.	N.A.	0.29	0.88	N.A.	N.A.	N.A.	N.A.
Piedmont	0.06	0.09	0.09	0.12	0.09	0.06	0.09	0.04	0.04	0.06

N.A. = not available.

of the size of ratio for that year, these cities were San Rafael, Hayward, Vallejo, Burlingame, Livermore, Oakland, Martinez, Pittsburg, San Francisco, and Redwood City. It is interesting to note in this connection that the two largest cities of the metropolitan area continue to be included in this group, despite the effects of the decentralization and dispersion movements. For most of this group of cities, the ratio has tended to increase since 1929; this is true especially for Vallejo, Burlingame, San Rafael, Redwood City, and Pittsburg. In the case of San Francisco, the ratio has been very steady since 1933, although slightly below the 1929 position. For Hayward, the ratio rose sharply between 1929 and 1933, remained well stabilized between 1933 and 1939, and then declined sharply in 1948 to a position slightly higher than the 1929 ratio.

Trends for the remaining 14 cities having ratios less than one in 1948 show mixed patterns. None of the cities in this group registered steady declines. Half of the cities—Berkeley, Alameda, San Leandro, Albany, Daly City, San Bruno, and Antioch—showed significant increases from 1929 to 1948. Only San Leandro and San Bruno, however, were approaching a one-to-one parity by 1948. Six cities—Richmond, El Cerrito, South San Francisco, San Anselmo, Sausalito, and Piedmont—first showed increasing ratios and then lost ground in the later years of the 1929–1948 period. None of these approached a one-to-one parity of relationships in 1948. San Mateo dipped slightly between 1929 and 1935 and then regained its ratio position in 1939 and 1948. Ratios for the remaining cities were available only during part of the period.

Retail-Establishment-to-Population Ratios

What positions did these cities maintain in the relationship of their retail-plant importance relative to their population importance? Table 35 also has the necessary ratios to answer this question. Thirteen cities had ratios of one or over in 1948 compared with only ten for sales-population ratios. These 13 cities were, in order of size of ratio, Livermore, Pittsburg, Martinez, Hayward, San Rafael, Vallejo, Antioch, Oakland, San Francisco, San Leandro, Burlingame, Redwood City, and Sausalito. Of this group, Vallejo, San Leandro, Pittsburg, Antioch, and Livermore, show increases in the size of the ratio. Redwood City, Hayward, and Sausalito have tended to lose some ground. The remaining cities of the group have had mixed patterns, but in general, their 1948 ratios were above their 1929 ratios.

For the other 11 cities with ratios below one, Berkeley has had a stable ratio over the period, and the ratio for Alameda has increased. Ratios for Daly City, San Bruno, and Piedmont show mixed patterns: Daly City had a peak in 1939, with its 1948 ratio above the 1929 portion; San Bruno declined sharply from 1929 to 1939 but recovered most of this loss in 1948; Piedmont declined from 1929 to 1935, reached a peak in 1939, and then equalled its 1929 ratio in 1948. The remaining cities—Richmond, San Mateo, El Cerrito, South San Francisco, and San Anselmo—had declines. Almost all of this group at one time during the 1929–1948 period had ratios exceeding one.

PER-CAPITA RETAIL SALES

One comparison of the extent of retail decentralization and dispersion is to be found in variations between per-capita sales, by cities, for the various census periods. The significant relationships are between any given city's per-capita retail sales in any year and the average for the metropolitan area. Because of changing price levels, however, changes between years require very careful evaluation. For purposes of this analysis, the comparisons for the given census periods in Table 36 are shown in two ways: the absolute sales per capita for each census year and the ratios of each city's per-capita sales to the average for the metropolitan area.

Variations in Absolute Per-Capita Sales

In 1948, sales per capita varied from only $65 for Piedmont to $2,416 for San Rafael. The overall average for the area was $1,125. In 1929, with an average of $748, the range was from $59 for Piedmont to $1,240 for Hayward. The shifts in the number of cities having per-capita sales above the area's average illustrate clearly how retail trade has become dispersed and decentralized. In 1929, only five cities of the 32 for which data were available, had per-capita sales above average. By 1933, the number of cities had increased to eight, and in 1935 and 1939 there were nine. With the accelerated movement of the war and postwar periods, there were 13 cities above average by 1948.

As of 1948, three cities (San Rafael, Fairfield, and Hayward) have sales per capita well over $2,000 for each. Emeryville and Vallejo had per-capita sales just below $2,000. Five cities (Burlingame, Livermore, Martinez, Oakland, and Pittsburg) had amounts ranging downward from $1,650 to $1,448 per capita. The remaining above-average cities (San Francisco, Vacaville, and Redwood City) had sales per capita of $1,376 to $1,298. By contrast, only Hayward, Vacaville, San Francisco, San Rafael, and Fairfield (in order of

TABLE 36

ABSOLUTE AND RELATIVE PER CAPITA RETAIL SALES FOR 33 SAN FRANCISCO-OAKLAND METROPOLITAN AREA CITIES; 1929, 1933, 1935, 1939, AND 1948

City (In Order of 1948 Size of Per Capita Sales)	Absolute Per Capita Sales					Relative Per Capita Sales (Metropolitan Area Average = 100)				
	1948	1939	1935	1933	1929	1948	1939	1935	1933	1929
San Rafael	$2,416	$1,105	$777	$533	$959	215	214	193	163	128
Fairfield	2,154	N.A.	N.A.	N.A.	846	191	N.A.	N.A.	N.A.	113
Hayward	2,143	1,299	960	775	1,240	190	252	239	237	166
Emeryville	1,988	N.A.	N.A.	N.A.	383	177	N.A.	N.A.	N.A.	51
Vallejo	1,973	621	495	305	621	175	120	123	93	83
Burlingame	1,650	748	477	395	660	147	145	119	121	88
Livermore	1,539	698	511	452	678	137	135	127	138	91
Martinez	1,495	645	455	391	638	133	125	113	120	85
Oakland	1,481	601	483	358	722	132	116	120	109	97
Pittsburg	1,448	459	350	264	452	129	89	87	81	60
San Francisco	1,376	718	470	400	1,015	122	139	117	122	136
Vacaville	1,360	N.A.	N.A.	N.A.	1,081	121	N.A.	N.A.	N.A.	145
Redwood City	1,298	581	409	351	647	115	113	102	107	86
San Bruno	1,071	249	144	142	199	95	48	36	43	27
San Leandro	1,058	302	214	156	309	94	59	53	48	41
Antioch	985	367	329	234	368	88	71	82	72	49
Berkeley	947	402	306	252	406	84	78	76	77	54
Daly City	942	347	190	145	195	84	67	47	44	26
San Mateo	922	440	290	282	622	82	85	72	86	83
San Carlos	901	N.A.	N.A.	N.A.	382	80	N.A.	N.A.	N.A.	51
Albany	850	248	147	115	123	76	48	37	35	16
Richmond	825	406	327	211	477	73	79	81	65	64
San Anselmo	805	330	198	226	437	72	64	49	69	58
Corte Madera	804	N.A.	N.A.	N.A.	223	71	N.A.	N.A.	N.A.	30
Fairfax	727	N.A.	N.A.	N.A.	N.A.	65	N.A.	N.A.	N.A.	N.A.
Sausalito	721	284	223	200	373	64	55	55	61	50
El Cerrito	692	468	329	110	331	62	91	82	34	44
Alameda	659	266	235	174	263	59	52	58	53	35
South San Francisco	613	414	238	192	401	54	80	59	59	54
Benicia	580	N.A.	N.A.	N.A.	297	52	N.A.	N.A.	N.A.	40
Menlo Park	570	N.A.	N.A.	N.A.	391	51	N.A.	N.A.	N.A.	52
Belmont	526	N.A.	N.A.	N.A.	N.A.	47	N.A.	N.A.	N.A.	N.A.
Piedmont	65	49	35	39	59	6	9	9	12	8
Area Average	$1,125	$516	$402	$327	$748	100	100	100	100	100

N.A. = not available.

declining importance) had above-average sales per capita in 1929.

The remaining cities with below-average sales per capita reflect various factors, such as relatively low consumer purchasing power, poor quality of retail stores and management, lessened drawing power by virtue of better retailing facilities in nearby cities, or primarily residential structure (as in Piedmont) as the result of rigid zoning laws.

Relative Per-Capita Sales

The tendency described above for absolute per-capita sales can be seen in another way by analyzing the relative per-capita sales data shown in Table 36. These relatives permit better comparisons to be made of each city's standing over time. Of the cities which had sales per capita in 1948 above the metropolitan-area average, all but Hayward, Livermore, San Francisco, and Vacaville have had increases in relative sales between 1929 and 1948. Especially to be noted, are the increases for San Rafael, Fairfield, Emeryville, and Vallejo. Hayward had a sharp increase from 1929 to 1939 but suffered a sharp decline in 1948. Livermore had a sharp increase between 1929 and 1933 but has since stabilized its position. Relative sales per capita for San Francisco declined somewhat between 1929 and 1935, then recovered all of the losses by 1939, followed by a moderate decline once more in 1948. Vacaville has lost ground between 1929 and 1948.

Of the remaining cities with below-average sales,

Berkeley, Daly City, San Carlos, Albany, Corte Madera, and Benicia have had increases in relative sales per capita, especially Daly City, Albany, and Corte Madera. Relative sales per capita for San Mateo and Menlo Park have shown little change. Antioch, San Anselmo, Fairfax, El Cerrito, and Alameda have had mixed patterns, but the 1948 relative per-capita sales were higher than in 1929. Richmond had a peak in 1935, with a slight decline thereafter, while relative sales for South San Francisco reached a peak in 1939, but fell back to 1929 levels in 1948.

ABSOLUTE CHANGES IN RETAIL SALES AND NUMBER OF ESTABLISHMENTS

It was pointed out earlier that a study of the geographic shifts in population based upon changes in the absolute numbers of persons reveals sharply different results than a study of percentage composition. The same conclusion can be stated for retail sales, as the following analysis indicates based upon Table 37.

Absolute Changes in Retail Sales

Total retail sales in the area, *without* correction for price level changes, increased by nearly $1.4 billion between 1929 and 1948. This increase consisted of an increase of $1.6 billion between 1939 and 1948 and a decrease of $241.4 million between 1929 and 1939. For the period as a whole, San Francisco accounted for about 29 percent of the increase and Oakland for an additional 25.2 percent. Berkeley, Richmond, the "remainder" of Contra Costa County, Vallejo, Alameda, and the "remainder" of Alameda County, accounted for an additional 21.4 percent, or a combined percentage of 75.6.

For the very-important period from 1939 through 1948, San Francisco accounted for 40.2 percent of the dollar increase in sales and Oakland for 22.7 percent. Berkeley, Richmond, the remainder of Contra Costa County, Vallejo, the remainder of San Mateo County, the remainder of Alameda County, and the remainder of Solano County, accounted for an additional 20.4 percent. Together, these units accounted for five sixths of the net increase. It is obvious that, while the larger cities have not expanded retail sales as fast relatively as the smaller areas, they have contributed the major share of the total increase in sales which has taken place.

Since the larger cities account for most of the absolute increases, it is to be expected that they will also account for most of the cyclical down-turns. This is illustrated graphically by the changes between 1929 and 1939. Of 24 cities for which data were available, six had net declines. Included in this group were San Francisco, with a decline of $250.8 million (more than the total net decline for the bay area) and Oakland, with an additional $20.8 million. Altogether, the six cities had declines of $272.1 million, while the remainders of Alameda and Solano counties accounted for an additional $866,000 of declines. The remaining cities and unincorporated units had net gains of $31.2 million of retail sales. All of the cities and unincorporated areas of Contra Costa and San Mateo counties had increases, while substantial gains were shown also by the remaining important cities in the other counties, including Albany, Berkeley, Hayward, El Cerrito, San Rafael, and Vallejo.

Absolute Changes in Numbers of Retail Establishments

The size of the retail plant in the area increased by 3,440 establishments between 1929 and 1948. Of this over-all net increase, 2,259 establishments were added between 1929 and 1939 and 1,181 between 1939 and 1948. Sharp contrasts are apparent between cities in changes in the size of their retail plant and changes in dollar volume of sales (see Table 37). For the entire period 1929–48, for example, San Francisco lost 591 establishments, while accounting for the largest single increase in retail sales. Only three other cities of considerably less importance (Sausalito, Vacaville, and Piedmont) had shrinkages in the size of retail plants.

For the remaining areas which expanded their number of retail establishments, some startling patterns emerge during the 1929-to-1948 period in relation to gains in retail sales. The small cities and the unincorporated sections of the counties accounted for 50.2 percent of the net increase in retail establishments but for only 11.3 percent of the increase in sales. Most of this increase in size of retail plant took place in Contra Costa County, followed by Alameda and San Mateo counties. Among the cities showing net increases, there was a range from 3 establishments for Corte Madera to 416 for Richmond. The principal gains, in addition to Richmond as noted, were in Oakland, Vallejo, San Leandro, San Mateo, Pittsburg, Redwood City, and Antioch. Especially to be noted is the lack of correlation between the pattern of relative gain in number of retail establishments and the pattern of gain for sales.

When the gain of 2,259 establishments during the period from 1929 through 1939 is studied by areas, a different picture is apparent than for 1929–1948. Only Sausalito and Alameda lost establishments, while Martinez and Pittsburg had no net changes. San Francisco had the largest net gain, 490 establishments or 21.7 percent of the total net increase. Other important

TABLE 37

CHANGES IN RETAIL SALES AND NUMBER OF RETAIL ESTABLISHMENTS FOR PRINCIPAL CITIES AND FOR COUNTIES, SAN FRANCISCO-OAKLAND METROPOLITAN AREA; 1929–1939, 1939–1948, AND 1929–1948

(Based on unadjusted data)

City and County	Sales Changes (Thousand Dollars)						Establishment Changes					
	1929–48		1939–48		1929–39		1929–48		1939–48		1929–39	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Total, Metropolitan Area	+1,375,631	100	+1,617,062	100	−241,431	100	+3,440	100	+1,181	100	+2,259	100
Alameda												
Alameda	+30,107	2.19	+29,603	1.83	+504	0.21	+57	1.66	+63	5.33	−6	−0.27
Albany	+13,009	0.95	+11,205	0.69	+1,804	0.75	+89	2.59	+49	4.15	+40	1.77
Berkeley	+70,561	5.13	+68,801	4.25	+1,760	0.73	+14	0.41	−6	−0.51	+20	0.89
Emeryville	+4,711	0.34	*	*	*	*	+11	0.32	*	*	*	*
Hayward	+21,083	1.53	+19,126	1.18	+1,957	0.81	+86	2.50	+31	2.62	+55	2.43
Livermore	+4,265	0.31	+4,293	0.27	−28	−0.01	+23	0.67	+10	0.85	+13	0.58
Oakland	+346,643	25.20	+367,515	22.73	−20,772	−8.60	+256	7.44	+163	13.80	+93	4.12
Piedmont	+125	0.09	+171	0.11	−46	−0.02	−1	−0.03	−7	−0.59	+6	0.27
San Leandro	+23,344	1.70	+22,419	1.39	+625	0.26	+179	5.20	+126	10.67	+53	2.35
Remainder	+29,764	2.16	+34,732	2.15	−257	−0.11	+415	12.06	+120	10.16	+229	10.14
Total	+543,712	39.52	+557,865	34.50	−14,153	−5.86	+1,146	33.31	+643	54.45	+503	22.27
Contra Costa												
Antioch	+8,597	0.62	+8,035	0.50	+562	0.23	+108	3.14	+62	5.25	+46	2.04
El Cerrito	+9,808	0.71	+8,239	0.51	+1,569	0.65	+68	1.98	+44	3.73	+24	1.06
Martinez	+8,067	0.59	+7,410	0.46	+657	0.27	+15	0.44	+15	1.27	0	0
Pittsburg	+13,477	0.98	+13,289	0.82	+188	0.08	+111	3.23	+111	9.40	0	0
Richmond	+61,723	4.49	+61,696	3.82	+27	0.01	+416	12.09	+404	34.21	+12	0.53
Remainder	+62,472	4.54	+59,666	3.69	+2,806	1.16	+706	20.52	+520	44.03	+186	8.23
Total	+164,144	11.93	+158,335	9.79	+5,809	2.41	+1,419	41.25	+1,156	97.88	+263	11.64
Marin												
Corte Madera	+1,215	0.09	*	*	*	*	+3	0.09	*	*	*	*
Fairfax	*	*	*	*	*	*	*	*	*	*	*	*
San Anselmo	+4,954	0.36	+5,033	0.31	−79	−0.03	+16	0.47	0	0	+16	0.71
San Rafael	+23,710	1.72	+21,799	1.35	+1,911	0.79	+58	1.69	+17	1.44	+41	1.82
Sausalito	+1,975	0.14	+2,311	0.14	−336	−0.14	−23	−0.67	−3	−0.25	−20	−0.89
Remainder	+19,341	1.41	+18,890	1.17	+1,666	0.69	+143	4.16	−14	−1.19	+160	7.08
Total	+51,195	3.72	+48,033	2.97	+3,162	1.31	+197	5.73	0	0	+197	8.72
San Francisco	+398,794	28.99	+649,644	40.17	−250,840	−103.90	−591	−17.18	−1,081	−91.53	+490	21.69
San Mateo												
Belmont	*	*	*	*	*		*	*	*	*	*	*
Burlingame	+23,359	1.70	+19,906	1.23	+3,453	1.43	+67	1.95	+15	1.27	+52	2.30
Daly City	+11,920	0.87	+10,102	0.62	+1,818	0.75	+66	1.92	−3	−0.25	+69	3.05
Menlo Park	+5,781	0.42	*	*	*	*	+28	0.81	*	*	*	*
Millbrae	*	*	*	*	*	*	*	*	*	*	*	*
Redwood City	+24,610	1.79	+22,997	1.42	+1,613	0.67	+109	3.17	+54	4.57	+55	2.43
San Bruno	+11,560	0.84	+10,678	0.66	+882	0.37	+65	1.89	+52	4.40	+13	0.58
San Carlos	+10,860	0.79	*	*	*	*	+87	2.53	*	*	*	*
San Mateo	+26,909	1.96	+26,571	1.64	+338	0.14	+147	4.27	+18	1.52	+129	5.71
South San Francisco	+8,070	0.59	+7,771	0.48	+299	0.12	+32	0.93	+25	2.12	+7	0.31
Remainder	+22,860	1.66	+35,892	2.22	+3,609	0.49	+282	8.20	+65	5.50	+334	14.78
Total	+145,929	10.61	+133,827	8.27	+12,102	5.01	+885	25.73	+226	19.14	+659	29.17
Solano												
Benicia	+2,871	0.21	*	*	*	*	+10	0.29	*	*	*	*
Dixon	*	*	*	*	*	*	*	*	*	*	*	*
Fairfield	+5,071	0.37	*	*	*	*	+23	0.67	*	*	*	*
Rio Vista	*	*	*	*	*	*	*	*	*	*	*	*
Vacaville	+2,294	0.17	*	*	*	*	−23	−0.67	*	*	*	*
Vallejo	+40,214	2.92	+37,116	2.30	+3,098	1.28	+193	5.61	+77	6.52	+116	5.14
Remainder	+21,407	1.56	+32,252	1.99	−609	−0.25	+181	5.26	+160	13.55	+31	1.37
Total	+71,857	5.22	+69,368	4.29	+2,489	1.03	+384	11.16	+237	20.07	+147	6.51

* Included in "Remainder".

TABLE 38

SAN FRANCISCO-OAKLAND METROPOLITAN AREA INDEXES OF DEPARTMENT STORE SALES, BY SELECTED CITIES, 1919–1951 (1947–49 = 100)

Year	San Francisco-Oakland	Oakland-Berkeley	Downtown Oakland	San Francisco
1919	21	15	23	26
1920	26	20	30	32
1921	24	18	27	30
1922	25	18	27	32
1923	28	21	30	34
1924	29	22	31	36
1925	32	24	34	39
1926	34	26	37	41
1927	35	27	37	42
1928	36	29	39	44
1929	38	31	42	45
1930	38	35	45	42
1931	35	33	42	38
1932	27	26	33	30
1933	26	24	30	29
1934	28	26	32	31
1935	32	29	36	35
1936	36	32	39	39
1937	37	34	40	40
1938	34	32	38	36
1939	37	35	40	40
1940	38	37	41	40
1941	42	42	47	45
1942	53	54	61	53
1943	62	62	72	63
1944	70	69	79	72
1945	78	75	86	80
1946	93	90	96	96
1947	97	97	97	98
1948	102	103	103	102
1949	100	99	100	100
1950	107	107	106	107
1951	113	108	107	113

Source: 12th Federal Reserve Bank, San Francisco, Calif.

gains were registered for San Mateo, Vallejo, and Oakland. The small cities and unincorporated areas once again accounted for 41.6 percent of the gain.

The diverse patterns of change are shown for the 1939–1948 period, when there was an overall net increase of 1,181 establishments. The most-significant gains took place in Contra Costa and Alameda counties, with smaller gains for Solano and San Mateo counties. The spectacular feature was San Francisco, with a loss of 1,081 establishments while accounting for over 40 percent of the net increase in retail sales. Once again, the smaller cities and unincorporated areas have had the big increases in establishments, with 71.8 percent of the total, although these areas in Marin County have had a decrease. Richmond, among the important cities, has had the largest net gain, followed by Oakland, San Leandro, and Pittsburg.

In interpreting these changes in the number of retail establishments, it must be emphasized, of course, that the discussion has dealt only with the absolute numbers. Since no adjustments have been made for the sales size of these establishments, the above discussion does not indicate that many gains in the smaller cities and unincorporated areas are, undoubtedly, of small establishments because of the smallness of the sales gains.

CHANGES IN DEPARTMENT-STORE SALES IN SELECTED CITIES

Special data are available since 1919 showing the indexes of department-store sales for San Francisco, downtown Oakland, Oakland-Berkeley, and San Francisco-Oakland (see Table 38). The main conclusions to be drawn from the data, apart from their indications of growth since 1919, are the comparative rates of change since 1929, so comparisons can be made with census data. If the index numbers are first changed to a base of 1929 as 100, the table indicates that sales of stores in Oakland-Berkeley have increased more rapidly than in either downtown Oakland or San Francisco. Especially to be noted is the increase between 1929 and 1939, contrary to the general trend, and the much sharper rise between 1939 and 1948. Department stores in San Francisco had the smallest relative sales increase, but between 1950 and 1951 had a larger increase than either Oakland-Berkeley or downtown Oakland.

Compared with the changes in total retail sales, the evidence seems clear that, for two of the areas analyzed above, sales of department stores increased more rapidly (or declined less) than did total retail sales.[42] For San Francisco, total retail sales in 1948 were 63 percent higher than in 1929, while department-store sales were 122 percent above the 1929 level. In downtown Oakland, however, department-store sales increased by 145 percent, while total retail sales in the city of Oakland increased by 172 percent. For Oakland and Berkeley combined, total retail sales increased by 178 percent in 1948 over the 1929 level, while department-store sales increased by 232 percent.

In summary, the data of retail sales show quite clearly that (1) some decentralization has taken place; (2) the larger cities have contributed the larger proportions of the absolute increases in sales; (3) the larger cities have more frequently maintained better-than-even relationships between percentage of sales and percentage of population; and (4) the smaller cities and unincorporated areas have had larger gains in numbers of retail establishments than of sales, indicating the wider geographical distribution of smaller retail stores.

[42] These comparisons are not quite accurate since the indexes of department-store sales are much more carefully computed than the simple relatives of total retail sales.

Shifts in Geographic Distribution of Selected Service Trades

The lack of comparable data makes it impossible to discuss shifts in the geographical distribution of selected service trades for any period of time. This discussion, accordingly, is limited mainly to the census data for 1948. Because of the heterogeneous nature of the selected service trades, the discussion which follows divides them into the following categories: (1) personal services, (2) business services, (3) automobile-repair services and garages, (4) miscellaneous repair services, (5) amusements, (6) hotels, and (7) tourist courts. The detailed composition of these categories is given in Appendix B. From these it is apparent that no professional personal services are included.

RELATIVE IMPORTANCE OF THE AREA

The importance of selected service trades, in relation to California and the United States in 1948, is shown in Table 39. Sharp variations are apparent, depending on whether or not the service trade is highly urban in nature. In terms of establishment, the area had 4.6 to 25.5 percent of the California total, and 0.66 to 2.78 percent of the United States total. The area was highest for business services, hotels, and personal services. Exceptionally low percentages were recorded for the amusement and the tourist-court (motel) categories.

In terms of recipts, the range was from 7.8 to 28.6 percent of the California total and 1.37 to 2.98 percent of the United States total. The area was most important for business services and hotels and of least importance for tourist courts. The area had significantly higher percentages of receipts for business services, auto-repair services and garages, amusements, and hotels than it had of establishments. For miscellaneous repair services it accounted for a smaller percentage of receipts than of establishments.

COUNTY DISTRIBUTION IN 1948

The bay area had 12,560 establishments in 1948 classified as carrying on the seven categories of service trade activities listed above. These establishments had receipts totaling $326.6 million (see Table 40). Personal services accounted for over 55 percent of the establishments and for 30 percent of the receipts. Amusements, although sixth in rank in terms of number of establishments, was second highest in receipts.

County Distribution of Establishments by Types of Service Trades

The type of service trade affects sharply the county distribution of establishments. Thus, San Francisco county, while most important in terms of overall number of establishments, ranged from 2.4 percent of the area's tourist courts to 68.1 percent of the hotels. This county was first in all service-trade categories except in automobile-repair service and garages and in tourist courts. In amusements, it was barely in front of Alameda County. The number of hotels and business-service establishments in San Francisco County sharply exceeded the next-most-important county, and this county also held a comfortable lead in number

TABLE 39

COMPARISON OF NUMBER OF SELECTED SERVICE TRADE ESTABLISHMENTS AND RECEIPTS: SAN FRANCISCO-OAKLAND METROPOLITAN AREA, CALIFORNIA, AND UNITED STATES; 1948

	Personal Services	Business Services	Auto Repair Services & Garages	Misc. Repair Services	Total Selected Services	Amusements	Hotels	Tourist Courts
San Francisco-Oakland Metropolitan Area:								
Number of establishments	6,971	890	1,654	1,489	11,004	620	765	171
Percent of California Total	25.53	22.57	17.31	22.00	23.13	18.84	21.59	4.64
Percent of U. S. Total	1.98	2.78	1.73	1.86	1.97	1.23	2.58	0.66
Total receipts (thousand dollars)	98,724	48,617	40,098	19,650	207,089	60,127	56,655	2,680
Percent of California Total	25.38	28.63	21.53	19.50	24.60	23.57	27.65	7.77
Percent of U. S. Total	2.22	2.98	2.57	2.07	2.41	2.56	2.61	1.37
California:								
Number of establishments	27,304	3,944	9,556	6,769	47,573	3,291	3,544	3,689
Total receipts (thousand dollars)	389,034	169,820	186,201	100,745	841,660	255,136	204,881	34,478
United States:								
Number of establishments	351,985	32,007	95,544	80,023	559,559	50,347	29,650	25,919
Total receipts (thousand dollars)	4,440,189	1,629,513	1,561,109	947,351	8,578,162	2,349,601	2,172,756	195,505

Source: Census of Business; Service Trades, 1948.

of personal-service and miscellaneous repair-service establishments.

Alameda county was generally second in importance, ranging from 18 to 41.9 percent of the total establishments for each of the seven basic categories. For the automobile-repair-service-and-garage category it was far ahead of San Francisco County. This county had significantly high proportions also of miscellaneous repair-service establishments, amusement establishments, and personal-service establishments. San Francisco and Alameda counties together accounted for 90.2 percent of the business-service establishments, 86.2 percent of the hotels, 82.3 percent of the personal-service establishments, 80.7 percent of the miscellaneous service establishments, 75.9 percent of the automobile-repair establishments, and 67.4 percent of the amusement establishments.

The remainder of the counties had varying degrees of residual importance, depending upon the type of service trades. For tourist courts, a dispersed location activity, San Mateo county ranked first in number of establishments with 25.9 percent, while 22.9 percent were in Contra Costa county and 17.1 percent in Solano county. Contra Costa county had 15 percent of the amusement establishments, 10 percent of the automobile-service establishments, and 9.1 percent of the miscellaneous repair-service establishments.

All in all, the data of county distribution of selected service-trade establishments in 1948 show higher concentrations in the metropolitan counties than was true for retail trade.

County Distribution of Receipts, by Types of Service Trades

In all seven categories, San Francisco county had much-higher percentages of the metropolitan area receipts than it had of establishments. This was especially true for the hotel, business-service, and auto-repair-and-garage categories. In the first two of these categories, the essentially large city nature of the service trades is indicated, when San Francisco accounted for 82.3 percent of the hotel receipts and 77.5 percent of the business-service receipts. In the other categories, except tourist courts, the county ranked first with 42.9 to 51.2 percent of the area totals. It is obvious that the establishments in the county had far larger unit receipts than was true for the metropolitan area as a whole.

Alameda county had higher percentages of receipts than of establishments only in the personal-service, miscellaneous-service, and tourist-court categories. On the other hand, it had far-lower percentages of business-service, auto-repair-service, and hotel receipts.

Once again, except for tourist courts, it is apparent that the two metropolitan counties overwhelmingly dominate the service trades by accounting for 74.5 to 96.2 percent of the total receipts.

For the remaining counties, the greatest relative importance is in tourist-court receipts, with San Mateo county in first place with 33.8 percent, and Contra Costa county in third place with 16.7 percent. In the remaining categories, Contra Costa county had 5.6 to 6.8 percent of the personal-service, automobile-service, miscellaneous-repair-service, and amusement categories. San Mateo county, with its large race-track operations, accounted for 14.8 percent of the amusements receipts.

CITY DISTRIBUTION IN 1948

Data of establishments and receipts for selected service trades are available for 34 cities in 1948 (see Tables 41 and 42). In the case of individual categories, however, individual city receipts data are not available in order to avoid revealing individual establishment incormation. No city data are available for tourist courts.

City Distribution of Establishments, by Types of Service Trades

Table 41 shows the city distribution of 1948 establishments. The importance of San Francisco has been discussed in the preceding section. For the remaining cities, Oakland ranks second with 14.1 to 26.2 percent of the establishments in the six categories for which data are available. This city has a much larger share of the establishments in the automobile-service category than for any of the remaining. It has its lowest percentage in the hotel category.

Few of the remaining cities had 1 percent or more of the total establishments. Berkeley had a range of 1.83 percent of the hotels to 5.56 percent of the automobile-service establishments and with a high percentage (5.41) of the personal-service establishments. Richmond had 1.69 to 3.33 percent of the total. Other cities had more than 1 percent only in some of the six categories. Thus Alameda had 1.57 to 2.01 percent in four categories; Hayward had 1.01 to 1.27 percent in three categories; San Leandro had 1.03 to 1.45 percent in three categories; Pittsburg had 2.26 percent of the amusement establishments; San Rafael had 1.15 percent of the auto-repair category and 1.18 percent of the hotels; Burlingame had 1.27 percent of the auto category; Redwood City had 1.01 percent of the business-service establishments and 1.09 percent of

TABLE 40

NUMBER OF SELECTED SERVICE TRADES ESTABLISHMENTS AND RECEIPTS; SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES, 1948

Type of Service Trade	Alameda County	Contra Costa County	Marin County	San Francisco County	San Mateo County	Solano County	Total Metropolitan Area
Number of establishments							
Amount							
Personal, business, and repair							
Personal services	2,342	514	134	3,393	376	212	6,971
Business services	221	23	9	582	39	16	890
Auto repair and garages	693	167	52	562	115	65	1,654
Misc. repair services	551	136	34	650	71	47	1,489
Total	3,807	840	229	5,187	601	340	11,004
Amusements	214	93	20	216	37	40	620
Hotels	138	38	17	521	26	25	765
Tourist courts	41	39	13	4	44	29	171
Percent							
Personal, business, and repair							
Personal services	33.60	7.37	1.92	48.67	5.39	3.04	100
Business services	24.83	2.58	1.01	65.39	4.38	1.80	100
Auto repair and garages	41.90	10.10	3.14	33.98	6.95	3.93	100
Misc. repair services	37.00	9.13	2.28	43.65	4.77	3.16	100
Total	34.60	7.63	2.08	47.14	5.46	3.09	100
Amusements	34.52	15.00	3.23	34.84	5.97	6.45	100
Hotels	18.04	4.97	2.22	68.11	3.40	3.27	100
Tourist courts	24.12	22.94	7.65	2.35	25.88	17.06	100
Receipts (thousand dollars)							
Amount							
Personal, business, and repair							
Personal services	34,255	5,666	2,161	48,606	5,573	2,463	98,724
Business services	9,058	736	245	37,690	744	144	48,617
Auto repair and garages	11,908	2,726	1,328	20,513	2,529	1,094	40,098
Misc. repair services	7,560	1,097	356	9,614	688	335	19,650
Total	62,781	10,225	4,090	116,423	9,534	4,036	207,089
Amusements	19,019	3,804	976	25,787	8,913	1,628	60,127
Hotels	7,030	826	522	46,596	930	751	56,655
Tourist courts	725	447	198	141	906	263	2,680
Percent							
Personal, business, and repair							
Personal services	34.70	5.74	2.19	49.24	5.65	2.50	100
Business services	18.63	1.51	0.50	77.52	1.53	0.30	100
Auto repair and garages	29.70	6.80	3.31	51.16	6.31	2.73	100
Misc. repair services	38.47	5.58	1.81	48.93	3.50	1.70	100
Total	30.31	4.94	1.98	56.22	4.60	1.95	100
Amusements	31.63	6.33	1.62	42.89	14.82	2.71	100
Hotel	12.41	1.46	0.92	82.25	1.64	1.33	100
Tourist courts	27.05	16.68	7.39	5.26	33.81	9.81	100

the auto category; and San Mateo had 1.07 to 1.61 percent in three categories.

Some important concentrations of establishments were found in the smaller cities and unincorporated sections of Alameda and Contra Costa counties. In Alameda County, these sections accounted for 4.72 percent of the auto-repair category and 5.65 percent of the amusement establishments, as well as 2.55 percent of the repair-service establishments. In Contra Costa county these sections had 8.06 percent of the amusement establishments, 5.02 percent of the automobile category, and 4.43 percent of the repair establishments.

City Distribution of Receipts, by Types of Service Trade

Considerably less-detailed data by cities are available for receipts (see Table 42). The outstanding predominance of San Francisco has been indicated above. Oakland had 6.72 percent to 29.52 percent of the total receipts in six categories. Its percentage of receipts for

TABLE 41

PERCENTAGE DISTRIBUTION OF NUMBER OF SERVICE TRADES ESTABLISHMENTS, BY TYPE OF SERVICE, FOR PRINCIPAL SAN FRANCISCO-OAKLAND METROPOLITAN AREA CITIES, 1948

County and City	Personal Services	Business Services	Auto Repair Services & Garages	Misc. Repair Services	Amusements	Hotels
Total, Metropolitan Area	100.	100.	100.	100.	100.	100.
Alameda						
Alameda	1.88	0.22	1.57	2.01	1.77	0.39
Albany	0.49	—	0.60	0.54	0.32	—
Berkeley	5.41	3.60	5.56	3.56	2.58	1.83
Emeryville	0.20	0.45	0.18	0.07	0.81	0.39
Hayward	0.69	0.22	1.27	1.01	1.13	0.13
Livermore	0.23	0.11	0.36	0.27	0.48	0.39
Oakland	21.93	19.10	26.18	25.72	21.13	14.12
Piedmont	0.03	—	—	—	—	—
San Leandro	1.03	0.45	1.45	1.28	0.65	—
Remainder	1.71	0.67	4.72	2.55	5.65	0.78
Total	33.60	24.83	41.90	37.00	34.52	18.04
Contra Costa						
Antioch	0.32	0.11	0.36	0.34	0.97	0.13
El Cerrito	0.56	0.11	0.48	0.27	0.81	—
Martinez	0.39	0.11	0.48	0.27	0.65	0.39
Pittsburg	0.86	0.22	0.42	0.54	2.26	1.05
Richmond	2.44	1.69	3 33	3.29	2.26	1.70
Remainder	2.81	0.34	5.02	4.43	8.06	1.70
Total	7.37	2.58	10.10	9.13	15.00	4.97
Marin						
Corte Madera	0.03	—	0.12	—	—	—
Fairfax	0.09	—	0.18	0.07	0.16	—
San Anselmo	0.16	—	0.18	0.20	0.48	0.13
San Rafael	0.63	0.45	1.15	0.81	0.97	1.18
Sausalito	0.24	0.22	0.30	0.20	0.32	0.52
Remainder	0.77	0.34	1.21	1.01	1.29	0.39
Total	2.81	1.01	3.14	2.28	3.23	2.22
San Francisco	48.67	65.39	33.98	43.65	34.84	68.11
San Mateo						
Belmont	—	—	0.06	—	—	—
Burlingame	0.85	0.79	1.27	0.60	0.32	0.26
Daly City	0.52	—	0.79	0.34	0.32	—
Menlo Park	0.26	0.22	0.30	0.13	0.48	—
Millbrae	0.24	0.11	0.12	0.13	—	—
Redwood City	0.80	0.01	1.09	0.67	0.48	0.65
San Bruno	0.32	0.34	0.24	0.13	0.65	—
San Carlos	0.23	0.11	0.36	0.54	0.16	—
San Mateo	1.09	0.90	0.85	1.07	1.61	0.78
South San Francisco	0.40	0.22	0.60	0.27	0.48	0.92
Remainder	0.69	0.67	1.27	0.87	1.45	0.78
Total	5.39	4.38	6.95	4.77	5.97	3.40
Solano						
Benicia	0.24	—	0.24	0.07	0.48	0.13
Fairfield	0.14	0.34	0.18	—	0.16	—
Vacaville	0.22	—	0.42	0.13	0.16	0.13
Vallejo	1.59	1.12	1.69	0.94	2.90	1.83
Remainder	0.85	0.34	1.39	2.02	2.74	1.18
Total	3.04	1.80	3.93	3.16	6.45	3.27

the personal-service and miscellaneous-repair categories were above its percentages of the establishments in these categories. On the other hand, it had a far-smaller percentage of receipts in the remaining four categories.

Berkeley had higher percentages of receipts in the amusement and hotel categories, but the relationship was reversed for the remaining categories. In Richmond, the percentages of receipts were less than the percentages of establishments for all six categories.

Only eight of the remaining cities had 1 percent or

TABLE 42

PERCENTAGE DISTRIBUTION OF SERVICE TRADES RECEIPTS, BY TYPE OF SERVICE, FOR PRINCIPAL SAN FRANCISCO-OAKLAND METROPOLITAN AREA CITIES, 1948

County and City	Personal Services	Business Services	Auto Repair Services and Garages	Misc. Repair Services	Amusements	Hotels
Total, Metropolitan Area	100.	100.	100.	100.	100.	100.
Alameda						
Alameda	1.91	*	0.96	*	1.25	0.54
Albany	0.29	—	0.48	0.85	*	—
Berkeley	5.24	1.68	4.17	2.77	2.75	4.36
Emeryville	0.43	*	0.05	*	1.26	0.09
Hayward	0.60	*	0.68	*	0.68	*
Livermore	*	*	0.10	0.18	0.21	0.03
Oakland	24.24	15.33	19.46	29.52	17.12	6.72
Piedmont	*	—	—	—	—	—
San Leandro	0.87	0.07	1.11	0.66	*	—
Remainder	1.12	1.55	2.70	4.49	8.36	0.67
Total	34.70	18.63	29.70	38.47	31.63	12.41
Contra Costa						
Antioch	0.25	*	0.24	*	*	*
El Cerrito	0.36	*	0.71	*	0.24	—
Martinez	0.55	*	0.08	*	*	*
Pittsburg	0.56	*	0.19	*	1.06	0.49
Richmond	2.28	0.48	2.61	2.68	2.23	0.22
Remainder	1.73	1.03	2.97	2.90	2.80	0.75
Total	5.74	1.51	6.80	5.58	6.33	1.46
Marin						
Corte Madera	*	—	*	—	—	—
Fairfax	*	—	*	*	*	—
San Anselmo	0.19	—	0.24	0.05	0.26	*
San Rafael	0.95	0.31	1.78	0.93	0.79	0.50
Sausalito	0.32	*	0.19	*	*	0.34
Remainder	0.73	0.19	1.10	0.83	0.57	0.08
Total	2.19	0.50	3.31	1.81	1.62	0.92
San Francisco	49.24	77.52	51.16	48.93	42.89	82.25
San Mateo						
Belmont	—	—	*	—	—	—
Burlingame	0.89	0.39	2.05	0.32	*	*
Daly City	0.37	—	0.64	0.23	*	—
Menlo Park	0.34	*	0.30	*	*	—
Millbrae	0.21	*	*	*	—	—
Redwood City	0.94	0.32	0.79	0.49	*	0.17
San Bruno	0.28	*	0.11	*	4.89	—
San Carlos	0.42	*	*	0.50	*	—
San Mateo	1.31	0.29	0.62	0.97	6.38	0.53
South San Francisco	0.45	*	0.52	*	*	0.51
Remainder	0.43	0.53	1.28	0.99	3.45	0.43
Total	5.65	1.53	6.31	3.50	14.82	1.64
Solano						
Benicia	0.09	—	*	*	*	*
Fairfield	0.23	*	*	—	*	—
Vacaville	0.15	—	*	*	*	*
Vallejo	1.51	0.25	1.42	0.73	1.69	0.99
Remainder	0.51	0.05	1.31	0.97	1.02	0.34
Total	2.50	0.30	2.73	1.70	2.71	1.33

* Withheld to avoid disclosure—included in "Remainder" for county in which located.

more of the total receipts in one of the six categories: Alameda had 1.25 percent of the amusement total and 1.91 percent of the personal-service total; Emeryville, because of a professional baseball park, had 1.26 percent for amusements; San Rafael had 1.78 percent of the automobile-repair category; San Bruno had 4.89 percent of the amusement total; San Mateo had 6.38 percent of the amusement total and 1.31 percent

of the personal-service total; and Vallejo had 1.42 to 1.69 percent of three categories.

Because receipts data were not available for many cities, the "remainder" data are not comparable with similar data for establishments.

SELECTED INDICATIONS OF GEOGRAPHICAL SHIFTS OVER TIME

Although no comparable data are available for various census periods with which to measure geographical shifts for each of the seven categories of service trades, some comparisons can be made for amusements between 1933 and 1948 and for hotels between 1933, 1935, and 1948.

Amusements

Data of number of establishments for 1933 and 1948 reveal a wide geographical shift. San Francisco declined from 48.9 percent to 34.8 percent, while the remaining counties increased in relative importance. The largest gains were in Contra Costa County from 9.4 to 15 percent; in Solano County from 2.8 to 6.5 percent; and in Alameda County from 31.9 to 34.5 percent.

Divergent trends are apparent for the cities, although data for 1933 are not as complete as for 1948. Oakland, second in importance, rose from 18.4 to 21.1 percent. Berkeley declined sharply from 6.01 to 2.58 percent. Sharp increases were recorded for Richmond from 1.00 to 2.26 percent, for San Mateo from 0.80 to 1.61 percent, and for Vallejo from 1.20 to 2.90 percent. The smaller cities and unincorporated areas also increased in importance, but comparable data are not available. San Francisco lost ground in receipts for amusement establishments, declining from 61.2 to 42.9 percent, although remaining above its percentage of establishments. San Mateo county rose sharply from 5.1 to 14.8 percent, especially in San Bruno and San Mateo. The percentage in Contra Costa County rose from 2.5 to 6.3 percent, with sizeable gains in Richmond and Pittsburg. Contrary to the trend for establishments, Oakland declined from 18.8 to 17.1 percent, although Alameda County increased from 28.1 to 31.6 percent. Berkeley and Alameda, in this county, also lost ground, but other cities gained sufficiently to more than offset the decline.

Hotels

A considerably different pattern is apparent for hotels. For establishments, San Francisco rose from 64 percent in 1933 to 65.7 percent in 1935, and 68.1 percent in 1948. Alameda County, during the same period, declined from 21 to 18 percent; Contra Costa County rose from 5.7 percent in 1933 to 6.5 percent in 1935, and then fell to 5 percent in 1948; Marin County declined from 3.1 to 2.2 percent; and San Mateo County declined from 4.4 to 3.4 percent. Only Solano County registered an increase, accounting for 1.8 percent of the 1933 total and 3.3 percent of the 1948 total.

Among the cities other than San Francisco, Oakland declined from 17 to 14.1 percent. The remaining cities each had less than 2 percent of the hotels in 1948. Alameda, Pittsburg, San Rafael, and San Mateo showed declines, while Berkeley, Richmond, and Vallejo increased.

When the data of receipts are analyzed, San Francisco dominates with 82.1 percent of the 1933 total, 81.2 percent of the 1935 total, and 82.3 percent of the 1948 total. Oakland declined sharply between 1935 and 1948 from 10.3 to 6.7 percent, while Berkeley rose from 2.4 to 4.4 percent. Vallejo increased from 0.24 to 0.99 percent. Obviously, especially when receipts are considered, hotels tend to concentrate in the larger metropolitan centers.

Dispersion of Economic Activities

This section deals in some detail with the extent of dispersion of manufacturing, wholesaling, and retailing activities in the area. Because of variations in the availability of data for geographic units, no uniform analysis can be made for each of these three classes of economic activity. Within these limitations, three kinds of comparisons are made for each class of economic activity: (1) the extent of diversification for each geographic unit in terms of both physical establishment and dollar value (together with employment for manufacturing); (2) dispersion measured in terms of differences in relation to diversification between each geographic unit and the metropolitan area as a whole; and (3) dispersion measured in terms of the percentage of the area total for each kind of business within each class accounted for by each geographic unit.

DIVERSIFICATION OF MANUFACTURING ACTIVITIES

Diversification in Number of Establishments

Nine kinds of industries dominate the bay area manufacturing establishments. Together, they ac-

TABLE 43

PERCENTAGE COMPOSITION OF MANUFACTURING ESTABLISHMENTS, BY TYPE OF INDUSTRY: SAN FRANCISCO-OAKLAND METROPOLITAN AREA AND FOUR COUNTIES; 1939, 1947–50

Area and Type of Industry* (In Order of 1950 Importance)	1950	1949	1948	1947	1939
Total 6 - County Metropolitan Area					
27	16.00	15.47	16.01	16.37	16.42
20	15.34	14.88	15.22	16.59	26.44
34	9.86	9.77	9.57	10.24	5.25
23	8.81	8.85	8.94	9.51	8.79
35	8.48	8.78	8.73	9.02	6.43
28	6.93	6.97	6.94	6.65	7.18
25	5.36	5.57	5.81	4.74	5.91
24	4.39	4.29	4.56	3.90	2.35
32	3.33	3.02	3.23	3.49	3.10
33	2.46	2.53	2.74	2.78	6.32
37	2.42	2.79	2.84	2.51	1.87
36	2.18	2.38	2.28	2.18	1.44
26	1.93	1.84	1.51	1.66	1.21
All Others					
Total	100.	100.	100.	100.	100.
San Francisco County					
27	19.82	18.81	19.13	20.85	19.98
20	14.74	14.29	14.67	15.58	22.51
34	8.87	8.82	9.07	9.75	6.26
23	14.05	13.97	13.67	15.48	13.03
35	6.61	7.12	6.61	6.88	5.76
28	6.10	6.31	6.70	5.68	5.03
25	4.67	5.19	5.15	3.67	5.94
24	3.56	3.63	3.74	2.91	1.43
32	1.85	1.84	1.91	2.06	2.30
33	1.38	1.54	1.91	1.31	5.62
37	1.48	1.57	1.87	1.61	1.52
36	1.89	2.02	1.91	1.76	1.15
26	1.80	1.84	1.64	1.81	1.24
All Others					
Total	100.	100.	100.	100.	100.
Alameda County					
27	10.25	10.13	10.71	10.12	9.82
20	16.92	16.55	16.43	18.38	30.88
34	12.28	12.83	11.46	12.31	4.40
23	2.77	3.02	3.35	2.87	2.15
35	11.72	12.07	12.60	13.15	9.30
28	7.57	7.27	6.95	7.34	9.00
25	6.10	6.50	6.54	5.99	7.16
24	3.99	3.71	4.50	3.79	3.58
32	4.15	3.25	3.68	3.37	3.68
33	4.14	3.86	4.17	4.64	8.38
37	3.42	4.25	3.92	3.46	2.25
36	2.44	2.78	2.86	2.95	2.25
26	2.12	1.86	1.64	1.43	1.23
All Others					
Total	100.	100.	100.	100.	100.
Contra Costa County					
27	12.44	13.50	13.69	13.10	11.11
20	12.44	13.00	14.88	19.64	28.57
34	8.47	8.00	7.75	5.95	1.59
23	1.00	0.50	0.60	0.60	0.79
35	7.46	4.50	4.76	3.57	—
28	13.43	14.50	16.07	15.48	27.78
25	6.47	5.50	9.52	5.36	3.17
24	7.96	7.00	7.14	8.33	1.59
32	6.97	6.00	8.33	9.52	6.35
33	2.50	3.00	2.99	3.57	5.56
37	4.98	5.00	5.36	3.57	3.17
36	1.00	1.00	—	—	—
26	4.48	5.00	1.19	2.98	2.38
All Others					
Total	100.	100.	100.	100.	100.
San Mateo County					
27	14.05	15.00	16.43	13.51	10.81
20	9.09	8.33	9.39	9.46	33.33
34	8.68	7.08	7.99	8.11	0.90
23	1.65	2.50	2.35	1.35	—
35	11.57	11.25	12.21	12.16	4.50
28	7.02	6.67	4.69	8.11	12.61
25	7.02	4.58	5.63	7.66	1.80
24	9.92	9.58	11.27	8.56	9.01
32	7.02	7.92	7.51	9.01	11.71
33	4.55	4.99	3.29	6.31	7.21
37	1.65	2.09	1.88	1.35	0.90
36	4.96	5.42	5.16	4.50	2.70
26	2.63	—	—	0.90	—
All Others					
Total	100.	100.	100.	100.	100.

Source: U. S. Bureau of the Census, and Old Age Survivors Insurance Data.

* See Table 44 for Industry-Type Codes.

counted for 78.5 percent of the 1950 total and 81.9 per cent of the 1939 total (see Table 43).[43] In order, they were printing, food, fabricated-metal products, apparel, machinery (except electrical), chemicals, furniture, lumber products, and stone, glass, and clay products. The main trend since 1939 has been a decline in the importance of the food-manufacturing plants.

With the exception of stone, glass, and clay products, these categories accounted for 78.4 percent of San Francisco's establishments in 1950, and 79.9 percent in 1939. In Alameda County, transportation-equipment and metal industries join the list, while apparel establishments are of lesser importance. Together, these kinds of manufacturing accounted for 80.5 percent of the county's 1950 total, and 88.5 percent of the 1939 total. In Contra Costa County, paper and petroleum establishments are added; the 11 important kinds accounted for 88.6 percent of the 1950 total and 92.1 percent of the 1939 total. In San Mateo County, 10 kinds accounted for 83.9 percent of the 1950 county total and 94.6 percent in 1939.

The extent of diversification in physical establishments is shown in differences in the leading kinds of industries in each county. Printing, food, and apparel-manufacturing dominate in San Francisco County. Food, fabricated-metal, machinery (except electrical), and printing establishments predominate in Alameda County. In Contra Costa County, chemical, food, and printing establishments are most important. And in San Mateo County, the important establishments are in printing, machinery, lumber, food, and fabricated metals.

[43] The discussion which follows will abbreviate the titles of each type. Appendix B contains the full breakdown.

TABLE 44

VALUE ADDED BY MANUFACTURES AND NUMBER OF PRODUCTION WORKERS, SAN FRANCISCO-OAKLAND METROPOLITAN AREA, AND SELECTED COUNTIES; BY LEADING TYPES OF INDUSTRIES, 1947

Type of Industry	Percentage Composition				Percent of Area Total				Metropolitan Area Total
	Metropolitan Area	San Francisco County	Alameda County	Contra Costa County	San Francisco County	Alameda County	Contra Costa County	Other Counties	
Value added by manufactures:									
20 Food and kindred products	23.27	29.84	21.88	9.36	50.14	36.67	5.95	7.24	100.00
28 Chemicals and allied products	11.30	7.01	12.06	16.17	24.25	41.61	21.15	12.99	100.00
37 Transportation equipment	9.34	5.27	13.82	*	40.25	57.68	*	*	100.00
27 Printing and publishing industries	9.25	17.40	5.06	1.07	73.51	21.34	1.72	3.43	100.00
34 Fabricated metal products	8.31	8.65	10.03	4.51	40.73	47.08	8.02	4.17	100.00
35 Machinery, except electrical	7.18	5.79	11.55	*	31.50	62.73	*	5.77	100.00
33 Primary metal industries	5.80	1.37	4.39	*	9.23	49.54	*	*	100.00
29 Petroleum and coal products	5.56	—	*	34.29	—	*	91.13	*	100.00
23 Apparel and related products	3.62	8.73	*	*	94.20	*	*	*	100.00
32 Stone, clay, and glass products	3.58	0.48	4.26	4.21	5.28	46.32	17.34	31.06	100.00
26 Paper and allied products	2.76	2.48	2.83	*	35.13	39.93	*	*	100.00
36 Electrical machinery	2.69	2.03	4.34	*	29.48	62.87	*	*	100.00
25 Furniture and fixtures	2.02	3.55	1.45	0.13	68.47	27.89	0.93	2.71	100.00
Total, group	94.68	92.60	*	*	—	—	—	—	—
All industries	100.00	100.00	100.00	100.00	39.10	38.99	14.78	7.13	100.00
Average number of production workers:									
20 Food and kindred products	18.64	21.48	17.71	13.00	41.96	39.13	10.68	8.23	100.00
37 Transportation equipment	13.44	10.69	20.36	6.78	28.97	62.43	7.73	0.87	100.00
34 Fabricated metal products	9.80	11.43	10.60	5.64	42.46	44.55	8.81	4.18	100.00
35 Machinery, except electrical	8.29	5.92	13.38	1.34	26.02	66.49	2.47	5.02	100.00
33 Primary metal industries	7.29	1.73	5.68	14.94	8.65	32.05	31.36	27.94	100.00
27 Printing and publishing industries	6.55	12.74	3.80	0.80	70.85	23.93	1.86	3.36	100.00
29 Petroleum and coal products	5.99	—	0.80	36.78	—	5.50	94.24	0.26	100.00
28 Chemicals and allied products	5.76	3.12	6.37	9.52	19.70	45.56	25.30	9.44	100.00
23 Apparel and related industries	5.59	13.97	0.90	*	91.04	6.67	—	2.29	100.00
32 Stone, clay, and glass products	3.30	0.66	4.51	5.11	7.32	56.34	23.70	12.64	100.00
26 Paper and allied products	2.95	3.01	2.70	4.32	37.20	37.74	22.45	2.61	100.00
25 Furniture and fixtures	2.83	5.10	2.03	0.19	65.58	29.47	1.02	3.93	100.00
36 Electrical machinery	2.55	2.24	3.56	—	32.03	57.53	—	10.44	100.00
Total, group	92.98	92.09	92.40	*	—	—	—	—	100.00
All industries	100.00	100.00	100.00	100.00	36.43	41.20	15.32	7.05	100.00

Source: Census of Manufactures: 1947.
* Data not available.

Diversification in Terms of Employment and Value added by Manufacturer

Analysis here can be made only for 1947 (see Table 44). In terms of employment, the following nine kinds of industries accounted for 81.4 percent of the metropolitan area total: food, transportation equipment, fabricated metals, machines (except electrical), primary metals, printing, petroleum, chemicals, and apparel. For San Francisco, employment was highest in the food, apparel, printing, fabricated metals, and transportation-equipment industries. For Alameda County, transportation equipment, food, machinery (except electrical), and fabricated metals have the highest percent of employment. And in Contra Costa County, employment in the petroleum industry accounted for 36.8 percent, with primary metals, food, and chemicals accounting for an additional 37.5 percent.

In terms of value added, eight industries were responsible for 80 percent of the area total in 1947: food, chemicals, transportation equipment, printing and publishing, fabricated metals, machinery, primary metals, and petroleum. The important kinds in the three leading industrial counties were: (1) *San Francisco*, food, printing, apparel, fabricated metals, chemicals, machinery (except electrical), and transportation equipment; (2) *Alameda*, food, transportation equipment, chemicals, machinery (except electrical), and fabricated metals; and (3) *Contra Costa*, petroleum and chemicals.

DISPERSION OF MANUFACTURING ACTIVITIES

Dispersion in Terms of Differences in Diversification

From Table 43, it becomes apparent that certain types of manufacturing establishments tend to be dispersed in counties other than San Francisco. If the main types of industries are analyzed, the following establishments tend to have high degrees of dispersion based on comparison of percentages found in the

counties relative to percentages for the metropolitan area as a whole: (1) printing and publishing industries, Solano; (2) food and kindred products, Alameda and Solano; (3) fabricated metal products, Alameda and Marin; (4) apparel and related products, none; (5) machinery, except electrical, Alameda and San Mateo; (6) chemicals and allied products, Alameda, Contra Costa, and San Mateo; (7) furniture and fixtures, Alameda, Contra Costa, Marin, and San Mateo; (8) lumber products (except furniture), Contra Costa, Marin, and San Mateo; (9) stone, clay, and glass products, Alameda, Contra Costa, Marin, San Mateo, and Solano. In the sense in which the term is used here, dispersion appears to have increased as the kind of industry declines in relative importance. For apparel establishments, none of this type of dispersion is found.

Based on 1947 data in Table 44, dispersion of employment existed as follows for the most-important kinds of industries:[44] (1) food and kindred products, none; (2) transportation equipment, Alameda; (3) fabricated metal products, Alameda; (4) machinery, except electrical, Alameda; (5) primary metals, Contra Costa; (6) printing and publishing industries, none; (7) petroleum and coal products, Contra Costa; (8) chemicals and allied products, Alameda and Contra Costa; (9) apparel and related industries, none.

Finally, for this type of dispersion measurement, the 1947 data of value added by manufacture gives the following: (1) food and kindred products, none; (2) chemicals and allied products, Alameda and Contra Costa; (3) transportation equipment, Alameda; (4) printing and publishing industries, none; (5) fabricated metal products, Alameda; (6) machinery, except electrical, Alameda; (7) primary metal industries, none; (8) petroleum and coal products, Contra Costa; (9) apparel and related products, none.

Dispersion in Terms of Importance of Each County

The preceding discussion has emphasized dispersion in terms of diversification patterns. Somewhat more meaningful for this study, perhaps, is the percent of each leading kind of industry found in counties other than San Francisco. Table 45 contains comparisons for establishments for 1939 and for 1947 through 1950. In two categories, printing and apparel, the data indicate centralization in San Francisco County, and in 1939, there was centralization as well of establishments producing fabricated metal, paper, and furniture

[44] Comparisons here can deal only with the three important counties of San Francisco, Alameda, and Contra Costa.

TABLE 45

PERCENT OF SAN FRANCISCO-OAKLAND METROPOLITAN AREA'S MANUFACTURING ESTABLISHMENTS, FOR EACH IMPORTANT TYPE OF INDUSTRY, ACCOUNTED FOR BY LEADING COUNTIES, 1939, 1947–1950

Area and Type of Industry* (In Order of 1950 Importance)	Percent, Metropolitan Area Total				
	1950	1949	1948	1947	1939
San Francisco County					
27	68.10	66.56	67.20	69.05	75.87
20	52.81	52.55	54.21	50.90	53.09
34	49.51	49.00	53.21	51.60	74.32
23	87.61	86.43	85.96	88.25	92.48
35	42.81	44.41	42.52	41.39	55.80
28	48.35	49.65	54.24	46.31	43.60
25	47.87	51.10	49.78	41.95	62.62
24	44.51	46.29	46.07	40.56	37.80
32	30.53	33.33	33.33	32.03	46.30
33	30.93	33.00	39.25	25.49	55.45
37	33.68	30.70	36.04	34.78	50.77
36	47.67	46.39	47.19	43.75	50.00
26	51.32	54.67	61.02	59.02	64.29
All Industries	54.97	54.77	56.22	54.21	62.36
Alameda County					
27	20.00	20.76	20.96	19.97	16.78
20	34.44	35.25	33.84	35.80	32.79
34	38.92	41.29	37.43	38.83	23.50
23	9.80	10.80	11.75	9.74	6.86
35	43.11	43.58	45.16	47.13	40.63
28	34.07	33.10	31.37	35.66	35.20
25	35.55	37.00	35.24	40.80	33.98
24	28.32	27.43	30.90	31.47	42.68
32	38.93	34.15	35.71	31.25	33.33
33	52.58	48.54	47.66	53.92	37.27
37	44.21	48.25	43.24	44.57	33.85
36	34.88	37.11	39.33	43.75	44.00
26	34.21	32.00	33.90	27.87	28.57
All Industries	31.22	31.71	31.33	32.03	28.08
Contra Costa County					
27	3.97	4.28	3.68	3.66	2.45
20	4.14	4.28	4.21	5.42	3.91
34	4.38	3.98	3.47	2.66	1.09
23	0.58	0.28	0.29	0.29	0.33
35	4.49	2.51	2.35	1.81	—
28	9.89	10.21	9.96	10.66	14.00
25	6.16	4.85	7.05	5.17	1.94
24	9.25	8.00	6.74	9.79	6.93
32	10.69	9.76	11.11	12.50	7.41
33	5.15	5.82	4.67	5.88	3.18
37	10.53	8.78	0.81	6.52	6.15
36	2.33	2.06	—	—	—
26	11.84	13.33	3.39	8.20	7.14
All Industries	5.11	4.91	4.30	4.58	3.62
San Mateo County					
27	5.40	5.71	5.60	4.99	2.10
20	3.64	3.29	3.37	3.45	4.02
34	5.41	4.23	4.57	4.79	0.55
23	1.15	1.66	1.43	0.86	—
35	8.38	7.54	7.62	8.16	2.23
28	6.23	5.63	3.69	7.38	5.60
25	8.06	4.85	5.29	9.77	0.97
24	13.87	13.14	13.48	13.29	12.20
32	12.98	15.45	12.70	15.63	12.03
33	11.34	11.65	6.54	13.73	3.64
37	4.21	4.39	3.60	3.26	1.54
36	13.95	13.40	12.36	12.35	6.00
26	2.63	—	—	3.28	—
All Industries	6.15	5.89	5.46	6.13	3.19

* See Table 44 for Industry-Type Codes.

products. For the remaining categories, dispersion exists as follows: (1) Alameda County, food, fabricated metal, machinery, chemicals, furniture, and stone, clay, and glass products establishments; (2) Contra Costa, chemicals, furniture, lumber products, and stone, clay, and glass establishments; and (3) San Mateo, the same kinds as for Contra Costa, together with machinery (except electrical). Greater dispersion is found once again as the kind of industry assumes smaller relative importance.

For employment, Table 44 reveals dispersion in the following kinds of establishments: (1) food and kindred products, none; (2) transportation equipment, Alameda; (3) fabricated metal products, Alameda; (4) machinery, except electrical, Alameda; (5) primary metal industries, Alameda, Contra Costa, and other counties; (6) printing and publishing, none; (7) petroleum and coal products, Contra Costa; (8) chemicals and allied products, Alameda; (9) apparel and related products, none; (10) stone, clay and glass products, Alameda, Contra Costa, and other counties; (11) paper and allied products, Alameda; (12) furniture and fixtures, none; (13) electrical machinery, Alameda.

Finally, the data of value added by manufacture give the following patterns: (1) food and kindred products, none; (2) chemicals and allied products, Alameda; (3) transportation equipment, Alameda; (4) printing and publishing industries, none; (5) fabricated metal products, Alameda; (6) machinery, except electrical, Alameda; (7) primary metal products, Alameda; (8) petroleum and coal products, Contra Costa; (9) apparel and related products, none; (10) stone, clay, and glass products, Alameda, Contra Costa, and other counties; (11) paper and allied products, Alameda; (12) electrical machinery, Alameda; (13) furniture and fixtures, none.

DIVERSIFICATION AND DISPERSION OF WHOLESALE TRADE

There are, unfortunately, no data of wholesale-middlemen establishments and sales, by cities, which give details for type of operation and kinds of goods handled except for San Francisco and Alameda counties. In any case, the concentration of both establishments and sales in San Francisco and Oakland is so great, that this section need emphasize only those types of operations and kinds of goods handled in which San Francisco and Alameda counties fall below their combined importance.

As Table 46 indicates, San Francisco and Alameda combined accounted for 93.2 percent of the 1948 wholesale establishments and 96.7 percent of these middlemen's sales. The remaining counties had higher-than-average percentages of establishments for merchant wholesalers handling edible farm products, beers, wines, and distilled spirits; tobacco and tobacco products; paper and its products; automotive equipment and accessories; electrical goods; lumber and construction materials; and metals and metal work. Petroleum bulk stations were located primarily in the outlying counties. Among the agents and brokers, only those handling raw-material farm products and lumber materials had dispersed locations; this was true for assemblers as a group.

So far as sales are concerned, the picture of dispersion is closely correlated with the above pattern, although the degree of dispersion was different. But as has been mentioned earlier, wholesaling is primarily a metropolitan-area activity, except where the kind of product handled, or the location of the customer, or the requirements for branch operation, require a dispersed locational pattern.

DIVERSIFICATION OF RETAIL TRADE

Census data are available by cities for census periods from 1929 to 1948 on a fairly comparable basis. The discussion which is included here is based on data for 12 cities which accounted for 79.7 percent of the 1948 establishments and 85.7 percent of the dollar sales.

Diversification of Establishments

The census data permit percentage comparisons to be made for the metropolitan area and the 12 most-important cities for eleven kinds of business and a miscellaneous group (see Table 47). In terms of numbers of stores, those selling prepared items in eating and drinking places, or in food stores, together accounted for 43.3 percent of all stores in the metropolitan area in 1929, 52 percent in 1939, and 47.3 percent in 1948. The food group has lost ground relatively, due mainly to conversion to supermarket operations. The eating-and-drinking places more than doubled in importance: most of this is due, of course, to Prohibition in 1929, which meant no drinking places were legally in existence. Other important groups, in declining order of importance, were the apparel group, gasoline stations, and furniture-and-appliance stores. Table 47 also shows how the pattern of diversification varies between the dozen most-important trading centers.

Diversification Based on Dollar Sales

Retail establishments vary widely in sales-size, and as a result, diversification based on dollar sales varies widely from the pattern based on numbers of establishments (see Table 48). Food stores rank first in the

TABLE 46

PERCENTAGE OF WHOLESALE ESTABLISHMENTS AND SALES, SAN FRANCISCO-OAKLAND METROPOLITAN AREA, ACCOUNTED FOR BY SAN FRANCISCO AND ALAMEDA COUNTIES IN 1948

Type of Operation and Kind of Business	Establishments				Sales			
	Metropolitan Area Total	Percent			Metropolitan Area Total (Thousands)	Percent		
		San Francisco County	Alameda County	Other Counties		San Francisco County	Alameda County	Other Counties
Total	5,086	72.22	20.96	6.82	$5,006,634	80.78	15.90	3.32
Merchant wholesalers								
Groceries, confectionery, meats	348	71.26	25.57	3.17	338,624	82.45	16.44	1.11
Farm products (edible)	247	55.06	36.03	8.91	244,361	72.39	22.56	5.05
Beers, wines, distilled spirits	147	54.42	21.09	24.49	117,650	61.72	28.55	9.73
Drugs, chemicals, allied products	114	67.54	25.44	7.02	66,752	83.17	9.60	7.23
Tobacco and products (excluding leaf)	40	60.00	27.50	12.50	47,394	61.33	32.81	5.86
Dry goods, apparel	173	92.49	7.51	—	55,027	95.59	4.41	—
Furniture, home furnishings	86	76.74	23.26	—	44,545	92.54	7.46	—
Paper and its products	63	76.19	—	23.81	44,139	88.77	—	11.23
Automotive equipment, tires, tubes	266	34.96	44.74	20.30	68,100	63.15	29.70	7.15
Electrical goods	111	76.58	—	23.42	103,314	74.69	—	25.31
Hardware, plumbing, heating	130	69.23	27.69	3.08	102,120	78.86	20.36	0.78
Lumber, construction materials	167	53.89	36.53	9.58	198,796	73.05	22.66	4.29
Machinery, equipment, supplies	548	65.15	31.20	3.65	158,070	67.93	26.71	5.36
Metals, metal work (excluding scrap)	48	66.67	—	33.33	57,715	73.63	—	26.37
Waste materials	79	46.84	46.84	6.32	21,021	51.39	45.83	2.78
Other merchant wholesalers	493	80.53	17.90	1.57	346,163	93.20	11.92	—
Total, merchant wholesalers	3,060	66.00	27.25	6.75	2,013,794	78.44	18.66	2.90
Manufacturers' sales branches (with stocks)	573	77.66	17.54	—	1,219,485	80.36	16.89	—
Manufacturers' sales offices	248	83.47			772,705	84.71		
Petroleum bulk tank stations, terminals	148	11.49	27.70	60.81	158,116	31.15	33.99	34.86
Agents and brokers								
Groceries, confectionery, meats	157	95.54	—	4.56	256,290	99.33	—	0.67
Farm products (edible)	23	100.00	—	—	33,176	100.00	—	—
Drugs, chemicals, allied products	33	100.00	—	—	21,677	100.00	—	—
Furniture, home furnishings	117	97.44	—	2.56	33,810	96.31	—	3.69
Paper and its products	22	100.00	—	—	9,458	100.00	—	—
Farm products (raw materials)	14	64.29	—	35.71	43,209	43.49	—	56.51
Electrical goods	66	100.00	—	—	21,292	100.00	—	—
Lumber, construction materials	29	89.66	—	10.34	20,010	95.09	—	4.91
Machinery, equipment, supplies	122	90.98	5.74	3.28	61,384	95.31	—	4.69
Other agents and brokers	404	96.29	2.54	1.17	275,705	96.96	1.62	1.42
Total, agents and brokers	987	95.54	2.94	1.52	776,011	94.89	1.83	3.28
Assemblers, total	36	41.67	30.56	27.77	66,523	67.21	23.47	9.32

Source: Census of Business—Wholesale Trade: 1948.

metropolitan area with 24.9 percent of the 1948 total, a sharp increase over its 1929 level, but somewhat below 1939. Reflecting the high per-capita automobile ownership noted elsewhere, the automotive stores accounted for nearly a seventh of total sales, followed by the general-merchandise group with 13 percent of the 1948 total and eating-and-drinking places with a ninth. Other important categories are the apparel and furniture groups. The table shows wide variations in diversification based upon sales.

DISPERSION OF RETAIL TRADE

Dispersion Based upon Diversification

First, if Table 47 is examined once again, dispersion of the number of stores is found as follows in the ten most-important cities not making up the metropolitan centers for the major types of business[45]: (1) eating-and-drinking places, none in 1929; Vallejo in 1939; and Vallejo in 1948; (2) food group, Alameda, Redwood City, and San Leandro in 1929; Berkeley, Alameda, and San Leandro in 1939; and Berkeley, Richmond, Alameda and San Leandro in 1948; (3) apparel group, Burlingame and Hayward in 1929; Berkeley, Burlingame, San Rafael, Redwood City, and Hayward in 1939; and Alameda, San Mateo, Burlingame, San Rafael, Redwood City, Hayward, and San Leandro in 1948; (4) gasoline stations, all ten cities in 1929; all but Vallejo in 1939; and all but San Rafael and Hayward,

[45] Berkeley, Richmond, Vallejo, Alameda, San Mateo, Burlingame, San Rafael, Redwood City, Hayward, and San Leandro (in order of 1948 sales importance).

TABLE 47

PERCENTAGE COMPOSITION OF RETAIL ESTABLISHMENTS, BY KINDS OF BUSINESS, FOR SAN FRANCISCO-OAKLAND METROPOLITAN AREA, AND PRINCIPAL CITIES; 1948, 1939, 1929

Kinds of Business (1948 Rank)	Year	Metropolitan Area	San Francisco	Oakland	Berkeley	Richmond	Vallejo	Alameda	San Mateo	Burlingame	San Rafael	Redwood City	Hayward	San Leandro
1. Eating and drinking places	1948	24.22	25.75	23.64	14.18	22.44	25.98	18.81	16.62	12.86	17.43	18.37	19.76	17.16
	1939	22.67	23.99	20.57	12.26	22.64	27.01	16.53	18.57	13.72	19.20	20.52	17.12	18.87
	1929	11.32	12.13	10.85	8.53	7.72	10.41	9.64	11.24	5.17	7.65	8.62	6.45	6.92
2. Food group	1948	23.09	23.26	23.96	25.71	26.96	20.13	25.95	18.46	17.43	18.26	14.49	18.97	23.18
	1939	29.29	29.42	31.02	29.81	28.65	25.97	39.50	28.01	27.43	20.98	22.71	26.13	32.08
	1929	32.11	32.03	35.25	31.42	27.30	29.74	36.64	26.40	28.16	29.51	32.76	23.87	35.85
3. Apparel group	1948	8.44	9.66	7.81	8.42	7.70	7.58	10.24	12.62	15.77	10.37	9.19	11.86	9.47
	1939	7.56	9.02	7.20	8.29	6.88	7.27	6.44	6.19	12.83	8.93	7.86	9.01	3.30
	1929	9.17	11.33	7.53	8.89	8.90	8.92	6.34	8.43	11.49	6.56	6.32	10.32	5.66
4. Gasoline service stations	1948	8.29	5.38	9.07	10.55	8.90	8.44	9.52	11.38	8.71	7.88	13.43	7.91	10.65
	1939	8.47	4.93	9.31	10.41	11.17	7.01	10.92	14.01	11.95	9.82	12.66	9.01	12.74
	1929	5.33	2.80	5.87	6.55	5.34	7.06	5.51	8.43	6.90	6.01	8.62	9.03	8.18
5. Furniture, appliances	1948	5.83	5.73	5.81	6.38	5.31	6.71	6.19	11.69	9.54	7.88	8.13	6.72	5.33
	1939	3.56	3.44	3.84	5.03	3.72	5.46	3.08	6.19	3.98	6.25	3.06	4.95	2.83
	1929	4.58	4.50	4.66	6.19	4.75	7.06	3.58	6.18	9.77	6.01	7.47	7.10	5.66
6. Automotive group	1948	3.70	2.15	4.44	4.70	5.31	6.93	4.76	3.38	7.05	7.88	6.71	7.51	3.85
	1939	2.68	1.51	2.89	4.23	4.01	5.20	3.08	3.26	7.08	8.04	6.11	6.76	5.19
	1929	3.99	2.89	4.70	3.68	7.12	7.43	5.51	3.93	8.05	7.10	9.77	8.39	5.03
7. Lumber, building, hardware	1948	3.42	2.50	2.80	3.55	3.59	3.03	3.33	3.69	4.56	5.81	5.30	4.74	5.92
	1939	3.22	2.48	2.83	5.29	4.30	2.60	2.24	4.56	3.98	5.36	4.80	6.76	5.19
	1929	4.58	3.89	4.21	5.30	6.83	2.60	3.86	11.80	8.62	9.29	5.17	7.74	6.92
8. Drug and proprietary stores	1948	3.13	3.34	3.07	4.17	2.26	1.95	3.81	2.77	2.90	3.32	2.47	2.77	4.44
	1939	3.21	3.27	3.12	4.06	3.15	3.12	4.20	2.93	3.54	3.13	3.06	2.70	4.25
	1929	3.31	3.39	3.24	4.31	3.56	2.60	3.86	3.37	2.30	2.19	3.45	3.23	5.03
9. Liquor stores	1948	3.13	3.20	4.04	3.01	3.19	2.16	2.86	1.85	2.49	1.66	3.89	2.37	4.44
	1939	*	1.96	3.03	1.94	2.29	2.08	1.40	0.33	2.21	1.34	1.31	3.60	2.83
	1929	0	0	0	0	0	0	0	0	0	0	0	0	0
10. General merchandise	1948	2.68	2.25	2.39	3.55	3.45	2.81	2.86	3.38	3.32	3.32	3.18	3.95	3.55
	1939	2.15	1.83	1.77	2.38	2.30	2.08	3.08	1.63	3.54	2.23	3.93	3.15	3.30
	1929	2.98	2.22	2.08	3.14	3.26	3.35	3.03	3.37	2.87	5.46	3.45	8.39	5.66
11. Secondhand stores	1948	1.52	1.75	1.94	1.51	*	*	*	*	*	*	*	*	*
	1939	*	2.13	2.66	2.12	*	*	*	*	*	*	*	*	*
	1929	*	1.78	3.10	2.33	*	*	*	*	*	*	*	*	*
All other stores	1948	12.55	15.03	11.04	14.27	10.89	14.29	11.66	14.15	15.35	16.18	14.84	13.44	12.00
	1939	17.18	16.02	11.76	14.20	10.89	12.21	9.53	14.33	9.74	14.73	13.97	10.81	9.43
	1929†	22.63	23.02	18.51	19.66	25.22	20.83	22.04	16.85	16.67	20.22	14.36	15.48	15.10
Total, all stores	1948	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	1939	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	1929	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.

Source: U. S. Bureau of the Census.
* Included in "all other stores."
† Includes Garages.

in 1948; (5) furniture, home furnishings, appliance, all but Alameda in 1929; Berkeley, Richmond, Vallejo, San Mateo, Burlingame, San Rafael and Hayward in 1939; and all but Richmond and San Leandro in 1948.

When sales-size is introduced, a study of Table 48 showing dollar-sales comparisons, indicates the following pattern of dispersion for the seven most-important groups of retail stores: (1) food group, all but Hayward in 1929; all but San Mateo and Hayward in 1939; and all but Vallejo, San Rafael and Hayward in 1948; (2) automotive group, all but Berkeley and San Mateo in 1929; all but San Mateo in 1939 and 1948; (3) general merchandise group, none in 1929; none in 1939; and San Rafael in 1948; (4) eating-and-drinking places, Vallejo in 1929; and none in 1939 and 1948; (5) apparel group, none in 1929, 1939, and 1948; (6) furniture, home furnishings, and appliances, Vallejo in 1929; Richmond, Vallejo, and San Rafael in 1939; and

TABLE 48

PERCENTAGE COMPOSITION OF RETAIL SALES, BY KINDS OF BUSINESS, FOR SAN FRANCISCO-OAKLAND METROPOLITAN AREA, AND PRINCIPAL CITIES; 1948, 1939, 1929

Kinds of Business (1948 Rank)	Year	Metropolitan Area	San Francisco	Oakland	Berkeley	Richmond	Vallejo	Alameda	San Mateo	Burlingame	San Rafael	Redwood City	Hayward	San Leandro
1. Food group	1948	24.91	20.90	21.11	32.51	35.71	22.52	39.36	27.31	31.24	19.87	29.03	23.10	41.03
	1939	25.70	22.71	24.84	31.42	28.59	28.35	45.34	39.20	32.83	24.64	31.16	22.13	38.10
	1929	19.24	19.82	25.73	31.53	22.83	24.40	40.39	22.19	34.53	30.73	34.28	14.81	29.96
2. Automotive group	1948	14.02	12.94	13.94	14.78	17.37	23.15	20.69	7.97	30.79	20.92	15.37	20.19	16.84
	1939	10.76	8.30	12.07	13.76	17.94	16.19	14.57	1.92	31.26	23.56	17.96	13.31	16.18
	1929	11.98	13.17	15.75	10.26	28.20	24.40	20.58	10.81*	22.87	18.44	13.49	16.93	12.41*
3. General merchandise	1948	13.04	14.16	20.50	8.59	8.13	9.82	3.25	12.36	5.26	15.98	8.49	7.17	5.55
	1939	14.83	14.90	21.43	8.62	12.65	14.21	4.17	11.83	5.28	12.32	12.80	6.74	7.89
	1929	12.10	13.71	17.11	3.17*	6.64*	3.26*	3.47*	*	*	11.03*	*	4.75*	2.11*
4. Eating and drinking places	1948	11.11	13.88	8.36	7.28	6.57	10.20	7.48	7.04	4.23	5.92	6.50	4.78	5.43
	1939	11.53	15.10	6.22	6.88	6.62	9.60	6.83	6.25	4.08	6.13	7.37	4.92	6.25
	1929	6.50	9.67	5.03	6.39	4.01	6.89	4.21	6.34	2.62	3.02*	4.53	2.32	4.40
5. Apparel group	1948	8.87	11.68	8.65	8.22	6.02	6.18	4.68	8.53	8.73	5.17	4.52	8.06	6.22
	1939	9.17	11.88	8.88	7.39	4.39	5.33	2.98	2.46	5.02	2.88	2.44	3.95	1.15
	1929	9.57*	14.71	9.20	6.94	6.60*	2.26*	3.38*	1.95*	3.99*	0.69*	0.86*	5.11*	1.58*
6. Furniture, appliances	1948	6.83	7.41	7.80	5.33	7.06	7.55	5.58	7.69	5.95	4.12	6.09	7.26	3.27
	1939	5.25	5.85	6.06	3.76	5.40	5.82	2.36	4.43	2.01	6.90	1.59	3.66	1.36
	1929	5.84*	7.53	7.49	5.22*	4.42*	5.85*	2.50*	5.49*	2.47*	2.30*	6.04	4.29*	4.96*
7. Lumber, building, hardware	1948	4.98	2.92	4.85	4.38	3.58	6.56	2.07	11.20	2.50	16.02	9.58	4.72	6.30
	1939	4.89	2.90	4.71	5.76	6.82	6.83	4.33	13.00	2.82	11.75	9.93	18.24	8.63
	1929	3.97*	3.36	4.46	5.79	4.62*	2.30*	2.87*	11.61*	5.11*	14.76*	13.37*	6.04*	10.48*
8. Gasoline service stations	1948	4.27	3.12	3.61	6.23	5.17	4.07	5.36	6.38	3.81	3.15	6.50	2.71	6.23
	1939	5.38	3.96	4.89	7.93	8.84	4.83	8.66	10.23	5.29	5.04	7.91	4.01	10.69
	1929	2.36	1.72	2.96	5.69	3.45	4.43	5.16	5.24	5.05	3.65	5.23	3.09	5.43
9. Drugs and Proprietary stores	1948	3.09	3.06	2.89	4.56	2.77	2.17	6.54	2.86	2.57	2.82	2.57	2.99	4.35
	1939	3.68	3.82	3.33	5.30	3.52	2.86	6.75	3.01	3.83	2.23	2.93	2.88	5.10
	1929	2.40	2.73	2.54	5.15	3.19	3.10	4.76	2.72	2.42	1.92	3.34	2.59	6.16
10. Liquor stores	1949	2.13	2.09	2.00	2.39	2.70	1.64	1.84	1.29	1.52	0.69	2.69	1.28	2.15
	1939	‡	1.20	1.10	1.27	1.40	‡	0.98	‡	1.21	0.17	0.25	0.90	1.57
	1929	0	0	0	0	0	0	0	0	0	0	0	0	0
11. Secondhand stores	1948	0.41	0.57	0.39	0.25	0.17	‡	‡	‡	‡	‡	‡	‡	‡
	1939	‡	0.40	0.47	0.70	‡	‡	‡	‡	‡	‡	‡	‡	‡
	1929	‡	0.48	0.76	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
All other stores	1948	6.34	7.26	5.90	5.48	4.75	6.14	3.16	7.37	3.40	5.33	8.67	17.75	2.66
	1939	8.79	9.00	6.00	7.21	3.83	5.98	3.04	7.68	6.37	4.39	5.65	19.25	3.07
	1929†	8.43	13.10	8.96	12.30*	9.41*	7.95*	10.77	6.48*	4.15*	5.48*	3.72*	40.07	5.90*
Total, all stores	1949	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	1939	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	1929	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.

Source: U. S. Bureau of the Census.
* Excludes data of confidential nature. Data, accordingly, do not add up to 100 percent.
† Includes garages.
‡ Included in "All other stores."

Richmond, Vallejo, San Mateo, and Hayward in 1948; (7) lumber, building, and hardware group, all but Vallejo and Alameda in 1929; all but Alameda and Burlingame in 1939; and Vallejo, San Mateo, San Rafael, Redwood City, and San Leandro in 1948.

A comparison of dispersion measured by sales in relation to dispersion measured by number of establishments reveals that there is much wider dispersion of establishments. These have been, however, mainly of smaller-than-average size, thus not reflecting such trends in terms of sales patterns.

Dispersion in Terms of City Importance

Finally, dispersion of retail trade may be measured for the same 12 cities in terms of the percentage of the metropolitan area total for each type in relation to city's percentage for all types (see Table 49). Once again, comparisons may be made first of all, for num-

TABLE 49

PERCENTAGE OF SAN FRANCISCO-OAKLAND METROPOLITAN AREA'S (6-COUNTY) RETAIL ESTABLISHMENTS AND SALES ACCOUNTED FOR BY PRINCIPAL CITIES, BY KIND OF BUSINESS: 1948, 1939, 1935, 1933, AND 1929

City and Kind of Business	Number of Establishments					Retail Sales				
	1948	1939	1935	1933	1929	1948	1939	1935	1933	1929
San Francisco										
Apparel group	46.77	56.52	56.21	60.01	61.82	57.49	64.41	70.30	70.66	72.64
Automotive group	23.76	26.64	35.50	38.41	36.26	40.30	39.39	44.09	50.56	52.23
Drug and proprietary stores	43.64	48.31	49.28	54.03	51.26	43.23	53.11	54.92	61.05	54.56
Eating and drinking places	43.42	50.12	48.02	53.64	53.61	54.54	66.98	64.58	72.01	71.27
Gasoline service stations	26.50	27.56	24.28	23.24	26.30	31.93	37.64	36.01	37.33	34.89
Food group	41.14	47.58	47.96	48.87	49.91	36.63	45.22	47.06	48.44	49.42
Furniture and appliances	40.14	45.78	42.65	49.41	49.14	47.40	56.95	58.91	59.54	61.76
General merchandise (incl. gen. stores)	34.32	40.39	39.05	36.19	37.25	47.41	51.41	50.58	55.70	56.62
Lumber - building - hardware group	29.77	36.40	40.38	42.54	42.60	25.60	30.40	39.54	44.58	41.05
All others	47.21	55.44	49.67	56.27	55.95	48.79	61.72	62.27	68.70	64.65
Total, all kinds	40.84	47.37	46.06	48.34	50.04	43.66	51.17	52.77	56.02	64.02
Oakland										
Apparel group	19.58	20.50	22.09	19.35	19.17	22.59	23.37	21.94	20.49	19.58
Automotive group	25.38	23.21	25.43	25.12	27.48	23.03	27.06	28.49	24.71	26.75
Drug and proprietary stores	20.74	20.96	23.26	21.56	22.84	21.67	21.81	20.05	17.88	21.54
Eating and drinking places	20.67	19.53	22.54	22.68	22.36	17.43	15.11	17.45	14.95	15.76
Gasoline service stations	23.14	23.67	28.05	27.58	25.69	19.61	21.89	23.69	24.70	25.50
Food group	21.97	22.81	23.82	25.21	25.63	19.64	23.33	23.02	23.11	27.22
Furniture and appliances	21.09	23.24	25.51	22.58	23.77	27.13	27.84	28.51	28.80	26.11
General merchandise (incl. gen. stores)	18.87	17.67	16.37	20.68	16.23	36.43	34.88	35.81	28.78	30.01
Lumber - building - hardware group	17.33	18.91	18.66	19.74	21.45	22.53	23.25	24.52	20.51	22.88
All others	21.20	21.86	25.37	22.06	23.33	21.15	18.03	19.63	15.11	18.56
Total, all kinds	21.17	21.53	23.62	23.47	23.35	23.17	24.13	25.07	22.91	20.35
Berkeley										
Apparel group	4.48	5.19	5.57	5.53	5.98	4.04	3.69	2.73	3.29	2.38
Automotive group	5.70	7.48	6.31	5.64	4.73	4.59	5.84	5.36	5.12	2.81
Drug and proprietary stores	5.98	5.99	6.31	5.82	6.69	6.44	6.58	6.95	5.92	7.07
Eating and drinking places	2.63	2.56	2.89	3.08	3.87	2.86	2.73	3.31	2.86	3.23
Gasoline service stations	5.71	5.82	6.13	5.12	6.31	6.36	6.73	7.58	6.07	7.90
Food group	5.00	4.82	5.41	5.08	5.03	5.69	5.60	6.47	6.95	5.38
Furniture and appliances	4.91	6.69	7.78	8.65	6.95	3.40	3.27	2.32	2.13	2.94
General merchandise (incl. gen. stores)	5.94	5.44	5.52	5.04	5.41	2.87	2.66	2.42	3.05	0.90
Lumber - building - hardware group	4.65	7.77	6.27	5.70	6.94	3.83	5.39	4.23	5.04	4.80
All others	4.97	5.03	5.74	5.28	4.95	4.46	4.78	3.89	3.40	3.87
Total, all kinds	4.49	4.74	5.19	5.03	5.14	4.36	4.58	4.53	4.63	3.28
Richmond										
Apparel group	2.74	1.33	1.66	1.14	1.51	2.04	0.61	0.65	0.56	0.66
Automotive group	4.30	2.18	2.26	2.18	2.77	3.73	2.11	1.78	1.36	2.25
Drug and proprietary stores	2.16	1.43	1.45	1.12	1.67	2.70	1.21	1.55	1.25	1.27
Eating and drinking places	2.78	1.46	1.74	0.98	1.06	1.78	0.73	1.00	0.51	0.59
Gasoline service stations	3.22	1.92	1.83	1.99	1.56	3.64	2.08	2.03	2.18	1.40
Food group	3.50	1.43	1.54	1.39	1.32	4.31	1.41	1.46	1.22	1.13
Furniture and appliances	2.73	1.53	2.02	1.32	1.61	3.11	1.30	1.24	0.91	0.72
General merchandise (incl. gen. stores)	3.86	1.55	2.96	2.52	1.70	1.88	1.03	0.74	0.63	0.55
Lumber - building - hardware group	3.14	1.94	2.62	2.19	2.32	2.16	1.76	2.21	1.22	1.12
All others	2.48	1.12	1.50	1.35	1.69	2.61	0.76	1.03	0.63	0.88
Total, all kinds	3.00	1.46	1.71	1.47	1.55	3.01	1.27	1.27	0.99	0.96
Vallejo										
Apparel group	1.65	1.55	0.96	0.88	1.21	1.45	0.94	0.53	0.34	0.22
Automotive group	3.44	3.12	1.64	1.58	2.31	3.44	2.45	1.86	1.58	1.86
Drug and proprietary stores	1.15	1.56	1.05	0.87	0.97	1.46	1.27	1.41	1.01	1.19
Eating and drinking places	1.97	1.92	2.06	0.89	1.14	1.92	1.36	1.66	0.70	0.82

TABLE 49—*Continued*

City and Kind of Business	Number of Establishments					Retail Sales				
	1948	1939	1935	1933	1929	1948	1939	1935	1933	1929
Vallejo—Cont.										
Gasoline service stations	1.87	1.33	1.47	1.78		1.98	1.46	2.10	1.61	1.72
Food group	1.60	1.43	1.45	1.02	1.28	1.88	1.80	1.70	1.30	1.17
Furniture and appliances	2.12	2.47	1.87	1.76	1.91	2.30	1.80	1.35	1.06	0.92
General merchandise (incl. gen. stores)	1.93	1.55	1.78	1.26	1.39	1.57	1.56	1.74	1.07	0.26
Lumber - building - hardware group	1.63	1.30	1.17	1.10	0.71	2.74	2.28	2.24	1.47	0.53
All others	1.78	1.34	1.16	0.96	0.96	1.83	1.11	0.89	0.64	0.70
Total, all kinds	1.84	1.61	1.49	1.11	1.24	2.08	1.63	1.52	1.10	0.92
Alameda										
Apparel group	2.03	1.27	1.22	1.35	1.16	0.87	0.41	0.29	0.33	0.33
Automotive group	2.15	1.71	2.12	1.76	2.31	2.44	1.74	1.74	1.43	1.58
Drug and proprietary stores	2.04	1.95	1.58	1.86	1.95	3.51	2.35	1.77	1.65	1.75
Eating and drinking places	1.30	1.09	1.24	1.18	1.43	1.12	0.76	1.19	0.61	0.59
Gasoline service stations	1.92	1.92	2.18	2.13	1.73	2.08	2.06	2.57	2.49	2.00
Food group	1.88	2.01	2.11	2.16	1.91	2.62	2.26	2.57	2.67	1.93
Furniture and appliances	1.77	1.29	2.31	1.61	1.31	1.35	0.57	0.88	0.48	0.40
General merchandise (incl. gen. stores)	1.78	2.14	2.37	1.39	1.70	0.41	0.36	0.36	0.36	0.27
Lumber - building - hardware group	1.63	1.04	2.04	1.10	1.41	0.68	1.13	3.04	0.86	0.66
All others	1.43	0.95	1.37	1.52	1.66	0.93	0.59	0.75	1.34	0.98
Total, all kinds	1.67	1.49	1.75	1.72	1.67	1.66	1.28	1.48	1.36	0.92
San Mateo										
Apparel group	1.93	1.05	1.02	1.01	0.75	1.42	0.30	0.34	0.26	0.16
Automotive group	1.18	1.56	1.17	1.15	0.81	0.84	0.20	0.67	0.58	0.73
Drug and proprietary stores	1.15	1.17	1.05	0.87	0.84	1.37	0.91	1.02	0.92	0.92
Eating and drinking places	0.89	1.05	0.77	0.98	0.81	0.93	0.60	0.49	0.69	0.79
Gasoline service stations	1.78	2.12	1.59	2.20	1.30	2.21	2.11	1.78	1.96	1.79
Food group	1.03	1.23	0.89	0.97	0.68	1.62	1.70	0.98	1.13	0.93
Furniture and appliances	2.59	2.23	1.59	1.61	1.11	1.66	0.94	0.84	0.65	0.76
General merchandise (incl. gen. stores)	1.63	0.97	0.99	1.51	0.93	1.40	0.89	0.83	0.92	*
Lumber - building - hardware group	1.40	1.81	1.90	2.08	2.11	3.31	2.96	2.68	3.34	2.37
All others	1.22	1.09	0.85	0.50	0.51	1.44	0.97	0.55	0.50	0.40
Total, all kinds	1.29	1.28	1.00	1.09	0.82	1.48	1.11	0.85	0.96	0.81
Burlingame										
Apparel group	1.79	1.60	1.41	1.01	1.01	1.32	0.86	0.60	0.57	0.35
Automotive group	1.83	2.49	1.51	1.58	1.62	2.94	4.56	2.45	2.33	1.60
Drug and proprietary stores	0.89	1.04	1.05	0.87	0.56	1.12	1.63	1.71	1.28	0.84
Eating and drinking places	0.51	0.57	0.52	0.62	0.37	0.51	0.56	0.48	0.79	0.34
Gasoline service stations	1.01	1.33	1.41	1.78	1.04	1.20	1.54	1.96	2.19	1.79
Food group	0.72	0.88	0.80	1.11	0.70	1.68	2.01	1.78	1.72	1.51
Furniture and appliances	1.57	1.06	0.86	1.32	1.71	1.17	0.60	0.66	0.83	0.35
General merchandise (incl. gen. stores)	1.19	1.75	0.99	0.76	0.77	0.54	0.56	0.64	0.54	*
Lumber - building - hardware group	1.28	1.17	1.17	1.86	1.51	0.67	0.90	0.84	1.34	1.08
All others	1.01	0.66	0.70	0.64	0.56	0.74	1.36	0.43	0.57	0.27
Total, all kinds	0.96	0.94	0.89	1.06	0.80	1.34	1.57	1.24	1.23	0.84
San Rafael										
Apparel group	1.18	1.10	1.47	1.08	0.60	0.77	0.39	0.33	0.39	0.35
Automotive group	2.04	2.80	1.64	1.40	1.50	1.97	2.76	1.92	1.41	1.17
Drug and proprietary stores	1.02	0.91	0.66	0.62	0.56	1.20	0.76	0.72	0.68	0.61
Eating and drinking places	0.69	0.79	0.80	0.74	0.57	0.70	0.67	0.39	0.35	0.35
Food group	0.76	0.67	0.80	0.79	0.78	1.05	1.21	1.39	1.01	1.21
Furniture and appliances	1.30	1.64	1.87	1.61	1.11	0.80	1.65	1.22	1.43	0.30
Gasoline service stations	0.91	1.08	1.06	0.85	0.95	0.97	1.17	1.12	1.05	1.17
General merchandise (incl. gen. stores)	1.19	0.97	0.79	1.01	1.55	1.62	1.04	1.06	0.91	0.72
Lumber - building - hardware group	1.63	1.55	1.75	1.43	1.71	4.25	3.03	2.57	2.34	2.83
All others	1.01	0.88	0.98	1.10	0.75	0.90	0.65	0.73	0.74	0.25
Total, all kinds	0.96	0.94	1.00	0.95	0.84	1.32	1.26	1.14	0.96	0.76

TABLE 49—*Concluded*

City and Kind of Business	Number of Establishments					Retail Sales				
	1948	1939	1935	1933	1929	1948	1939	1935	1933	1929
Redwood City										
Apparel group	1.23	0.99	0.64	0.20	0.55	0.65	0.26	0.11	0.06	0.05
Automotive group	2.04	2.18	1.44	1.09	1.96	1.40	1.59	1.03	0.78	0.63
Drug and proprietary stores	0.89	0.91	0.92	0.74	0.84	1.07	0.76	0.85	0.77	0.78
Eating and drinking places	0.85	0.87	0.77	0.71	0.61	0.75	0.61	0.41	0.27	0.39
Food group	0.71	0.74	0.85	0.88	0.82	1.49	1.16	1.01	1.08	1.00
Furniture and appliances	1.57	0.82	1.01	0.44	1.31	1.13	0.29	0.21	0.19	0.58
Gasoline service stations	1.82	1.43	1.36	1.56	1.30	1.94	1.41	1.63	1.55	1.24
General merchandise (incl. gen. stores)	1.34	1.75	1.58	1.13	0.93	0.83	0.83	0.78	0.72	*
Lumber - building - hardware group	1.74	1.42	1.31	0.88	0.91	2.45	1.95	1.20	2.19	0.74
All others	1.24	0.85	0.85	0.81	0.48	1.63	0.64	0.67	0.49	0.17
Total, all kinds	1.13	0.96	0.93	0.85	0.80	1.28	0.96	0.78	0.78	0.56
Hayward										
Apparel group	1.42	1.10	1.09	1.08	0.80	1.06	0.49	0.41	0.52	0.36
Automotive group	2.04	2.34	1.03	1.27	1.50	1.69	1.42	1.61	1.34	0.94
Drug and proprietary stores	0.89	0.78	0.79	0.87	0.70	1.14	0.90	0.61	0.57	0.72
Eating and drinking places	0.82	0.70	0.66	0.65	0.41	0.50	0.49	0.48	0.37	0.24
Food group	0.83	0.83	0.68	0.87	0.53	1.09	0.99	0.99	1.02	0.52
Furniture and appliances	1.16	1.29	1.59	1.32	1.11	1.25	0.80	0.86	0.56	0.50
Gasoline service stations	0.96	0.98	1.06	1.42	1.21	0.74	0.85	0.77	0.81	0.87
General merchandise (incl. gen. stores)	1.49	1.36	1.18	1.89	2.01	0.65	0.52	0.44	1.55	0.27
Lumber - building - hardware group	1.40	1.94	2.19	1.75	1.21	1.11	4.30	1.78	1.52	1.02
All others	0.94	0.78	0.82	0.67	0.64	2.52	2.64	2.94	0.73	2.47
Total, all kinds	1.00	0.93	0.86	0.98	0.77	1.17	1.15	1.05	1.01	0.67
San Leandro										
Apparel group	1.51	0.39	0.45	0.34	0.45	0.79	0.07	0.07	0.08	0.05
Automotive group	1.40	1.71	1.44	0.91	0.92	1.35	0.87	0.70	0.39	0.36
Drug and proprietary stores	1.91	1.17	1.05	0.62	1.11	1.59	0.80	0.67	0.40	
Eating and drinking places	0.95	0.74	0.63	0.44	0.45	0.55	0.31	*	0.21	0.23
Food group	1.34	0.97	0.96	0.97	0.82	1.86	0.86	0.78	0.85	0.54
Furniture and appliances	1.23	0.70	0.72	0.73	0.91	0.54	0.15	0.20	0.10	0.28
Gasoline service stations	1.73	1.33	1.53	1.07	1.12	1.65	1.15	1.01	0.89	0.79
General merchandise (incl. gen. stores)	1.78	1.36	0.99	0.88	1.39	0.48	0.31	0.22	0.24	0.06
Lumber - building - hardware group	2.33	1.42	1.02	0.99	1.11	1.43	1.03	0.96	0.56	0.91
All others	1.31	0.63	0.70	0.32	0.35	0.61	0.30	0.27	0.08	0.08
Total, all kinds	1.35	0.89	0.89	0.73	0.73	1.13	0.58	0.50	0.43	0.34

Source: U. S. Bureau of the Census.
* Data cannot be revealed.

bers of establishments. For the five most-important groups, the following pattern of dispersion may be noted: (1) eating-and-drinking places, none in 1929; Vallejo in 1939 and 1948; (2) food group, Vallejo, Alameda, Redwood City, and San Leandro in 1929; Berkeley, Alameda, Redwood City, and San Leandro in 1939; and Berkeley and Richmond in 1948; (3) apparel group, Berkeley, Burlingame, and Hayward in 1929; Berkeley, Burlingame, and Redwood City, and Hayward in 1939; and Alameda, San Mateo, Burlingame, San Rafael, Redwood City, Hayward, and San Leandro in 1948; (4) gasoline stations, all ten cities in 1929; all but Vallejo in 1939; and all but San Rafael and Hayward in 1948; (5) furniture, home furnishings, and appliance group, all but Alameda in 1929; all but Alameda, Redwood City, and San Leandro in 1939; and all but Richmond and San Leandro in 1948.

In term of sales volume quite different patterns, once again, can be noted from Table 49. The patterns below are given for the seven most-important groups: (1) food group, all but Hayward in 1929; all but San Rafael and Hayward in 1939; and all but Vallejo, San Rafael, and Hayward in 1948; (2) automotive group, all but Berkeley and San Mateo in 1929; and all but

San Mateo in 1939 and 1948; (3) general-merchandise group, none in 1929, 1939; none but San Rafael in 1948; (4) eating-and-drinking places, none in 1929, 1939, and 1948; (5) apparel group, none in 1929, 1939, and 1948; (6) furniture, home furnishings, and appliance group, none but Redwood City in 1929; none but Richmond, Vallejo and San Rafael in 1939; and none but Richmond, Vallejo, San Mateo, and Hayward in 1948; (7) lumber, building, and hardware group, all but Vallejo and Alameda in 1929; all but Alameda and Burlingame in 1939; and all but Berkeley, Richmond, Alameda, Burlingame, and Hayward in 1948.

Thus, while the percentages of each type of retail store have generally declined for San Francisco and, in part, for Oakland, the changes have not always resulted in dispersion as the term has been defined in this section of this report. Especially to be noticed is the degree to which Oakland stores have increased in importance in the sale of apparel, eating-and-drinking and general-merchandise groups.

SUMMARY

The preceding discussion has revealed that dispersion varies sharply between manufacturing, wholesaling, and retailing. These variations are accentuated according to whether or not number of establishments or dollar sales are considered. They reveal that the spatial needs of the enterprise, the value of the products handled, and the shopping habits of consumers are all factors to be considered. In addition, the sharply varying patterns are influenced by variations in the growth patterns of the kind of business or commodity analyzed and by the population-growth pattern of the geographic units. These factors will all be considered, together with other pertinent materials, in the section which follows.

Factors Affecting Centralization, Decentralization, and Dispersion of Economic Activities

The preceding sections have discussed a complex pattern of centralization, decentralization, and dispersion of manufacturing, agriculture, wholesale trade, retail trade, and selected service trades, together with population, in the San Francisco-Oakland metropolitan area. This section deals with the more-important factors which have tended to influence this complex pattern. The reader is warned to be aware constantly of the interrelationships between the various sets of factors, as no single category of factors, in and of itself, can be assumed to operate independently of the other considerations.

In the discussion which follows, the following categories of factors are discussed: (1) the changing functions of the metropolitan area, (2) technological factors, (3) the impact of transportation, (4) population movements, (5) locational theory and management practices, (6) congestion and parking, (7) marketing changes, (8) growth factors, (9) locational separation of activities of a single firm, (10) changing importance of economic activities, (11) effects of governmental activities, and (12) effects of World War II.[46]

CHANGING FUNCTIONS OF THE METROPOLITAN AREA

Although this factor has been discussed previously in detail, some additional discussion and refocusing is in order at this point. First to be emphasized is that the metropolitan area is, and must be, considered as an organic unity, and that this organic approach has meant an evolving pattern of interdependence between the central cities of the metropolitan area and the subcenter cities and remaining territory. This has meant an increasing specialization of each geographic unit in each phase of activity, economic, social, etc. Thus, San Francisco is dependent upon farmers in Marin County for its fresh milk and dairy-product supply; but the Marin farmers, in turn, must depend upon the population of San Francisco and their economic activities for many things. Retail stores depend upon wholesale middlemen.

At the same time, however, there are elements of competition between each segment of the metropolitan area. This competition, accentuated by changing functions, is evident at the economic, political, and social levels. It manifests itself in a variety of informal and formal institutions and devices. These give rise to both linkages and blockages of the types which have been mentioned. It leads, as well, to many forms of centralization of control, even while decentralization and dispersion are taking place.

These developments have made it necessary to realize that the metropolitan area is a natural evolution. It is indigenous to the kind of civilization in which we live. From this stems the realization that the metropolitan area is a form of spatial adaptation by man in which all geographic segments must be viewed in

[46] The author acknowledges here the valuable assistance of Leo Grebler, of Columbia University, in critically reviewing this list and in making suggestions for expansion and revision.

relation to this organic unity which is the metropolitan area. Accordingly, various sizes of cities must be recognized as fundamental to the type of economic structure and to the accomplishment of the diverse functions found today. Many of the developments of activities in smaller cities could not exist without the array of facilities in the larger cities; conversely, the larger cities cannot disregard the role of these smaller geographic segments.

Thus, the metropolitan unit, true to its organic foundation, is a reflection of constant change and of man's attempts to accentuate, to control, or to block such change.

TECHNOLOGICAL FACTORS

Technological factors will emphasize mainly those aspects which affect the overall view of the metropolitan area dealt with in this study. The tremendous strides in technology which have resulted in a widening array of products which require, in turn, a corresponding widening circle of economic establishments and sales, are all significant for this study. We need not specify all of these new developments in order to realize the nature of the impact. What needs emphasizing is that the expansion requires new spatial units, affects old spatial arrangements, and leads to changes in control, linkages, and blockages.

A different aspect of technological change deals with the development of methods of production which permit manufacturing establishments to be realigned from a physical point of view. This may be the remote control of a substation plant of an electrical utility, or it may involve other substantial changes. These changes may increase the effectiveness of smaller-scale units leading to decentralized locational needs, or they may accentuate rather the need for a single larger plant.

A third aspect of the impact of technological factors is the development of means of transportation and communication, which underlie the growth of the city and of the metropolitan unit and geographical shifts within these. The next section will deal with additional aspects of such developments.

A final aspect has to do with the relationship of technological change to the centralization of control, primarily from a management point of view. To the extent that technological factors enter into the necessity for large-scale units, increased centralization of control will take place. Many of the area's manufacturing establishments are merely branches of activities located in other larger metropolitan centers. But the centralization of control also manifests itself through the increasing interpendency of various kinds of production activities through patent control, interlocking processes, and the like. And within the metropolitan area, the same patterns may be repeated, once again, between San Francisco or Oakland and the rest of the area.

IMPACT OF TRANSPORTATION

The general physical shape and characteristics of the San Francisco-Oakland metropolitan area places a premium upon the existence of a well-integrated system of passenger- and freight-transportation facilities. The large water area between the different segments of the bay area, coupled with the topographical factors and distances, are significant in predetermining the channels of movements of people and the possible locations of economic activities.

Transportation links between San Francisco and cities in San Mateo County and beyond date back to Civil War days with the building of the San Francisco to San Jose Railroad in 1861.[47] A ferry and rail link between San Francisco and Marin County, the North Pacific Coast Railroad Company, was built in 1875. Steam railroad and ferry service between San Francisco and Alameda was begun in 1863, and extended later to include Oakland. Ferry and electric train service to Berkeley dates from 1902, and additional lines were developed by 1911. With the completion of the San Francisco Bay Bridge, direct rail and bus connections were established between San Francisco and the East Bay cities. Similarly, the completion of the Golden Gate Bridge led to direct bus transportation between San Franciso and Marin County.

It goes without detailed discussion that these interurban transportation developments had begun long before present-day happenings—the pattern of decentralization and dispersion of people and economic activities—and helped to set up a basis for a metropolitan area with San Francisco and Oakland as its centers. The early development of mass transit within San Francisco and Oakland could have only the same types of results on an intracity basis. Horse-drawn omnibuses began commercial operations in San Francisco in 1852. Cable-car transportation was begun in 1873. From these beginnings, and with promotional activities designed to promote the sale of real estate, came the expansion and electrification of street railways. Since World War II, wide conversion to bus and trackless-trolley operations has taken place.

Similar developments have been taking place in

[47] This, and successive historical materials, are based upon unpublished materials written by Arthur L. Grey, Jr.

Oakland and other East Bay cities. As a result, by as early as 1915, the East Bay possessed some rapid transit features, such as: (1) traveling time between North Berkeley (Thousand Oaks district) and the Sixteenth Street Station in Oakland was 20 min. or 18.9 mph., due to the existence in part of a private right-of-way;[48] and (2) traveling time between San Leandro and downtown Oakland, a distance of 8.9 mi., was only 30 min., or at a rate of speed of 17.8 mph.

These mass-transit facilities, while providing a basis for decentralization and dispersion, did link the outlying sections with the centers of the larger cities. The explosive effect of the automobile and motor truck result, in part, from the increase in mobility and flexibility which result. We may add here, in addition to what has been said already, that these developments (joined with other factors) accentuated the movements away from the central sections, while permitting drivers either to go into or to avoid such central sections from a transportation point of view.

One of the explosive effects of the motor age has been the falling off in revenues of mass-transit agencies, leading, in turn, to the general deterioration of mass-transit service, even though at increased fares. Deterioration of San Francisco Bay area mass-transit facilities has been manifested in many ways: (1) considering improvements in equipment, a gradual disintegration of schedules and running times; (2) increased costliness of service, especially if the deterioration of quality is considered; (3) a general failure to provide increasing passenger comforts commensurate with improvements made in automobiles; and (4) failure to change routings sufficiently in keeping with changing demand load factors. These and other factors are considered in detail in later sections.

What is important to recognize is that no coördinated treatment of the problem has been accomplished to date. The overall aspects of the transportation of persons and goods in relation to the geographic nature of the metropolitan area, and the various purposes for which such movements take place, require a bold, imaginative, integrated attack. Talk about building of additional bridges across San Francisco Bay emphasizes mainly the movements of people by automobile. The extent of the problem is not merely a matter of downtown stores losing business to outlying stores or to stores located in other cities. It involves realization, as well, of movements of goods; of the diseconomies of permitting large numbers of vehicles to carry only a few persons in each unit; and of the costliness of governmental investment in highway facilities, which may aggravate rather than alleviate problems.

Increasing attention should be directed to a study of the increasing intricacies of the movement of goods within the area, and from the area to other metropolitan areas and rural areas. Linkages, of the type already referred to, have resulted in ever-widening and complicated patterns of flows of goods as well as of persons. When coupled with the ever-widening area over which the motor truck can operate economically, it can be realized that the transportation problem needs to be considered jointly in its passenger and freight aspects.

POPULATION MOVEMENTS

A previous discussion has dealt in adequate detail with patterns of growth and shifts. Attention here is directed, first, towards the predominant preferences for one-family and duplex living quarters and the influence of such preferences upon requirements for greater spatial spreading of the population. Such widespread spatial requirements, coupled with an increasing population, seem to aggravate the problems of decentralization and dispersion.

Few attempts outside of San Francisco have been made in the bay area in the use of the apartment building to house groups of tenants. The dispersed "California style" of living has serious repercussions, of course, on requirements for special types of economic, social, and political facilities. It places additional stress on transportation and communication facilities.

The changing composition of the population, and its geographic distribution in the bay area, results in unequal movements of economic activities. There are sharp differences in per-capita incomes of residents in Richmond as compared with the Peninsula cities in Marin County. These affect, in turn, the types of economic activities which locate in each section. Of a similar nature in its effects is the increasing proportion of various minority groups now living in bay area cities. Through restriction measures, they influence, by this geographic concentration, the location of economic activities operated by members of such groups or of economic activities catering to their purchasing and consumption requirements.

LOCATIONAL THEORY AND MANAGEMENT LOCATIONAL PRACTICES

The first aspect of this factor is the role which an evolving theory of location of manufacturing and marketing activities has played in increasing the many alternatives open for locating an establishment. This

[48] Via present-day transit facilities, the same journey would require more than twice the time.

evolving theory, by increasing the range of profitable economic alternatives, led to possibilities for increased decentralization and dispersion. After all, the larger cities had choice locations in the shopping districts well-picked over by existing establishments; similar problems existed in locating establishment in the manufacturing sections. The selection of a site for an economic activity, aided by the development of better theoretical materials, became a problem to be analyzed and not to be set aside or disregarded.

From this first aspect arose not only the realization on the part of management that the selection of a location was a problem area requiring careful analysis, but also the realization that poor location meant serious competitive disadvantages. And the nature of the problem studied in this report led to more attention devoted to the development of sound management practices based upon locational theory.

Building upon these aspects, management had to recognize at an early date that (1) the number of choice locations in any given city were limited; (2) this meant selecting a choice elsewhere within the city or in other cities; and (3) this required adapting business policies and practices to offset the fact that a second quality location might have to be selected. In a sense, it might be said that decentralization begins when the management of one economic activity finds that another economic activity, through its choice of a first-quality location, has reduced the former's range of locational possibilities.

Many types of businesses long ago recognized this by selecting alternative locations. Several examples may be drawn from the retail field. In Chicago, the Weiboldt chain of department stores never located any units in the downtown area—nor did the Goldblatt chain, until the company had several outlying stores. Marshall, Field and Company, on the other hand, opened branch units in outlying sections of Chicago during the 1920's.

But some of the most-spectacular examples may be drawn from the development of department-store chains by the mail-order companies.[49] As early as 1880, Montgomery Ward had opened a branch store, but this was closed by the spring of 1882. About 1916, the same company opened branch mail-order plants in Kansas City and Chicago to receive and fill orders.

However, the major examples came in 1925, when Sears Roebuck began to open department stores in the outlying sections of cities, where adequate parking space could be provided. In February of that year, Sears opened a pilot store in its mail-order plant on the west side of Chicago, followed by stores in Seattle in May, in Dallas and Kansas City in August, in Philadelphia and Evansville in October, and on the north and south sides of Chicago in November. The big periods of growth came in 1928 and 1929 with another large spurt in 1932. By 1948, this company had 632 stores in operation in the downtown and outlying shopping sections of cities of many different population sizes. For example, two such stores are found in outlying sections of San Francisco, one in Oakland, and others in smaller bay area cities.

In the development of this chain of stores, the company has selected the following policies: (1) Type A stores, in outlying districts of larger cities where ample parking space exists, and where low rental sites can be obtained; (2) Type B stores, originally in the central shopping districts of smaller cities, but later located in outlying districts; and (3) Type C stores, in or near shopping centers.

These developments were amplified because of the "delayed explosive effect" of the automobile age. By the "delayed explosive effect" is meant the existence of a time lag between the period when the automobile and truck were developed and used, and the period when their effects upon the location of economic activity assumed significant proportions. In addition to the examples already quoted for Sears, Roebuck, attention may be called to the way in which the motor truck could be used to link the company's central warehouse in a larger city with unit stores in the same city and surrounding area. The same type of transportation linkage exists for bakeries, corporate chains, and parent and branch stores.

CONGESTION AND PARKING

While the factors of congestion and parking will be discussed later in more detail, it is useful here to point out how the very transportation developments which first led to the rise of the city and the metropolitan unit resulted later in problems of congestion and parking. These, in turn, have served to plague the important areas of economic activities in all cities of any importance in each metropolitan area. While felt most heavily in the central districts, each decentralization and dispersion movement tends to set up the possibilities of congestion and centralization on a new geographic plane.

Thus, the development of a city like Richmond (Contra Costa County) to its present size from a small 1939 base, results in significant problems of parking and

[49] Much of the material which follows is based on Boris Emmet and John Jeuck, *Catalogues and Counters* (Chicago: The University of Chicago Press, 1950).

congestion in its downtown shopping district and in its manufacturing areas. Similarly, the opening of a large-scale shopping center in the outlying section of a city creates a new nucleus of congestion in that section.

Another aspect sometimes overlooked is the impact of congestion and parking on land-use patterns. Increasing proportions of land, particularly in higher-property-value areas, must be allocated to facilities designed to alleviate the congestion and parking problems.

MARKETING CHANGES

First to be noted among the marketing changes is the rapid increase in the volume and variety of marketable goods and services. These rapid changes create pressures upon existing spatial arrangements for the wholesale and retail middlemen concerned. Existing locations may be adequate, spatially, to handle only a part of the increased volume and variety. As a result, and in keeping with the locational theory noted above, the search for new marketing channels often requires the development of locational alternatives to existing wholesale and retail districts.

A second aspect to be noted is the relation of changes in types of wholesale and retail institutions to the geographic shifts noted. At the retail level, for example, the development and rise of importance of the department stores accentuated the development of downtown and key outlying shopping areas. On the other hand, the perfection of the mail-order principle in retailing freed this type of institution from the necessity of locating in the congested shopping areas; rather, locations were sought in manufacturing and warehousing areas—areas of motor-truck congestion instead.

The corporate chain created diverse locational patterns, depending upon the kind of goods handled. Those selling foods, drugs, and other types of convenience goods and services could, and did, select locations on a highly diversified geographical basis: string street locations, outlying shopping areas, and central shopping areas. They could pick such locations in a wide range of cities from a population-size point of view. Those selling shopping and specialty goods would concentrate their choices in the central or outlying shopping districts. But in either case, transportation linkages would have to be provided with company warehouses and managerial linkages between unit stores and district offices.

Supermarkets, with their increased physical size and with the resulting larger volume of sales per store, were the principal influence in causing a movement of stores selling convenience goods from the less-important to the more-important string-street locations. Further increases in size led to location in outlying shopping districts and shopping centers. These movements represent, in effect, a movement towards partial centralization.

A word might be said about the evolution of wholesale middlemen. Those emphasizing physical possession of goods sold fall into three locational patterns: (1) those who function in organized wholesale markets, such as fruit and vegetables, and who must, accordingly, locate in or near such markets; (2) those who may rent space in existing warehouses, and whose location is influenced accordingly, although they might be able to separate office from warehouse location; and (3) those whose warehousing operations permit them to seek decentralized locations or branch operations. On the other hand, there are many types of wholesale middlemen who do not take physical possession of the goods sold and who can, accordingly, locate in office buildings in central districts.

To the expansion in the volume and variety of goods and services to be marketed must be added a discussion of changes in marketing methods. Two illustrations will suffice to show the relationship of this factor to the problem at hand. The first example is the development of the drive-in store. The requirement for parking facilities is self-explanatory in pointing up the need for an outlying location. The second aspect is the increase in the importance of "scrambled marketing." What is meant by this expression is the increased extent to which retail stores are handling merchandise not formerly considered to be typical for that type of store. The grocery supermarket handling apparel and drugs is a case in point.

To the extent that such scrambled marketing is successful, the results can only be to widen the geographic distribution of stores and sales. On the other hand, increased use of telephone ordering and mail ordering, bolstered by the effects of television advertising, may lead to more centralization of sales for certain types of goods. Thus, buyers of books or phonograph records from the various "of-the-month" clubs in New York are reducing the relative importance of book and record stores in the bay area.

One final illustration of the effects of changes in marketing methods concerns changes in the advertising aspects of marketing, so far as media and circulation are concerned. Depending on the form taken, these may have either centralizing or decentralizing effects.

Advertising media make effective the centralizing process of mail-order selling of books and phonograph records. Car cards, window signs, etc., offer advertising opportunities for decentralized and dispersed activities.

GROWTH FACTORS

At several points in the analysis, stress has been placed on some aspects of the problem of centralization, decentralization, and dispersion arising from growth trends in the San Francisco Bay area and the United States as a whole. These may now be discussed in somewhat more complete fashion. First among these growth factors is the large expansion in population. The reasons for such expansion need not be reviewed here. What does concern us is that, among other effects, such growth creates serious spatial problems. The larger cities, already well inhabited, must develop new residential sections if they are to share in the growth. This has taken place, as earlier discussion has indicated. But when the increase becomes so large as to exceed the absorptive capacity of these cities and when it is accompanied by favorable increases in per capita incomes, desire for more living space, and the like, then accelerated spilling over into new outlying sections is inevitable.

The expansion in population is sometimes preceded, accompanied, or followed by expansions in economic, social, and political facilities. And these, in turn spill over into the outlying areas as existing locational possibilities offer no opportunities, or considerably less-attractive alternatives.

These growth factors aggravate existing inadequacies of land use and of quality and quantity of transportation facilities. The creation of additional aggravations and maladjustments may lead, in turn, to further spatial rearrangements. Aggressive real-estate promotors enter into the picture. The complete result is a kaleidoscopic series of movements and counter movements. And these areas, already heavily utilized, find themselves at a considerable disadvantage in maintaining the same flexibility in attracting new growth to the same degree possessed by the newer outlying areas.

LOCATIONAL SEPARATION OF ACTIVITIES OF A SINGLE FIRM

As the problem of spatial adjustment increases in complexity, many firms may make an adjustment which involves separation of its internal operations from a locational point of view. Those activities of a managerial nature, requiring rapid accessibility to various other economic units, may well continue to be located in the larger city's central business district. Often this continues to be necessary merely to assure accessibility to out-of-town customers. Those activities requiring more space (such as manufacturing, warehousing, and even accounting) can be moved to outlying sections of the city or to other cities, unless accessibility to centrally-located customers is a dominant consideration. When such separations take place, transportation, communication, managerial control, and other auxiliary devices make possible the necessary linkages.

Thus, for example, one sugar-refining company has its executive officers in downtown San Francisco and its sugar-refining plant in Crockett (Contra Costa County). The large petroleum-products companies maintain executive headquarters in San Francisco but operate refining and tank-station installations in Contra Costa County in and around Richmond. The Bank of America centralizes its activities involving executives and staff specialists in San Francisco, but it maintains branch activities throughout the world.

CHANGING IMPORTANCE OF ECONOMIC ACTIVITIES

One group of factors which is important is the changing importance of economic activities. While not too much is known about all of the causes which lie back of these changes, general explanations can be given. The technological factors discussed above tend to displace existing products and to create expanding demands for the new products. Note, in this connection, the impact of fast-frozen foods on the consumption of both canned and fresh products. The chain effects of the expanding industry are carried to all related activities. To a large extent the declining trends in competitive activities likewise have their own chain reactions.

Similarly, at the wholesale and retail levels, changes in the importance of various types of middlemen are associated with changes in the demand for the products or services handled and with changes in the quality of the management. Many of these changes, such as the declining importance of the orthodox wholesale or the single-unit department store, have nationwide explanations.

In the bay area, the changing quality of the competition affects the importance of each type of economic activity. Macy's enters the San Francisco department-store field, and the competitive repercussions and counter-repercussions affect not only downtown San Francisco but the whole area. And the same tendency holds true for other types of economic activity, affecting also every geographic unit within the San Francisco-Oakland metropolitan area.

Accordingly, part of the problem of understanding centralization, decentralization, and dispersion of

economic activities is the necessity for understanding the causes of changing trends in the importance of various types of business operations and in the consumption of various kinds of goods and services by all classes of users.

EFFECTS OF GOVERNMENTAL ACTIVITIES

The discussion of the factors affecting centralization, decentralization, and dispersion would not be complete without some discussion of the role of government at all administrative levels. Of prime importance have been the planning activities of these agencies. Particularly to be noted has been the enactment of zoning laws, land-use plans, etc., by city-planning boards. The results of such activities have been felt on the spatial arrangements by which activities are permitted to select particular locations within each city. These have affected, in turn, future locational patterns to the extent that land use has been controlled and future use forecasted. From such activities may arise blockages.

Government activities—in the form of taxes, business licenses, and legislation—have direct and indirect bearing on the changes noted. Taxes may not only restrict direct entrance into a business but, through provision of tax revenues for highways and the like, may also affect the problem at hand. Taxes have had an effect, together with other factors, on the quantity of building and on the height of buildings erected. To the extent that more "taxpayer units" are built, or lots used for parking, will the downtown area's facilities fail to keep pace with demand.

The location of various government establishments have tremendous impact, because they themselves constitute activities competing in land-use requirements with other activities and also frequently attract related activities. These generate traffic linkages and all of the other aspects of the problem which have been discussed.

Finally may be noted the promotional activities of governmental and quasi-governmental agencies. Oakland has promoted aggressively, by means of advertisements and brochures, its advantages as a location for manufacturing activities. Chambers of commerce actively study many aspects of the decentralization problem. Tax advantages on exemptions may be granted to new establishments. Larger incorporated areas can, and do, absorb outlying unincorporated areas in the battle to overtake competing cities. People may locate in unincorporated areas, however, to seek relief from higher taxes in cities. All in all, a myriad of competitive pressures on the problem are created from these and other types of government actions.

EFFECTS OF WORLD WAR II

No discussion would be complete without some treatment of the effects of World War II. One aspect of this was the exposure of thousands of persons in or related to the armed forces to certain natural advantages of the bay area's environment. This exposure undoubtedly influenced many to return to the area after the war.

A second aspect was the location in the area of many manufacturing establishments (and the other related activities) connected with the war effort because of locational proximity to the Pacific war theater, some national policy of decentralization, and political pressures. These have continued in existence, in many cases, either in producing material for the Korean conflict or in converting to the production of other products.

A third effect of World War II, and one which continues to the present, has been the demand for many types of economic and social activities resulting from the location of numerous military installations in or adjacent to bay area cities. Particularly affected have been retail sales and receipts from service trades. The sharp fluctuations in the level of such government activities greatly affects the stability of such activities, e.g., the shipbuilding and repair program at Mare Island in relation to trade in Vallejo and Benicia.

A final aspect has been the complete dynamic aspect given by the change initiated or stimulated by the general tempo of the war. Space does not permit detailed treatment of this aspect. It may be pointed out, however, that these permeate every segment of the problem from the effects on population directly to changes in types of business operation and changes in the patterns and modes of transportation.

Review of Economic Activities

In the preceding sections this report attempted, first of all, to indicate a reorientation of the concepts of the city and of the metropolitan unit. Because of the varied interrelationships which exist between institutional groups, functions, and the like, there was emphasized the necessity for viewing the city and the metropolitan unit in an organic entity. Emphasis was placed upon the existence of physical and nonphysical linkages and

blockages which further accentuate the intricate intertwinings of the various components of the metropolitan unit.

Various concepts of centralization, decentralization, and dispersion were discussed. In developing an outline of the various types, great stress was placed upon both the physical and the nonphysical varieties once again. Especially to be noted are centralization of control exercised by various group arrangements and how such centralization once again links the various forms of decentralization and dispersion to the central cities in increasingly important and complex ways. Other linkages resulting from the types of centralization, decentralization, and dispersion were discussed as well.

Considered next were the various concepts of the San Francisco-Oakland metropolitan area. It was emphasized that no single useful concept of the metropolitan area exists at present and that, while the census' standard metropolitan concept of six counties (Alameda, Contra Costa, Marin, San Francisco, San Mateo and Solano) was most useful, it was not without some important limitations.

Later sections analyzed in detail the shifts which have taken place within the metropolitan area in the geographic distribution of population, manufacturing, agriculture, wholesale trade, retail trade and selected services trades. While the usual lessening in percentage importance was found to exist for San Francisco and, to a more-variable extent, for Oakland, sharp differences in levels were found between each category studied. San Francisco and Oakland combined accounted for 76 percent of the population in the metropolitan area in 1900; 68 percent in 1930; 64 percent in 1940; and 52 percent in 1950. In manufactures, these two cities had, for example, 67 percent of the 1929 total value added by manufacture; 57 percent of the 1939 total; and 59 percent of the 1947 total. In wholesale trade, these cities had 95 percent of the 1929 establishments and 97 percent of the sales, while in 1948 they had 88 percent of the establishments and 94 percent of the sales. In retail trade these cities' share of the establishment dropped from 73 percent in 1929 to 63 percent in 1948 and from 84 percent of the 1929 sales to 67 percent of the 1948 sales. For selected service trades the two cities accounted for from 60 percent of the total for amusements to 93 percent for business services in 1948. In all cases, it should be noticed that the two metropolitan centers accounted for more business proportionately than population, and in wholesale trade, retail trade and selected services the percentages are substantially higher.

Further analysis revealed sharp differences as well in the percentage distribution of these classes of activity in the remaining cities and unincorporated places. So far as population is concerned, of some 44 cities studied, only half have had steady rises in relative importance from 1900 to 1950. In retail trade many smaller cities continue to account for a smaller percentage of establishments and sales than of population.

When absolute changes are analyzed in place of percentage importance, a sharply different picture is apparent. Populationwise, San Francisco, Oakland and Richmond accounted for half of the total absolute gain between 1900 and 1950, and for nearly two fifths of the absolute change between 1940 and 1950. Similar patterns are apparent for the economic activities as well. This suggests the need of adopting a multiple point of view in talking about centralization, decentralization, and dispersion.

The various patterns of change which characterized the forces of dispersion of manufacturing, wholesale trade, and retail trade were then analyzed. And, once again, sharp variations were apparent in the degree, direction, and incidence of such movements by each subdivision of each class activity.

Discussion in the last section centered around some of the major factors affecting centralization, decentralization, and dispersion of economic activities.

IMPLICATIONS OF THE FINDINGS

Brief attention may be directed at this point to the implications of the findings on related problem areas and for future areas of study. First, what are some of the implications for the analysis of land-use patterns? This study has emphasized throughout that the problem is a complex matter involving consideration of all economic activities and is not restricted merely to patterns of use by retail stores in relation to loss of sales position of downtown merchants to outlying areas and other cities. Limited spatial resources require consideration as well of other uses than merely the economic. And because future developments cannot be predicted precisely much attention must be directed towards securing the necessary flexibility.

Closely related to the above is the increasing prospect of developing excess capacity, especially of retail trade. A cursory study of the location and capacity of shopping centers in the area since 1947 leads one to ask questions such as the following: (1) Have locational studies for each made sufficient allowances for poten-

tial competition? Has the Stanford development, for example, made allowance for the Palo Alto plan? (2) Will the units established possess sufficient competitive strength to compete successfully with older locations during a period of business deflation? Are their costs sufficiently comparable, for example, to permit vigorous price appeals if necessary during a period of business recession? (3) Have the smaller retailers in the new shopping centers received flexible enough rental arrangements to permit them to exist? The writer believes that a period of substantial reduction in the level of economic activity will reveal areas of excess capacity.

But the study of land-use patterns is not merely a physical spatial problem. It involves intricate problems of linkages and blockages through managerial devices, through group pressures, and through other manifestations. These further amplify the need for the maintenance of a flexible, all-encompassing point of view in making land-use studies and programs for the future.

This study has contended at several points that centralization, decentralization, and dispersion cannot be studied properly without a recognition of the organic unity of the metropolitan area and of the necessity for coordinating all aspects into an all-encompassing view. The importance of the San Francisco-Oakland metropolitan area is a function of the interrelationships of all geographic segments engaged in a wide array of economic, social, and political activities.

If this is granted, then many additional implications follow for the movements of people and of goods. These will be developed in the sections to follow. Suffice to note here that too much time, effort, and money may have gone into studying and providing for only private transportation facilities. All forms of transportation within the metropolitan area need to be considered as units for all purposes. The recent activities of groups in discussing the possibilities of a bay area rapid-transit system hold out possibilities for just such integrated thinking. The approach to the problem of bridges across the San Francisco Bay represent the nonintegrated approach.

All of the preceding, in turn, give impetus to further study into the administration of the units comprising the San Francisco-Oakland metropolitan area. Are there too many government levels and agencies at present? Is there any justification for, and possibility of, a metropolitan area level of govenment? How can rivalries be submerged so that the metropolitan area may develop along better integrated directions? These are the problems which require the best kind of professional study.

Other areas for study are in the opinion questionnaire field. One set of fruitful studies can deal with the reasons why various kinds of activities relocated within the area. Another can deal with reasons why activities either moved away from the bay area or decided not to move to the area. Studies can and should be made of the habits of persons in making trips for various purposes, of patterns of flow of goods, and of reasons for following the patterns indicated.

SOME SPECIAL PROBLEM AREAS

This section cannot be complete without some statement about existing problem areas. One such area is in the continued divergencies of concepts. There continue to be many different meanings of a metropolitan unit. More investigation is required to uncover the possibilities of more objective criteria. And if any one concept has the greatest potentialities, then that concept should be sharpened and polished so as to meet the needs of various research groups who are and will be investigating problems in this area.

A second problem area exists in the need for better coordination of statistical and other data with the concepts set forth. Lack of comparable, detailed data and fluctuation in the physical size of areas between census periods are only a few of the existing problems. And the increasing costliness of securing special intracity tabulations of census and other data are mounting barriers to better analyses. If the budgets of government agencies cannot permit them to supply such data in regular statistical publications, then metropolitan area groups can and should take coöperative action.[50] Or perhaps the government could make such data available on a low-cost basis.

Much work needs to be done in the area of linkage, blockage, group pressures, etc., and how these relate specifically to centralization, decentralization, and dispersion. A related study pertains to the absence or presence of community leadership in the area, and its effect on the problem area being discussed.

Finally, the investigation of this problem points up the necessity for combining the professional capabilities of persons in many fields of interest. After all, this problem is fundamentally one of the scientific study of human behavior in the adaptation of activities to geographical space. Here, then, lies a rich opportunity for a valuable interchange of concepts, research methods, and analysis in an interdisciplinary effort which could serve only to enrich the knowledge in this area.

[50] Such examples e ist already in Chicago, Cleveland, and New York.

The Transportation Problem

The balance of this report is designed to furnish an integrated analysis of the specific problems of parking, automobile congestion, and mass transportation in the San Francisco Bay area. It should be considered in the light of the first several sections of this part of the study, which dealt with centralization, decentralization, and dispersion, and with Part 4 (beginning on page 117), which discussed central city property values in the bay area.

That there is a problem requiring investigation needs no elaborate demonstration at this point. Rarely a day passes but that one or more of the area's newspapers have news stories, special articles, or editorials relating to various aspects. Conferences have been held, and more will be held. Traffic and mass transportation surveys have been made by bay area cities by private research organizations and by federal and state governmental agencies. The San Francisco Bay Area Rapid Transit Commission has recently published a preliminary report,[51] and the state and counties are being asked to finance further investigations. New parking facilities are being built, and more are planned, and the same situation prevails for highways and freeways. San Francisco has organized the "Forward San Francisco Committee" to study many of these types of problems in that city. And as this is being written, rivalries between San Francisco and East Bay cities have reached white heat in the state legislature over alternative places for new bridges across San Francisco Bay.[52] All of these are merely some day-to-day manifestations of the problem being investigated.

COMPONENT SEGMENTS OF THE PROBLEM

In developing a statement of the problem to be investigated, and of its component segments, only brief attention needs to be directed at this point toward the importance of transportation to the modern metropolitan area. Transportation made possible, first of all, the founding of the city. Evolving transportation technologies permitted the city to expand its boundaries. In this connection, the shift from mass to personal transportation in the movement of people, and to the motor truck in the movement of goods, has served to revolutionize the spatial arrangements of the city, and its relationship to the metropolitan unit. Transportation is an important spatial organizing force within and between cities. It makes possible the integration into systematic patterns of where people live with where they want to work or to carry on activities.

The increasing impacts of transportation viewed in relation to other factors have created several problem areas, five of which will be discussed. First of these is the relation of local transportation factors to the location of urban economic activities. The topics to be investigated in this connection deal with the location of manufacturing activities in urban places, the location of wholesaling activities, the location of retailing and services trade activities, and transportation linkages and the various types of economic activities. The related factors include such topics as the possible effects of parking costs and congestion and the changing of mass transportation facilities and costs.

Parallel with the preceding analysis will be an analysis of the problem of mass transportation in the metropolitan area. The significant areas for discussion include a study of trends in the use of commuting facilities by various patterns of movement, trends in the supply of and demand for mass transportation in San Francisco and East Bay cities, the adequacy of existing facilities including speed, schedules, etc., and the comparative positions of San Francisco and the East Bay cities.

Next, in the logical investigation of this problem, would seem to be an explanation of the reasons for the development of urban transportation problems. The list of the component topics to be considered includes: 1) changes in the quantity and quality of personal and mass transportation and of freight transportation; 2) interrelationships of changing economic functions of cities and of metropolitan areas upon the demand for motor vehicle transportation; 3) causes of traffic congestion; 4) provisions of parking facilities (street and off-street) as a part of business and government activities; 5) rising levels of parking and mass transportation costs; and 6) the effects of government activities.

With this as background, the analysis of the parking problem in San Francisco and Oakland would appear to follow in sequence. This involves an analysis, in turn, of trends in the supply of the various types of parking facilities, trends in the nature of the demand for parking facilities, and trends in the adequacy of parking facilities' relation to the demand. The discussion will consider, also, the comparative positions of San Francisco and Oakland in each of these aspects.

Finally, the results of this transportation phase of

[51] *San Francisco Bay Area Rapid Transit Commission Preliminary Report* (San Francisco: The Commission, January, 1953).

[52] The Dolwig Bill providing for a southern crossing, that supported by San Francisco, has been made state law on June 6, 1953.

the study will be reviewed together with background materials from other related studies.

TYPES OF METROPOLITAN AREA TRAFFIC MOVEMENTS

As a basis for discussion, there is given below a schematic outline of the types of movements of people and of goods in a metropolitan area which enter into the problem as discussed above. An understanding of the existence of such a complex array is necessary to an understanding of the problems involved in providing facilities for such movements.

I. *Patterns of Movements of People, via All Forms of Private and Mass Transportation.*

- A. Intracity movements, by geographical patterns
  - 1. For purposes of going to work
  - 2. For purposes related to trips to work
  - 3. For purposes of business trips
  - 4. For trips to medical offices, dental offices, or hospitals
  - 5. For shopping trips
    - a. to downtown area
    - b. to neighborhood shopping areas, or to shopping centers
    - c. to neighborhood string street locations
  - 6. For trips to educational institutions
  - 7. For civic purposes
  - 8. For religious purposes
  - 9. For trips to eating places
  - 10. For transporting other persons
  - 11. For social and recreational purposes
    - a. pleasure trips
    - b. vacation trips
    - c. visits to friends, parties, social meetings, etc.
  - 12. For miscellaneous purposes
  - 13. For multi-purpose trips involving various combinations of types 1–12.
- B. Types of trips as in (A)
  - 1. Between cities in the metropolitan area
  - 2. Between unincorporated segments
  - 3. Between cities and unincorporated segments
- C. Types of trips as in (A) between the various segments of the metropolitan area
  - 1. And various segments of other metropolitan areas
  - 2. And various segments not included in metropolitan areas
- D. Variations in types of trips in (A), (B), and (C)
  - 1. By time periods
  - 2. By distances
  - 3. By types of transportation facility

II. *Patterns of Movements of Goods by Motor Truck and Other Facilities*

- A. Intracity movements
  - 1. Intrabusiness firm's physical transfers of goods
  - 2. Interfirm transfer of goods
    - a. between manufacturing firms
    - b. between agricultural establishments
    - c. between wholesale middlemen
    - d. between retail middlemen
    - e. between service trade establishments
    - f. between combinations of 2a–2e.
  - 3. Movements of goods between establishments in (2) and
    - a. transportation facilities
    - b. other auxiliary facilities; *viz.*, warehouse facilities
    - c. institutional customers; *viz.*, educational and governmental agencies
    - d. ultimate consumers
  - 4. Other types
- B. Types of trips as in (A)
  - 1. Between cities in the metropolitan area
  - 2. Between unincorporated segments
  - 3. Between cities and unincorporated segments
- C. Types of trips as in (A) between the various segments of the metropolitan area
  - 1. And various segments of other metropolitan areas
  - 2. And various segments not included in metropolitan areas
- D. Variations in types of trips in (A), (B), and (C)
  - 1. By time periods
  - 2. By distances
  - 3. By type of transportation facility.

TYPES OF DATA USED

A word may be said at this point about the types of data which have been collected and analyzed. One set of data pertains to changes in the number of registered automobiles and motor trucks in the bay area in absolute and per-capita terms. A second set of data pertains to various aspects of mass transportation: trends of passenger traffic, by various routes; patterns of utilization, by hours of the day, etc.; changes in average speeds; and changes in costs. A third set of data pertains to the supply of and the demand for various types

of parking facilities. Data collected in various origin-and-destination traffic studies for San Francisco and Oakland since 1927 have been analyzed and compared. Records of private and business-sponsored parking facilities have been collected and studied. Materials developed by such agencies as city planning groups, parking authorities, and consulting firms have been utilized. And, finally, many newspaper and magazine articles have been used.

In using these qualitative and quantitative data, the outlook has been to view the problem in a broad perspective. Movements of goods as well as of people have been considered. Changes have been analyzed over periods of several years. One aspect of this broader perspective is indicated, also, by relating the findings to the decentralization of economic activities and to a related study of property values.

SOME HYPOTHESES

1. The problems of parking, congestion, and mass transportation have to be viewed in relation both to movements of people and movements of goods.

2. Problems of parking and congestion have to be considered and coordinated with studies of the problems of mass transportation.

3. The continuous expansion of the facilities for automobile and truck transportation may continue to aggravate rather than to relieve problems of parking and congestion.

4. The problem has to be viewed in terms of future patterns of population growth, changes in economic activities, and numbers of automobile and truck vehicles, and accordingly, attention must be paid to physical limitations on the supply of facilities that can be provided to accommodate such increased numbers.

5. In considering future plans for mass transportation, there must be a break with traditional form of thinking so far as modernization, the role of government, and coordination with other forms of urban transportation are concerned.

6. In the provision of bridges crossing San Francisco Bay, adequate provision be made for rapid transit facilities.

7. The entire problem must be viewed as encompassing the metropolitan area as a whole—not one to be solved on a piecemeal, city-by-city basis.

Local Transportation Factors in Location of Urban Economic Activities

This section is not intended to be a "theory of location of urban economic activities." Rather, the emphasis is on the interrelationships of where economic activities take place within the city and the metropolitan area, with local transportation facilities for people and commodities and the patterns of movements of both. Locational theory does enter into the analysis to be sure; but the point of view is broader in scope. This section is designed to serve, in other words, as a general framework against which to appreciate the effects of where economic activities locate, and changes in location, on the whole problem of transportation in the cities and metropolitan areas.

From a general point of view, its function is to deal with the basic proposition of bringing people and economic activities into relationship each with the other through the instrumentality of the various types of transportation agencies. In a very important sense, then, this is a problem of linkages once more. We may distinguish the manner in which transportation serves to link where people live and where they work; to link where people live and work with where they buy; to link where people live and work with other activities, social, etc.; and finally, to link all of these with the accompanying flows of goods via the various transportation agencies. In tracing these linkages, emphasis is placed on those factors which influence which segment of the linkage dominates where the economic activity is located in a metropolitan area.

LOCATION OF MANUFACTURING ACTIVITIES

In discussing this category, the main emphasis is on those establishments which actually conduct manufacturing activities on the premises. Where office activities are located in separate central locations, their locational factors will be discussed briefly at several intervals. Restricted in this sense, the location of manufacturing activities within the city or other parts of the metropolitan area may be classified as follows: (1) tied to inbound and outbound rail and water transportation facilities; (2) tied to inbound and outbound trucking facilities; (3) tied to metropolitan area market considerations; and (4) "footloose" industries.

Manufacturing Activities Tied to Inbound and Outbound Rail- and Water-Transportation Facilities

Those industries which are large enough to require inbound shipments of raw materials and other commodities in carlot or boatload quantities will, of necessity, locate in those parts of a city where zoning laws permit the necessary types of building to adjoin railroads or dockside facilities. Industries may be similarly located, as well, because their outbound shipments are sufficient to require large movements by boat or rail.

Wherever these conditions obtain, accordingly, the manufacturing establishments must seek out those railside or dockside sites where the transportation agencies protect through freight rate and switching conditions. Within these basic requirements, such manufacturing activities may be found in the older, central manufacturing sections of a city, or in the newer, outlying sections depending on 1) the age of the plant and the investment in its existing facilities; 2) the type of plant design and layout required—that is, extensive or intensive—in relation to cost factors; 3) requirements of the labor market, that is, the importance of accessibility to local labor supply; and 4) the comparative inducements held out by competing municipalities. In addition, the existence of organized manufacturing districts with special freight handling advantages may serve as attracting forces.[53]

The location of such manufacturing industries may be affected, also, by the necessity of clustering so as to maintain necessary linkages. Thus, a can factory may adjoin a canning factory if the latter creates enough demand to make possible direct conveyor-belt connections. Meat-slaughtering establishments cluster around stockyard facilities. And members of the same industry, e.g., apparel manufacturing, may find clustering together of great advantage.

Manufacturing Activities Tied to Inbound and Outbound Trucking Facilities

Where the volume of products handled is in less-than-carlot quantities inbound or outbound, or the bulkiness of the goods creates no special problems, manufacturing establishments need not be tied to railside or dockside locations. Such rail or boat shipments as are involved can be transferred to and from the plant by motor truck. And if the bulk of the manufacturing plant's inbound goods come by motor truck because of comparatively cheaper freight rates, there is a further relaxation of the necessity of having a railside or dockside location.

[53] The Central Manufacturing District in Chicago is one of several examples in that city.

Thus, within limits of zoning law restrictions and the types of clusterings referred to above, these plants have a much-wider variety of locational possibilities than the first group. They reflect, in turn, the attractions of labor supply, cheap land, or other considerations to be discussed below.[54] Under such circumstances they do not need to restrict themselves completely to manufacturing districts, but can locate with warehousing, wholesaling, and some retailing activities. They must, of course, locate on or near streets and arterials connecting with state and interstate highways.

Manufacturing Activities Tied to Metropolitan Area Market Considerations

This discussion emphasizes mainly, in addition to the factors discussed above, those conditions where transportation costs constitute a significant percentage of the value of the products manufactured and shipped. In addition, the nature of the business may require quick delivery service to customers. Thus, accessibility to customers located mainly in the central city of the metropolitan area will influence, in turn, the location of the manufacturing activity involved. If these customers are themselves oriented towards the more-congested areas of the city, transportation factors may cause the manufacturing establishment to secure, in turn, a location which exposes it, in part, to such congestion.

If customers are dispersed throughout the metropolitan area, however, then the manufacturing plant may seek the less-congested parts of the city or of the metropolitan area. Important in this connection is not only the importance of the transportation cost burden as such, but also the requirements of speed and frequency of delivery and the size of the average order to be delivered. Another important locational factor in this connection is the extent to which the manufacturing activities of the firm can be separated from the office and marketing activities so that the former can be decentralized in location and the others centralized.

"Footloose" Industries

There are many small-scale manufacturing industries which have great flexibility of location (apart from zoning requirements) because the value of products produced may be so high, or the physical space requirements may be so small, or the incidence of transportation costs may be so slight as to require no special locational considerations. Or the nature of the manu-

[54] See Edgar M. Hoover, *The Location of Economic Activity* (New York: McGraw-Hill Book Co., Inc., 1948).

facturing process may be mainly assembling, thus requiring the use of little or no machinery. All of these considerations permit such manufacturing establishments to be located in buildings adapted mainly to commercial, rather than strictly manufacturing, purposes. As a result, such manufacturing establishments are likely to be found in a wide assortment of locations in the metropolitan area.

LOCATION OF WHOLESALING ACTIVITIES

The incidence of local transportation on the location of wholesaling activities divides itself into four patterns, viz., those activities which are 1) tied to inbound and outbound transportation considerations, 2) influenced by the locations of their customers; 3) influenced by both sets of considerations; or 4) not required to handle in any physical sense the goods marketed. Included in this discussion are facilitating services, such as warehousing, in addition to the activities of the wholesale middlemen as such.

Wholesaling Activities Tied to Inbound and Outbound Transportation Facilities

Wholesaling activities within a city or a metropolitan area may be tied in location to inbound transportation facilities as a result of the specialization of such facilities. Thus, wholesaling activities may be tied to dockside locations in order to facilitate receipt of goods arriving via boats. Similarly, wholesaling facilities at a fruit and vegetable market may reflect specialization in the arrival of fruits and vegetables via specific transportation agencies. Or the transportation agencies may provide jointly for union freight-yard facilities (as at many stockyards and fruit and vegetable markets in larger cities). These, in turn, attract those middlemen who specialize either in selling directly from the railroad cars or in reshipping the products to other markets.

It should be noted, also, that the perishability of the product may link the wholesaling activity to the transportation facility. If the volumes of goods handled are significant and if reshipment by truck within the city would lead to costly results, then wholesaling activity may be transportation oriented.

Wholesaling Activities Tied to Customer Location

The necessity of servicing customers may lead either to a location in the central section of a city or in the outlying sections, depending upon the geographic distribution of such customers. Thus, if a wholesale market has half of its customers located in downtown San Francisco, its middlemen may, in order to minimize trucking time and costs, locate in or close to the downtown section. If, on the other hand, there are no such high geographic concentrations, the wholesaling activity may move to the outskirts of the city, adapting itself to the best combination of transportation and other factors.

Where there is a mixed distribution of customer locations, the wholesaling activity may have two locations. A wholesale bread bakery, for example, may have a central depot from which bread is delivered to dispersed warehouses and then, by trucks, to the various retail and other types of customers. Similarly, a wholesale middleman may operate from an office in a central location by locating separately the stocks of merchandise in public warehouse facilities located elsewhere.

Wholesaling Activities Tied to Both Transportation Facilities and Customer Locations

The mutual operation of both sets of factors may be best illustrated by considering the factors which influence the location of a wholesale fruit and vegetable market in a metropolitan area. A detailed list of considerations would include:

1. Accessibility to points of rail receipts in terms of
   a. the speed and capacity of transportation vehicles
   b. the physical features of facilities for unloading, loading, display and sale
   c. entry and exit facilities
2. Accessibility to cold storage warehouses
3. Accessibility of market to trucked-in supplies
   a. in terms of north-south and east-west arterials
   b. in terms of the effects on congestion in the market proper and in the city
4. Accessibility to supplies arriving by water (important for key seaboard cities receiving imports of bananas, pineapples, etc.)
5. Accessibility to other wholesale markets in the city, or in the metropolitan district
6. Accessibility to buyers
   a. ease with which buyer may reach the market in order to obtain his requirements
   b. variations in consumers' buying habits and preferences in different parts of the area served by the market
   c. the overwhelming percentage importance of the demand from buyers located in the central business district

d. variations in the geographic distribution of population and facilities handling fruits and vegetables.[55]

These considerations have, in turn, a significant effect on local truck transportation within the city and the metropolitan area. In San Francisco, Chicago, and other cities where the existing wholesale market facilities have no direct connection with railroad sidetrack facilities, there is an initial haul from the point of rail receipt to the wholesale market facilities. There are, in addition, several types of intermediate hauls: 1) from one wholesale market to another, as between San Francisco and Oakland; 2) between the wholesale market and the cold storage facilities; 3) from the main wholesale market to subsidiary wholesale markets (where they exist); 4) back haul movements for out-of-town shipments; and 5) between the wholesale markets and chain-store produce warehouses. The final hauls involve truck movements from the various wholesale agencies to the various types of buyers patronizing these wholesale middlemen.

Wholesaling Activities without Physical Possession of Goods

These types of wholesale middlemen who do not take physical possession of the goods handled tend generally to select central district locations, except where the nature of the product may tend to require locations adjacent to the wholesale markets handling these products. They require office space and the necessary communication linkages with sources of market information and supplies and with customers but no other elaborate physical facilities. On occasion, they may arrange for handling their principal's products through public warehouses, and this may require transportation connections. But locationwise, they concentrate either in downtown districts or in or around wholesale markets.

LOCATION OF RETAILING AND SERVICES TRADE ACTIVITIES

Retail and services trades are dependent upon flows of people by locations to provide the anticipated sales volumes. In attempting to capitalize on the pattern of such flows in a city, any business manager must recognize that the product or service to be sold may be brought to or close to the customers' places of residence, or that the consumer may be induced to travel varying distances to the place of business. Where the ultimate in convenience is desired by the customer, the store may have to be placed on wheels, so to speak, and brought to the customer, as in the case of milk and dairy products, bakery goods, teas and coffees, etc. In some instances, customers may order from samples or catalogs and delivery effected at a later date, as in the case of brushes, cosmetics, silverware, and the entire mail-order assortment.

But these arrangements can satisfy only a small volume of the total retail and services trade sales which may be expected. Accordingly, most retail and services trade is concentrated in stores at varying distances from the customers (except where phone or mail can be used). In every case, the pattern of transportation routes is significant in affecting the location of these activities. There are those stores which, by virtue of marketing convenience goods and services, are primarily neighborhood oriented. These categories of goods and services are widely and frequently used and must, accordingly, have widely distributed locations in order to cater to customer convenience.

Where the amount of financial resources is limited, with corresponding restrictions on expected sales volumes, the convenience goods stores will locate along those neighborhood streets having streetcar or bus facilities, or a well-traveled automobile route, where large accumulations of people may be expected. On the other hand, where the amount of financial resources is sufficient to support much-higher volumes of sales expectations, such stores may be expected to seek such locations where the convergence of two or more transportation routes bring larger volumes of customer traffic, as in shopping districts or shopping centers, than are found in the "string street" locations. Generally, a clustering of stores is to be expected because their combined attractive power usually will exceed the sum of the individual store's drawing power. Food stores of all types, drug stores, cleaning-and-dyeing establishments, laundries, and barber and beauty shops, are among the most-important kinds found in the so-called string-street locations.

A second group of stores deals in those types of goods and services catering mainly to the automobile and motor truck. This group tends to be located on the principal thoroughfares outside of the downtown area and at strategic automobile traffic concentrations. Those selling new and used cars, and accessories, tires, and batteries seek the higher-density traffic locations. Filling stations, garages, and repair facilities have more widely dispersed locations. The former pattern is illustrated by sections of Van Ness Avenue in San Fran-

[55] Edward A. Duddy and David A. Revzan, "The Location of the South Water Wholesale Fruit and Vegetable Market in Chicago," *The Journal of Business of the University of Chicago*, XII (October, 1939), 386–412; XIII (January, 1940), 39–55. See, also, W. T. Calhoun, H. E. Erdman, and G. Mehren, *Improving the San Francisco Wholesale Fruit and Vegetable Market*, U. S. Department of Agriculture, Bureau of Agricultural Economics, in cooperation with University of California, College of Agriculture, Agricultural Experiment Station, February, 1943.

cisco or Broadway in Oakland. And once again, clusterings of stores are typical for purposes of increasing the attractive power of such businesses.

A third group of stores deal in those goods and services which tend to attract customers from wide geographic areas. Some of these may be attractive principally because of variety of assortment and the appeal of attractive prices, as in the case of shopping goods and services, or they may be attractive because of exclusiveness, brand name, special services, etc., as in the case of specialty goods and services. Locationwise, stores selling these categories may concentrate at the intersection of two or more important outlying transportation routes, or because of sales-volume expectations, they may prefer the downtown sections of a city. In the outlying shopping districts and centers may be found apparel and accessory, cigar, smaller department, drug, fancy grocery, general merchandise, household appliance, jewelry, and variety and shoe stores in variout clusterings and numbers.

They may occupy stores and offices independent of each other, or they may occupy units in architecturally uniform shopping centers. Because of their attractive strength, various types of service establishments will cluster around these stores. The largest sales-size stores *in toto* are found in the downtown district where the department store usually dominates and is joined mainly by various types of wearing apparel and accessory stores, variety stores, jewelry stores, and various business and personal services establishments. These economic activities depend on the working population in the downtown district and on the transient population for high level sales.

In all of these examples, transportation makes possible these clusterings, but it also furnishes the dynamics whereby trade is diverted away from existing concentrations to new clusterings. And it furnishes, in part, the dynamics by means of which competition between existing clusterings may be accentuated.

TRANSPORTATION LINKAGES AND THE VARIOUS TYPES OF ECONOMIC ACTIVITIES

The preceding discussion has stressed some of the transportation factors in the location of groups of economic activities of comparable classes in cities and metropolitan areas. Equally important for this discussion are the transportation linkages between the various groups and classes of economic activities. Manufacturing activities must have transportation linkages with wholesale middlemen and wholesale middlemen with various retail middlemen and service trades. And there are linkages, as well, between the various transportation agencies themselves.

It is exactly at these linkages that the factors of congestion, costs, and the like have significant effects. For congestion, parking difficulties, and high transportation costs represent upsetting influences in the normal pattern of transportation linkages. As a result, the persons and business establishments involved may go so far as to change transportation habits, and the linkages, accordingly. The shift from dependence on rail transportation to greater use of the motor truck has increased the variety of linkages by increasing the variety of possible alternatives. Similarly, the shift from dependence on mass transportation to greater use of the automobile has increased the variety of linkages for the drivers. The provision of facilities for high-speed travel changes linkages by widening the area of travel within the same elapsed time.

And it should not be overlooked that the transportation patterns of people in the cities and other parts of the metropolitan area create linkages with the facilities dealing with the transportation of goods. The simplest aspects involve the delivery of many products purchased by the customers. But what is forgotten, of course, is how these purchases lead to related cycles of movements of goods at the wholesaling and manufacturing levels leading to related linkages. These become more and more complicated as the geographic distribution of population becomes more complex within the metropolitan area and as the variety and geographic distribution of goods and services also become more complex. It is in these ways that the analysis of the remaining sections must be related to these relationships between transportation and the location of economic activities in the metropolitan area.

The Parking Problem in San Francisco

This section is designed to focus attention on some of the quantitative aspects of the problem of handling the parking of motor vehicles in San Francisco with emphasis on the area in and around the downtown section. On the supply side of the problem, attention is directed to an analysis of changes in the quantity and kinds of curb and off-street parking facilities since 1927. In addition, proposed facilities under construction or

in the planning stage are also listed. On the demand side of the problem, the trends in the nature of the demand for parking facilities are analyzed in terms of changes in the total number of automobiles and motor trucks in the San Francisco-Oakland metropolitan area; changes in the number of vehicles parking within the central business and parking districts of San Francisco; the use made of various types of parking facilities in relation to their capacity; and some data of origins and destinations of traffic flows. To the extent permitted by the data, the two analyses are integrated in order to determine the adequacy of the parking facilities.

TRENDS IN SUPPLY OF CURB PARKING FACILITIES IN CENTRAL DISTRICTS OF SAN FRANCISCO

The data which follow are derived from traffic and parking studies made in 1927, 1937, 1947, and 1951, from information supplied by Vining Fisher, general manager, San Francisco Parking Authority, and Ross Shoaf, city traffic engineer, City of San Francisco; and from newspaper clippings.[56]

Problems of Comparability of Data

It has been indicated that the basic purpose underlying the analysis of the supply of parking facilities is to trace, so far as is possible, the changes in the amount and type of parking facilities available in the central district of San Francisco. To make the analysis of these changes over time as accurate as possible, the data used must relate to closely comparable geographic districts.

In the 1927, 1937, and 1948 studies, data were based on a central business or traffic district, but unfortunately, the boundaries differed from study to study. Figure 2 outlines these varying boundaries as follows: 1) *the 1927 Central Business District:* Mission, First Battery, Pine, Sansome, California, Kearny, Sutter, Powell, and Fifth; 2) *the 1937 Central Business District:* Mission, First, Battery, California, Grant, Sutter, Taylor, and Sixth; 3) *the 1937 Central Parking District:* Folsom, Seventh, Jones, Price, Stockton, Clay, Davis, Market, and Spear; 4) *the 1948 Metropolitan Traffic District:* Front, Jackson, Pacific, Taylor, California, Van Ness, Gough, Howard, Eleventh, Bryant, Brannan, Fourth, Welsh, New Montgomery, and Perry; and 5) *the 1948 traffic segments* used in identifying the origin and destination points for traffic movements. Those included in the four areas above are outlined in Figure 2.

Fortunately for purposes of this study, the 1937 study recorded the supply of curb and off-street parking facilities block by block and street by street. As a result, the necessary adjustments could be made to secure a high degree of comparability. To a less accurate extent, the existence of the origin-destination segments of the 1948 study made possible some adaptation of that study's data. The 1948 Metropolitan Traffic District as such had boundaries far beyond any of the districts used in the 1927 and 1937 studies. Because of the data by segments, the use of Segments 1 through 9 delimit a "central business district" closely comparable with the preceding studies. Since the downtown business activities had broadened their geographic base since 1937, the use of these nine segments gives an area somewhat larger than the 1937 Central Business District described above.[57]

The Supply of Curb Parking Space

The central business district as defined in the 1927 study included streets and alleys having a total curb space of 47,934 ft. Due, however, to legal restrictions on parking and to other prohibitions, there was a reduction in the space available for permissible public parking to 36,200 ft. If a space of 18 ft. is allowed as that needed to accommodate one vehicle, about 2,010 cars could park at any given time in 1927 in the permissible parking space. By 1937 that same district could accommodate only 1,400 cars at any one time; and by 1948 the number of spaces had been reduced, approximately, to only 298 cars!

Table 50 permits further comparisons to be made between 1937 and 1948 on the basis of the segments used in the 1948 study as shown in Figure 2. To facilitate comparisons, these segments have been so grouped into subdistricts as to divide downtown San Francisco into four categories on the basis of the predominant types of economic activities in each which attract parkers. The first subdistrict, Segment 1, contains the financial and banking sections of the downtown area. Subdistrict consisting of Segments 2, 3, and 4 has the important shopping, theater, restaurant, and hotel section north of Market Street centering around Union Square. The third and fourth subdistricts, containing Segments 5 through 9, include the Market Street shopping section and the area to the south.

[56] These four studies are as follows: Miller McClintock, *The Street Traffic Control Problem of San Francisco* (San Francisco: San Francisco Traffic Survey Committee, 1927). This will be referred to as the 1927 study; Miller McClintock, *San Francisco City-wide Traffic Survey*, W.P.A. Project prepared for William H. Worden, Director, Department of Public Works, San Francisco (San Francisco: Department of Public Works, 1937). This will be referred to as the 1937 study; DeLeuw, Cather & Company, *Transportation Plan for San Francisco*, Report to the City Planning Commission of San Francisco (San Francisco: DeLeuw, Cather & Company, 1948). This will be referred to as the 1948 study; Bureau of Engineering, Department of Public Works, City and County of San Francisco, *Report to the Parking Authority of San Francisco on Proposed Public Garage in the Central Market Street Area* (San Francisco: November, 1951). This will be referred to as the 1951 study.

[57] The boundaries of this 1948 district are: Natoma, Eighth, Market, Taylor, Post, Mason, Sutter, Montgomery, Sacramento, Spear, and three short blocks of Mission Street (see Fig. 2).

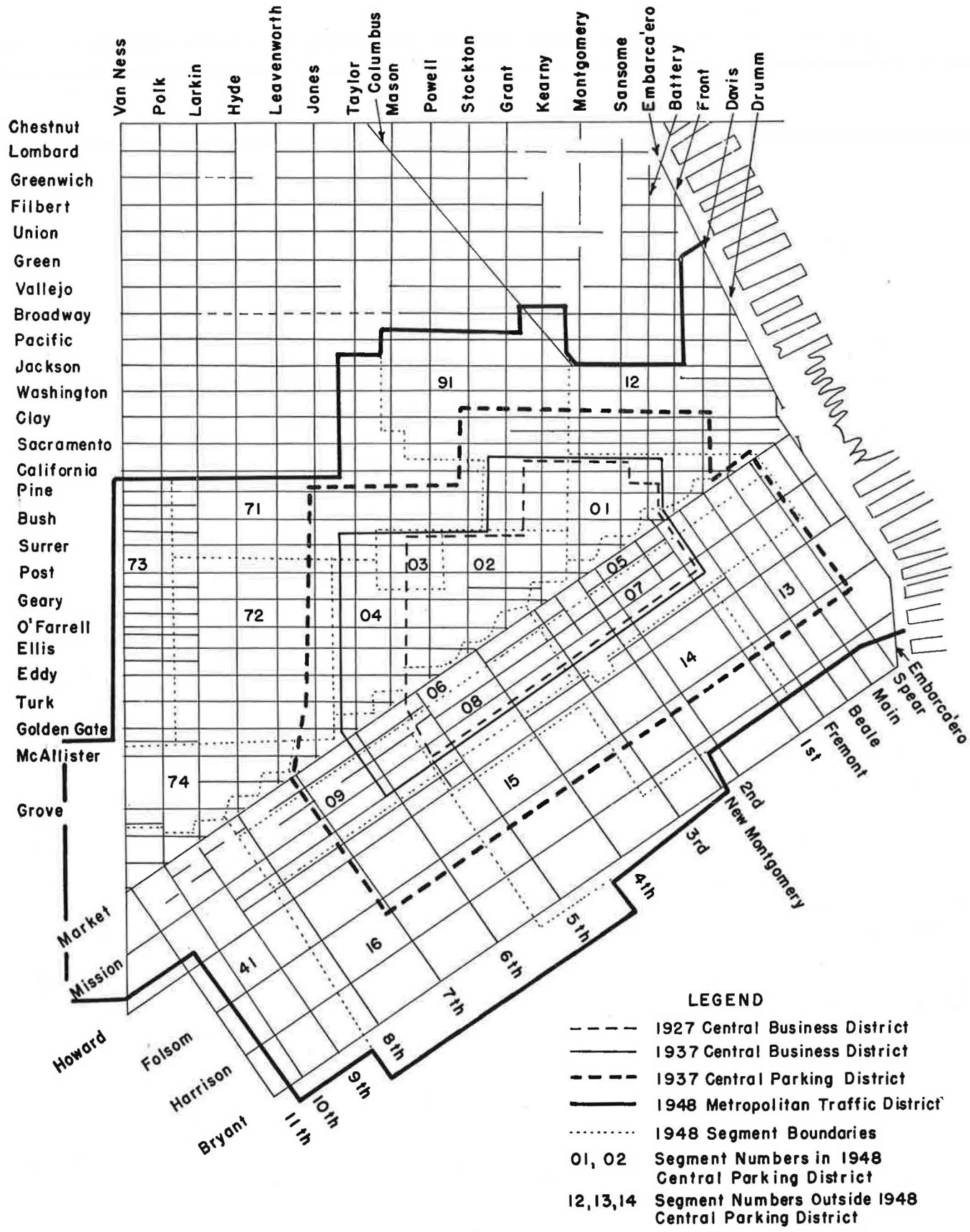

Figure 2. Business and parking districts in the central area of San Francisco.

TABLE 50

CHANGES IN THE NUMBER OF CURB PARKING SPACES IN DOWNTOWN SAN FRANCISCO, BY SUBDISTRICTS, 1937 AND 1948*

Subdistrict	Curb Parking Spaces				1948 as Percent of 1937 Spaces
	1937		1948		
	No.	Percent	No.	Percent	
Segment 1	383	12.7	273	20.2	71.3
Segments 2, 3, 4	936	31.1	327	24.2	34.9
Segments 5, 7	882	29.3	376	27.8	42.6
Segments 6, 8, 9	811†	26.9	377	27.8	46.5
Total	3,012	100.0	1,353	100.0	44.9

* *Source:* 1937 and 1948 Studies.

† This figure is underestimated because only half of the area of Segment 9 was included in the Central Parking District for 1937.

TABLE 51

PERCENTAGE DISTRIBUTION OF 1937 SAN FRANCISCO CENTRAL DISTRICT CURB SPACE ACCORDING TO AVAILABILITY FOR PUBLIC PARKING PURPOSES (BASED ON LINEAL FEET OF SPACE)

Category	Percent of Total Space
1. *No stopping at any time*	
Safety zone	3.38
Hydrants	4.33
Cross-walks	0.45
Fire department use	0.08
Driveways	3.42
Tunnels	0.07
Total	11.73
2. *No parking at any time*	
Public alleys	9.86
Certain streets	5.72
Taxi zones	0.36
Driveways	6.23
Passenger loading	2.74
Total	24.91
3. *No parking except on Sundays and holidays*	
Loading zones	10.68
Certain streets	2.07
Total	12.75
4. *Time limit parking*	
20-min. zones	2.92
40-min. zones	14.72
60-min. zones	21.43
Total	39.07
5. *Unlimited parking*	11.54
Grand Total	100.00

Source: 1937 Study.

For the downtown area as a whole as so defined, there were only 45 percent of the 1937 curb parking spaces available in 1948, or a net loss of space for 1,659 cars.

By subdistricts, however, the percentage declines were quite varied. The financial subdistrict had the smallest decline; the number of spaces in 1948 was 71 percent of the 1937 base. The largest decline took place in the Union Square subdistrict; the 1948 volume of curb parking spaces was only 35 percent of the 1937 base. Finally, the Market Street subdistricts had 42.6 and 46.5 percent of the 1937 base.

The preceding analysis makes no adjustment for the condition that many drivers with destinations in the central business district may find curb parking space on the outskirts of that district. Two different measurements are available: (1) the 1937 study of the total number of curb spaces available between 9:30 A.M. and 4:30 P.M. in the Central Parking District shows 6,600 spaces compared with 2,008 spaces within the Central Business District itself[58]; (2) the 1948 study, with its widespread Metropolitan Parking District, showed 13,253 curb spaces for public parking use in that district, as compared with 1,353 curb spaces for the inner central district. A subsequent section on parking demand will analyze the various purposes for which space in the outlying section was used.

Curb Parking Space, by Types of Zones

The long-term decline in the number of permissible curb parking spaces is due to the absorption of such footage for legal loading and unloading zones both for automobiles and motor trucks, for driveways, and for restrictions on parking designed to increase street traffic capacity. Table 51 shows the percentage distribution of the total amount of curb parking space in 1937 (in lineal feet) according to its availability for parking purposes. Slightly more than half of the total space was available for parking during weekdays even in that year, but of this amount, 39 per cent had time limits. On Sundays and holidays, the amount of available space for parking rose to slightly more than 64 percent. While no exactly comparable breakdown was available, the 1927 study revealed that about 25 per cent of the curb space within the Central Business District was restricted so far as parking use was concerned. Thus, increased restriction on parking between 1927 and 1937 reduced the amount of available curb parking space by one fourth of the overall total.

A breakdown of 1948 curb space, by type of zone, was available for the Metropolitan Parking District. Even with the inclusion of much of the peripheral parking, Table 52 shows how important restrictions on curb parking have been. It should be noticed that the 1948

[58] The number of spaces vary at different times of the day according to the nature of the time restrictions placed on loading zones and to restrictions placed on parking on certain streets during rush hours.

data do not include the space occupied by driveways; thus, there is a corresponding overstatement of the proportion of space indicated as available for parking. But even with these qualifications, it is apparent that only slightly more than half of the space was available for parking, and that better than two fifths of that proportion consisted of 60-min. zones, and slightly less than one third, of unlimited parking. Of the restrictions on parking, the most important was complete prohibition.

In order to be able to bring the 1937 data into some comparable basis with the 1948 data, allowances and adjustments were made for the larger geographic coverage of the Metropolitan Parking District used in the 1948 study. Since no unlimited parking was permitted in the central business districts, such zones were eliminated in making the necessary comparisons. And since no allowance was made in the 1948 study for space occupied by driveways, such space was excluded from the 1937 totals. Table 53 shows the comparisons after these adjustments, but with no corrections for the bias of the larger number of time-limit zones within the 1948 Metropolitan Parking District but outside the central business districts.

As might be expected, a higher proportion of adjusted total space was available for parking in 1937 as compared with 1948. This was due mainly to the large increase in the number of no-parking zones in 1948. The zones permitting longer parking were relatively more important in 1948 due to the factors noted above. In addition, space for trucks and taxis was significantly less in 1948 than in 1937.[59]

Significance of Changes in the Supply of Curb Parking Space

The decline in the amount of curb parking spaces, and in the proportion available for legal parking, has more than proportionate significance for the overall parking situation in San Francisco. Vehicles using curb space usually do not park for as long periods of time compared with those using off-street facilities. As a result, when a significant number of curb parking spaces are withdrawn from public use, several times that amount of automobiles must find alternative parking spaces either in off-street facilities in the downtown area, or in parking facilities (curb or off-street) outside the downtown area.

[59] Some idea of parking spaces available in the more congested sections of San Francisco as a whole may be obtained from the following data of parking meters: 1) as of October, 1952, there were 10,916 meters in use, and 511 to be added, for a total of 11,427; 2) as of June, 1953, there were 11,525 meters in use, and 342 on order, for a total of 11,867. (Based on data reported in the *San Francisco Chronicle*, October 27 and 28, 1952, and June 18, 1953.)

TABLE 52

PERCENTAGE DISTRIBUTION OF 1948 CURB PARKING SPACES IN SAN FRANCISCO'S METROPOLITAN PARKING DISTRICT, BY TYPE OF USE

Type of Use	Percent of Total
For parking	
10–20-min. zones	1.03
40-min. zones	11.61
60-min. zones	22.15
120-min. zones	0.65
Unlimited parking	16.12
Total	51.56
Restrictions on parking	
Truck and taxi space	8.08
Passenger loading	2.26
No parking	38.10
Total	48.44
Grand total	100.00

Source: 1948 Study.

TABLE 53

ADJUSTED PERCENTAGE DISTRIBUTION OF 1937 AND 1948 PARKING SPACE IN CENTRAL SAN FRANCISCO, BY TYPES OF ZONES

Type of Zone	1937 (Curb footage)	1948 (Curb spaces)
For parking		
10–20-min. zones	3.71	1.23
40 min. zones	18.70	13.85
60-min. zones	27.29	26.40
120-min. and misc. zones	—	0.77
Total	49.70	42.25
Restrictions on parking		
Truck and taxi space	14.07	9.63
Passenger loading	3.48	2.70
No parking	32.75	45.42
Total	50.30	57.75
Grand total	100.00	100.00

Source: Computations and adjustments based on Tables 51 and 52.

TRENDS IN THE SUPPLY OF OFF-STREET PARKING FACILITIES

Changes in Capacity

Keeping in mind the problems of comparability already referred to, the 1927 study showed that garages located in the central business district had a capacity, at any given moment, of 4,202 cars. No mention is made in that study of the capacity of parking lots, but the inference may be drawn that this type of facility was relatively unimportant in that year. For approximately the same district, the 1937 study indicated a maximum capacity in off-street facilities of only 3,400

TABLE 54

OFF-STREET PARKING CAPACITY IN THE CENTRAL BUSINESS DISTRICT, BY SUBDISTRICTS, 1937, 1948, AND 1951

Subdistrict	Number of Spaces			Percent of Total		
	1937	1948	1951	1937	1948	1951
Segment 1	1,184	1,130	1,252	13.3	10.4	11.3
Segments 2, 3, 4	4,279	4,585	4,107	48.3	42.1	37.2
Segments 5, 7*	1,142	1,427	1,631	12.9	—	—
Segments 5, 7†	1,142	2,927	3,131		26.9	28.3
Segments 6, 8, 9	2,258‡	2,246	2,557‡	25.5	20.6	22.2
Total*	8,863	9,388	9,547	100.0	—	—
Total	8,863	10,888	11,047	100.0	100.0	100.0

* Segments and totals exclude the 1,500-car Barrett Garage at the Key System Terminal.

† Segments and totals include the 1,500-car Barrett Garage at the Key System Terminal.

‡ The 1937 and 1951 inventories do not include all Segments 6 and 9. Accordingly, the capacity may be understated by several hundred spaces.

TABLE 55

AVERAGE OF PARKING CHARGES IN SAN FRANCISCO OFF-STREET FACILITIES, CENTRAL BUSINESS DISTRICT, JANUARY, 19

Time Period	33 Public Garages	55 Public Parking Lots
hr.		
1	$0.47	$0.34
2	.50	.38
3	.60	.44
4	.67	.48
5	.68	.52
6	.68	.54
9	.69	.57
12	.70	.60
24	.75	.61

Source: The 1948 Study.

cars at any one time, or a decline to a level about 81 percent of the 1927 capacity. By 1951, the total available space, based on compilation from the parking inventory for the Central Market Street area, had risen sharply to a capacity of 4,938 cars. This sharp reversal of trend is due principally to the capacity provided by the construction of the Union Square Garage in 1942.

If the segments used in Table 50, which represent the central business district or the inner core of the larger Metropolitan Parking District, are related to the 1937, 1948, and 1951 studies, the comparisons shown in Table 54 result. Since the Barrett Garage at the Key System Terminal straddles the boundary lines, the table gives totals with and excluding the 1,500-car space. This garage is used to a considerable extent by drivers with destinations in the downtown area.

The striking fact revealed by this table is the great stability of the off-street parking capacity even after the construction of the Union Square Garage. Even when the Barrett Garage is included, there was an increase of slightly more than 2,000 spaces between 1937 and 1948, and an addition of only 159 spaces between 1948 and 1951. The subdistrict containing the Union Square Garage, Segments 2, 3, and 4, has the largest proportion of the parking space, although there has been an actual decline since 1948. The sharp increase has taken place in the Market Street area (Segments 5 and 7) as a result of the inclusion of the Bridge Terminal Garage. A slight increase has taken place, also, in the south-of-Market subdistrict. No additional analyses need be made to establish that the sharp decline in curb space noted above has not been offset by such increases in off-street capacity as are shown in Table 54. This is true particularly if allowance is made for differences in turnover of space which tends to increase the total capacity of curb parking.

As was done with the analysis of curb capacity, the supply of off-street parking facilities in the central business district, may be compared with the aggregate data for the entire parking area in and around such district. The 1937 study gave the following breakdowns: (1) for the central parking district, 11,455 spaces in garages, and 3,507 spaces in lots, for a total of 14,962 spaces; and (2) for the central business district, 7,593 off-street spaces. In 1948, the study for that year gave the following breakdown of 22,245 spaces in the Metropolitan Parking District: public garages, 12,409 spaces; public lots, 8,012 spaces; private garages, 1,088 spaces; and private lots, 736 spaces. A comparison of the two reveals that the increase in space between 1937 and 1948 has resulted mainly from the use of more public parking lots since the 1948 garage space exceeded the 1937 capacity by only some 2,000 spaces.

Charges for Off-Street Parking

A detailed breakdown of the scale of charges for the use of off-street parking facilities is available from the 1948 study, and is shown in Table 55. These charges apply to facilities located in the central business district, consisting of the segments shown in Tables 50 and 54. It is recognized, of course, that there has been an increase in the schedule of rates since that year. In 1951, for example, most facilities had rates ranging from 60 to 75 cents for 9 hours. The main purpose of the table, however, is to show how the schedule of rates discriminates in favor of the long-time parker and penalizes the short-time shopper with high rates. While it is recognized that these pricing practices lead to high utilization of space throughout the day, and to the reduction of certain operating expenses, especially labor, two offsetting considerations must be noted. First, it must not be overlooked that, by reducing turnover in this manner, the capacity available for shopping cus-

tomer and business clientele is, accordingly, severely reduced.[60] Second, the savings in operating expenses may be overstated, especially if there is self-parking.

Plans for Future Off-Street Facilities

The provision of additional parking lot and garage facilities in and around downtown San Francisco is a matter of much argument, political debate, and day-to-day change. And this makes no allowance for additional needs to be created by the expansion of bridges across the bay. What can be presented are those facilities which are under construction or which have been approved and those facilities which have been projected but about which varying degrees of uncertainty exist.

Those facilities which presently are being built, or for which plans have been approved are the following: 1) *St. Mary's Garage*, located a half block from the important shopping districts in Segment 2, and from the financial district, now under construction and will have a capacity of 1,025 cars when completed; 2) *Commerce High School athletic field*, the use of this field has been approved for 400 cars for private and city parkers; 3) *Bartlett and 22nd Street*, parking lot; and 4) garage fronting on Ellis and O'Farrell within the block bounded by Powell and Stockton will have a capacity of 900 cars—this facility would serve the district composed of Segments 2, 3, and 4.

Several facilities presently are in various stages of planning, talking, or approval by various government and business groups. These consist of the following: 1) O'Farrell-Mason-Ellis-Taylor Garage with a capacity of 1,200 to 1,250 cars[61]; 2) A garage south of Market Street between Fifth and Sixth streets, with a capacity of 1,500 cars; 3) a garage at Stevenson, Jessie, Sixth, and the old U. S. Mint, with a capacity of 1,500 cars[62]; 4) a series of projected garages with capacities totaling 28,200 cars at (a) Washington, Clay, Montgomery, and Sansome; (b) Stockton, Grant, Bush, and Sutter; (c) the west half of the Third, New Montgomery, Mission, Howard block; and (d) Mission, Howard, Fourth, Fifth[63]; 5) a plan proposed by the San Francisco Police Department for a garage between Minna and Natoma from Third to Seventh streets, with a capacity of 4,000 cars[64]; 6) a garage on Broadway between Montgomery and Kearny Streets for 200 cars; 7) a garage on Eddy Street between Mason and Powell for 1,000 cars; 8) a garage at Sutter and Kearny for 500 cars; and 9) the famous "Lurie Plan" for one garage for 3,750 cars at Mission, Fourth, Fifth, Howard (see Item 4 above); and a garage for 1,179 cars at Stockton, Sutter, Bush, Grant.[62]

And yet with all of these facilities underway or projected for every segment of the central business district, or for peripheral parking, will there be adequate facilities? The following negative view of Vining Fisher is of interest: "The need for parking stalls in the downtown area is about the same as it was in 1948—we need about 10,000 to 11,000 more spaces than we have. And even with our present plans, we can meet only about one third of the demand in the next few years."[63] Apparently, based upon past experience, he believes a high proportion of the projects listed above will perish while yet in the planning stage.

TRENDS IN THE NATURE OF THE DEMAND FOR PARKING FACILITIES

Changes in Total Number of Automobiles in the Bay Area

This section will serve to analyze the overall picture in the area. Data available since 1914 show the tremendous increase in the number of registered automobiles by counties (see Table A-9 in the appendix). For the metropolitan area as a whole, the total rose from 24,252 registered automobiles in 1914 to over four times as many (101,758) in 1920. Between 1920 and 1930 there was an increase of 3½ times. The depression years reversed the trend to 1933; but by 1940 the volume was 33⅓ percent above the 1930 level. After 1940, despite wartime restrictions, the rise was sharply upwards, reaching a peak of 807,277 cars in 1951.

Very different trends are apparent, however, for each of the six counties. San Francisco County led up to 1934. In absolute terms, the number of registered automobiles in the county rose from 12,081 in 1914 to 244,551 in 1951. Relative to the bay area total, however, there has been a steady decline from 52.6 percent of the 1915 total to a low of 29 percent in mid-1952. Alameda County first surpassed San Francisco County in 1934 and has since maintained that position. In absolute numbers there has been an increase from 8,449 cars in 1914 to 279,922 in 1951. Relatively, however, the county reached a peak of 40 percent of the total in 1926, but has declined since to a low point of 34.6 percent for 1952.

Registrations in Contra Costa County rank third in importance rising steadily from 930 cars in 1914 to

[60] Vining T. Fisher, general manager of the San Francisco Parking Authority, has proposed recently that the rate structures of off-street parking facilities be revised to penalize all-day parkers (see *San Francisco Chronicle*, July 3, 1953). Similarly, Louis Lurie, in his plan for large parking garages, would penalize long-time parking.

[61] See *San Francisco Chronicle*, October 23 and November 13, 1952.

[62] See *San Francisco Chronicle*, December 11, 1952.

[63] See *San Francisco Chronicle*, November 13, 1952.

[64] See *San Francisco Chronicle*, March 8, 1953.

[62] See *San Francisco Chronicle*, April 21 and 23, 1953. In his plan, Lurie makes provision for the discouragement of long-time parking by use of the following schedule of rates: 5 cents for the first hour; 10 cents for each of the next four hours; and $1 per hour thereafter.

[63] As quoted in the *San Francisco Chronicle*, July 3, 1953.

TABLE 56
NUMBER OF PERSONS PER REGISTERED AUTOMOBILE IN THE SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES, 1920, 1930, 1940, 1950

Year	Alameda	Contra Costa	Marin	San Francisco	San Mateo	Solano
1920	9.5	9.3	10.4	10.6	8.9	8.0
1930	3.4	3.2	3.8	4.3	3.2	3.1
1940	2.8	2.7	3.2	3.6	2.7	2.7
1950	2.8	3.0	2.8	3.3	2.6	2.9

110,464 in 1951 and from 3.8 percent of the 1914 total to 14.2 percent of the 1952 total. Next in importance is San Mateo County with an absolute increase from 1,258 cars in 1914 to 100,617 in 1952 and from 4.1 percent of the 1919 total to 13 percent of the 1952 total.

Solano and Marin Counties, with far fewer people, rank well below the rest of the bay area so far as registered automobiles are concerned. Solano County has had a steady increase from 848 cars in 1914 to 39,751 in 1951, and from a low of 3 percent of the 1915 total to a high of 5.7 percent of the 1943 and 1944 totals. Marin County has had a somewhat smaller amount, increasing from 686 registered cars in 1914 to 32,688 in 1951 and from 2.5 to 4.2 percent of the total.

Changes in Per Capita Registrations

But these absolute and relative changes in automobile registrations make no allowance for the rapid changes which have taken place in the population base. When automobile registrations are related to population (see Table 56), the increased per-capita utilization over time is emphasized.

The decade from 1920 to 1930 saw the great reduction in the number of persons per automobile; smaller changes in per-capita relationships have taken place since 1930. In 1920, the number of persons per registered automobile ranged from a low of 8.0 in Solano County to a high of 10.6 in San Francisco County. By 1950, the ratios had been sharply reduced, with a low of 2.6 persons per registered automobile in San Mateo County to a high of 3.3 persons in San Francisco County. A further comparison of these data between 1940 and 1950 reveals a decline in the ratio in Marin, San Francisco, and San Mateo counties, no change for Alameda County, and an increase for Contra Costa and Solano counties.

These comparisons, it should be remembered, do not correct for the number of automobiles used for business purposes, now estimated nationally at 30 percent of the total. Neither do they adjust for increases in the average mileage driven annually now as compared with 1914. A later analysis will indicate the repercussions of the larger number of persons per registered automobile in San Francisco upon the utilization of mass-transportation facilities.

Changes in Total Number of Registered Trucks

The reclassification of light trucks as "automobiles" in 1929 makes it impossible to analyze a complete pattern of change from 1920 when data were first available. Rather, the analysis must be made principally after 1929 (see Table A-10). From 1920 to 1928, the total number of registered trucks in the bay area increased from 8,176 to 42,170, about fivefold. Beginning with the new classification base in 1929, there was an absolute increase from 18,118 in that year to 85,499 in mid-1952.

Unlike the pattern for automobile registrations, San Francisco County, while declining steadily in relative terms, has continued to maintain itself in first position. Since 1929, the number of trucks, except for the depression years, rose steadily from 10,073 in 1929 to a peak of 33,006 in 1951. Relatively, however, the county's position has slipped from 55.6 percent of the 1929 total to 36 percent of the mid-1952 total. The number of registered trucks in Alameda County has increased at about the same rate as for the metropolitan area as a whole. In absolute terms, the increase was from 5,093 in 1929 to 28,369 in 1951. But in relative terms, except for 1929, that county accounted for 30.4 to 32.8 percent of the total, with no definite tendency towards growth or decline apparent.

Contra Costa County now ranks third in importance with 12.2 percent of the mid-1952 total. The absolute increase has been from 946 in 1929 to 10,439 in mid-1952. There has been a steady increase in the proportion of the bay area's registered trucks accounted for, from 5.2 percent in 1929 to the 12.2 percentage noted above. In San Mateo County, the absolute increase has been eightfold from 1,069 in 1929 to 8,499 in mid-1952, while the relative position has grown from 5.9 percent of the 1929 total to 9.9 in mid-1952. Solano County has doubled in relative importance from 2.7 to 5.3 percent of the bay area total, but the trend since 1945 has been mixed. The absolute number has increased over nine times from 485 in 1929 to 4,530 in mid-1952. Marin County, last in rank, has increased from 2.5 percent of the 1929 total to 4.2 per cent of the mid-1952 total and from 452 to 3,627 in absolute numbers. None of these changes correct for (1) increases in the number of miles traveled per truck per year or (2) increases in the average physical capacity per truck.

Aggregate Demand for Parking Facilities in the Central Business District

The 1927, 1937, and 1948 studies all contain cordon traffic data which measure the aggregate numbers of persons and vehicles entering and leaving the cordon area at various hours of the day. In all three studies, cordon counts were made for a so-called central district of San Francisco as outlined in Figure 2. But because of certain limitations discussed below, such comparisons as can be made are subject to important qualifications.

The measures of aggregate numbers of persons and vehicles within the cordon area at any hour of the day are presented in the form of accumulation statistics. The accumulation of persons or vehicles at any given hour of the day is computed by subtracting the number who have departed from the cordon area, from the number who have entered the area. From this computation, it can be seen that the accumulation is net only in the sense that no count is made of persons or vehicles already in the cordon area when the count is started. This characteristic of accumulation data leads to certain complications in the making of comparisons.

It has been noted above that the cordon areas used in the 1927 and 1937 studies, were the respective central business districts. Within this area, the 1927 study made its cordon count for a "typical weekday" in November 1926. The 1937 study made its cordon count for a typical weekday in April of that year. But the 1948 study used the Metropolitan Traffic District as the cordon area, and the cordon count was made for a typical day in October 1947. Thus the 1947 count was based on a considerably larger cordon area than either the 1927 or 1937 counts which had roughly comparable areas. Additional analytical difficulties stem from variations in the number of hours covered in each cordon count. They are as follows: the 1927 study, 6 A.M. to 8 P.M.; the 1937 study, 7 A.M. to 11 P.M.; and the 1947 count, 7 A.M. to 7 P.M. Because it was not possible to align the 1926 time periods with those used in 1937 and 1947, the total accumulation in 1926 was overstated.

Because of the variations noted above, conclusions are difficult to make on any comparable basis regarding trends in the aggregate numbers of persons and vehicles visiting the central districts. Table 57 indicates that the increase in number of vehicles is not so pronounced as might be expected, especially since much parking in 1926 and 1937 took place outside the central business district. Not all of the increase should be attributed to downtown in view of the parking demands generated by the Civic Center and Nob Hill areas.

TABLE 57

ACCUMULATIONS OF PERSONS AND VEHICLES WITHIN CORDON AREAS FOR A TYPICAL WEEKDAY, 1926, 1937 AND 1947

Time Period Ending	1926 Count		1937 Count		1947 Count	
	Persons*	Vehicles†	Persons*	Vehicles†	Persons*	Vehicles†
7:30 A.M.			4,000	900	21,000	4,900
8:00 A.M.	18,000	1,000	15,000	2,100	64,000	13,000
9:00 A.M.	58,000	3,100	53,000	5,500	130,000	24,800
10:00 A.M.	66,000	3,500	71,000	6,800	149,000	28,200
11:00 A.M.	74,000	3,800	80,700	7,800	163,000	30,000
12:00 noon	80,000	3,500	89,600	8,200	171,000	30,900
1:00 P.M.	84,000	3,500	94,000	8,500	173,000	30,100
2:00 P.M.	87,000	4,100	97,000	9,000	176,000	30,800
3:00 P.M.	87,000	3,900	97,000	9,500	172,000	30,600
4:00 P.M.	85,000	3,800	94,000	9,700	166,000	30,400
5,00 P.M.	80,000	4,200	81,000	9,700	130,000	25,600
6:00 P.M.	29,000	2,500	39,000	7,300	50,000	11,100
7:00 P.M.			26,000	6,100	31,000	7,800

Source: 1927, 1937 and 1948 Studies.
* Data rounded to nearest thousand.
† Data rounded to nearest hundred.

TABLE 58

ACCUMULATION OF PERSONS, BY MODE OF TRANSPORTATION; 1947 CORDON COUNT

Time Period Ending	Private Auto and Taxi	Local Transit
7:30 A.M.	7,100	12,000
8:00 A.M.	18,600	34,600
9:00 A.M.	35,900	67,100
10:00 A.M.	41,500	77,000
11:00 A.M.	44,300	85,500
12:00 noon	45,900	90,400
1:00 P.M.	45,200	93,000
2:00 P.M.	46,300	94,700
3:00 P.M.	46,000	91,600
4:00 P.M.	45,200	87,200
5:00 P.M.	38,100	66,900
6:00 P.M.	17,200	23,700
7:00 P.M.	12,300	10,200

Source: The 1948 Study.

The peak accumulation hours in San Francisco are in the early afternoon. Since the peak accumulations in 1927 and 1937 are higher relatively than in 1947, it may be argued that this reflects a tendency for shoppers to shop for longer periods of time in recent years once they reach the central district. San Francisco's attraction as a center of restaurants and entertainment facilities is evident in the substantial net accumulation after 6 P.M.

Table 58 indicates another characteristic of these data in comparing the accumulation of persons traveling by automobile with those using local transit. The continued level of accumulation of the former between 10 A.M. and 4 P.M. as compared with the steady increase of accumulation via local transit between 9 A.M. and 2 P.M., suggests many things. The implication of a tendency towards longer shopping periods was noted

TABLE 59

TOTAL NUMBER OF PERSONS, AND PEDESTRIANS, ENTERING AND LEAVING THE CORDON AREA, 1937 AND 1947

	1937 Cordon Area	1947 Cordon Area
Total number of persons	1,058,849	1,144,051
Entering area	534,843	587,332
Leaving area	524,006	556,619
Number of pedestrians	350,091	96,944
Entering area	186,168	51,246
Leaving area	163,923	45,698

TABLE 60

PERCENTAGE DISTRIBUTION OF PERSONS AND VEHICLES IN 1926 SAN FRANCISCO CORDON COUNT AREA BY MODE OF TRAVEL

Mode of Travel	Percentage Distribution of No. of Persons		Percentage Distribution of No. of Vehicles
	Including Pedestrians	Excluding Pedestrians	
Passenger automobiles	16.5	23.8	60.7
Trucks	4.6	6.6	20.2
Horse-drawn vehicles	0.2	0.2	0.9
Taxis and buses	2.9	4.2	7.6
Street cars	45.2	65.2	10.6
Walking (pedestrians)	30.6	—	—
Total	100.0	100.0	100.0

Source: The 1927 Study.

TABLE 61

PERCENTAGE DISTRIBUTION OF PASSENGERS ARRIVING IN SAN FRANCISCO CORDON AREAS, BY MASS AND INDIVIDUAL TRANSPORTATION FACILITIES, BY SELECTED TIME PERIODS 1937 AND 1947

Time Periods	1937 Study			1947 Study		
	Mass	Individ.	Total	Mass	Individ.	Total
7:30–8:30 A.M.						
Entering	73.0	27.0	100.0	64.2	35.8	100.0
Leaving	69.2	30.8	100.0	42.3	57.7	100.0
10:30–11:30 A.M.						
Entering	56.2	43.8	100.0	47.4	52.6	100.0
Leaving	48.6	51.4	100.0	30.6	69.4	100.0
2:30–3:30 P.M.						
Entering	51.7	48.3	100.0	42.1	57.9	100.0
Leaving	58.4	41.6	100.0	48.5	51.5	100.0
4:30–5:30 P.M.						
Entering	58.8	41.2	100.0	39.5	60.5	100.0
Leaving	70.2	29.8	100.0	58.8	41.2	100.0
Total: 7:00 a.m. to 7:00 p.m.						
Entering	58.8	41.2	100.0	49.7	50.3	100.0
Leaving	60.9	39.1	100.0	49.5	50.5	100.0

above. In addition, there would appear to be an early saturation of on-street and off-street parking facilities. From these indications, and the peaking up of accumulations of persons traveling by local transit, it may be concluded that the provision of additional parking facilities will continue to divert persons from the use of local transit facilities.

Another interesting aspect is to measure from Table 57 the differences between the maximum accumulations for each typical day in 1926, 1937, and 1947 and the 9 A.M. accumulation. When these are computed, it is found that the differences have increased from 29,000 persons in 1926 to 44,000 in 1937 and 46,000 in 1947. This would seem to indicate no significant increase in the number of shoppers since 1937—a conclusion not borne out by other changes which have been known to take place and from other data.

Finally, a comparison of the total number of persons entering and leaving the cordon areas, during the hours covered by the counts, reveals some problems (see Table 59). The 1947 count exceeds the 1937 count by only 85,202 persons, despite the much-larger area covered by the 1947 cordon. The only logical explanation would seem to be based on the much higher numbers of pedestrians in 1937, with the great likelihood of duplication counting.[64] If these duplications are taken into account, then the 1947 increase would be considerably greater.

Modes of Travel Used in Entering and Leaving the Cordon-Count Area

All three studies, in their use of cordon counts, recorded the mode of transportation used by persons entering and leaving the cordon area. Table 60 shows the resulting breakdown from 1926 by mode of travel for the cordon count period as a whole, when pedestrians are both included and excluded. It shows, as well, the proportionate importance of the number of vehicles involved. When pedestrians are included, they, together with street-car passengers, accounted for better than three fourths of the persons involved in the cordon count, while accounting for only 10.6 percent of the total number of vehicles. Some portion of the pedestrians undoubtedly were people who parked automobiles outside the cordon count area and walked to their destinations in the area. The other significant feature of these data is the low percentage of persons accounted for by passenger automobiles and trucks, relative to the percentage of vehicles.

The cordon counts for 1937 and 1947 provide a breakdown of number of persons by modes of travel at ½-hr. intervals. Table 61 shows the percentage divisions between mass and individual transportation modes for selected time periods during the typical

[64] There are possibilities, also, of variations in the quality of interviewing done for each study and of differences in the degree of accuracy of the data.

TABLE 62

TRAVEL HABITS OF 32,000 PERSONS INTERVIEWED IN SAN FRANCISCO CORDON AREA, 1927 STUDY

Destination	Walked	Used street-cars	Used automobiles		Total
			Curb parking	Garage parking	
	%	%	%	%	%
Department stores	19.3	63.2	10.6	6.9	100.0
Office buildings	28.5	49.6	14.3	7.6	100.0
Banks	24.3	59.7	9.9	6.1	100.0
Restaurants	36.7	46.5	9.8	7.0	100.0
Total	21.8	60.2	11.1	6.9	100.0

TABLE 63

MEANS OF TRANSPORTATION USED BY WORKERS AND OTHER PERSONS IN 1951, TO REACH DESTINATIONS IN SAN FRANCISCO'S CENTRAL DISTRICT

Destination segment	Workers			Shoppers and Others		
	Autos	Transit	Total	Autos	Transit	Total
No.	%	%	%	%	%	%
1	30.6	69.4	100.0	71.3	28.7	100.0
2	24.7	75.3	100.0	44.1	55.9	100.0
3	44.2	55.8	100.0	47.8	52.2	100.0
4	51.1	48.9	100.0	55.9	44.1	100.0
5	26.5	73.5	100.0	43.6	56.4	100.0
6	27.3	72.7	100.0	30.2	69.8	100.0
7	29.3	70.7	100.0	44.6	55.4	100.0
8	45.9	54.1	100.0	49.2	50.8	100.0
9	28.5	61.5	100.0	47.0	53.0	100.0
Average	30.1	69.9	100.0	41.6	58.4	100.0
Metr. Traf. Dist.	39.6	60.4	100.0	44.7	55.3	100.0

day.[65] The general significance of these data is in revealing (1) the domination of the mass transit facilities in bringing people into the cordon area during the morning rush hours, and in taking them out of the area during the afternoon and evening rush period, and (2) the declining use of mass-transit facilities and the increased use of individual facilities in 1947 for all time periods as compared with 1937. Another interesting aspect is the greater rate of increase in the use of individual facilities during the rush-hour periods. This means, in turn, increased driving to and from work and corresponding increases in the demand for all-day parking facilities.[66]

Further data are available to show the modes of travel used by workers and other persons entering and leaving the cordon area. The 1927 study secured data from 32,000 questionnaires returned by customers of downtown establishments (see Table 62). The over-all importance of the streetcar is as expected. But the small percentage importance of the automobile relative to those who walked is in sharp contrast to today's travel habits.

The 1951 Metropolitan Traffic Survey collected data showing the modes of transportation used by all persons having destinations in Segments 1 through 9 (see Fig. 2). These data were collected by means of home and roadside interviews. The percentage breakdown between users of the automobile and mass transit facilities, by segment, is shown in Table 63 for workers, shoppers, etc. It is fairly obvious from this table that while workers, taking all nine segments as a group, were heavy users of mass transit (70 percent), those with destinations in Segments 3, 4, and 8 were heavy users of the automobile. Of those persons classified as shoppers, or who were in the central business district for reasons other than work there was an even wider range in the use of these facilities, segment by segment. The use of mass-transit facilities ranged from only 29 percent of this group with destinations in Segment 1, to a high of 70 percent in Segment 6. The overall average of 58 percent, however, was exceeded only in the latter segment. On the other hand, those persons in the category using the automobile average 42 percent, with a range from 30 percent in Segment 6 to 71 percent in Segment 1, and with those driving to destinations in eight segments ranking above average. Table 63 also shows the increased relative importance of the automobile when the Metropolitan Traffic District is considered rather than Segments 1 through 9.

Utilization of Selected Parking Facilities

One aspect of the problem of trying to measure the adequacy of parking facilities in San Francisco is to analyze the utilization characteristics of various types of facilities. Most of the data presented in the San Francisco studies pertain to the utilization made of curb-parking facilities. Such data as were collected for off-street facilities have been supplemented by data compiled by the author pertaining to the utilization of the Union Square Garage.

The 1927 study developed one measure of utilization which, unfortunately, was not repeated in later studies, namely, the percentage of curb parking space used during various hours of the day in the central district. Table 64 shows that the high utilization rate of 92 to 97 per cent between 9:40 A.M. and 5 P.M. indicated a serious parking problem in downtown San Francisco over 25 years ago.

Further evidence of the long-run nature of the parking problem can be obtained by studying the changes in

[65] Mass transit includes local transit rail service, out-of-town buses, and ferry facilities. Individual transportation facilities include only automobile and taxicabs. Persons riding in trucks or walking are excluded.

[66] A later section will deal further with these shifts in discussing the changing situation for mass-transit facilities as such.

TABLE 64

PERCENTAGE UTILIZATION OF 1927 CURB PARKING SPACE IN SAN FRANCISCO'S CENTRAL DISTRICT

Period Ending	Percent	Period Ending	Percent
8:20 A.M.	33	10:00 A.M.	95
8:40 A.M.	50	—	—
9:00 A.M.	67	5:00 P.M.	97
9:20 A.M.	87	5:20 P.M.	88
9:40 A.M.	92	5:40 P.M.	77

Source: The 1927 Study.

TABLE 65

PERCENTAGE DISTRIBUTION OF CURB PARKING, BY TIME PERIODS; SAN FRANCISCO, 1927 AND 1937

Time	Central Business District, 1927		Central Parking District, 1937	
	Percent	Cumulative Percent	Percent	Cumulative Percent
0–20 min.	38.3	38.3	38.3	38.3
20–40 min.	22.8	61.1	19.0	57.3
40–60 min.	12.8	73.9	11.7	69.0
1–2 hr.	16.7	90.6	15.2	84.2
2–3 hr.	4.9	95.5	5.7	89.9
Over 3 hr.	4.5	100.0	10.1	100.0
Total	100.0	—	100.0	—

Source: The 1927 and 1937 Studies.

TABLE 66

PERCENTAGE DISTRIBUTION OF CURB PARKING TIME, BY TIME ZONES, IN SAN FRANCISCO, 1937 AND 1948

Time zone and time periods	1937 Study		1948 Study	
	Percent	Cumulative Percent	Percent	Cumulative Percent
In 20-min. zones				
0–20 min.	40.8	40.8	34.0	34.0
20–40 min.	20.5	61.3	24.0	58.0
40–60 min.	12.9	74.2	17.0	75.0
Over 60 min.	25.7	100.0	25.0	100.0
In 40-min. zones				
0–40 min.	60.4	60.4	46.0	46.0
40–60 min.	12.8	73.2	13.0	59.0
Over 60 min.	26.8	100.0	41.0	100.0
In 60-min. zones				
0–40 min.	55.2	55.2	42.0	42.0
40–60 min.	11.2	66.4	12.0	54.0
Over 60 min.	33.6	100.0	46.0	100.0

the average parking time for curb facilities. In 1927, the average parking time was 59 min., which undoubtedly was an important factor in helping to reduce the availability of curb parking space. However, there has been no material improvement in the situation since that year (see Table 65). Although the districts covered in 1927 and 1937 are not quite comparable, resulting in longer-time parking zones in 1937, there is considerable consistency in the continued importance of parking for

TABLE 67

TURNOVER OF CURB PARKING SPACE, SAN FRANCISCO METROPOLITAN PARKING DISTRICT ON A NORMAL WEEKDAY, SEPTEMBER, 1948, FROM 7:00 A.M. TO 7:00 P.M.

Time Zones	No. Stalls	No. Cars per Stall	Total Cars Parked
10–20 min.	287	8.0	2,220
40 min.	2,985	6.0	17,900
60 min.	5,692	3.2	18,200
120 min.	139	2.5	347
Misc. zones	14	2.5	35
Unlimited zones	4,145	2.5	10,368
Total	13,253	3.7	49,070
Commercial zones	2,658	3.0	7,970
No parking (red zones)	5,001	0.5	2,360
No parking signs	4,790	2.5	12,000
Total	12,449	1.8	22,330
Grand Total	25,702	2.8	71,400

Source: The 1948 Study.

periods exceeding 1 hour for the two periods. Yet, the shorter parking time predominates in both years.

Although the Metropolitan Parking District in the 1948 study was more extensive than the 1937 area, comparability of utilization is made possible because the statistics of parking time lengths were reported by time zones. Table 66 compares the utilization for these two years for the 20-min., 40-min., and 60-min. time zones. The amazing trend revealed by this table is the sharp increase between 1937 and 1948 in the average parking time for all zones. One explanation for this unusual trend is a high proportion of overtime parking, only partially eliminated through the use of parking meters.[67] Especially to be noted in the table is the increase in importance of over-60 min. parkers in the 40-min. and 60-min. zones.

Another good measure of utilization of parking facilities is found in turnover data, *i.e.*, the number of cars using a given parking space for a given time period. Unfortunately, so far as curb-parking facilities are concerned, data of turnover were compiled only in the 1948 study for the Metropolitan Parking District (see Table 67). The large number of 60-min. parking zones accommodated, on the average, only slightly more than three cars per day between 7 A.M. and 7 P.M. The turnover rate increases when the 40-min. zone is considered, but the available evidence would seem to indicate that the turnover rate could have been increased if existing legal restrictions had been more strictly enforced. This conclusion is supported in part by the data in the table

[67] The 1948 study reveals, for example, that on a "normal weekday" in September 1948, more than 5,000 cars in the Metropolitan Traffic District were classified as "all-day parkers" although parking took place in no-parking or limited-parking zones. This compares with a total number of vehicles using parking facilities of 71,400 during the period.

showing the number of cars parking in the prohibited zones.

When turnover rates are considered for the central business district as measured by Segments 1 through 9, it is found that turnover rates are higher than for the Metropolitan Parking District. The explanation lies in the fact that parking laws are more rigidly enforced in the central district. Segments 2 and 3, the most-congested areas, have the highest turnover rates (see Table 68). For the central district as a whole, the turnover rate is better than four times higher than that for the Metropolitan Parking District.

The comparison in Table 68 of turnover rates between curb and off-street parking space is quite revealing. Low turnover rates for all off-street parking facilities reflect the demand of the all-day parker. The rate is only about 13 percent, on the average, of the overall rate for curb facilities. Another aspect of the problem is in the comparison of the number of vehicles parked in curb as against off-street facilities. In every segment except Nos. 2, 3, 4, 9 the users of curb space exceed the users of off-street facilities. However, the same vehicle may have used two or more spaces during the counting period.

The low-turnover rates for off-street parking facilities support observations made in the 1951 study, and conclusions based on data collected in the study at hand. In the 1951 study, the inventory of off-street parking recorded the use made of the capacity, the approximate turnover, and the hours of peak load for each facility. While no statistical summary was prepared, it may be noted that, except when the fee schedule was set deliberately to favor short-time parking (as was the case for the Union Square Garage), the peak hour often was reached early in the day around 9 A.M. and turnover rates did not go much above 1. Because of these factors not a very high proportion of space was available for the use of shoppers.

During the course of this study data pertaining to the utilization of parking space in the Union Square Garage were collected. Located in the center of downtown San Francisco, this garage has established a schedule of charges which makes all-day parking expensive and yet discourages short-time parkers (see Table 69). Nevertheless, some 500 cars daily park in the garage for the entire day. The remainder of the garage's 1,500-car capacity is used mainly for shorter periods of time. A section of the garage with a separate entrance is available at a monthly rate.

TABLE 68

TURNOVER OF PARKING SPACE IN THE SAN FRANCISCO CENTRAL BUSINESS DISTRICT, SEPTEMBER, 1948 BY SEGMENTS AND TYPE OF SPACE

Segment Number	No. of Vehicles Parked		No. Cars Per Stall	
	Curb	Off-street	Curb	Off-street
1	2,594	1,937	9.5	1.7
2	2,021	3,285	34.3	1.9
3	672	1,370	25.8	1.9
4	2,239	3,082	9.3	1.5
5	1,814	813	11.4	1.1
6	2,383	1,060	13.4	1.2
7	2,248	755	10.4	1.1
8	1,100	780	19.6	1.7
9	1,351	1,671	15.3	1.9
Total	16,422	14,753	12.1	1.6

Source: The 1948 Study.

TABLE 69

SCHEDULE OF PARKING CHARGES, UNION SQUARE GARAGE, SAN FRANCISCO

Time (hr.)	Original Charge	Revision 3/3/49	Revision 12/19/50
1	$0.25	$0.35	$0.50
2	.35	.35	.50
3	.50	.50	.50
4	.50	.50	.75
5	.50	.75	1.00
6–9	.75	.75	1.25
9–15	.75	1.00	1.25
15–24	1.00	1.50	1.50

Since its opening in September, 1942, the Union Square Garage has been used virtually to capacity as Table 70 indicates. On the average, the low daily load is 2,400 cars and the peak load, 2,600 cars. After the all-day parkers are subtracted, the turnover rate for the remainder is about two cars per parking space. Compared with other data of utilization presented in the preceding tables, this turnover rate is very low for a garage servicing parkers who are not primarily workers.

Table 71 shows the accumulation of vehicles in the Union Square Garage in March, 1952, by hourly time

TABLE 70

NUMBER OF CARS PARKED ANNUALLY IN UNION SQUARE GARAGE, SAN FRANCISCO: 1942–1943 TO 1951–1952

Date	Cars	Date	Cars
Sept. 1942 to June 30, 1943	565,000	July 1, 1947 to June 30, 1948	963,595
July 1, 1943 to June 30, 1944	800,743	July 1, 1948 to June 30, 1949	972,449
July 1, 1944 to June 30, 1945	818,332	July 1, 1949 to June 30, 1950	1,007,397
July 1, 1945 to June 30, 1946	907,040	July 1, 1950 to June 30, 1951	986,688
July 1, 1946 to June 30, 1947	932,872	July 1, 1951 to June 30, 1952	968,670

TABLE 71
VEHICLE ACCUMULATION IN UNION SQUARE GARAGE, SAN FRANCISCO, BY HOURS, FOR THREE DAYS IN MARCH, 1952*

Time	Friday	Saturday	Monday
7:00 A.M. to 8:00 A.M.	209	229	200
8:00 A.M. to 9:00 A.M.	333	302	279
9:00 A.M. to 10:00 A.M.	546	452	455
10:00 A.M. to 11:00 A.M.	736	704	720
11:00 A.M. to 12:00 noon	957	921	977
12:00 noon to 1:00 P.M.	1,043	1,000	1,104
1:00 P.M. to 2:00 P.M.	1,040	1,175	1,163
2:00 P.M. to 3:00 P.M.	1,029	1,064	1,134
3:00 P.M. to 4:00 P.M.	855	918	1,032
4:00 P.M. to 5:00 P.M.	674	710	857
5:00 P.M. to 6:00 P.M.	403	354	778
6:00 P.M. to 7:00 P.M.	355	332	772
7:00 P.M. to 8:00 P.M.	347	366	832
8:00 P.M. to 9:00 P.M.	379	478	667
9:00 P.M. to 10:00 P.M.	348	498	361
10:00 P.M. to 11:00 P.M.	306	475	287

* Excludes all-day parkers.

Finally, a comparison can be made of parking time lengths for 1946 and 1952 as computed from parking fees paid to the Union Square Garage (see Table 72). While there has been a sharp increase in the schedule of rates as shown in Table 69, the data for this section reveal the importance of 1-to-4-hr. parking time. It also shows weekday variations.

Destination of Persons Visiting the Central Business District

One other feature of the demand for parking space may be noted, namely, the distribution of trips to the central business district by destination and type of traveler. These data pertain to October 1947, so allowance must be made for changes since that date. Table 73 shows the percentage composition of persons who

TABLE 72
CUMULATIVE PERCENTAGES OF PARKING TIME FOR CARS, UNION SQUARE GARAGE, SAN FRANCISCO: SAMPLE DAYS, NOVEMBER, 1946 AND MARCH, 1952

Parking Less Than	Wednesday		Saturday		Monday		Total (Week)	
	1946	1952	1946	1952	1946	1952	1946	1952
hr.								
1	8.74	—	9.27	—	9.99	—	9.31	—
2	23.95	—	26.57	—	26.12	—	25.40	—
3	—	54.86	—	51.32	—	58.78	—	54.67
4	—	70.15	—	66.99	—	72.92	—	69.17
5	87.32	79.45	88.26	77.90	89.96	82.63	86.71	79.09
15	96.77	96.94	97.56	96.71	99.15	97.75	97.41	96.19
All other	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 73
DESTINATION AND TRIP PURPOSE OF PERSONS IN SAN FRANCISCO'S CENTRAL BUSINESS DISTRICT, BY SEGMENTS, 1948

Segment Number	For Work	Other	Total
1	82.0	18.0	100.0
2	45.7	54.3	100.0
3	33.4	66.6	100.0
4	37.0	63.0	100.0
5	70.6	29.4	100.0
6	33.6	66.4	100.0
7	70.2	29.8	100.0
8	60.4	39.6	100.0
9	49.6	50.4	100.0
Average	54.2	45.8	100.0
Metro. Traff. Dist.	52.8	47.2	100.0

periods, after all-day parkers were disregarded. The time pattern of these accumulations is very similar to the general pattern described for the downtown area: the peak is reached between 1 and 2 p.m. and is at a high level from 11 A.M. to 4 P.M. The effect of Monday evening shopping is evident, as is the late Saturday evening travel to eating places, etc.

TABLE 74
DISTRIBUTION OF PERSONS WITH CENTRAL BUSINESS DISTRICT DESTINATION SEGMENTS, BY PURPOSE OF TRIP, 1948

Segment	Work	Other
No.	%	%
1	23.5	6.1
2	12.6	17.8
3	4.0	9.4
4	2.3	4.6
5	21.2	10.5
6	16.2	38.0
7	13.6	6.8
8	3.6	2.8
9	3.0	4.0
Total	100.0	100.0

have destinations in each of the nine segments, by trip purpose. The proportions of workers are high in Segments 1, 5, 7, and 8. Because Segments 2, 3, and 4 are the shopping, hotel, and theater sections and because Segment 6 contains the Market Street shopping section, the proportions of shoppers and other persons are correspondingly high.

Table 74 shows what proportions of persons going to

the central business district, by trip purpose, go to each destination segment. Segments 1 and 5 were the key destinations of persons going to work while shoppers and others traveled mainly to Segment 6, and to a lesser extent to Segment 2.

Total Flow of Traffic to San Francisco, by Origin Gateways, and Estimated 1970 Data

A short statement may be in order at this point indicating the present size of the automobile traffic flow into San Francisco, by origin gateways, and the estimated magnitude of the flow in 1970. Table 75 shows the estimates of the San Francisco Chamber of Commerce for 1952. As might be expected, the heavily populated San Mateo County points originated 47 percent, while 39 percent came from the East Bay, and 14 percent from North Bay points. The overall number jumped by 40 percent over the 1949 total of 384,000. Of the 1952 total, only 21 percent used interurban mass transit facilities; the remainder traveled in a number of automobiles totaling 241,512 on a separate trip basis.

A somewhat-different picture of present travel patterns via automobile, and of projected 1970 patterns, is shown by the data in Table 76. The continued importance of the San Mateo County origins is shown. But what is especially interesting is the estimated increase in the volume by 1970. The impact of these increases on demand of facilities other than parking has been summarized as follows: 1) The present capacity of the Golden Gate Bridge will continue to be adequate, but improved street and highway approach facilities will be needed. 2) To handle the expected increases from San Mateo County and beyond, as many as 9 freeway lanes will be needed in each direction. 3) For traffic from East Bay points, at least five additional transbay bridge lanes will be needed in each direction.[68]

What this means for parking facilities in the nine segments of the central parking district was estimated in the 1948 study (see Table 77). These estimates are based merely on natural increases in demand as forecasted. They make no allowance for the multiplier effect induced by the added attraction of new parking facilities. Only Segments 4 and 9 had and will have anticipated surpluses. The shopping areas, and other entertainment areas, will have mounting deficits.

[68] San Francisco Bay Area—Rapid Transit Commission, *Preliminary Report, January, 1953* (San Francisco: The Commission, 1953).

TABLE 75

PASSENGER MOVEMENTS TO AND FROM SAN FRANCISCO, BY GATEWAY ORIGINS, 1952

Gateway	Number of Passengers			No. of Automobiles
	Total	Interurban Transit	Automobile	
Peninsula	254,248	45,289	208,959	119,405
East Bay	207,243	57,182	150,061	85,749
North Bay	76,559	12,933	63,626	36,358
Total trips	538,050	115,404	422,646	241,512
Total, round trips	269,025	57,702	211,323	120,706

Source: Research Department, San Francisco Chamber of Commerce, July, 1952.

TABLE 76

ESTIMATED DAILY TRIPS TO AND FROM SAN FRANCISCO, BY ORIGIN GATEWAYS, 1952 AND ESTIMATED 1970

Gateway	1952	Est. 1970
West Bay Marin	60,000	72,000–100,000
West Bay Peninsula	228,000	277,000–336,000
Transbay	203,600	245,000–270,000
Total	491,600	594,000–706,000

Source: San Francisco Bay Area—Rapid Transit Commission, *Preliminary Report, January, 1953* (San Francisco: The Commission, 1953).

TABLE 77

ESTIMATED SHORTAGES OF PARKING FACILITIES BY SEGMENTS IN THE CENTRAL PARKING DISTRICT, 1948 AND 1970

Segment Number	Estimated Car Stalls Needed	
	1948	1970
1	1,245	3,380
2	1,486	2,550
3	1,168	1,600
4	−2,861	−2,130
5	2,227	3,240
6	2,907	4,370
4	371	1,170
8	231	590
9	−1,035	−770
Total	5,739	14,000

Source: The 1948 Study.

The Parking Situation in Oakland

While this section is patterned after the framework used in the preceding section for San Francisco, it must be noted at the outset that the discussion lacks the same detailed development and chronological comparisons due to the comparative lack of quantitative and qualitative data for Oakland. Only in the utilization of selected parking facilities does the discussion which follows permit development beyond that possible for

TABLE 78
PARKING FACILITIES IN OAKLAND'S CENTRAL DISTRICT, 1946, BY TYPE AND PARKING TIME

Type and Parking Time	No. of Stalls	Percent of Type	Percent of Total
Curb facilities			
3-min. loading	90	1.47	0.64
30-min. loading	513	8.35	3.68
10-min. parking	19	0.31	0.14
40-min. parking	670	10.91	4.81
1-hr. parking (meter)	1,667	27.14	11.96
2-hr. parking	2,513	40.90	18.03
No limit	206	3.35	1.48
No parking	465	7.57	3.34
Total	6,143	100.00	44.08
Off-street facilities			
Private lots	736	9.44	5.28
Public lots	5,835	74.87	41.87
Private garage	147	1.89	1.06
Public garage	1,075	13.80	7.71
Total	7,793	100.00	55.92
Grand Total	13,936	—	100.00

Source: The Bartholomew report.

San Francisco. There is far less information available pertaining to the supply of parking facilities in Oakland.

SUPPLY OF PARKING FACILITIES

Two sets of data are available for the central district of Oakland: a complete inventory for 1946 made by Harland Bartholomew and Associates[69]; and a 1948–1949 inventory made available by Jay A. Czizek, traffic engineer for the City of Oakland. In addition, detailed data have been collected and analyzed dealing with parking lots operated by the Downtown Merchants Parking Association.

The 1946 Supply of Parking Facilities

Table 78 shows the classification of curb and off-street parking facilities in Oakland in 1946, by type, based upon the Bartholomew report. The sharp contrast with San Francisco is evident, first of all, in the high proportion of 1-hr. and 2-hr. parking zones for curb facilities in Oakland, amounting to 68 percent of all curb space. In addition, the total number of such spaces (6,143) was considerably above the San Francisco level for the comparable type of district, especially if differences in the population of the two cities is considered. The differences reflect, also, the sharp contrast between the compact central district of San Francisco and the sprawling central district of Oakland (see Figure 3 for the boundaries of the Oakland Central District used in the Bartholomew Report).

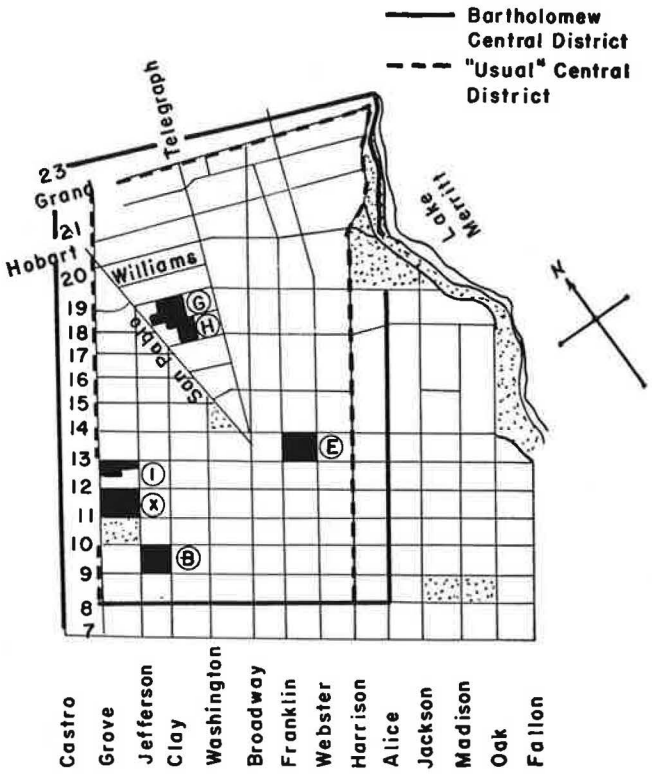

Figure 3. Central business district of Oakland showing locations of the six parking lots of the Downtown Merchants Parking Association, Inc.

The data for off-street parking facilities reflect further differences between Oakland and San Francisco. Nearly three fourths of the off-street parking capacity consists of public lots, while an additional 13.8 percent consists of public garages. In San Francisco, the distribution of off-street parking facilities shows a predominance of garages, with a heavy proportion of these consisting of public garage space.[70]

The 1948–1949 Inventory

Jay A. Czizek, city traffic engineer for Oakland, has prepared an inventory of parking space in the smaller Central Business District shown in Figure 3. These data reveal no significant differences from the 1946 situation except to show a reduction in capacity due to the difference in boundaries (see Table 79). When the data of the Bartholomew report are adjusted for the difference in the area covered, the results show curb

[69] Harland Bartholomew and Associates, *Off-Street Parking and Traffic Control in Oakland Business Districts*, Oakland Master Plan, Vol. II (St. Louis, Mo., 1947). This will be referred to as the Bartholomew Report.

[70] The central district used in the Bartholomew report consisted of the area bounded by Eighth, Castro, Alice, Lake Merritt, and 23rd streets. The usual central business district is approximately one block narrower on three sides and is bounded by Eighth, Grove, Harrison, and Grand (see Figure 3).

TABLE 79
PARKING SPACE IN OAKLAND'S CENTRAL BUSINESS DISTRICT, 1948–1949 BY TYPE AND PARKING TIME

Type and Parking Time	No. stalls	Percent	Type and parking time	No. stalls	Percent
Curb facilities			*Off-street facilities*		
1-hr meter	2,420	60.32	Public parking lots	5,204	87.77
2-hr. meter	823	20.51	Public garages	725	12.33
2-hr. general	769	19.17			
Total	4,012	100.00	Total	5,929	100.00

Source: Mr. Jay A. Czizek, city traffic engineer, Oakland.

facilities of 4,061 stalls in 1946 as against 4,012 in 1948–1949, and off-street facilities of 5,731 stalls in 1946 as against 5,929 stalls in 1948–1949.

A general analysis of both sets of data reveals a large supply of both curb and off-street parking facilities available within reasonable walking distance of any block in Oakland's central business district. Even at the main downtown intersection of the San Pablo and Broadway, in addition to metered curb-parking facilities, a parking lot is only one short city block away.

Downtown Merchants Parking Association Parking Lots

Beginning November 30, 1929, a group of business interests in downtown Oakland formed a Downtown Merchants Parking Association to acquire and operate a series of parking lot facilities in downtown Oakland. These operate on a validation principle in which the cooperating members absorb the parking fee for the first time period. From five parking lots, the number increased to six in 1932, seven in 1935, and eight in 1936. The number remained stabilized until 1939 when the number decreased to six. There were no further changes until 1946 when an additional lot was opened. No changes were recorded until 1951 when the number of lots in operation was reduced once again to six. The present capacity of the six lots is 922 vehicles.

The capacity and general characteristics of the six parking lots currently in operation may be summarized as follows (see Figure 3 for their respective locations): 1) *Lot B* (capacity, 234 vehicles) caters mainly to the Sherwood Swan and Co. store at 10th and Clay streets and the Hale's store at Washington and 11th streets; 2) *Lots G and H* (capacities, 241 and 53 vehicles) serve mainly Kahn's department store and the surrounding stores; 3) *Lot X* (capacity, 60 vehicles) serves mainly the Hale and Penney department stores, and Smith's men's furnishings stores; 4) *Lot E* (capacity, 234 vehicles), located at 14th and Franklin streets serves customers of downtown banks, offices, and retail stores; presently, this lot is being replaced by a multistory garage facility which will accommodate 600 automobiles; and 5) *Lot I* (capacity, 100 vehicles) services a variety of customers. A later section will deal extensively with the utilization of each of these facilities.

NATURE OF THE DEMAND FOR PARKING FACILITIES IN OAKLAND

Unfortunately, there are no studies comparable to those for San Francisco to show changes in the demand for parking facilities in central Oakland. What can be given is a fragmentary picture consisting of the following parts: 1) data of vehicle accumulation and turnover for 1946 from the Bartholomew report; 2) data of vehicle counts for 1934, 1937, and 1946; 3) data of means of transportation used in 1935 and 1946; 4) data showing total utilization of all Downtown Merchants Parking Association parking lots since 1929; and 5) data showing utilization characteristics for each of these six parking lots. In addition, a ater section will present data of the gross volume of automobile traffic entering and leaving Oakland, by principal gateways, in 1952 and estimated for 1970.

Vehicle Accumulation and Turnover Data for 1946

The Bartholomew report recorded the vehicle accumulation in Oakland's central district for a typical day in 1946 (see Table 80). The results show a peak of 6,600 vehicles reached between 1 and 2 P.M., with a continued high level of vehicles between 12M. and 4 P.M. With a total of 9,941 stalls available in the smaller central district (see Table 79), this gives a percentage of only 66.4.

TABLE 80
HOURLY ACCUMULATION OF VEHICLES IN THE CENTRAL DISTRICT OF OAKLAND, 1946

Hour	No. of Vehicles	Hour	No. of Vehicles
7–8 A.M.	1,200	1–2 P.M.	6,600
8–9 A.M.	3,400	2–3 P.M.	6,500
9–10 A.M.	4,600	3–4 P.M.	6,300
10–11 A.M.	5,500	4–5 P.M.	5,800
11 A.M.–12 noon	5,700	5–6 P.M.	2,700
12 noon–1 P.M.	6,300	6–7 P.M.	2,100

Source: The Bartholomew report.

TABLE 81
VEHICLE COUNT IN OAKLAND CORDON AREA, 1934, 1937, 1946

Year	Outbound	Inbound	Total
1934	74,951	78,208	153,159
1937	81,960	81,824	163,784
1946	83,388	85,560	168,948

Source: The Bartholomew report.

If the capacity of the larger central area is used, the percentage declines to 47.4. In comparison, in San Francisco the peak accumulation in the 1948 Metropolitan Traffic District was 30,800 vehicles, with only 35,498 spaces available in curb and off-street facilities.

This same report computed an average turnover of 2.55 cars per day for each off-street stall. But at the peak hours for an average day, these off-street facilities were only 75 per cent filled. This is in sharp contrast to the much-lower turnover noted at San Francisco's Union Square Garage, and its practical capacity utilization each day.

Vehicle Counts for 1934, 1937, and 1946

Table 81 shows the sharp increase in the number of vehicles entering and leaving the central district between 1934 and 1946. The change was from a total of 153,159 vehicles in 1934 to 168,948 in 1946, a net increase of 15,789 vehicles. Of this increase, 8,437 were accounted for by changes in the number of outbound vehicles, and the remainder by increases in the number of inbound vehicles. A special study made in this connection indicates that 24 percent of the vehicles continued to destinations outside the cordon count area.

Means of Transportation, 1935 and 1946

Two studies are available which show some of the demand characteristics in terms of means of transportation used in 1935 and 1946 (see Table 82). The data for the two years are not quite comparable due to differences in the method of gathering statistics and the problem of evaluating pedestrian counts. With these qualifications kept in mind, and the sharp declines in the use of mass-transit facilities since 1946 to be noted later, the significance of the 1935 data is in showing how unimportant travel by mass transit was at that early data. Even in 1946, the utilization of mass-transit facilities by both shoppers and workers reveals a far higher utilization of automobiles in Oakland than in San Francisco. Undoubtedly, however, the high percentage of pedestrians in 1935 reflects a count of persons many of whom must have used mass-transit facilities and were walking to a destination when counted.

TABLE 82
MEANS OF TRANSPORTATION USED BY PASSENGERS IN AND OUT OF OAKLAND'S CENTRAL DISTRICT, 1935 AND 1946

Facility	No. Passengers	Percent
1935 Data		
Streetcar or bus	91,324	19.92
Private automobile	251,379	54.85
On foot	115,681	25.23
Total	458,384	100.00
	Percent Shoppers	Percent Employees
1946 Data		
Mass transit	39.9	50.6
Private automobile	54.3	41.9
On foot	5.8	7.5
Total	100.0	100.0

Sources: 1935 data—Cordon Count, March 14 to April, 1935. 1946 data—Questionnaires, The Bartholomew Report.

TABLE 83
TOTAL NUMBER OF CARS PARKED EACH YEAR IN DOWNTOWN MERCHANTS PARKING ASSOCIATION PARKING LOTS, OAKLAND; AND NUMBER OF PARKING LOTS IN OPERATION, 1930–1951*

Year	No. Cars	No. Lots	Year	No. Cars	No. Lots
1930	496,858	5	1941	1,314,136	6
1931	595,198	5	1942	1,262,518	6
1932	583,907	6	1943	1,070,854	6
1933	614,138	6	1944	879,286	6
1934	653,822	6	1945	954,777	6
1935	711,356	7	1946	1,195,336	7
1936	805,085	8	1947	1,235,288	7
1937	926,764	8	1948	1,265,012	7
1938	1,046,376	8	1949	1,380,820	7
1939	1,084,726	6	1950	1,512,335	7
1940	1,132,220	6	1951	1,495,676	6

Source: Downtown Merchants Parking Association, Inc.
* Number in operation at end of year.

Total Utilization of Downtown Merchants Parking Association Parking Lots

Beginning with 1930, data are available showing the total number of cars parked each year in the parking lots operated by the Downtown Merchants Parking Association (see Table 83). Without correcting for changes in the number of parking lots in operation, the total rose steadily from 496,858 in 1930 to 1,314,136 in 1941. With wartime restrictions on car production and driving, the total number of cars parked fell sharply to a low point of 879,286 in 1944. Since 1944, there was a steady increase once again to 1,512,335 in 1950. The small decline to 1,495,676 in 1951 seems to be due mainly to the discontinuance of one facility on October 1, 1951.

These trends show, once again, the sharply different picture between the expansion of use of these off-street facilities in Oakland and the lack of such expansion in San Francisco.

Utilization of Individual Parking Lots

Detailed data are available which measure the nature of the demand for parking space in each of the six parking lots. Table 84 summarizes the pertinent data for each lot for three separate months; December 1951, April 1952, and August 1952. Sharp variation may be noted both in total numbers of cars utilizing each lot, and in the range from low to high by months. In April 1952, the range was from a low of 4,034 cars in Lot X to a high of 33,210 for Lot E; in August 1952, the range was from 4,979 cars in Lot X to 32,432 cars in Lot E. The table shows wide variations, also, in the percent of each parking lot's patronage which cluster around particular destination points as measured by the validation stamp on each parking ticket.

TABLE 84

NUMBER OF CARS PARKED, BY PARKING LOT AND LARGER VALIDATING STORES, DOWNTOWN MERCHANTS PARKING ASSOCIATION, DECEMBER, 1951, APRIL, 1952, AND AUGUST, 1952

Parking Lot and Validating Store	Dec. 1951	April, 1952	August 1952
Lot B			
Hale's Validations	5,347	3,917	3,197
Sherwood Swan & Co. validations	28,184	25,924	23,810
Total validations	35,890	31,418	28,565
Total no. cars parked	38,443	32,837	29,923
Lot G			
Kahn's validations	16,952	14,020	12,944
Total validations	20,904	17,900	16,702
Total no. cars parked	27,117	27,473	23,739
Lot H			
Kahn's validations	5,248	5,537	5,674
Total validations	6,338	6,856	7,103
Total no. cars parked	7,838	9,202	9,346
Lot X			
Smith's validations	2,075	1,002	1,325
Hales validations	1,668	745	886
J. C. Penney validations	1,137	557	809
Total	7,070	3,272	4,143
Total no. cars parked	9,111	4,034	4,979
Lot E			
Kahn's validations	3,274	2,521	2,432
Central Bank validations	1,787	2,500	2,456
Tribune Bldg validations	1,140	1,631	1,491
Crocker validations	894	1,200	1,330
Owl Drug validations	761	730	628
J. C. Penney validations	757	515	616
Bank of America validations	621	812	857
Total validations	18,906	20,155	19,619
Total no. cars parked	31,812	33,210	32,432
Lot I			
Athens Club validations	1,297	1,508	1,331
Smith's validations	1,021	528	435
Jackson's validations	829	675	741
J. C. Penney validations	772	465	435
Hale's validations	762	437	399
Total validations	7,599	5,251	4,773
Total no. cars parked	9,941	6,635	5,904

Source: Downtown Merchants Parking Association, Inc.

TABLE 85

AVERAGE DAILY TURNOVER RATES IN SIX PARKING LOTS, APRIL AND AUGUST, 1952

Parking Lot	No. Stalls	April, 1952	August, 1952
B	234	5.40	4.91
E	234	5.46	5.33
G	241	3.23	3.29
H	53	5.98	6.25
I	100	2.55	2.24
X	60	2.58	3.20

Source: Downtown Merchants Parking Association.

From the data in Table 84, daily turnover rates may be computed for each parking lot (see Table 85). The sharp differences existing between lots indicate wide variations in the capacity utilized. For April 1952, Lot I had an average turnover rate of 2.55 compared with a high of 5.98 for lot H. In addition to Lot I, Lots G and X also had low turnover rates. In August, 1952, the range was from a low of 2.24 for Lot I to a high of 6.25 for Lot H.

Data are available, also, which give a breakdown of the length of time automobiles parked in each parking lot during December 1951, and April and August of 1952 (see Table 86). Wide variations exist in the average parking time for each parking lot. First among the important points to be noticed is the high proportion of less-than-1-hour parking in Lot B in comparison with the small proportions in Lots G and I. Lot G, which is the most accessible to central downtown office buildings and banks, together with Lot E seem to have lower turnover rates and longer average parking times because of higher capacity and lower demand. A comparison of December data with the other months reveals the effect of Christmas shopping in increasing the average parking time. And, finally, differences in peak demands between each parking lot may be inferred from the relation between the data in this table, and the turnover data given in Table 85. For example, Lots B and E have the same average daily turnover rates, but the average parking time per car is much longer in Lot E.

TABLE 86

PROPORTIONATE LENGTHS OF AVERAGE PARKING TIME, OAKLAND DOWNTOWN MERCHANTS ASSOCIATION PARKING LOTS, FIRST WEEK, DECEMBER, 1951, APRIL, 1952, AUGUST, 1952

Parking Time	Lot B			Lot E			Lot G		
	Aug., 1952	April, 1952	Dec., 1951	Aug., 1952	April, 1951	Dec., 1951	Aug., 1952	April, 1952	Dec., 1951
Less than 1 hour	71.6	71.0	63.0	48.6	48.6	43.5	38.7	39.5	32.3
Less than 2 hours	20.5	20.8	24.8	27.8	28.7	29.6	32.7	32.7	31.8
Less than 3 hours	5.4	5.5	7.9	13.8	12.0	13.7	17.3	15.8	18.4
Less than 4 hours	1.6	1.8	2.9	4.8	5.7	6.5	7.2	7.5	8.9
4 hours or over	0.9	0.9	1.4	5.0	5.0	6.7	4.1	4.5	8.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Parking Time	Lot H			Lot I			Lot X		
	Aug., 1952	April, 1952	Dec., 1951	Aug., 1952	April, 1952	Dec., 1951	Aug., 1952	April, 1952	Dec., 1951
Less than 1 hour	55.1	54.6	44.1	42.9	37.7	37.1	52.2	47.2	41.5
Less than 2 hours	25.1	27.6	28.3	34.6	36.4	33.0	32.7	35.6	34.5
Less than 3 hours	10.9	9.7	14.2	15.1	15.5	17.3	9.8	10.8	14.3
Less than 4 hours	4.9	4.9	7.5	4.4	6.2	8.6	3.4	2.9	7.1
4 hours or over	4.0	3.2	5.9	3.0	4.2	4.0	1.9	3.5	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Downtown Merchants Parking Association, Inc.

TABLE 87

COMPARISONS OF WEDNESDAY AND SATURDAY PARKING, BY TIME PERIOD, IN FIVE DOWNTOWN MERCHANTS PARKING ASSOCIATION PARKING LOTS, DECEMBER, 1951, APRIL, 1952, AND AUGUST, 1952

Parking Time and Month	Cumulative Percentages									
	Lot B		Lot E		Lot G		Lot H		Lot I	
	Wed.	Sat.	Wed.	Sat.	Wed.	Sat.	Wed.	Sat.	Wed.	Sat.
Less than 1 hour										
December, 1951	64.0	63.5	46.1	34.1	32.0	25.3	44.4	37.4	35.4	38.8
April, 1952	74.9	65.0	50.5	40.2	42.3	32.6	56.1	49.8	30.2	41.4
August, 1952	76.9	69.3	49.3	35.2	39.9	29.9	57.4	53.8	37.7	52.1
Less than 2 hours										
December, 1951	87.0	89.4	76.0	64.3	63.6	55.1	73.7	68.0	67.6	70.9
April, 1952	92.5	90.7	78.4	69.4	73.5	67.2	81.6	77.6	65.6	77.5
August, 1952	92.2	93.0	76.4	62.5	70.6	65.4	84.4	77.1	70.4	80.3
Less than 3 hours										
December, 1951	95.6	96.6	87.5	82.5	80.4	76.8	89.5	81.6	85.1	86.4
April, 1952	97.1	97.4	89.9	86.0	87.3	84.6	91.2	89.8	88.4	92.6
August, 1952	97.8	98.4	88.3	88.9	88.2	86.3	93.0	90.3	91.2	93.2
Less than 4 hours										
December, 1951	98.6	98.8	94.0	92.2	91.1	89.9	96.1	92.7	95.9	95.7
April, 1952	99.2	99.2	94.9	95.7	95.7	93.6	95.8	98.5	94.2	96.4
August, 1952	99.2	99.3	94.0	94.7	97.1	95.3	96.1	96.5	96.2	97.1
Totals										
December, 1951	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
April, 1952	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
August, 1952	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Downtown Merchants Parking Association, Inc.

The type of data in Table 86 may be further analyzed to show variations in parking time associated with the day of the week for each of the three months. Table 87 contains such data for Wednesday and Saturday. With the exception of Lot I, which does not cater to high proportions of shoppers, effect of Saturday shopping is reflected in a sharp reduction in the importance of the automobiles parking for less than 1 hr. Another aspect of this table is the change in importance of each parking time period for each of the three months. These

TABLE 88
INDEXES OF SEASONAL VARIATIONS IN NUMBER OF AUTOMOBILES USING DOWNTOWN MERCHANTS PARKING ASSOCIATION LOTS, 1944–1951

Year	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1951	99.3	101.1	98.8	98.1	101.8	102.6						
1950	100.1	103.9	101.2	101.5	98.7	96.5	96.6	93.1	99.5	98.8	103.0	112.1
1949	98.6	101.6	99.1	101.0	95.0	94.2	96.1	92.8	96.2	99.8	106.9	114.3
1948	99.3	100.2	99.9	98.2	99.3	97.7	94.0	92.0	94.4	101.0	106.6	114.5
1947	98.5	103.2	105.9	93.2	97.0	105.9	92.6	91.0	91.0	96.7	111.8	114.0
1946	99.4	103.1	103.5	98.1	98.4	99.7	92.1	96.8	98.7	98.8	112.0	109.4
1945	98.6	99.1	101.9	90.1	91.7	90.6	90.8	93.6	100.4	104.5	111.8	108.5
1944							95.4	88.5	95.4	100.5	108.7	119.2

shifts reflect, in part, the incidence of seasonal shopping, and factors of variations in peak demand, weather conditions, etc. The types of destinations reached most conveniently by each parking lot are also reflected.

Additional data permit the computation of seasonal indexes of parking volume from 1945 to 1951 (see Table 88). The analysis of these data is complicated by a reduction in the length of free parking time by validation of tickets in June 1949 from 2 hr. to 1 hr. Excluding that year, however, it is apparent that the Christmas shopping season brings a seasonal peak of parking demand in November and December. This peak is accentuated, as well, by the longer daily shopping hours. Considerably less peaking of demand is apparent during the Easter shopping period due to the shorter length of that season and its lesser commercial importance. The low point in seasonal demand occurs, as might be expected, during the summer months of July and August.

Other Evidences of Utilization

The preceding discussion has emphasized the utilization of off-street facilities sponsored by the Downtown Merchants Parking Association. Some discussion may be given of other use data. The Bartholomew report found that, before parking meters were installed, the average lengths of parking time for users of curb facilities were as follows: 10-min. parking zone, 46 min.; 40-min. parking zone, 61 min.; and 2-hr. parking zone, 2.25 hrs. This situation was not unlike that noted in San Francisco, including the reflection of a high incidence of violation of parking regulations. The average lengths of parking time for curb facilities after installation of meters were as follows: one-hr. metered zone, 29.6 min.; 2-hr. metered zone, 1.7 hrs.; and 2-hr. general zone, 6.2 hrs. Prior to the use of parking meters, less than 5 percent of the total stalls were available at all times; after the use of parking meters, this rose to 11 percent of the stalls.

TABLE 89
PRESENT AND ESTIMATED DAILY AUTOMOBILE TRIPS ENTERING AND LEAVING OAKLAND, 1952 and 1970

East Bay Gateway	1952	Est. 1970
Southern	126,400	167,000
Eastern	59,000	72,000–89,000
Northern	136,000	170,000

Source: San Francisco Bay Area—Rapid Transit Commission, *Preliminary Report, January, 1953* (San Francisco: 1953).

ORIGINS OF OUT-OF-TOWN TRAFFIC ENTERING AND LEAVING OAKLAND

An approximation of the present gross volume of automobile passenger traffic entering and leaving Oakland is available from Table 89, together with the estimated volumes for 1970. The East Bay southern gateway (Hayward) accounts for 126,400 trips daily, mainly by way of East 14th Street, the East Shore Freeway, and Foothill Boulevard. A much-smaller part of that traffic stream moves via Hesperian Boulevard. The East Bay northern gateway via Albany, El Cerrito, and Berkeley, accounts for 136,000 daily trips, with the flow via the East Shore highway about twice as important as the flow via San Pablo Avenue. The East Bay eastern gateway via the tunnel route, accounts for 59,000 trips.

The estimated increases for 1970 are in much the same ratios as the existing distributions. To meet this forecasted growth, it is expected that five freeway lanes would have to be added for the southern gateway in the direction of heaviest traffic and that four freeway lanes in each direction would have to be provided for the East Bay eastern gateway. Additional lanes currently are being added to the southern segment of the East Shore Highway.

RELATIVE ADEQUACY OF PARKING FACILITIES IN SAN FRANCISCO AND OAKLAND

A comparison of the foregoing data and analyses indicate that a more-acute parking problem exists in San Francisco. The supply of facilities in San Francisco

has not been maintained either on an absolute basis, or relative to increasing needs. High turnover space has been reduced regularly, while off-street facilities satisfy mainly low-turnover traffic. Off-street facilities in Oakland, mainly parking lots, have over twice the turnover rate of similar facilities in San Francisco. As a result, the preponderance of places for new facilities is for construction of garages in San Francisco. At the present time there is no apparent shortage of facilities in Oakland.

Mass Transportation in the Bay Area

This section summarizes some of the more-important data dealing with changes in the quantity and quality of mass transportation in the San Francisco–Oakland metropolitan area. It brings together data pertaining to such changes as number of passengers, scheduled service, average speeds, and passenger fares. These data have been collected for the following geographic segments: commuter traffic to and from San Francisco, commuter traffic to and from Oakland, local transportation in San Francisco, and local transportation in East Bay cities. Some passenger data are available for other bay area cities. The next section will deal with some of the reasons which help to explain changes in the mass-transportation situation.

MASS TRANSPORTATION SITUATION FOR COMMUTERS TO AND FROM SAN FRANCISCO

The Nature of Routes and Facilities

San Francisco draws commuters via mass transportation facilities from Marin County, Solano County, East Bay cities, and Peninsula cities. Pacific Greyhound Lines buses are the sole mass-transportation link between San Francisco and Marin and Solano counties. Key System transbay trains and buses and Pacific Greyhound Lines buses furnish service between East Bay cities and San Francisco. Southern Pacific suburban trains and Pacific Greyhound Lines buses furnish service between the Peninsula cities and San Francisco.

The nature and number of facilities used for each of the above types of service have been compiled in the Bay Area Rapid Transit Commission Report:

1) *Marin County service.* The Pacific Greyhound Lines currently provide service by means of 95 buses. These were built in 1940–1941, and each bus seats 45 persons.

2) *Solano County service.* The Pacific Greyhound Lines use equipment similar to that used for the Marin County service. Vallejo-Napa service requires 55 buses, but some of these are used, also, for the Peninsula service.

3) *East Bay service.* The Key System operates 80 two-car articulated electric train units, each seating 140 passengers. In addition, the Key System uses 164 buses each with an average seating capacity for 44 persons. Pacific Greyhound buses service Contra Costa points. There are 30 which were built in 1940–1941, and have an average capacity for 41 persons.

4) *Peninsula service.* The Southern Pacific uses 75 passenger coaches each seating 96 persons, and 154 passenger coaches each seating 72 persons. The Pacific Greyhound Lines use 20 buses built in 1952 with 53-seat capacity in addition to part of the 53 buses used also for the Vallejo-Napa service.

Daily Patterns of San Francisco Commuting Service

Table 90 summarizes the currently available statistics showing the distribution of daily passenger trips to and from San Francisco by route and origin point. From this table, the important generating points of mass-transportation commuting traffic and routes traveled can be determined. Nearly three fifths of all trips were accounted for by East Bay commuters, while Peninsula commuters accounted for 32 percent and Marin County commuters for only 9 percent.

The Key System and Southern Pacific facilities together carry nearly 80 percent of the total commuting traffic. Of the Key System total of 69,250 passenger trips, 44,000 were made on the electric trains and only 25,250 via buses. Berkeley, Albany, and Central Oakland were the key loading points for this traffic. Burlingame, Palo Alto, Redwood City, and San Mateo were the key stations for the Southern Pacific traffic.

Of Pacific Greyhound Lines bus traffic totaling 25,150 passenger trips, Marin County and Peninsula origins were most important.

Changes in the Annual Volume of Commuting Traffic

Diverse trends are apparent in the long-run pattern of commuting traffic. Table 91 shows these trends before and after the building of the San Francisco Bay and the Golden Gate bridges. Transit travel between the East Bay and San Francisco has undergone sharp changes since 1920. Beginning in that year with 37.5 million passengers, the total rose to 39.7 million in 1925. From that peak, there was a steady decline to 24.4 million at the bottom of the depression in 1933 and with some recovery to 26 million in 1936. The all-time low for the period 1920–1951 of 20.8 million was registered in 1938. The impact of World War II was an all-time peak of 52.9 million by 1945, but this was followed by a precipitous decline to 25 million by

TABLE 90
NUMBER OF COMMUTING PASSENGER TRIPS TO AND FROM SAN FRANCISCO, BY ROUTE AND ORIGIN, DAILY, 1952

Route and Origin Point	No. Daily Trips
East Bay Points	
Key System	
Trains	
Berkeley	14,850
Central Oakland	17,250
Piedmont	6,300
Claremont	5,600
Total, Trains	44,000
Buses	
Berkeley and Albany	4,350
East Oakland	8,700
Richmond	4,700
Alameda	4,300
Hayward	3,200
Total, Buses	25,250
Total, Key System	69,250
Pacific Greyhound Lines	3,350
Total, East Bay Points	72,600
Peninsula Points	
Southern Pacific Trains	
South San Francisco	630
San Bruno	1,200
Burlingame	5,040
San Mateo	3,300
Hillsdale	2,700
San Carlos	2,500
Redwood City	3,400
Palo Alto	4,400
San Jose	1,235
All Others	5,795
Total, Southern Pacific	30,200
Pacific Greyhound Lines	10,200
Total, Peninsula Points	40,400
Marin County Points	
Pacific Greyhound Lines	11,600
Grand Total	124,600

Source: Bay Area Rapid Transit Comission Report.

1949, and by further decline to 22.4 million in 1951. Thus, despite the sharp increase in population, the 1951 volume of passengers was 15.2 million below the 1920 total, and 9 million below the 1947 volume. That level was only 1.6 million above the all-time low in 1938.

In 1920, transit passengers accounted for 37.5 out of every 40 persons commuting to San Francisco. By 1951, they accounted for only 22.4 out of every 70.7 commuters.[71] Key System trains and buses dominate mass-transit travel with a much smaller percentage using Pacific Greyhound Lines buses. The volume of passengers using Key System trains has fallen relative to the numbers using buses, but this is partly due to changes in train service to opening of new bus routes.

From Marin County points, there was a steady decline in passenger volume from 5.7 million in 1928 to 3.2 million in 1938 via Northwestern Pacific electric trains and ferries. After the opening of the Golden Gate Bridge and the development of direct bus connections and automobile travel, the volume rose from 836,000 for part of 1940 to 7.1 million in 1944 and to 7.3 million in 1947. Since that year, there has been a steady decline to a low of 5.2 million in 1951, about 2.1 million less than the 1947 level and more than 400,000 below the 1928 level.

TABLE 91
ANNUAL VOLUMES OF PASSENGERS TRAVELING TO AND FROM SAN FRANCISCO, BY PRINCIPAL CARRIERS, 1912–1951
(in thousands)

Year	Peninsula Points		Marin County		East Bay	
	Via Southern Pacific	Via Pacific Greyhound	Via Northwestern Pacific	Via Pacific Greyhound	Via Key System	Via Pacific Greyhound, etc.
1912	2,858	—	N.A.	*	N.A.	N.A.
1914	3,698	—	N.A.	*	N.A.	N.A.
1920	N.A.	—	N.A.	*	37,530	—
1921	N.A.	—	N.A.	*	36,780	—
1922	3,397	—	N.A.	*	36,820	—
1923	N.A.	—	N.A.	*	38,810	—
1924	N.A.	—	N.A.	*	39,390	—
1925	4,359	—	N.A.	*	39,670	—
1926	N.A.	—	N.A.	*	37,130	—
1927	5,227	—	N.A.	*	36,500	—
1928	N.A.	—	5,672	*	35,390	—
1929	N.A.	—	5,682	*	34,120	—
1930	N.A.	—	5,537	*	32,770	—
1931	N.A.	—	5,310	*	30,240	—
1932	N.A.	—	4,832	*	26,800	—
1933	4,670	—	4,519	*	24,410	—
1934	N.A.	—	4,701	*	24,670	—
1935	N.A.	—	4,575	*	25,700	—
1936	N.A.	—	4,538	*	26,020	—
1937	N.A.	—	3,580	*	22,710	—
1938	N.A.	—	3,264	*	20,750	—
1939	N.A.	2,598	—	*	22,780	—
1940	4,722	2,793	—	836	23,270	—
1941	5,691	3,359	—	2,865	21,690	—
1942	N.A.	5,298	—	4,591	31,400	—
1943	N.A.	7,305	—	5,882	39,470	—
1944	N.A.	9,084	—	7,131	48,010	—
1945	N.A.	8,667	—	6,768	52,870	—
1946	8,055	8,355	—	6,710	41,370	—
1947	7,524	9,235	—	7,325	26,750	4,630
1948	7,547	9,679	—	7,185	24,520	3,840
1949	7,859	8,658	—	6,373	21,607	3,373
1950	7,953	7,659	—	5,709	19,326	3,104
1951	8,162	7,282	—	5,212	18,930	3,420

Sources: Records of carriers; California Public Utilities Commission Reports, 1920–1946.
1947–1951 data are from the Bay Area Rapid Transit Commission Report.
* Service not in operation.
N.A. = Data not available.

[71] These data include for both transit and other passengers persons who are not strictly commuters. In addition, it includes passenger travel to and from Yerba Buena Island.

Commuting to San Francisco via Southern Pacific trains has registered the one bright trend. In 1912, there were 2.9 million passengers traveling via that route. By 1927, the volume was 5.2 million, in 1947 7.5 million, and in 1951, 8.2 million. Pacific Greyhound buses serving the same Peninsula points had an increase in passenger traffic from 2.6 million to a peak of 9.7 million in 1948. Since that year there has been a steady decline to 7.3 million in 1951.

There is no question that, based on the analysis of these data, there has been a significant diversion of commuting traffic from mass-transit facilities to the automobile. Only one facility—the Southern Pacific service to Peninsula points—has been able to maintain a fairly stable volume of passenger traffic. Even this, however, represents a declining percentage of the available population.

Changes in Weekday Commuting, 1946–1951

A further measure of the decline in commuting traffic via mass transit lines may be had from Table 92, which shows a comparison of weekday rush-hour traffic via Key System routes between 1946 and 1951. In all cases where comparisons can be made, there have been significant declines except for the N and R bus lines. Part of the apparent greater loss for trains as against buses is due to the shift of some traffic from trains to buses as in the case of shortening the A rail line and transferring part of the route to the K bus line.

TABLE 92

COMPARISONS OF KEY SYSTEM TRANSBAY WEEKDAY PASSENGER TRAFFIC, BY ROUTES, FOR 1946 AND 1951*

Routes	Arrive San Francisco 7:00 to 8:30 A.M.		Leave San Francisco 4:30 to 6:00 P.M.	
	1946	1951	1946	1951
Rail				
A	2,654	654	3,019	708
B	1,697	1,038	1,718	1,172
C	1,661	1,175	1,716	1,191
E	1,306	1,250	1,310	940
F	3,081	2,184	3,709	2,240
Total	10,399	6,301	11,472	6,251
Motor Coach				
G	912	812	791	647
H	1,087	816	867	764
J	646	274	640	308
K	—	1,036	—	978
L	1,334	968	1,364	935
N	1,537	1,449	1,470	1,551
R	728	775	749	835
Two others	1,325	1,104	1,369	1,146
Total	7,569	7,234	7,250	7,164
Grand Total	17,968	13,535	18,722	13,415

Source: California Public Utilities Commission, *Engineering Division, Key System Transit Lines Application No. 32781* (San Francisco: The Commission, November, 1951).

* The 1946 check was made on May 15, 1946 for rail operations, and on various days during May and October, 1946 for the motor coach operations. The 1951 check was made on Wednesday, October 10, 1951.

Changes in the Overall Importance of Mass Transit

A comparison may be made of the proportions of the San Francisco commuting traffic traveling via transit lines as against automobiles. For a 24-hr. period in 1952, mass transit accounted for 20 percent of the Marin County commuters, 18 percent of the Peninsula commuters, and 36 percent of the East Bay commuters. During rush hours, the proportions via mass transit increase to 28, 35, and 53 percent, respectively. Obviously, the situation for mass transit will become more unfavorable as more and better facilities are built for the convenience of automobile drivers.

Schedule Characteristics

Table A-11 (in the appendix) summarizes the schedule characteristics of selected commuter mass transit service. For Key System trains and buses, the table shows sharp variations in number of runs, and in the frequency of service from line to line. In addition, the data reveal unimpressive scheduled travel times for most lines, and sharp reductions in daytime and evening non-rush-hour service and in Saturday and Sunday service. Many of the bus lines offer no service in the evening, while three of the five rail transbay lines offer only hourly service.

On the other hand, Southern Pacific trains offer superior service during rush hours to Peninsula commuters. From Palo Alto, the station accounting for the heaviest commuter traffic, trains run from 4 to 28 min. apart during the heaviest morning rush hours. They travel the 30.1 mi. to San Francisco in 50 to 60 min. of running time, or at an average rate of 30 to 36 mph. This is, as an example, the fastest average running time of any of the bay area commuting services. In sharp contrast to this, is the running time of 1 hr. 37 min. via Greyhound Pacific Lines, and 1 hr. 55 min. by automobile via the Bayshore Highway, or an average speed of only 17 mph.[72] During the evening rush hour, the fastest Southern Pacific running time to Palo Alto is 39 min., or at a rate of 46 mph. Perhaps this wide superiority of service, as measured by speed, is one of the main explanations behind the maintained traffic volumes for the Southern Pacific commuter service.

Further evidences of traveling times may be had

[72] As reported in Edwin F. Davis, "Bayshore Highway. I. The Slow Road Home," *San Francisco Chronicle*, Thursday, November 20, 1952, p. 17.

by comparing the best traveling times by mass transit between San Francisco and various Bay Area cities as shown in the following list: 1) *20-minute zone*, South San Francisco, Golden Gate Bridge toll plaza, 40th and San Pablo, Oakland; 2) *30-minute zone*, San Mateo; Ashby Avenue, Berkeley; Grand Lake area, Oakland; 3) *40-minute zone*, Palo Alto; Sharp Park; Mill Valley; Richmond; Albany; San Leandro; Alameda; 4) *50-minute zone*, Mountain View; Montara; Kentfield; Pinole; Lafayette; and 5) *60-minute zone*, Santa Clara; Half Moon Bay; Ignacio; Walnut Creek.

Passenger Load Factors

Table 93 shows variations in the volume of passengers via Key System transbay buses and trains in relation to the capacity of the vehicles provided for a typical week in 1952. The inflexibility of the train unit as against the bus is illustrated. Sharp difference in the load factor of the bus as against the train is evident. Especially to be noted, is the high load factor for the L line between San Francisco and Richmond.

TABLE 93

AVERAGE NUMBER OF WEEKDAY TRANSBAY PASSENGERS CARRIED, BY EACH KEY SYSTEM LINE, NUMBER OF UNITS, AND LOAD FACTOR,* 1952

Transbay Line	To San Francisco			From San Francisco		
	Number Passengers	Number Units	Load Factor	Number Passengers	Number Units	Load Factor
Week of March 10, 1952						
Trains						
A	4,003	61	50	4,057	61	50
B	2,475	40	47	2,768	40	52
C	2,634	37	54	2,642	36	56
E	2,564	37	52	2,159	34	48
F	5,141	70	56	5,853	72	62
Week of May 5, 1952						
Buses						
G	1,032	—	66	921	—	61
H	1,148	—	68	1,057	—	65
K	1,734	—	72	1,556	—	65
L	2,085	—	80	2,268	—	89
N	2,466	—	74	2,488	—	73
O-W	1,950	—	74	1,928	—	75
K	1,443	—	73	1,531	—	76

Source: California Public Utilities Commission, *Key System Transit Lines Application No. 33113: Report on Traffic Checks, Service and Future Mileage Estimates* (San Francisco: The Commission, May 29, 1952), pp. 7–18.

* *Load factor:* percent ratio between passengers carried and seats provided.

Changes in Fares

Space does not permit a full discussion of the sharp increases which have taken place in commuting fares. One example may suffice, namely, that of the fares from the central zone of Berkeley and Oakland to San Francisco via Key System trains and buses. In 1947, the one-way passenger fare was 19 cents without the purchase of a monthly commuter book, or only 17½ cents per ride on the basis of a 20-ride unlimited ticket. Today, the non-rush-hour passenger pays a straight 50-cent fare or with a 60-day, 20-ride ticket may save 10 cents per ride. Similar changes characterize other trips.

MASS TRANSPORTATION SITUATION FOR COMMUTERS TO AND FROM OAKLAND

Nature of Routes and Facilities

Oakland is a much-less-developed attraction point for commuter traffic than is San Francisco due, in part, to its smaller population base and its less-diversified economic activities. As a result, there is neither the diversification of mass-transit facilities nor the volume of commuting traffic found in San Francisco. The available routes and facilities are: 1) Key System train and bus service from East Bay cities to Oakland. This service is considered under local mass transportation in the East Bay cities. The trains are identical with those described for San Francisco. The buses vary in age and in capacity from 35 to 55 persons. 2) Pacific Greyhound buses, between Oakland and north and east Contra Costa points, of the same age and capacity indicated for the San Francisco runs. 3) Peerless Line buses between Oakland and San Jose.

Daily Pattern of Oakland Commuting Traffic

No adequate data are available showing the daily pattern of commuting traffic to and from Oakland as was the case for San Francisco. Fragmentary data are available from the Bay Area Rapid Transit Commission Report. Pacific Greyhound Lines accounted for 7,750 passengers on its Broadway Tunnel routes, while an additional 4,350 traveled from remaining points in Contra Costa County and the adjoining area. Of the 12,100 total, 8,750 passengers traveled to and from Oakland. No daily data are available for the Peerless Line buses.

Changes in Annual Volumes

Selected data are available since 1947 which show trends in commuting traffic via the routes indicated above. The Peerless Lines traffic was maintained at 1.8 to 1.9 million passengers between 1947 and 1949, but by 1951, the total was down to 1.4 million, a net loss of over 632,000 from the 1947 peak. Travel on the Contra Costa County routes of the Pacific Greyhound Lines buses fell from 2 million in 1947 to 1.5 mil-

lion in 1949, and then rose to 1.8 million in 1951. The proportion of this traffic going to Oakland is unknown. The most-significant reduction was in the Vallejo run of the Pacific Greyhound Lines: from 2.6 million in 1947 to only 1.1 million in 1951. Once again, the proportion destined for Oakland is unknown.

Changes in Overall Importance of Mass Transit

Data for 1952 from the Bay Area Rapid Transit Commission Report reveal for a 24-hr. period that only 3 to 9 percent of the commuting passengers travel via mass transit for the principal gateways. During the peak hours, 9 percent of the passengers entering via the South Gateway used mass transit, compared with 8 percent via the Eastern Gateway and 21 percent via the Northern Gateway. These percentages do not include local passenger movements between East Bay cities and Oakland.

LOCAL MASS TRANSPORTATION SITUATION IN SAN FRANCISCO

The City of San Francisco presently controls the operation of local transit facilities which consist of the usual network of north–south and east–west lines following the gridiron street pattern but oriented mainly towards the Market-Street-to-downtown section. This transportation system consists of seven streetcar routes, five cable-car routes, and 55 bus and trackless-trolley routes.

Changes in Annual Passenger Volumes

Table 94 traces the yearly fluctuations in the number of passengers from 1920 to 1952. Beginning with 242.6 million in 1920, there was a steady rise to a peak of 266.9 million in 1929, a volume never to be reached again during this period. From the 1929 peak, the depression caused a sharp reduction to 207.4 million in 1933, with some recovery by 1936 to 218 million. By 1941, the volume had reached a low of 172.8 million, but wartime restrictions on automobile travel together with sharply increased population caused an increase in volume by 1944 to the level of 263.6 million. Since that year, there has been a steady decline to an all-time low for the period of 168 million in 1952. The 1952 volume is 74.6 million below the 1920 riding level and 52 million less than the 1947 level. That there has been a sharp decline in annual per capita riding is self apparent.

TABLE 94

CHANGES IN THE VOLUME OF LOCAL MASS TRANSIT PASSENGERS IN SAN FRANCISCO, 1920–1952

	Passengers (in thousands)
1920	242,589
1921	246,863
1922	250,991
1923	258,677
1924	262,276
1925	265,973
1926	266,222
1927	265,640
1928	266,941
1929	266,860
1930	257,210
1931	241,617
1932	219,394
1933	207,407
1934	208,812
1935	211,693
1936	217,964
1937	210,490
1938	191,093
1939	183,685
1940	173,665
1941	172,792
1942	209,892
1943	249,912
1944	263,634
1945	252,172
1946	231,605
1947	221,417
1948	212,339
1949	195,933
1950	183,420
1951	182,060
1952	168,032

Sources: 1920–1945: Jenkins, *Economic and Organizational Features of the Municipal Railway of San Francisco.* Report to the Board of Supervisors (San Francisco: The Board, 1929).
1946–1952: From annual reports to the California Public Utilities Commission by the Municipal Railway of San Francisco.

Selected Operating Data

Further aspects of the local mass-transportation situation in San Francisco from 1947 to 1950 are available in Table 95.

1. *Passengers per vehicle mile.* Cable cars have the highest number of passengers per vehicle-mile, followed by streetcars. Motor coaches have had, on the other hand, the lowest passenger density. For the period, there has been a decline in the ratio for both cable cars and streetcars, while motor and trolley coaches have had increases.

2. *Distribution of passenger traffic by type of facility.* The sharp transformation in the physical equipment of the Municipal Railway is reflected in Part B of Table 95. In 1947, streetcars accounted for 159.2 million of the total of 221.4 million. By 1950, both the motor bus and trackless trolley were carrying more passengers. The conversion of motor bus routes to trackless trolley operation is apparent, in part, in the shift of passenger volume.

TABLE 95
SELECTED OPERATING DATA, SAN FRANCISCO MUNICIPAL RAILWAY, 1947–1950

Facility	1947	1948	1949	1950
A. Passengers per vehicle mile				
Streetcars	9.4	9.5	8.8	8.6
Cable cars	14.2	15.3	14.8	13.9
Trolley coaches	5.8	6.1	6.6	7.0
Motor coaches	4.4	4.8	4.5	4.9
Entire system	7.4	7.2	6.3	6.1
B. Passengers (in thousands)				
Streetcars	159,200	128,917	70,918	45,213
Cable cars	6,368	6,654	6,485	5,552
Trolley coaches	6,472	8,475	30,001	46,728
Motor coaches	49,378	68,293	88,528	85,925
Entire system	221,417	212,339	195,933	183,420
C. Operating costs (cents per vehicle mile)				
Streetcars	79.46	80.18	86.00	85.04
Cable cars	120.65	130.31	145.82	137.76
Trolley coaches	48.61	50.76	65.62	69.19
Motor coaches	37.30	40.70	47.80	48.46
Entire system	63.03	60.63	61.61	60.69
D. Average speed				
Streetcars	8.8	8.8	8.6	8.7
Cable cars	5.3	5.3	5.3	5.2
Trolley coaches	9.3	9.4	8.5	8.3
Motor coaches	10.4	9.9	9.6	9.5
Entire system	9.3	9.2	9.1	9.0

Source: Marmion D. Mills, *Report on the Rehabilitation of the San Francisco Municipal Railway* (San Francisco: April 1, 1951).

3. *Operating costs.* Part C of the table reveals wide variations in operating costs per vehicle-mile. Cable cars and streetcars have much the highest cost, while motor coaches have the lowest. An outstanding aspect of the data is the sharp rise in costs for trackless trolleys between 1947 and 1950. The conversion of equipment had the effect of lowering the overall operating costs per vehicle-mile.

4. *Average speeds.* Part D of the table reveals an overall decline in the average speed of these transit vehicles even for four years—from 9.3 mph. in 1947 to 9.0 mph. in 1950, despite modernization of equipment. The cable cars have by far the lowest average rate of speed due, in part, to the fact that they travel some of the steepest hills in San Francisco. While motor coaches have had the highest average rate, this has declined quite sharply in the four-year period. The rate of speed for trackless trolleys also had a sharp decline during the period. Only the street-cars and cable cars have had no change in average rates of speed.

TABLE 96
MONTHLY PASSENGER TRAFFIC, SAN FRANCISCO MUNICIPAL RAILWAY, 1951 AND 1952
(in thousands)

Month	1951	1952
January	15,926.0	15,096.0
February	14,143.6	12,941.2
March	16,326.5	15,175.0
April	15,483.7	15,397.4
May	15,941.9	15,351.7
June	15,430.8	13,279.7
July	14,596.3	13,287.2
August	15,171.7	13,065.0
September	14,480.3	13,399.0
October	16,537.8	14,325.4
November	15,056.2	12,962.4
December	14,973.6	13,751.8
Total	182,060.2*	168,031.9*

Source: California Public Utilities Commission.
* Totals do not add, due to rounding.

Seasonal Variations in Passenger Traffic

Table 96 reveals some peculiar characteristics of mass transit travel in San Francisco based upon 1951 and 1952 data. In 1951, peaks were reached in March and October, and low points in February and July. In 1952, the peaks were in April and May, with the low points in August and November. Christmas shopping did not create a seasonal bulge.

Changes in Fares

The Municipal Railway had a basic one-way fare of 5 cents in effect until 1944. Subsequent increases raised the fare first to 7 cents and then to 10 cents per ride. The current level dating from 1952 is 15 cents. As this report is being written, the scene is being set for an experiment with a 5-cent fare for a special shoppers' bus service.

LOCAL MASS TRANSPORTATION SITUATION IN OAKLAND AND EAST BAY CITIES

The East Bay, from Richmond on the north to San Leandro, San Lorenzo, and Hayward, on the east and south, is serviced by the buses and trains of the Key System. Until 1949, streetcars were used on selected routes, but have since been eliminated. Unlike San Francisco, no trackless trolleys presently are in use. Buses currently vary from equipment over 10-yrs. old, to those placed in use in 1952.

Changes in Annual Passenger Volumes

Data are available beginning in 1920 to show the volume of local passenger traffic via mass transit in the East Bay (see Table 97). Beginning with a peak

TABLE 97

CHANGES IN THE VOLUME OF KEY SYSTEM LOCAL PASSENGERS, EAST BAY CITIES, 1920–1952

	Passengers (in thousands)
1920	103,793
1921	101,787
1922	100,433
1923	101,642
1924	101,521
1925	102,633
1926	94,670
1927	91,023
1928	87,481
1929	84,544
1930	78,960
1931	69,976
1932	57,614
1933	53,485
1934	56,280
1935	57,375
1936	67,008
1937	67,892
1938	65,371
1939	66,546
1940	50,427
1941	52,188
1942	71,793
1943	84,206
1944	98,934
1945	110,424
1946	108,303
1947	91,216
1948	88,801
1949	87,114
1950	76,238
1951	70,667
1952	64,982

Sources: 1920–1945: Harland Bartholomew and Associates, *A Report on Transit Facilities and Mass Transportation for Eden Township, Alameda County, California*. Prepared for the Board of Supervisors, County of Alameda, California. (St. Louis: 1947), p. 10.

1946–1952: Taken from reports made to the California Public Utilities Commission.

of 103.8 million passengers in that year, there was a steady decline to 53.5 million by 1933. By 1937, the volume had recovered to 67.9 million, only to fall once again to an all-time low for the period of 50.4 million in 1940. The World War II conditions referred to above lead to a rapid rise to an all-time peak of 110.4 million in 1945. Since that date, there has been a rapid decline to 65 million in 1952. This volume was 38.8 million passengers below the 1920 level and 45.4 million fewer than the all-time peak in 1945. A look at the data indicates that, despite the enormous expansion of population in the East Bay cities, only in 1945 and 1946 did the passenger volume reach the levels of the 1920 to 1925 period. It is no wonder that the Bay Area Rapid Transit Commission Report concludes that per capita transit riding in East Bay cities is about the lowest in the United States.

Selected Operating Data

Several operating aspects of the Key System local lines may be indicated including data on number of scheduled runs for several important routes, passenger load factors for selected lines, bus-miles and revenue-per-mile statistics, and total revenues accounted for by groups of lines.

TABLE 98

VARIATIONS IN NUMBER OF SCHEDULED TRIPS FOR 20 KEY SYSTEM EAST BAY BUS LINES, 1953

Route	Direction	Monday to Friday	Saturday	Sunday
No. 7	To Euclid	55	50	34
	To Arlington	52	50	33
No. 11	North	40	38	22
	South	38	37	22
No. 12	North	55	49	36
	South	58	50	37
No. 14	North	51	45	28
	South	51	45	28
No. 15	North-West	117	91	48
	South-East	115	89	52
No. 18	North	93	64	47
	South	93	64	48
No. 30	North	43	31	28
	South	41	30	28
No. 42–42A	North	77	58	44
	South	81	60	44
No. 46	North	50	44	29
	South	52	46	29
No. 56	From S. L. Blvd.	65	48	48
	To S. L. Blvd.	61	47	47
No. 57	West	95	71	56
	East	93	71	53
No. 64	To Alameda	52	44	36
	From Alameda	53	45	37
No. 67	To Kenyon	62	50	32
	From Kenyon	59	49	32
No. 68	To Humboldt	31	31	18
	From Humboldt	31	31	19
No. 72	North	147	149	98
	South	144	148	96
No. 80	East	52	42	38
	West	49	43	38
No. 81	East	52	43	38
	West	50	42	38
No. 82	East	58	48	43
	West	60	48	43
No. 83	East	31	N.S.	N.S.
	West	27	N.S.	N.S.
No. 88	South	78	80	61
	North	80	78	59

Source: Schedules in effect, July 1, 1953.
N.S. = no service.

1. *Number of trips.* Table 98 indicates the wide range of scheduled trips for 20 selected local lines. The number of scheduled trips for Monday–Friday service ranges from a low of 31 to a high of 147 per route. On Saturday, the range is similar, from a low of 31 to a high of 149. But the Sunday deterioration is evident from the fact that the range is from a low of 18 trips to a high of 98 trips. Further aspects of these data, in terms of scheduled frequencies of service are available from Table 100.

2. *Number of passengers and passenger load factors.* Sharp variations are apparent in the utilization of various bus routes by passengers. Table 99 shows the relationship between the load factor and waiting time

TABLE 99

PASSENGER LOAD FACTORS AND RANGE OF WAITING TIME FOR 8 KEY SYSTEM LINES: 6:30 TO 11:30 A.M., AND 12:00 NOON TO 5:30 P.M., MARCH 10–11, 1952

Line	Inbound: 6:30 to 11:30 A.M., March 11, 1952			Outbound: 12:00 Noon to 5:30 P.M., March 10, 1952		
	Load Factor*		Range of Max. Wait (min.)	Load Factor*		Range of Max. Wait (min.)
	Range	Average		Range	Average	
No. 40-43	67–136	100	6–14	57–138	95	5–13
No. 80-83	73–136	98	6–13	63–120	92	6–11
No. 15	67–120	94	8–16	61–123	85	6–14
No. 18 (Park)	36–110	72	9–16	31–108	64	8–14
No. 18 (Lakeshore)	29–105	60	11–22	20–122	58	9–14
No. 42	22–116	50	9–23	22–118	64	13–22
No. 51-58	50–114	84	8–13	68–125	87	6–13
No. 11	27–124	64	14–25	24–120	61	13–22

Source: California Public Utilities Commission, *Key System Transit Line Application No. 33113: Report on Traffic Checks, Service and Future Mileage Estimates* (San Francisco: The Commission, May 29, 1952), pp. 2–5.

* *Load Factor:* Percent ratio between passengers carried and seats provided.

for buses. Each bus route has wide variations in the load factor between rush and non-rush hours. Each of the eight lines for which data were available had more than full seating capacity utilization during rush hours. On the average, however, there was a range from only 50 percent for the No. 42 line on inbound trips to 100 percent for the No. 40–43 line. Outbound, the range was from 58 to 95 percent. It will be noticed that those lines which have the higher passenger load factor also tend to have the shorter waiting times between buses, especially during the rush hours.

3. *Bus miles and revenue per mile.* Further characteristics of the revenue-producing characteristics of Key System bus routes may be had from Table 100. During 1952, all bus lines averaged 48.18 cents revenue per mile. For 38 lines, the range was from a low of 0.3 cents to a high of 74.9 cents. It will be noticed that the bus routes with the highest number of bus miles for the month tend to have, as would be expected, the higher revenues per mile.

A further aspect of these relationships may be had when the revenues generated by 43 bus lines are grouped according to scheduled frequency of service. As Table 101 indicates, the eight bus lines with the most frequent service accounted for 72.6 percent of the total revenues. Nineteen lines accounted for only 24.3 percent, and had intermediate frequency of service. The 16 lines with the most infrequent service accounted for only 3.1 percent. One may well ask the question, would improved frequency of service on several of the 35 lines be of some value in increasing revenues.

Change in Average Speeds

Available data permit a comparison of average rates of speed for eight lines between 1935 and 1946. Table 102 indicates wide variations between these lines from 7.1 mph. in 1946 for the San Pablo Avenue route to

TABLE 100

COMPARISON OF BUS MILES OPERATED, REVENUE PER MILE, AND WEEKDAY SCHEDULE FREQUENCY; KEY SYSTEM LOCAL LINES, FEBRUARY, 1952

Route	No. Bus Miles	Revenue per Mile (cents)	Weekday Schedule Frequency (minutes)			
			A.M. Peak	Mid-day	P.M. Peak	Night
7	22,052	29.62	15	20	10	30
11	15,659	46.12	15	20	10	30
12	18,627	55.15	16	20	16	30
14	15,764	39.98	17	20	12	30
15	74,112	55.87	6	8	5	20
17	7,660	12.56	15	40	10	30
18	37,489	57.32	8	10	6	20
39	10,575	22.36	10	40	20	40
40-43	184,425	52.21	4	5	2	10
42	41,466	48.19	4	20	7	30
44	5,421	31.12	20	30	20	30
46	16,850	32.96	15	20	15	30
50	4,875	23.76	30	40	30	30
51-58	131,552	64.39	4	6	3	15
53	8,105	38.00	15	20	15	30
54	9,945	34.41	20	20	20	30
55	11,892	21.65	10	20	15	30
56	22,148	24.86	20	20	20	30
57	50,243	35.32	5	15	5	30
59	12,982	13.21	20	20	20	40
60	6,628	21.42	15	30	15	30
64	17,277	35.19	15	20	20	30
65	7,165	30.93	20	20	20	30
67	27,245	25.39	15	20	10	30
68	10,840	20.54	30	30	30	60
69	15,463	45.62	20	20	20	30
72	131,107	55.37	5	7	4	10
73	4,185	54.21	24	—	12	—
74	9,473	23.43	20	20	20	30
76	9,316	15.89	20	40	20	60
78	30,430	35.12	15	15	15	30
79	13,032	16.53	15	30	15	40
80-82	154,992	50.29	5	10	4	10
83	63,444	74.94	4	7	4	—
84	5,712	30.05	20	30	30	30
86	10,402	0.32	5	30	20	30
88	35,529	69.70	12	15	7	20
91	4,576	13.26	60	60	60	—
Total.....	1,270,426	48.18	—	—	—	—

Source: California Public Utilities Commission, *Key System Transit Lines Application No. 33113, Report on Traffic Checks, Service, and Future Mileage Estimates* (San Francisco: The Commission, May 29, 1952), p. 19.

TABLE 101

TOTAL KEY SYSTEM REVENUE, LOCAL BUS LINES, ACCOUNTED FOR BY SELECTED LINES, FEBRUARY, 1952

Group	Total Revenue	Revenue Per Mile (cents)
1. *8 lines*—10 minute or less midday service and 20 minute or less night frequency*	$444,253	56.9
2. *19 lines*—11–20 minute midday service, and 21–30 minute night frequency†	148,758	39.4
3. *16 lines*—over 20 minute midday service, and over 30 minute night frequency‡	19,013	18.8
Total	$612,024	48.2

Source: California Public Utilities Commission, *Key System Transit Lines Application No. 33113, Report on Traffic Check, Service and Future Mileage Estimate* (San Francisco: The Commission, May 29, 1952), p. 19.

* Routes 15, 18, 40–43, 51–58, 72, 73, 80–82, and 83.

† Routes 7, 11, 12, 14, 42, 46, 53, 54, 55, 56, 57, 64, 65, 67, 69, 74, 78, 87, and 88.

‡ Routes 17, 39, 44, 47, 50, 59, 60, 68, 75, 76, 77, 79, 84, 90, 91, and 92.

15.2 mph. for the Oakland–Hayward route. Of greater significance is the decline in average speed between 1935 and 1946 for five of the eight lines. Two lines had increases of some significance, while the Oakland-Alameda line had little change. The sharp increase for the Oakland-Hayward line was due mainly to the institution of express bus service in place of combination bus-streetcar service.

Seasonal Variations in Passenger Traffic

The seasonal patterns for local passenger traffic in 1951 and 1952 closely parallel the patterns already discussed for San Francisco. In 1951, passenger traffic was at a low point in February and July, while the peaks were reached in March and October. In 1952, November was the low month, with the peaks in April and May.

Recent Changes in Fares

Key System local fares are based upon a division of the East Bay territory served into three zones: a central zone including Berkeley and central Oakland up to 60th Avenue and two zones in each direction from the central zone. In 1947, the basic central zone local fare was 7 cents per ride, or, if tokens were used, 15 rides for $1. A series of sharp increases have brought this central zone fare to its present level of 20 cents per ride, or three tokens for 50 cents.

TABLE 102

COMPARISONS OF AVERAGE SPEEDS FOR EIGHT SELECTED KEY SYSTEM ROUTES, 1935 AND 1946

Route	Type of Facility		Average Speed—mph.	
	1946	1935	1946	1935
Oakland–Hayward	Bus	Bus-streetcar	15.22	14.61
San Pablo Avenue	Streetcar	Streetcar	7.14	8.87
Telegraph Avenue	Streetcar	Streetcar	8.06	9.18
College Avenue	Bus	Streetcar	9.70	9.40
Park Blvd.–Lakeshore	Streetcar	Streetcar	7.46	8.95
Oakland–Richmond	Bus	Bus	12.36	13.52
Oakland–Alameda	Bus	Bus	10.78	10.73
Shattuck Avenue	Streetcar	Streetcar	7.51	8.73

Sources: Bartholomew Report on Mass Transit (1946); and 1935 Mass Transportation Survey for East Bay. See Bibliography for complete references.

VOLUME OF MASS TRANSPORTATION PASSENGER TRAFFIC IN OTHER BAY AREA CITIES

The Bay Area Rapid Transit Commission Report makes available 1951 passenger volumes for three additional bay area mass-transit facilities. These facilities and their 1951 passenger volumes are: 1) South San Francisco (Peninsula Bus Lines), 1,117,620; 2) Peninsula Transit Lines, 1,785,020; and 3) San Mateo-Burlingame Transit, 1,212,805. These volumes indicate the small-scale nature of the respective operations.

ESSENCE OF THE MASS TRANSPORTATION PROBLEM IN THE BAY AREA

What inferences can be drawn from these data so far as characterizing the nature of the mass transportation problem in the bay area is concerned? The Bay Area Rapid Transit Commission Report has summarized in effective fashion the essence of the problem from both the East Bay and the San Francisco viewpoints. The main aspects of the summary, together with points emphasized in this report, are as follows:

A. The problem in the East Bay

1. A large and steadily increasing population tends to travel by automobile. Conversely, both a decreasing proportion of the population is using mass transit facilities, and the number of rides per capita is among the lowest in the United States today.
2. Indications are that the more the automobile is used the less effective it becomes as a transportation medium. Rights of way become increasingly congested; parking spaces, if at all available, may be had only at increasing costs; and new facilities may be provided but only with heavy financial outlays.
3. Conversely, the more mass transit facilities are used, the more frequent the service that can be provided, and the better the equipment which can be used.
4. The success of mass transit in rebuilding former levels of acceptability and use, and to go beyond, in order to

render service the public will buy, consists of the following elements; (a) accessibility; (b) speed; (c) comfort; (d) costs; and (e) convenience.

5. A comparison of the cost of alternatives may be made as follows:
   a. Freeways or highways can handle only 1,500 vehicles or 2,625 persons per lane per hour.
   b. Rapid transit facilities can handle 40,000 persons an hour on a single track.
   c. Each rail line is the equivalent of 15 freeway lines.
   d. The cost of constructing subways runs as high as $15,000,000 per mile.
   e. Freeways in the East Bay currently cost $1,000,000 to $8,000,000 per mile, including acquisition of the necessary right of way.
   f. Substantial economies may be effected by combining rapid transit and vehicular rights of way.
   g. Each additional traffic lane added by widening streets can carry only 900 vehicles or 1,575 passengers per hour, in contrast to 9,000 passengers in buses or 13,500 passengers in streetcars.
   h. In many cities, the widening of streets results only in freeing additional curb parking space, at a cost per space as high as $500.
6. The importance of mass transportation during times of defense emergencies needs to be emphasized.

B. The problem in San Francisco

1. The interest in good mass transit is related to:
   a. Service which is frequent, fast, and attractive enough to attract commuters, shoppers, and business men.
   b. The preservation of the "Metropolitan Center" by such service.
   c. Avoiding the necessity of providing costly grade-separated approaches and off-street parking facilities for all of the private automobiles that might enter the district if there were no adequate rapid transit.
   d. Providing easy access to outlying segments of the metropolitan area.
2. The factors involved in improved mass transit are:
   a. Mass transit should be attractive enough to develop sufficient patronage, thus serving to reduce existing congestion caused by the widespread use of the private automobile.
   b. Mass transit should be grade-separated in San Francisco in order to reduce congestion.
   c. Mass transit facilities should have terminals which are convenient to users and which are coordinated with San Francisco's transit and traffic patterns.

Reasons for Development of Problems of Parking and Urban Transportation

This section summarizes the main reasons behind the development of urban transportation and parking problems in the San Francisco-Oakland metropolitan area. These reasons include: 1) changes in the quantity and quality of motor-transportation facilities; 2) effects of changing economic functions of cities and metropolitan areas; 3) causes of parking congestion; 4) effects of government activities; 5) the deterioration of mass transit service; 6) other factors.

CHANGES IN QUANTITY AND QUALITY OF MOTOR-TRANSPORTATION FACILITIES

One aspect of the problem of urban transportation is in the manner in which growth has influenced the decentralization and dispersion of economic activities. The tremendous expansion in the number of registered automobiles and trucks found in each of the six counties comprising the present metropolitan area was outlined earlier. This, in itself, has sparked a virtual revolution in the means of transporting people and goods. But what is of key importance is that this expansion requires a more-than-proportionate expansion of related facilities which cannot be provided as readily; *e.g.*, wider highways and freeways, parking facilities, and facilities catering to the maintenance of the vehicles themselves. And as has been noted, the expansion is in terms of both total and per-capita bases.

But the expansion in the use of the automobile and motor truck cannot be measured merely by the increase in the total and per-capita registrations. The problem is qualitative as well. Automobiles and trucks travel longer distances; they are used more frequently; and truck capacities have increased. Thus the multiplier effect of a mere increase in the total supply of the vehicles is accentuated when these qualitative factors are considered. If the supply of these vehicles in the bay area is estimated to double within the next few decades, the disorganizing influence on urban transportation may be expected to more than double in the absence of any corrective actions.

There is a so-called vicious-circle effect resulting from these trends. City streets and metropolitan-area highways are improved both in number and quality in response to the demand created; these improvements invite, in turn, both increased usage of trucks and automobiles already on the road and an increased desire on the part of nondrivers to drive. At this point in the cycle, the supply of such facilities begins to lag behind the expanding demand. Costs of construction rise, and the space required and available for such facilities becomes more and more difficult to acquire. Additional problems of accident-rate increase and traffic generated by these central facilities mount and accentuate the already acute and trying problems. People, economic activities, and other activities relocate in reaction against

congestion and maladjustments in existing centers, only to generate, in turn, new focal points for such problems.

One final aspect needs to be discussed, namely, the interplay of the increasing use of the motor vehicle on the one hand and changes in the utilization of mass-transportation facilities on the other. Concrete statistical measurement of the decline in the use of mass transportation in the bay area for various patterns of travel has been presented. A later section will deal more concretely with the factors involved in the deterioration of transit facilities and service. What needs to be emphasized at this point is the past lack of coordinated thinking in terms of relating improvements in facilities for automobiles and motor trucks to the mass-transport aspects of the problem.

Once again, the situation is not unlike that of a vicious circle. The stimulation of the increased use of the automobile and motor truck has been the result, in part, of provisions of various facilities designed to make possible faster and more-comfortable journeys. In relation to trends taking place in mass transit, the reaction on the volume of mass-transportation passenger volume is usually a sharp reduction.[73] This, in turn, causes rising levels of passenger fares, deteriorated service, and the like, which, when coupled with further comparative improvements in the private transportation situation, create further spirals of improved private transportation facilities and depressed effects on mass transportation. Barring a program of vigorous action, the total problem expands in scope, complexity, costs, maladjustments, and aggravating qualities.

EFFECTS OF CHANGING ECONOMIC FUNCTIONS OF CITIES AND METROPOLITAN AREAS

Without repeating or reviewing all of the prior analysis of decentralization, two aspects need emphasis at this point: 1) the widening use of the motor truck in connection with the changing economic functions of the cities and metropolitan area and 2) changing patterns of use of the passenger automobile.

Widening Use of the Motor Truck

The patterns of movements of goods by motor truck were outlined under four headings: 1) intracity movements, 2) movements between the various geographic segments of the metropolitan area, 3) movements between the various geographic segments of the metropolitan area and other geographic sections, and 4) variations in these three categories by time and distance elements. Perhaps some elaboration of these patterns will be useful in understanding the interrelationships being discussed at this point.

Considering intracity movements first, there are many intricate aspects of these overall movements to be noted. There are those movements by motor truck involving transfers of goods within the same business firm. These stress one aspect of the changing functions of the city and metropolitan area through the introduction of changes in the locational arrangements of different functional units of the same business firm. Again, the inter-firm transfer of goods reflects a widening circle of economic activities within the metropolitan area. These inter-firm transfers may involve movements of goods by truck between the same level of economic activities—from manufacturing establishment to manufacturing establishment or between one or more combinations of different business levels. Similarly, there are movements between manufacturing, wholesaling, retailing, and service establishments, on the one hand, and transportation facilities, such as trucking facilities, or to and from storage and warehouse facilities, or to various categories of customers of such establishments, on the other hand.

But these are only the patterns for intracity movements of goods by truck. The same intricate array of patterns must be extended to include movements between various cities in the metropolitan area, between unincorporated segments of the same metropolitan area, or between various combinations of these two groups. Finally, as the economic range of operation of the motor truck widens, there are expansions in the number of linkages which the motor truck makes possible between the various parts of the United States.

These ever-widening patterns of use of the motor truck strengthen the increasing range of economic functions of the metropolitan area, as well as its ever-widening geographical composition. Again, as has been noticed earlier, the increased use of the motor truck has had an important influence in changing the spatial arrangements of such functions within the cities and the metropolitan area.

Widening Use of the Passenger Automobile

Statistical evidence of the tremendous increase in the use of the automobile in the San Francisco-Oakland metropolitan area as measured by the number of registered cars has been presented, as well as one aspect of the qualitative nature of the increase in terms of the various purposes for which an automobile trip may be made. These need not be elaborated at this point, ex-

[73] Thus the American Transit Association reports that the total number of automobiles in the United States has risen from 28 million in 1946 to 44 million today. Meanwhile, the traffic on urban transit lines has dropped from 23 billion passengers in 1946 to 15 billion last year. And annual riding per capita on such facilities fell from 115 to 61.6. (Reported in *The Wall Street Journal*, Pacific Coast Edition, July 20, 1953.)

cept to emphasize the increasing patterns emerging from the growth of the bay area and the effects on the number of alternatives open to each driver in each category. The main significance for purposes of this discussion is to emphasize what has been pointed out many times before: *The more people that use the automobile, the less effective it becomes as a transportation facility*. (On the other hand, expanding use of mass-transit facilities tends to increase their effectiveness.) And this is true not only because of the increasing pressures placed on existing streets, highways, freeways, bridges, and parking spaces, but because the more an individual uses his automobile the more he becomes dependent upon it. This creates, in turn, one aspect of a problem to be discussed later, namely, how to convince automobile drivers to reduce the frequency of use of their vehicles in their day-to-day activities.

CAUSES OF PARKING CONGESTION

Apart from the factors referred to above, there are some eight categories of reasons which may be advanced specifically as the causes of parking congestion. The steady decline in the number of adequate curb parking spaces relative to the number of vehicles demanding such spaces has already been described. This lack of space creates a special form of congestion in the form of automobiles lagging in each block in the hope of spotting a driver who is about to vacate a curb space. This lagging flow of traffic leads, in turn, to a second cause of congestion—the conflict between curb or double-line parking, on the one hand, and the flow of street traffic, on the other hand. Such conflicts between parkers and flow of street traffic are aggravated where diagonal parking rather than parallel parking is permitted (as in Berkeley), and where curb parking is too close to bus and trackless trolley loading and unloading zones.

Not much needs to be said here about the obvious effects of illegal parking on the whole problem of congestion. The prevalence of illegal parking stems, in part, from the very lack of facilities as cited above. Accordingly, a $1 fine, for example, may be an insufficient deterrent compared with the alternatives open to the driver. Thus, while cities derive substantial amounts of revenues from such fines,[74] they find that the problem of illegal parking mounts. A small but growing problem arises, also, from the mechanical failures of parking meters which may permit undetected overtime parking. The net effect is to serve to decrease the existing parking capacity by reducing turnover.

[74] In San Francisco, these amounted to $394,938 for the 1951–1952 season (see *San Francisco Chronicle*, October 27 and 28, 1952).

The increased use of the motor trucks referred to above leads, in turn, to another cause of parking congestion, namely, the time consumed in loading and unloading such commercial vehicles. In San Francisco, this factor causes additional complications because many of the loading and unloading zones in the central business district face on narrow streets. And these streets, in turn, contain many off-street and curb parking facilities. The interference caused by such arrangements is one of the strangling factors in downtown San Francisco traffic.[75]

Parallel to the lack of adequate curb parking facilities is the inadequacy of existing off-street parking facilities in the bay area. Demand for parking facilities has outrun the ability of public and private capital to finance desired projects. Part of this is due to increasing lack of availability of good sites, especially at reasonable cost levels. In many instances there is a problem arising out of inadequate locations of such facilities as do exist. Other aspects of this problem are related to mounting parking costs, poor service, poor facilities, and the possibilities or actualities of damage to the automobile in the parking facility.

Two other causes of parking congestion are evident. One involves the increased shift from street cars to buses and trackless trolleys in bay area cities. The shift has been complete in the East Bay cities, and has taken place to a very substantial extent in San Francisco. This shift has meant a change from a straight-line movement of mass-transit facilities over a fixed right-of-way to a movement in which the mass-transit vehicles shift from curb to traffic lane and back again. This type of movement of bus and trackless trolley accentuates the conflict between the stream of traffic on a street and automobiles entering and leaving the parking places. The other cause is related to a policy question of whether or not cities are attempting to attract too many parkers. This aspect will be discussed later in detail.

EFFECTS OF GOVERNMENT ACTIVITIES

Space prevents more than a brief reference to the component aspects of the effects of government activities on the problems of urban transportation and parking. Five aspects may be referred to briefly. The first is the extent to which zoning activities may have failed to be coordinated completely with the overall

[75] Data on the traffic situation in the San Francisco fruit and vegetable market for two days in June 1942 illustrate this. On Friday, June 2, 1942, the range of vehicles was 127 at 4 A.M. to 597 at 7 A.M.; on Monday, June 22, 1942, the range was from 158 at 4 A.M. to 643 at 7 A.M. The increase in volume of trucked-in produce since these dates merely accentuate the situation (see W. T. Calhoun, H. E. Erdman, and G. L. Mehren, *Improving the San Francisco Wholesale Fruit and Vegetable Market*, U. S. Dept. of Agriculture, Bureau of Agricultural Economics, in cooperation with the University of California, College of Agriculture, Agricultural Experiment Station, February, 1943).

transportation needs of the various cities. Fortunately, there is increasing evidence in bay area cities of improved coordination of new zoning laws with adequate provision for parking and mass transportation. Related to this is a second aspect which involves consideration of the extent to which governmental agencies in the area have provided a groundwork for adequate urban mass-transportation facilities.

Closely related to these aspects are three other sets of factors. One is the adequacy of government enforcement of legal restrictions on parking. What needs to be questioned particularly at this point is whether or not the restrictions are severe enough relative to the mounting size of the problems of parking congestion and traffic flows in the area. Second, in this connection, is the size of the problem which will be created by the building of the projected transbay bridges. And the last factor to be mentioned in this connection is the very intangible aspect of the quality of the vision of the governing authorities in facing the increasing complexities of the bay area problems. The solution of the problems of parking and mass transportation in the San Francisco Bay area requires both drastic political actions by each major city, and an integration of efforts on a regional basis. The recent history of the wrangling over the projected transbay bridge between advocates of the northern and southern crossing, together with the resulting complications of the compromise effected, are fresh examples of the problem. And much of the problem is the result of political pragmatism on the part of government leaders in an unwillingness to antagonize any large blocs of voters. The result is failure to support necessary drastic plans of action designed to improve the parking and mass-transportation situations.

On the positive side, cooperative action of state and municipal government groups have been successful in providing the Bay Area Rapid Transit Commission with supporting allocations of funds for necessary research.

DETERIORATION OF MASS-TRANSIT SERVICE IN THE BAY AREA

The changes in quality and quantity of mass transportation in San Francisco, the East Bay cities, and commutation traffic were outlined previously. This section will elaborate on some of the reasons which underlie this deterioration. These reasons may be grouped under two headings: 1) those which are attributable to the respective transit managements and 2) those which lie beyond their control. Chief among the factors within the control of management has been its inability or unwillingness to improve the quality of transportation equipment used relative to the improvements in private transportation.

For example, as far back as the midthirties, recommendations made to the management of East Bay mass-transit facilities had included the substitution of the then-new "presidential conference" model streetcar for existing equipment. These recommendations were never put into effect. Thus the quality of the streetcar equipment remained unchanged over many decades, declining drastically relative to competing forms. San Franscisco, although using many of the new models, still has many old models in use. Transbay trains are slow, and their high centers of gravity produce uncomfortable riding. In addition, exit and entry are impeded by the use of a single set of doors (except at the San Francisco terminal) and by the necessity of using steep stairs within each car unit. More recently, buses and trackless trolleys have replaced streetcars, but these have not always improved either the speed or the comfort of the ride.

The lack of improvements in the quality of the equipment has been responsible, in part, for the failure of these transit facilities to show any improvements in the speed of travel. Indeed an actual deterioration of the speed of mass-transit travel has been noted. In part, the failure to improve speeds has been due to routing problems. In the East Bay, an increase in the length of key bus routes has resulted in difficulties of maintaining scheduled service. In a few cases, express buses have been introduced into local and transbay service.

More effective as a factor in the deterioration has been the vicious cycle of rate increases. The deteriorating effect has been due more apparently to the frequency with which changes have been instituted since 1947 than on the mere fact of an increase. These have led to diversions of passengers to the automobile, especially during nonrush hours, and reductions in scheduled service. As has been indicated, local fares in the East Bay, for example, have risen in the central zone from a level of 15 tokens for a dollar in 1947 to six tokens for $1 at present. In addition, the manipulation of zone differentials has meant equally significant increases in the cost of interzonal trips.

In San Francisco, local fares have jumped since 1947 from 5 cents to 15 cents per ride. Transbay fares via Key System trains and buses have risen likewise from a rate for the central zone of 17½ cents per ride, based on a 20-ride unlimited ticket, to the present rate of 50 cents per ride. Longer rides have had such increases in

rates that all require payment of the federal transportation tax in addition.

What needs to be emphasized in these increases, once again, is the rapidity of increases which cause declines in passenger traffic, which result, in turn, in requests for additional increases, and so on. Thus, the pattern diverts more passengers to automobile travel, accentuating traffic congestion.

Of the factors outside the control of the individual transit management, one of the most important has been the shortsighted view of government agencies. This shortsightedness has been manifested in part by the following: 1) an unwillingness, until recently, to recognize the importance of an integrated, high-speed transit system for the San Francisco-Oakland metropolitan area; 2) a lack of recognition of the interrelationship between the widespread provision of improved facilities for private transportation and the corresponding undermining of one of the economic bases of mass transit; and 3) the lack of recognition, in rate cases, of placing pressure upon management to try other tactics than merely rate increases in trying to maintain or increase mass-transit passenger traffic.

Especially shortsighted, in the writer's opinion, was the decision which permitted the Key System to shift its entire East Bay operations to the use of the motor bus without considering the advisability of maintaining some tracks as a framework for higher-speed transit. And presently, the Key System is attempting to abandon the operation of electric transbay trains on Lines A and B to Oakland. If granted, this means the ultimate complete abandonment of all electric transbay train service.[76]

What is needed is a complete reëvaluation of public necessity so far as provision of mass transit is concerned. From such reëvaluation must come a decision as to whether or not this requires public provision of aid and facilities in the same sense in which government agencies provide automobile and truck owners with a wide range of facilities.

OTHER FACTORS

One of the other factors arises from the effect of too-rapid expansion of freeway and parking facilities on the whole problem. This rapid expansion has aggravated congestion, increased demand for further parking space, and aided in diverting traffic from mass transit. It has accentuated diverse movements of economic activities with unpredictable effects on problems of transporting people and goods.

Other factors of importance are the rigidity imposed by topographical features in the bay area and by the system of streets in relation to present and future needs. Not far behind have been the antiquated traffic-signal systems (until very recently). Inadequate knowledge and study of the problem, and lack of data, have contributed further to the problem. And lack of vision among the very businessmen affected most by the problem has frequently stymied programs designed to reduce or eliminate some of the pressure areas.

Too often the problem has been thought of as affecting only the downtown sections of the larger cities. Unfortunately, it is too pervasive to be so easily confined. Other sections of this report will develop some aspects of this factor.

[76] Fortunately, many government agencies are now sufficiently perturbed and alerted as to vigorously oppose the petition. One of the most-interesting basis for opposition is that presented by Captain Eker of the San Francisco police, in charge of traffic. His opposition is based on the resulting congestion caused by substituting buses for trains (see *San Francisco Chronicle*, July 18, 1953).

Review of Transportation Trends and Related Studies

That there is a growing problem of adequacy of transportation in the area has been indicated by the analysis presented in the preceding sections. The nature of the problem and the increasingly complex patterns of movements of people and goods was discussed first, followed by discussion of the varying impacts of urban transportation upon the location of economic activities in metropolitan areas. The increasing inadequacies of the supply of curb and off-street parking facilities in San Francisco were next analyzed, together with the tendency towards longer parking times on the part of both workers and shoppers with corresponding reductions in turnover rates. The rising levels of parking costs are as to be expected. Oakland was then shown to have a somewhat-better balance between the supply of parking facilities and the demand with a large part of the supply in the form of parking lots. The considerable use of parking lots owned and controlled by the Downtown Merchants Parking Association, with validated parking through supporting members, was also discussed.

Considerable analysis of the declining use of mass-transit facilities for commuting purposes and for local travel in San Francisco and in East Bay cities has been presented. The loss of passengers, with the exception of commuters using Southern Pacific trains, has affected

TABLE 103
PERCENTAGE DISTRIBUTION OF CUSTOMERS IN DOWNTOWN KANSAS CITY, BY FUNCTIONAL REASONS FOR MAKING TRIP
Saturday, April 18, 1953, and Thursday, April 23, 1953

Functional Reasons	Saturday, April 18, 1953	Thursday, April 23, 1953
No. of persons interviewed	1,101	1,295
Percentage distribution		
1. Shopping	60.0	61.1
2. Work	11.4	21.2
3. Medical and Dental	7.8	3.2
4. Dates and appointments with friends	5.1	3.1
5. Movies, theatres, sports, public events	4.7	1.5
6. Beauty parlors and other personal services	3.2	1.9
7. Paying bills	3.0	1.3
8. Official meetings	2.1	2.0
9. Government business	0.6	0.5
10. Banking	0.3	0.9
11. All others	1.6	2.5
No answers	0.2	0.8
Total	100.0	100.0

Source: Community Studies, Inc., *Downtown Transportation Survey: A Survey of Methods of Transportation Used by Shoppers to Reach the Downtown Area of Kansas City, Missouri* (Kansas City, Mo.: May 1953).

all classes of traffic. In addition, speeds of travel have shown serious reductions in many instances, especially if improvement in equipment and right-of-way are considered. The declines in passenger traffic have been so rapid since the peak of 1945 and 1946 that the main defenses of the transit lines have been sharp increases in fares and serious reductions in service, especially for evening and Sunday schedules. From these data the essence of the mass-transportation problem in the bay area was outlined. Finally, some explanations for the changes analyzed were advanced.*

WHY PEOPLE TRAVEL TO DOWNTOWN AREAS OF CITIES

To establish the necessary interrelationships between the three problem areas under study, some discussion is necessary at this point as to why people travel to the downtown areas of cities. Apart from the outline given at the outset, the discussion in this section considers two aspects. The first is the general breakdown of the functional purposes for which people travel to downtown areas. The other aspect is the reasons why people prefer to shop in downtown as against other retail establishments.

* In his original manuscript the author outlined a general plan of recommendations, embodying suggestions for short-run and long-run improvements of both local and interurban transportation in the San Francisco Bay area, including changes required in public policy toward such matters. Since it was beyond the scope of this research project, this section is not included herein. Copies may be obtained by writing the author at the School of Business Administration, University of California, Berkeley 4, California.—ED.

Functional Purposes of Downtown Trips

From the data in Table 103, it is apparent that shopping was the functional reason for trips made by three out of every five customers interviewed in Kansas City. Work was a poor second due, in part, to where the sample was taken, but the proportions giving this reason varied sharply as between Thursday and Saturday. The other functional reasons together accounted for 16.9 percent on Thursday and 28.4 percent on Saturday. The higher percentage on Saturday is due mainly to the sharp decrease in numbers of persons going to work on Saturday. Although the distribution is on the basis of the main reason given, it is apparent that many persons had a combination of functional purposes in mind in making the trip.

The relationship between purpose of trip and mode of travel is interesting in view of the earlier breakdowns given for Oakland and San Francisco. Of the workers interviewed, 75.7 percent used bus or streetcar, 17.2 percent traveled in their own or some other person's automobile, 3.7 percent walked, and the remainder gave no answer or fell into an unclassified category. Of a group of customers of twelve downtown stores, 56.4 percent used bus or streetcar, 40.5 percent used automobile or taxicab, and 3.1 percent walked.

A somewhat-different, although not-as-detailed, set of functional reasons is given for trips to the Central Business District of Washington, D. C.[77] Of 107,152 trips analyzed in 1948, 45.6 percent were for work, 23.4 percent for shopping, 13.8 percent for social and recreational purposes, 8.2 percent for business, and 9.0 percent for "all other reasons." The sharp difference in the percentage distribution between Kansas City and Washington is attributable, in part, to the high concentration of government employment in the central business district of Washington. But more important is the fact that the Kansas City data pertained only to persons who were shoppers at some time during their downtown trip, while the Washington sample was unlimited. Of all trips made to the central business district of Washington, 62.4 percent were made by transit, 33.2 percent by automobile, and 4.4 percent by taxicab. But unlike the situation in Kansas City, mass transit accounted for 71.1 percent of the shopping trips and 67.5 percent of the work trips. The predominance of automobile trips for other purposes is apparent.

Reasons for Shopping in Downtown Retail Establishments

Since shopping ranks as the most-important functional purpose for trips by nonworkers, an explanation

[77] Gordon B. Sharpe, *Travel to Commercial Centers of the Washington Metropolitan Area*, Bulletin 79, Travel to Commercial Centers, (Washington, D. C.: Highway Research Board, 1953).

of why people shop in downtown retail establishments may be in order. Although evidence from only a few studies can be included here, it is recognized that many special factors pertinent to a local situation in each city will affect the reasons given and their proportional importance.

In Jonassen's study of the attitudes of shoppers in Columbus, Ohio, various data of importance for explanations of why people shop in downtown retail establishments were collected.

In Table 7 on page 18, the advantage securing first rank on a composite basis (large selection of goods) is exactly the advantage which has been stressed in the marketing literature for many years. The next-most-important advantage (can do several errands at one time) reflects the locational linkages which have been discussed elsewhere. And no surprise need be shown over the third composite choice (cheaper prices). But the fourth choice (convenient public transportation) is obviously one which will occupy a variable rank of importance from city to city, depending upon the quality and frequency of the facilities and service offered.

In considering these data, it must be remembered that other advantages may be associated with trips made for other than shopping purposes. Some of these may arise, for example, from the fact that the downtown area has the only facility in the city, e.g., an opera house or legitimate theater. Similarly, medical and dental trips may be due to the central location of the only specialist in the city.

WHY PEOPLE TRAVEL TO AND SHOP IN OUTLYING SHOPPING CENTERS

This discussion is concerned mainly with trips made to outlying shopping centers. But even though dealing only with such centers, the importance of short trips to string-street districts, mainly for convenience goods and services, should not be overlooked.

Functional Purposes of Outlying-Shopping-Area Trips

Data are available from the Washington, D. C., study which show the functional purposes of trips made to 14 outlying shopping centers of that city. On the average, trips for shopping purposes accounted for 35.5 percent of all trips. The range was from a low of 14.2 percent to a high of 62.7 percent. Half of the centers had higher-than-average percentages of trips made for shopping purposes.

The second-most-important functional purpose for all fourteen centers combined was trips made for work, 21.6 percent. The range was from a low of 5.4 percent to a high of 31.2 percent. Eight of the fourteen centers had higher-than-average percentages.

Social-recreational trips followed with 21.5 percent of all the trips, ranging from 37.1 percent down to 8 percent, with as many above as below the average.

Business trips accounted for only 5.9 percent of all trips made to the fourteen centers combined, with a range from only 1.0 percent to a high of 10.8 percent. Only six of the shopping centers had percentages exceeding the average. On the average, 15.5 percent of all trips were made for other than the four reasons specified. A wide range exists among the centers with a low of only 4 percent and a high of 39 percent. Only five of the centers had percentages higher than the average.

One sixth of all trips made to the fourteen shopping centers were made by mass transit, while only 12.2 percent of the shopping trips were made in such facilities. Use of automobiles for all trips ranged from 71.1 percent to 96.9 percent. For shopping trips, the use of the automobile ranged from a low of 67.0 percent to a high of 98.3 percent, with an overall percentage for the 14 centers of 87.8.

Reasons for Shopping in Outlying Shopping Centers

The Columbus study also has a tabulation of certain disadvantages of downtown shopping (see Table 8, page 18). It is interesting to note that the most important disadvantages reported against downtown shopping are related to parking and congestion, particularly difficult parking. However, of great interest is Jonassen's conclusion (page 32) that as little as 10 percent of those most concerned with the difficulties and expense of parking and traffic would allow these deterrents to prevent them from driving their cars downtown to shop.

From this and the other downtown disadvantages it can be seen that problems of urban transportation, more than any other single factor, affected the willingness of people in Columbus to shop in downtown establishments.

How do these negative aspects of downtown shopping affect the positive advantages of patronizing the outlying shopping centers? The Jonassen study advances three main reasons: "nearer home," "easy parking," and "more convenient shopping hours." On the other hand, these centers had three prime disadvantages: "lack of large selection of goods," "not all kinds of businesses represented," and "prices too high."

Relationship of Urban Transportation to Property Values and Urban Decentralization

This concluding section brings together some of the qualitative interrelationships between the urban transportation problem and the centralization, decentralization, and dispersion of economic activities as these have been analyzed in this part and trends of central city property values presented in Part 4 of this composite report on the effect of parking on business. Together, these analyses form an interrelated treatment of the study of the structure and function of the bay area.

REVIEW OF PERTINENT BACKGROUND MATERIALS

In order fully to understand and appreciate the intricacies of the interrelationships to be discussed, a brief review of some pertinent materials is in order. First in importance is the emphasis which must be placed upon the structure of the metropolitan area and its inherent cohesive nature. The San Francisco-Oakland metropolitan area, as defined in these studies, is a six-county geographical unit having the characteristic, first of all, of being centered around the gravitational pull of San Francisco and Oakland. These central cities and the remainder of the metropolitan area have various types of linkages which underlie the necessary cohesiveness of the entire metropolitan area and which permit, at the same time, shifts between the various segments of the metropolitan area as to where people live and where functions—economic, social, government, etc.—take place.

The functional bases of the bay area are complex and ever changing. As has been stressed in preceding discussions, the problems being investigated pertain to many classes of economic activities, namely, agriculture, manufacturing, wholesaling, retailing, and service trades. But in addition, there are many social and governmental activities. Thus, the problems of urban transportation, property values, and decentralization are something more than merely what is going to happen to the downtown district of San Francisco or Oakland or to the merchants in such districts.

Earlier sections pointed out that such geographic shifts as have taken place in the bay area are much more complex than is usually designated by the term "decentralization." It was indicated that such geographic shifts have varied according to class of activity. Thus, a much-higher proportion of wholesale trade is concentrated in San Francisco than of retail trade. And there are similar sharp variations between the subgroups in each class. In addition, the proportions of each class and subgroup bear varying relationships in each city and county to the proportions of population.

Other aspects of the analysis indicated that although the proportions of the bay area totals for each class and subgroup found in San Francisco have declined, the absolute changes frequently have shown different relationships in that San Francisco accounted for a large percentage of such changes. And the same was true in many cases for Oakland. All in all, many of the shifts bear a much-closer relationship to factors of an expanding total economic base than merely locational shifts from the larger cities to the smaller ones. Much of this growth and the accompanying geographic shifts are due to this general economic growth which has characterized so many sections of the West. But, within the bay area itself, part of the shift is inherent also in the fact that San Francisco, with a limited physical size of 44.6 sq. mi. of land area, is reaching its physical limits of capacity to handle much of the expansion. And certain kinds of expanding activities must, in any case, adapt themselves to where people live for reasons of convenience, etc.

Throughout there is the necessity for reëmphasizing the following: 1) the complex nature and varying interrelationships between all classes and subgroups of activities and, therefore, 2) the importance of considering both the overall metropolitan area aspects of the problem and those aspects which have primarily city-wide implications.

INTERRELATIONSHIPS BETWEEN URBAN TRANSPORTATION, PROPERTY VALUES, AND URBAN DECENTRALIZATION

There are no series of comparable statistical data by means of which correlation can be established between changes in the adequacy of parking facilities, declines in the number of mass transit riders, and central property values and location of economic activities in the area. All that can be done in this section is to outline some of the main qualitative interrelationships.

Preceding sections of this report have established that there has been a deterioration of adequacy of supply of parking facilities in downtown San Francisco along with a sharp decline in the use of both local and commuter mass-transit facilities. On the other hand, downtown Oakland has continued to have adequate central district parking facilities, although mass-transit

usage has declined to a point where per-capita usage in East Bay cities is among the lowest of any place in the United States.

These trends point up the dilemma of central districts everywhere. Both the San Francisco and Oakland business districts are the result of the confluence of major rapid-transportation routes. In San Francisco, it is the confluence on Market Street which serves as the major pattern, with parking facilities at Union Square an important modifying force. In Oakland, the confluence on Telegraph, Broadway, San Pablo, and 14th Street, are significant. And, in both cities, motor routes have served merely to reënforce the earlier influences of transportation. Thus, the downtown areas thrive because transportation routes bring larger proportions of people to these areas than elsewhere. Whatever interferes with the effectiveness of such process interferes with the maintenance of the area's dominant position.[78]

How have property values fared in the central districts of San Francisco and Oakland? Wendt reaches the following conclusions on page 149:

> By 1950, sales prices of downtown real estate in San Francisco and Oakland had risen from depression lows to values close to those established at the peak in the late 1920's. The fact that current sales prices for the sample of properties studied in San Francisco were higher relative to the 1920's than was true for the Oakland sample is probably a reflection of some differences in the composition of the sample in the two cities and the well-established investment position of San Francisco property, as well as the greater degree of optimistic speculation in Oakland real estate during the boom of the 1920's.

It is interesting to note that the very problem of parking in the central business districts has created substantial property developments in garage and parking facilities. In this connection, Wendt comments: "It is notable that many postwar sales of property on the fringe of the central business districts of Oakland and San Francisco have been for garage and parking development. The prices at which this property has been sold would seem to indicate that parking as a private business offers strong inducements to business-property investors."

We may quote Wendt finally as to what some of the principal factors are which have influenced the general pattern of property values noted. On page 150 he states:

> Several factors appear to have acted to hold business and maintain values in the central business districts during recent years. Older buildings, which may be fully depreciated on the books of present owners, represent attractive investments to prospective new owners, since tax laws permit new owners to establish depreciation charges based upon purchase prices. Such permitted depreciation changes represent so-called tax-free income to investors. Further, the prospects of having to pay high capital-gains taxes upon the sale of properties has discouraged present owners from selling, thus tending to raise offering prices. During recent years of high construction costs, investors have found it profitable to acquire old buildings in preference to building new structures (in other locations), and consequently, they have bid up the prices of older buildings in central business districts. The combination of these factors has served to hold business and encourage investment in downtown real estate.

The maintenance of property values in downtown San Francisco, in the light of the deterioration of both parking supply and mass transportation as analyzed, is to be explained mainly in terms of the expansion of economic and governmental activities in absolute terms both in San Francisco and the entire area. The downtown section is the nodal point for office activities of various types as well as for retail trade. And the expectations of expansion of the bay area during the next few decades, if realized, can mean only greater needs for business offices in central locations, for expanded financial institutions, and for expansion in wholesale, retail, and service trades activities. The central districts must be in a position to aggressively compete for a significant share of such expansion.

It can only be inferred from the analysis of the bay area studies, that the retail-business section of the downtown area is especially vulnerable to the deterrents related to deterioration of urban transportation by means of the automobile and mass-transit facilities. From this inference it may be argued that the volume of retail trade in downtown San Francisco, while increasing between 1929 and 1952, has failed to keep pace with the overall rate of growth in the area. Therefore, when added to the increasing base of other economic and governmental activities, it might be argued that property values should have increased instead of merely reaching the peak of the 1920's. Wendt's treatment of the factors involved, however, illustrate the complex array of variables which must be noted.

A comparison with Seattle might be in order at this point. On page 61 Wagner indicates that the share of the city's total retail trade accounted for in downtown Seattle declined from 39.6 percent in 1939 to 34.8 percent in 1948. The decline, however, varied as between different types of establishments. Losses in relative terms were smallest for shopping and specialty goods stores where variety and comparison shopping were important. On the other hand, convenience-goods

[78] An extreme illustration of this is the weak position of the downtown area in Los Angeles.

stores, and stores requiring large space for the turnover realized (*e.g.*, furniture, home furnishings, and appliances) had the largest relative declines. So far as property values in Seattle are concerned, values in the retail section of downtown Seattle in 1952 were 115.4 percent of the 1939 base, compared with 165.0 percent for the entire city (see page 65).

The National Association of Real Estate Boards has compiled summary information of trends in the retail sales of central districts in 12 cities as compared with the suburbs.[79] Increases in the importance of retail sales in the central districts were reported for Atlanta and New Orleans; no change was reported for Kansas City (Missouri), New York, Portland (Oregon), and Washington (D. C.). Decreases were reported for Baltimore, Buffalo, Chicago (unofficial estimates), Cleveland, Louisville, and San Francisco.

Even these mixed trends based on sparse data merely reflect, once again, the complex nature of the problem of understanding what has been happening.

The situation in Oakland is somewhat different than in San Francisco. Its downtown section, so far as financial and office building space are concerned, did not develop until after the 1906 earthquake as compared with the 1880's for San Francisco. The retail and service trades of downtown Oakland are considerably less developed than for San Francisco. In addition, they are more widely scattered than is the case for San Francisco. Yet, the city's share of wholesale and retail trade has fared better in the metropolitan area picture. Part of this is related to the availability of room for expansion in Oakland and part may be related to availability of parking space. A good deal is related to the rapid growth of the surrounding environs of the East Bay. And yet, the physical structure of Oakland's downtown section is characterized by an overwhelming number of relatively low structures and a lack of tall buildings such as are found in San Francisco.

The avoidance of congestion, poor parking, inadequate mass transit, and high transportation costs have been instrumental, together with other factors, in spreading the geographic base of economic activities in the bay area. Particularly to be noted among the other factors is the importance of the automobile and motor truck in accelerating the geographic expansion. In permitting the bay area to best adjust itself to the possibilities of the coming growth, what needs to be avoided are policies which will result in 1) uneconomic development of private transportation facilities, 2) the uneconomic spreading out and over-expansion of economic facilities, and 3) the stratification instead of the unification of the structural and functional bases of the San Francisco-Oakland metropolitan area. For it may be only a short time before the outlying sections of the larger cities and the central districts of the smaller cities suffer from the same problems of urban transportation.[80]

One must conclude that a downtown area will suffer in attracting economic activities, especially retail trade, if there is a deterioration of urban transportation. If the city is declining in total, the result will be a more-than-average decline for the downtown section. If the entire economic base is expanding, the result will be an absolute increase for the downtown section but a less-than-proportionate relative change.

[79] "Summary of Urban Development Information Provided by Twenty-Two American Cities." The Rebuild America Committee of the National Association of Real Estate Boards, September, 1952.

[80] Several examples of this tendency may be noted already. Outlying districts of San Francisco are complaining about the "diversion" of funds from parking meters in their districts to provide central district facilities. Instead they are clamoring for off-street facilities for their own districts. Such facilities already are being built in Berkeley for the Telegraph-Durant shopping district.

That smaller cities are suffering from congestion and lack of parking facilities is evident, also, from such reports as "Small Cities are Turning Traffic Jams into Profits," *Business Week*, March 22, 1952, pp. 98 ff; and the examples of parking facilities described in *Parking—How It is Financed* (New York: National Retail Dry Goods Association, 1952).

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APPENDIX A

TABLE A-1

DISTRIBUTION OF SAN FRANCISCO-OAKLAND METROPOLITAN AREA POPULATION BY INCORPORATED CITIES, AND BY "REMAINDER OF TOWNSHIPS" IN EACH COUNTY, IN DECLINING ORDER OF IMPORTANCE, 1900–1950

Incorporated Cities and Remainder of Townships (1950 Rank)	Number of Persons						Percentage of Area's Total					
	April 1, 1950	April 1, 1940	April 1, 1930	Jan. 1, 1920	April 15, 1910	June 1, 1900	April 1, 1950	April 1, 1940	April 1, 1930	Jan. 1, 1920	April 15, 1910	June 1, 1900
Principal incorporated cities												
300,000 and over												
San Francisco (San Francisco)	775,357	634,536	634,394	506,676	416,912	342,782	34.60	43.41	47.07	50.19	53.87	63.13
Oakland (Alameda)	384,575	302,163	284,063	216,261	150,174	66,960	17.16	20.67	21.07	21.42	19.40	12.33
Total	1,159,932	936,699	918,457	722,937	567,086	409,742	51.76	64.08	68.14	71.61	73.27	75.46
75,000–299,999												
Berkeley (Alameda)	113,805	85,547	82,109	56,036	40,434	13,214	5.08	5.85	6.09	5.55	5.23	2.43
Richmond (Contra Costa)	99,545	23,642	20,093	16,843	6,802	N.I.	4.44	1.62	1.49	1.67	0.88	N.I.
Total	213,350	109,189	102,202	72,879	47,236	13,214	9.52	7.47	7.58	7.22	6.11	2.43
25,000–74,999												
Alameda (Alameda)	64,430	36,256	35,033	28,806	23,383	16,464	2.88	2.48	2.60	2.86	3.02	3.03
San Mateo (San Mateo)	41,782	19,403	13,444	5,979	4,384	1,832	1.86	1.33	1.00	0.59	0.56	0.34
San Leandro (Alameda)	27,542	14,601	11,455	5,703	3,471	2,253	1.23	1.00	0.85	0.57	0.45	0.42
Vallejo (Solano)	26,038	20,072	16,072	21,107	11,340	7,965	1.16	1.37	1.19	2.09	1.46	1.47
Redwood City (San Mateo)	25,544	12,453	8,962	4,020	2,442	1,653	1.14	0.85	0.67	0.40	0.32	0.30
Total	185,336	102,785	84,966	65,615	45,020	30,167	8.27	7.03	6.31	6.51	5.81	5.56
10,000–19,999												
Burlingame (San Mateo)	19,886	15,940	13,270	4,107	1,565	N.I.	0.89	1.09	0.99	0.40	0.20	N.I.
South San Francisco (San Mateo)	19,351	6,629	6,193	4,411	1,989	N.I.	0.86	0.45	0.46	0.44	0.26	N.I.
El Cerrito (Contra Costa)	18,011	6,137	3,870	1,505	N.I.	N.I.	0.80	0.42	0.29	0.15	N.I.	N.I.
Albany (Alameda)	17,590	11,493	8,569	2,462	808	N.I.	0.78	0.79	0.64	0.24	0.10	N.I.
Daly City (San Mateo)	15,191	9,625	7,838	3,779	N.I.	N.I.	0.68	0.66	0.58	0.38	N.I.	N.I.
San Pablo (Contra Costa)	14,476	N.I.	N.I.	N.I.	N.I.	N.I.	0.65	N.I.	N.I.	N.I.	N.I.	N.I.
San Carlos (San Mateo)	14,371	3,520	1,132	N.I.	N.I.	N.I.	0.64	0.24	0.09	N.I.	N.I.	N.I.
Hayward (Alameda)	14,272	6,736	5,530	3,487	2,746	1,965	0.64	0.46	0.41	0.35	0.36	0.36
San Rafael (Marin)	13,848	8,573	8,022	5,512	5,934	3,879	0.62	0.59	0.59	0.55	0.77	0.71
Menlo Park (San Mateo)	13,587	3,258	2,254	N.I.	N.I.	N.I.	0.61	0.22	0.17	N.I.	N.I.	N.I.
Pittsburg (Contra Costa)	12,763	9,520	9,610	4,715	2,372	N.I.	0.57	0.65	0.71	0.47	0.31	N.I.
San Bruno (San Mateo)	12,478	6,519	3,610	1,562	N.I.	N.I.	0.56	0.45	0.27	0.16	N.I.	N.I.
Antioch (Contra Costa)	11,051	5,106	3,563	1,936	1,124	674	0.49	0.35	0.26	0.19	0.15	0.12
Piedmont (Alameda)	10,132	9,866	9,333	4,282	1,719	N.I.	0.45	0.67	0.69	0.42	0.22	N.I.
Total	207,007	102,922	82,794	37,758	18,257	6,518	9.24	7.04	6.15	3.75	2.37	1.19
5,000–9,999												
San Anselmo (Marin)	9,188	5,790	4,650	2,475	1,531	N.I.	0.41	0.40	0.35	0.25	0.20	N.I.
Millbrae (San Mateo)	8,972	N.I.	N.I.	N.I.	N.I.	N.I.	0.40	N.I.	N.I.	N.I.	N.I.	N.I.
Martinez (Contra Costa)	8,268	7,381	6,569	3,858	2,115	1,380	0.37	0.50	0.49	0.38	0.27	0.25
Mill Valley (Marin)	7,331	4,847	4,164	2,554	2,551	N.I.	0.33	0.33	0.31	0.25	0.33	N.I.
Benicia (Solano)	7,284	2,419	2,913	2,693	2,360	2,751	0.33	0.17	0.22	0.27	0.31	0.51
Concord (Contra Costa)	6,953	1,373	1,125	912	703	N.I.	0.31	0.09	0.08	0.09	0.09	N.I.
Belmont (San Mateo)	5,567	1,229	984	N.I.	N.I.	N.I.	0.25	0.09	0.07	N.I.	N.I.	N.I.
Total	53,563	23,039	20,405	12,492	9,260	4,131	2.40	1.58	1.52	1.24	1.20	0.76
Under 5,000												
Sausalito (Marin)	4,828	3,540	3,667	2,790	2,383	1,628	0.21	0.24	0.27	0.28	0.31	0.30
Livermore (Alameda)	4,364	2,885	3,119	1,916	2,030	1,493	0.20	0.20	0.23	0.19	0.26	0.28
Fairfax (Marin)	4,078	2,198	N.I.	N.I.	N.I.	N.I.	0.18	0.15	N.I.	N.I.	N.I.	N.I.
Atherton (San Mateo)	3,630	1,908	1,242	N.I.	N.I.	N.I.	0.16	0.13	0.09	N.I.	N.I.	N.I.
Hillsborough (San Mateo)	3,552	2,747	1,891	931	N.I.	N.I.	0.16	0.19	0.14	0.09	N.I.	N.I.
Vacaville (Solano)	3,169	1,614	1,556	1,254	1,177	682	0.14	0.11	0.12	0.12	0.15	0.13
Fairfield (Solano)	3,118	1,312	1,131	1,008	834	1,220	0.14	0.09	0.08	0.10	0.11	0.22
Larkspur (Marin)	2,905	1,558	1,241	612	594	N.I.	0.13	0.11	0.09	0.06	0.08	N.I.
Emeryville (Alameda)	2,889	2,521	2,336	2,390	2,613	1,016	0.13	0.17	0.18	0.24	0.34	0.19
Walnut Creek (Contra Costa)	2,420	1,578	1,014	538	N.I.	N.I.	0.11	0.12	0.08	0.05	N.I.	N.I.
Pleasanton (Alameda)	2,244	1,278	1,237	991	1,254	1,100	0.10	0.09	0.09	0.10	0.16	0.20
Ross (Marin)	2,179	1,751	1,355	727	556	N.I.	0.10	0.12	0.10	0.07	0.07	N.I.
Corte Madera (Marin)	1,933	1,098	1,027	607	N.I.	N.I.	0.09	0.07	0.08	0.06	N.I.	N.I.
Rio Vista (Solano)	1,831	1,666	1,309	1,104	884	682	0.08	0.11	0.10	0.11	0.11	0.14
Brentwood (Contra Costa)	1,729	N.I.	N.I.	N.I.	N.I.	N.I.	0.08	N.I.	N.I.	N.I.	N.I.	N.I.
Dixon (Solano)	1,714	1,108	1,000	926	827	783	0.08	0.08	0.08	0.09	0.11	0.14
Pinole (Contra Costa)	1,147	934	781	967	798	N.I.	0.05	0.06	0.06	0.10	0.10	N.I.
Suisun (Solano)	946	706	905	769	641	625	0.04	0.05	0.07	0.08	0.08	0.12
Belvedere (Marin)	800	457	500	616	481	434	0.04	0.03	0.04	0.06	0.06	0.08
Total	49,476	30,859	25,311	18,146	15,072	9,663	2.22	2.12	1.90	1.80	1.94	1.80
Total, all incorporated cities	1,868,664	1,303,493	1,234,135	929,827	701,931	473,435	83.41	89.32	91.60	92.13	90.70	87.20

TABLE A-1—*Concluded*

Incorporated Cities and Remainder of Townships (1950 Rank)	Number of Persons						Percentage of Area's Total					
	April 1, 1950	April 1, 1940	April 1, 1930	Jan. 1, 1920	April 15, 1910	June 1, 1900	April 1, 1950	April 1, 1940	April 1, 1930	Jan. 1, 1920	April 15, 1910	June 1, 1900
Remainder of townships												
Alameda												
Eden Township	73,789	22,354	14,912	8,793	5,298	5,112	3.29	1.53	1.11	0.87	0.68	0.94
Washington Township	16,895	13,051	12,711	8,494	7,874	6,914	0.76	0.89	0.94	0.84	1.03	1.27
Murray Township	4,167	2,617	2,963	1,992	2,107	2,507*	0.19	0.18	0.22	0.20	0.27	0.46*
Pleasanton Township	3,621	1,643	1,513	1,305	1,629	2,072	0.16	0.11	0.11	0.13	0.21	0.38
Brooklyn Township	—	—	—	26	463	8,168*	—	—	—	†	0.06	1.50*
Oakland and Peralta Townships	—	—	—	1,233	128	959*	—	—	—	0.12	0.02	0.18*
Total	98,472	39,665	32,099	21,843	17,499	25,732	4.40	2.71	2.38	2.16	2.26	4.74
Contra Costa												
Township #3	24,507	5,522	3,160	1,884	1,330	N.A.	1.10	0.38	0.23	0.19	0.17	N.A.
Township #6	23,606	2,193	1,082	640	1,254	N.A.	1.06	0.15	0.08	0.06	0.16	N.A.
Township #5	18,706	5,617	3,611	2,695	1,547	N.A.	0.83	0.38	0.27	0.27	0.20	N.A.
Township #10	15,101	4,643	2,944	2,059	1,379	N.A.	0.67	0.32	0.22	0.20	0.18	N.A.
Township #7	6,601	3,355	1,423	226	1,432	N.A.	0.29	0.23	0.11	0.02	0.19	N.A.
Township #11	6,558	2,467	1,987	1,407	978	N.A.	0.29	0.16	0.15	0.14	0.13	N.A.
Township #1	5,364	3,038	2,523	1,105	957	N.A.	0.24	0.21	0.19	0.12	0.12	N.A.
Township #17	5,135	2,945	2,908	1,907	—	N.A.	0.23	0.20	0.22	0.19	—	N.A.
Township #12	4,596	4,470	4,315	4,184	2,402	N.A.	0.21	0.31	0.32	0.41	0.31	N.A.
Township #16	3,289	1,683	1,570	1,730	—	N.A.	0.15	0.12	0.12	0.17	—	N.A.
Township #4	2,925	1,775	1,454	1,285	1,146	N.A.	0.13	0.12	0.11	0.13	0.15	N.A.
Township #9	2,305	3,237	1,678	739	2,075	N.A.	0.10	0.22	0.12	0.07	0.27	N.A.
Township #14	1,413	1,486	1,092	994	833	N.A.	0.06	0.10	0.08	0.10	0.11	N.A.
Township #8	1,352	1,463	1,323	630	1,105	N.A.	0.06	0.10	0.10	0.06	0.14	N.A.
Township #13	628	431	320	340	449	N.A.	0.03	0.03	0.02	0.03	0.06	N.A.
Township #2	535	454	593	790	873	N.A.	0.02	0.03	0.04	0.08	0.11	N.A.
Total	122,621	44,779	31,983	22,615	17,760	15,992	5.47	3.06	2.38	2.24	2.30	2.94
Marin County												
San Rafael Township	14,204	9,143	8,630	4,237	4,565	4,129	0.63	0.63	0.64	0.42	0.59	0.76
Sausalito Township	13,168	7,169	3,909	3,407	3,270	1,998	0.59	0.49	0.29	0.34	0.42	0.37
Novato Township	9,016	5,127	2,778	2,220	1,700	1,673	0.41	0.35	0.20	0.22	0.22	0.31
Tomales Township	2,141	1,656	1,705	1,585	1,549	1,961	0.09	0.11	0.13	0.16	0.20	0.36
Total	38,529	23,095	17,022	11,449	11,084	9,761	1.72	1.58	1.26	1.14	1.43	1.80
San Mateo												
Township #3	27,304	12,197	7,954	3,586	3,372	2,300	1.22	0.83	0.59	0.36	0.44	0.42
Township #1	17,002	8,208	4,880	3,821	7,184	2,452	0.76	0.56	0.37	0.38	0.93	0.45
Township #4	4,024	3,937	2,182	1,921	1,923	1,383	0.17	0.27	0.16	0.19	0.25	0.25
Township #2	2,788	1,544	307	1,445	2,710	1,466	0.12	0.11	0.02	0.14	0.35	0.27
Township #5	630	2,665	1,262	1,219	1,016	1,008	0.03	0.18	0.09	0.12	0.13	0.19
Total	51,748	28,551	16,585	11,992	16,205	8,609	2.30	1.95	1.23	1.18	2.09	1.59
Solano												
Vallejo Township	44,075	9,991	4,081	2,922	798	732	1.97	0.68	0.30	0.29	0.10	0.14
Suisun Township	6,965	2,099	1,909	1,977	1,948	313	0.31	0.14	0.14	0.20	0.25	0.06
Vacaville Township	2,530	1,354	2,019	1,904	1,828	3,478	0.11	0.09	0.15	0.19	0.24	0.64
Silveyville Township	2,132	1,690	1,747	1,518	1,026	803	0.09	0.12	0.13	0.15	0.13	0.15
Rio Vista Township	1,297	2,082	3,170	821	744	818	0.06	0.14	0.24	0.08	0.10	0.15
Green Valley Township	1,025	607	702	618	960	757	0.05	0.04	0.05	0.06	0.12	0.14
Elmira Township	819	633	628	452	494	717	0.04	0.04	0.05	0.04	0.06	0.13
Main Prairie Township	689	333	591	221	205	282	0.03	0.02	0.04	0.02	0.03	0.05
Tremont Township	395	256	237	275	373	403	0.02	0.02	0.02	0.03	0.05	0.07
Benicia Township	394	759	344	423	379	423	0.02	0.05	0.03	0.04	0.05	0.08
Montezuma Township	308	316	386	466	481	429	0.01	0.02	0.03	0.05	0.06	0.08
Denverton Township	104	101	134	144	260	280	†	†	†	0.01	0.03	0.05
Total	60,733	20,221	15,948	11,741	9,496	9,435	2.71	1.38	1.18	1.16	1.23	1.74
Total, remainder of townships	372,103	156,311	113,637	79,640	72,042	69,529	16.59	10.68	8.40	7.87	9.30	12.80
Total, Metropolitan Area	2,240,767	1,461,804	1,347,772	1,009,467	773,975	542,964	100.	100.	100.	100.	100.	100.

Source: U. S. Bureau of the Census.
N.I. = City not incorporated at time of census indicated.
N.A. = Data not available.
* Based upon estimated township populations.
† Less than .01 percent.
Note: Percentages do not always total 100.00 because of rounding.

TABLE A-2

CHANGES IN POPULATION (SAN FRANCISCO-OAKLAND METROPOLITAN AREA), BY PRINCIPAL INCORPORATED CITIES AND REMAINDER OF TOWNSHIPS, 1900–1950

Incorporated Cities and Remainder of Townships (1950 Rank)	Net Changes in Population						Percentage of Total Net Change					
	1900 to 1910	1910 to 1920	1920 to 1930	1930 to 1940	1940 to 1950	Cumulative 1900–1950	1900 to 1910	1910 to 1920	1920 to 1930	1930 to 1940	1940 to 1950	Cumulative 1900–1950
Principal incorporated cities												
300,000 and over												
San Francisco	74,130	89,764	127,718	142	140,821	432,575	32.09	38.12	37.75	0.12	18.08	25.48
Oakland	83,214	66,087	67,802	18,100	82,412	317,615	36.02	28.06	20.04	15.87	10.58	18.71
Total	157,344	155,851	195,520	18,242	223,233	750,190	68.11	66.18	57.79	15.99	28.66	44.19
75,000 to 299,999												
Berkeley	27,220	15,602	26,073	3,438	28,258	100,591	11.78	6.63	7.71	3.01	3.63	5.92
Richmond	6,802	10,041	3,250	3,549	75,903	99,545	2.94	4.26	0.96	3.11	9.74	5.86
Total	34,022	25,643	29,323	6,987	104,161	200,136	14.72	10.89	8.67	6.12	13.37	11.78
25,000 to 74,999												
Alameda	6,919	5,423	6,227	1,223	28,174	47,966	3.00	2.30	1.84	1.07	3.62	2.83
San Mateo	2,552	1,595	7,465	5,959	22,379	39,950	1.10	0.68	2.21	5.23	2.87	2.35
San Leandro	1,218	2,232	5,752	3,146	12,941	25,289	0.53	0.95	1.70	2.76	1.66	1.49
Vallejo	3,375	9,767	−5,035	4,000	5,966	18,073	1.46	4.15	−1.49	3.51	0.77	1.06
Redwood City	789	1,578	4,942	3,491	13,091	23,891	0.34	0.67	1.46	3.06	1.68	1.41
Total	14,853	20,595	19,351	17,819	82,551	155,169	6.43	8.75	5.72	15.63	10.60	9.14
10,000 to 19,999												
Burlingame	1,565	2,542	9,163	2,670	3,946	19,886	0.68	1.08	2.71	2.34	0.51	1.17
So. San Francisco	1,989	2,422	1,782	436	12,722	19,351	0.86	1.03	0.53	0.38	1.63	1.14
El Cerrito	N.I.	1,505	2,365	2,267	11,874	18,011	N.I.	0.64	0.70	1.98	1.52	1.06
Albany	808	1,654	6,107	2,924	6,097	17,590	0.35	0.70	1.81	2.56	0.78	1.04
Daly City	N.I.	3,779	4,059	1,787	5,566	15,191	N.I.	1.60	1.20	1.57	0.71	0.89
San Pablo	N.I.	N.I.	N.I.	N.I.	14,476	14,476	N.I.	N.I.	N.I.	N.I.	1.86	0.85
San Carlos	N.I.	N.I.	1,132	2,388	10,851	14,371	N.I.	N.I.	0.33	2.09	1.39	0.85
Hayward	781	741	2,043	1,206	7,536	12,307	0.34	0.31	0.60	1.06	0.97	0.72
San Rafae	2,055	−422	2,510	551	5,275	9,969	0.89	−0.18	0.74	0.48	0.68	0.59
Menlo Parlk	N.I.	N.I.	2,254	1,004	10,329	13,587	N.I.	N.I.	0.67	0.88	1.33	0.80
Pittsburg	2,372	2,343	4,895	−90	3,243	12,763	1.03	0.99	1.45	−0.08	0.42	0.75
San Bruno	N.I.	1,562	2,048	2,909	5,959	12,478	N.I.	0.66	0.61	2.55	0.76	0.73
Antioch	450	812	1,627	1,543	5,945	10,377	0.19	0.34	0.48	1.35	0.76	0.61
Piedmont	1,719	2,563	5,051	533	266	10,132	0.74	1.09	1.49	0.47	0.03	0.60
Total	11,739	19,501	45,036	20,128	104,085	200,489	5.08	8.28	13.31	17.65	13.36	11.81
5,000-9,999												
San Anselmo	1,531	944	2,175	1,140	3,398	9,188	0.66	0.40	0.64	1.00	0.44	0.54
Millbrae	N.I.	N.I.	N.I.	N.I.	8,972	8,972	N.I.	N.I.	N.I.	N.I.	1.15	0.53
Martinez	735	1,743	2,711	812	887	6,888	0.32	0.74	0.80	0.71	0.11	0.41
Mill Valley	2,551	3	1,610	683	2,484	7,331	1.10	*	0.48	0.60	0.32	0.43
Benicia	−391	333	220	−494	4,865	4,533	−0.17	0.14	0.07	−0.43	0.62	0.27
Concord	703	209	213	248	5,580	6,953	0.30	0.09	0.06	0.22	0.72	0.41
Belmont	N.I.	N.I.	984	245	4,338	5,567	N.I.	N.I.	0.29	0.21	0.56	0.33
Total	5,129	3,232	7,913	2,634	30,524	49,432	2.22	1.37	2.34	2.31	3.92	2.91
Under 5,000												
Sausalito	755	407	877	−127	1,288	3,200	0.33	0.17	0.26	−0.11	0.17	0.19
Livermore	537	−114	1,203	−234	1,479	2,871	0.23	−0.05	0.36	−0.21	0.19	0.17
Fairfax	N.I.	N.I.	N.I.	2,198	1,880	4,078	N.I.	N.I.	N.I.	1.93	0.24	0.24
Atherton	N.I.	N.I.	1,242	666	1,722	3,630	N.I.	N.I.	0.37	0.58	0.22	0.21
Hillsborough	N.I.	931	960	856	805	3,552	N.I.	0.40	0.28	0.75	0.10	0.21
Vacaville	495	77	302	58	1,555	2,487	0.21	0.03	0.09	0.05	0.20	0.15
Fairfield	−386	174	123	181	1,806	1,898	−0.17	0.07	0.04	0.16	0.23	0.11
Larkspur	594	18	629	317	1,347	2,905	0.26	*	0.19	0.28	0.17	0.17
Emeryville	1,597	−223	−54	185	368	1,873	0.69	−0.09	−0.02	0.16	0.05	0.11
Walnut Creek	N.I.	538	476	564	842	2,420	N.I.	0.23	0.14	0.49	0.11	0.14
Pleasanton	154	−263	246	41	966	1,144	0.07	−0.11	0.07	0.04	0.12	0.07
Ross	556	171	628	396	428	2,179	0.24	0.07	0.19	0.35	0.05	0.13
Corte Madera	N.I.	607	420	71	835	1,933	N.I.	0.26	0.12	0.06	0.11	0.11
Rio Vista	202	220	205	357	165	1,149	0.09	0.09	0.06	0.31	0.02	0.07
Brentwood	N.I.	N.I.	N.I.	N.I.	1,729	1,729	N.I.	N.I.	N.I.	N.I.	0.22	0.10
Dixon	44	99	74	108	606	931	0.02	0.04	0.02	0.08	0.08	0.05
Pinole	798	169	−186	153	213	1,147	0.35	0.07	−0.05	0.13	0.03	0.07
Suisun	16	128	136	−199	240	321	*	0.05	0.04	−0.17	0.03	0.02
Belvedere	47	135	−116	−43	343	366	0.02	0.05	−0.03	−0.04	0.04	0.02
Total	5,409	3,074	7,165	5,548	18,617	39,813	2.34	1.31	2.12	4.87	2.39	2.34
Total, all incorporated cities	228,496	227,896	304,308	71,358	563,171	1,395,229	98.91	96.78	89.95	62.58	72.30	82.18

TABLE A-2—*Concluded*

Incorporated Cities and Remainder of Townships (1950 Rank)	Net Changes in Population						Percentage of Total Net Change					
	1900 to 1910	1910 to 1920	1920 to 1930	1930 to 1940	1940 to 1950	Cumulative 1900–1950	1900 to 1910	1910 to 1920	1920 to 1930	1930 to 1940	1940 to 1950	Cumulative 1900–1950
Remainder of townships												
Alameda												
Eden Township	186	3,495	6,119	7,442	51,435	68,677	0.08	1.48	1.81	6.53	6.60	4.05
Washington Township	960	620	4,217	340	3,844	9,981	0.42	0.26	1.25	0.30	0.49	0.59
Murray Township	−400	−115	971	−346	1,550	1,660	−0.17	−0.05	0.29	−0.30	0.20	0.10
Pleasanton Township	−443	−324	208	130	1,978	1,549	−0.19	−0.14	0.06	0.11	0.25	0.09
Brooklyn Township	−7,705	−437	−26	—	—	−8,168	−3.34	−0.19	−*	—	—	−0.48
Oakland and Peralta Township	−831	1,105	−1,233	—	—	−959	−0.36	0.47	−0.36	—	—	−0.06
Total	−8,233	4,344	10,256	7,566	58,807	72,740	−3.56	1.84	3.03	6.63	7.55	4.28
Contra Costa												
Township #3	N.A.	554	1,276	2,362	18,985	N.A.	N.A.	0.24	0.38	2.07	2.44	N.A.
Township #6	N.A.	−614	442	1,111	21,413	N.A.	N.A.	−0.26	0.13	0.97	2.75	N.A.
Township #5	N.A.	1,148	916	2,006	13,089	N.A.	N.A.	0.49	0.27	1.76	1.68	N.A.
Township #10	N.A.	680	885	1,699	10,458	N.A.	N.A.	0.29	0.26	1.49	1.34	N.A.
Township #7	N.A.	−1,206	1,197	1,932	3,246	N.A.	N.A.	−0.51	0.35	1.69	0.42	N.A.
Township #11	N.A.	429	580	480	4,091	N.A.	N.A.	0.18	0.17	0.42	0.52	N.A.
Township #1	N.A.	148	1,418	515	2,326	N.A.	N.A.	0.06	0.42	0.45	0.30	N.A.
Township #17	N.A.	1,907	1,001	37	2,190	N.A.	N.A.	0.81	0.30	0.03	0.28	N.A.
Township #12	N.A.	1,782	131	155	126	N.A.	N.A.	0.76	0.04	0.14	0.02	N.A.
Township #16	N.A.	1,730	−160	113	1,606	N.A.	N.A.	0.73	−0.05	0.10	0.21	N.A.
Township #4	N.A.	139	169	321	1,150	N.A.	N.A.	0.06	0.05	0.28	0.15	N.A.
Township #9	N.A.	−1,336	939	1,559	−932	N.A.	N.A.	−0.57	0.28	1.37	−0.12	N.A.
Township #14	N.A.	161	98	394	−73	N.A.	N.A.	0.07	0.03	0.35	−*	N.A.
Township #8	N.A.	−475	693	140	−111	N.A.	N.A.	−0.20	0.20	0.12	−0.01	N.A.
Township #13	N.A.	−109	−20	111	197	N.A.	N.A.	−0.05	−*	0.10	0.02	N.A.
Township #2	N.A.	−83	−197	−139	81	N.A.	N.A.	−0.04	−0.06	−0.12	0.01	N.A.
Total	1,768	4,855	9,368	12,796	77,842	106,629	0.77	2.06	2.77	11.22	9.99	6.28
Marin												
San Rafael Township	436	−328	4,393	513	5,061	10,075	0.19	−0.14	1.30	0.45	0.65	0.59
Sausalito Township	1,272	137	502	3,260	5,999	11,170	0.55	0.06	0.15	2.86	0.77	0.66
Novato Township	27	520	558	2,349	3,889	7,343	0.01	0.22	0.16	2.06	0.50	0.43
Tomales Township	−412	36	120	−49	485	180	−0.18	0.02	0.04	−0.04	0.06	0.01
Total	1,323	365	5,573	6,073	15,434	28,768	0.57	0.16	1.65	5.33	1.98	1.69
San Mateo												
Township #3	1,072	214	4,368	4,243	15,107	25,004	0.46	0.09	1.29	3.72	1.94	1.47
Township #1	4,732	−3,363	1,059	3,328	8,794	14,550	2.05	−1.43	0.31	2.92	1.13	0.86
Township #4	540	−2	261	1,755	87	2,641	0.23	−*	0.08	1.54	0.01	0.16
Township #2	1,244	−1,265	−1,138	1,237	1,244	1,322	0.54	−0.54	−0.34	1.08	0.16	0.08
Township #5	8	203	43	1,403	−2,035	−378	*	0.09	0.01	1.23	−0.26	−0.02
Total	7,596	−4,213	4,593	11,966	23,197	43,139	3.29	−1.79	1.36	10.49	2.98	2.54
Solano												
Vallejo Township	66	2,124	1,159	5,910	34,084	43,343	0.03	0.90	0.34	5.18	4.38	2.55
Suisun Township	1,635	29	−68	190	4,866	6,652	0.71	0.01	−0.02	0.17	0.62	0.39
Vacaville Township	−1,650	76	115	−665	1,176	−948	−0.71	0.03	0.03	−0.58	0.15	−0.06
Silveyville Township	223	492	229	−57	442	1,329	0.10	0.21	0.07	−0.05	0.06	0.08
Rio Vista Township	−74	77	2,349	−1,088	−785	479	−0.03	0.03	0.69	−0.95	−0.10	0.03
Green Valley Township	203	−342	84	−95	418	268	0.09	−0.15	0.02	−0.08	0.05	0.02
Elmira Township	−223	−42	176	5	186	102	−0.10	−0.02	0.05	*	0.02	*
Main Prairie Township	−77	16	370	−258	356	407	−0.03	*	0.11	−0.23	0.05	0.02
Tremont Township	−30	−98	−38	19	139	−8	−0.01	−0.04	−0.01	0.02	0.02	−*
Benicia Township	−44	44	−79	415	−365	−29	−0.02	0.02	−0.02	0.36	−0.05	−*
Montezuma Township	52	−15	−80	−70	−8	−121	0.02	−*	−0.02	−0.06	−*	−*
Denverton Township	−20	−116	−10	−33	3	−176	*	−0.05	−*	−0.03	*	−0.01
Total	61	2,245	4,207	4,273	40,512	51,298	0.03	0.95	1.24	3.75	5.20	3.02
Total, remainder of townships	2,515	7,596	33,997	42,674	215,792	302,574	1.09	3.22	10.05	37.42	27.70	17.82
Total, Metropolitan Area	231,011	235,492	338,305	114,032	778,963	1,697,803	100.	100.	100.	100.	100.	100.

Source: Computed from Table A-1.
N.I. = City not incorporated at time of census indicated.
N.A. = Data not available.
* Less than .01 percent.

TABLE A-3

SAN FRANCISCO'S POPULATION, BY COMMUNITY AREA, RETAIL TRADE AREA, AND CENSUS TRACT, 1940 AND 1950

Community Area No., Retail Trade Area No., and Census Tract			1950		1940		Change: 1940–50	
			Number	Percent	Number	Percent	Amount	Percent
#1	#1–1	A–3	4,892	0.63	4,949	0.78	−57	−0.04
		A–4	5,571	0.72	5,609	0.88	−38	−0.03
		A–5	4,775	0.62	3,465	0.55	+1,310	0.93
		A–6	4,547	0.59	4,401	0.69	+146	0.10
		A–13	4,261	0.55	4,601	0.73	−340	−0.24
		Total	24,046	3.10	23,025	3.63	+1,021	0.72
	#1–2	A–2	4,621	0.60	4,409	0.69	+212	0.15
		A–7	5,716	0.74	5,466	0.86	+250	0.18
		A–8	5,106	0.66	5,152	0.81	−46	−0.03
		A–9	5,647	0.73	5,052	0.80	+595	0.42
		A–10	5,209	0.67	4,902	0.77	+307	0.22
		A–11	3,934	0.51	4,005	0.63	−71	−0.05
		A–12	5,940	0.76	5,853	0.92	+87	0.06
		Total	36,173	4.67	34,839	5.48	+1,334	+0.89
Total, Community Area #1			60,219	7.77	57,864	9.11	+2,355	+1.61
#2	#2–1	A–1	2,148	0.27	2,123	0.33	+25	0.02
		A–16	3,613	0.47	2,658	0.42	+955	0.68
		Total	5,761	0.74	4,781	0.75	+980	0.70
	#2–2	A–14	4,264	0.55	6,427	1.01	−2,163	−1.54
		A–15	2,786	0.36	3,095	0.49	−309	−0.22
		Total	7,050	0.91	9,522	1.50	−2,472	−1.76
	#2–3	A–17	3,516	0.45	3,350	0.53	+166	0.12
	#2–4	A–18	4,728	0.61	4,725	0.74	+3	*
		A–19	3,738	0.48	3,720	0.59	+18	0.01
		A–20	5,927	0.77	5,499	0.87	+428	0.30
		A–21	6,738	0.87	6,855	1.08	−117	−0.01
		A–22	4,599	0.59	4,381	0.69	+218	0.15
		A–23	5,899	0.76	4,956	0.78	+943	0.67
		Total	31,629	4.08	30,136	4.75	+1,493	1.12
Total Community Area #2			47,956	6.18	47,789	7.53	+167	0.18
#3	#3–1	K–1	10,435	1.35	4,626	0.73	+5,809	4.13
	#3–2	K–2	8,394	1.08	8,070	1.27	+324	0.23
	#3–3	K–3	7,312	0.94	6,216	0.98	+1,096	0.78
		K–4	2,049	0.27	1,683	0.27	+366	0.26
		Total	9,361	1.21	7,899	1.25	+1,462	1.04
Total Community Area #3			28,190	3.64	20,595	3.25	+7,595	5.40
#4	#4–1	K–5	53	*	45	*	+8	*
		K–6	2,559	0.33	2,742	0.43	−183	−0.13
		L–1	11,451	1.48	9,035	1.42	+2,416	1.72
		L–2	10,623	1.37	10,898	1.72	−275	−0.20
		L–3	8,123	1.05	7,945	1.25	+178	0.13
Total Community Area #4			32,809	4.23	30,665	4.82	+2,144	1.52
#5	#5–1	L–4	13,361	1.72	5,812	0.92	+7,549	5.36
		L–5	38,045	4.91	8,199	1.29	+29,846	21.19
		Total	51,406	6.63	14,011	2.21	+37,395	26.55
#5	#5–2	M–5	10,708	1.38	6,698	1.06	+4,010	2.85
		M–10	4,916	0.64	638	0.10	+4,278	3.04
		M–11	8,777	1.13	4,086	0.64	+4,691	3.33
		Total	24,401	3.15	11,422	1.80	+12,979	9.22
Total Community Area #5			75,807	9.78	25,433	4.01	+50,374	35.77

TABLE A-3—*Continued*

Community Area No., Retail Trade Area No., and Census Tract			1950		1940		Change: 1940–50	
			Number	Percent	Number	Percent	Amount	Percent
#6	#6-1	M-6	11,854	1.53	10,632	1.68	+1,222	0.87
		M-7	7,410	0.95	6,524	1.03	+886	0.63
		M-8	9,153	1.18	6,942	1.09	+2,211	1.57
		M-9	9,428	1.22	6,223	0.98	+3,205	2.28
Total Community Area #6			37,845	4.88	30,321	4.78	+7,524	5.35
#7	#7-1	N-1	5,002	0.64	4,549	0.72	+453	0.32
		N-2	6,182	0.80	5,273	0.83	+909	0.64
		N-7	5,931	0.77	6,047	0.95	−116	−0.08
		N-8	5,496	0.71	5,375	0.85	+121	0.09
		N-9	4,372	0.56	4,403	0.69	−31	−0.02
		N-10	5,064	0.65	4,988	0.79	+76	0.05
		Total	32,047	4.13	30,635	4.83	+1,412	+1.00
	#7-2	N-11	5,073	0.65	4,858	0.77	+215	0.15
		N-12	7,018	0.91	6,837	1.08	+181	0.13
		N-13	2,114	0.27	1,395	0.22	+719	0.51
		N-14	6,041	0.78	6,151	0.97	−110	−0.08
		N-15	6,406	0.83	5,912	0.93	+494	0.35
		Total	26,652	3.44	25,153	3.97	+1,499	1.06
	#7-3	M-1	2,453	0.31	2,258	0.36	+195	0.14
		M-2	5,408	0.70	5,041	0.79	+367	0.26
		M-3	4,560	0.59	4,573	0.72	−13	−*
		M-4	8,898	1.15	7,070	1.11	+1,828	1.30
		Total	21,319	2.75	18,942	2.98	+2,377	1.70
Total Community Area #7			80,018	10.32	74,730	11.78	+5,288	+3.76
#8	#8-1	J-15	6,919	0.89	6,808	1.07	+111	0.08
		J-16	6,337	0.82	6,016	0.95	+321	0.23
		J-17	8,104	1.04	7,680	1.21	+424	0.30
		J-20	9,460	1.22	9,058	1.43	+402	0.29
		O-1	8,655	1.12	7,986	1.26	+669	0.48
		Total	39,475	5.09	37,548	5.92	+1,927	1.38
	#8-2	J-18	4,221	0.54	4,356	0.69	−135	−0.10
		J-19	3,697	0.48	3,487	0.55	+210	0.15
		N-3	3,520	0.46	3,692	0.58	−172	−0.12
		N-4	4,658	0.60	4,288	0.68	+370	0.26
		N-5	6,998	0.90	6,654	1.05	+344	0.24
		N-6	6,025	0.78	5,922	0.93	+103	0.10
		Total	29,119	3.76	28,399	4.48	+720	0.53
Total Community Area #8			68,594	8.85	65,947	10.40	+2,647	1.91
#9	#9-1	B-9	5,115	0.66	4,623	0.73	+492	0.35
		B-10	4,039	0.52	3,602	0.57	+436	0.31
		J-1	2,681	0.35	2,493	0.39	+188	0.13
		J-2	6,137	0.79	5,106	0.80	+1,031	0.73
		J-3	3,822	0.49	3,386	0.53	+436	0.31
		J-6	6,593	0.85	5,650	0.89	+943	0.67
		J-7	10,557	1.36	9,392	1.48	+1,165	0.83
		J-8	7,079	0.91	6,473	1.02	+606	0.43
		J-9	3,241	0.42	3,201	0.50	+40	0.03
		J-10	7,324	0.94	5,534	0.87	+1,790	1.27
		J-11	4,354	0.56	3,636	0.57	+718	0.51
		J-12	5,722	0.74	5,157	0.81	+565	0.40
		J-13	4,692	0.61	4,359	0.69	+333	0.24
Total Community Area #9			71,356	9.20	62,613	9.85	+8,743	6.21
#10	#10-1	B-1	6,757	0.87	6,623	1.04	+134	0.10
		B-2	4,860	0.63	5,015	0.79	−155	−0.11
		B-3	5,831	0.75	6,129	0.97	−298	−0.21
		B-4	7,406	0.95	7,312	1.15	+94	0.07
		B-5	5,341	0.69	5,264	0.83	+77	0.05
		B-6	6,263	0.81	5,845	0.92	+418	0.30
		B-7	5,323	0.69	5,179	0.82	+144	0.10
Total Community Area #10			41,781	5.39	41,367	6.52	+414	+0.30

TABLE A-3—*Concluded*

Community Area No., Retail Trade Area No., and Census Tract			1950		1940		Change: 1940–50	
			Number	Percent	Number	Percent	Amount	Percent
#11	#11-1	C-1	4,854	0.63	6,021	0.95	−1,167	−0.83
Total Community Area #11			4,854	0.63	6,021	0.95	−1,167	−0.83
#12	#12-1	B-8	6,404	0.83	6,263	0.99	+141	0.10
		D-1	4,570	0.59	4,783	0.75	−213	−0.15
		D-2	5,487	0.71	5,697	0.90	−210	−0.15
		H-1	4,427	0.57	4,650	0.73	−223	−0.16
		H-2	6,949	0.89	7,058	1.11	−109	−0.08
		J-4	6,174	0.80	5,542	0.87	+632	0.45
		J-5	8,136	1.05	6,791	1.07	+1,345	0.96
		J-14	6,008	0.77	5,909	0.93	+99	0.07
Total Community Area #12			48,155	6.21	46,693	7.35	+1,462	+1.04
#13	#13-1	E-1	2,972	0.38	2,997	0.47	−25	−0.02
		E-2	3,952	0.51	4,069	0.64	−117	−0.08
		E-3	7,055	0.91	7,473	1.18	−418	−0.30
		F-1	365	0.05	234	0.04	+131	0.09
		G-1	5,605	0.72	6,053	0.95	−448	−0.32
		G-2	7,385	0.95	7,627	1.20	−242	−0.17
		G-3	6,768	0.87	5,776	0.91	+992	0.70
		G-4	8,329	1.08	6,884	1.08	+1,445	1.03
Total Community Area #13			42,431	5.47	+41,113	6.47	+1,318	+0.93
#14	#14-1	I-1	28	*	186	0.03	−158	−0.11
		O-2	7,579	0.98	6,968	1.10	+611	0.43
		O-3	11,961	1.54	9,253	1.46	+2,708	1.92
		P-1	13,824	1.78	10,534	1.66	+3,290	2.34
		Q-1a(½)	12,678	1.64	3,130	0.49	+9,548	6.78
		Total	46,070	5.94	30,071	4.74	+15,999	+11.36
	#14-2	P-2	15,196	1.96	8,171	1.29	+7,025	4.99
		P-3(½)	7,759	1.00	3,252	0.51	+4,507	3.20
		Q-1(½)	12,678	1.64	3,129	0.49	+9,549	6.78
		Total	35,633	4.60	14,552	2.29	+21,081	+14.97
Total Community Area #14			81,703	10.54	44,623	7.03	+37,080	+26.33
#15	#15-1	O-4	8,413	1.08	7,848	1.24	+565	0.40
		O-5(½)	5,178	0.67	3,490	0.55	+1,688	1.20
		Total	13,591	1.75	11,338	1.79	+2,253	+1.60
	#15-2	O-5(½)	5,178	0.67	3,490	0.55	+1,688	1.20
		O-8	10,188	1.31	4,600	0.72	+5,588	3.97
		O-9	6,211	0.80	5,329	0.84	+882	0.63
		Total	21,577	2.78	13,419	2.11	+8,158	5.80
#15	#15-3	O-6	3,457	0.44	3,329	0.52	+128	0.09
		O-7	7,128	0.92	6,078	0.96	+1,050	0.75
		P-3(½)	7,759	1.00	3,253	0.51	+4,506	3.20
		R-1	127	0.02	176	0.03	−49	−0.03
		Total	18,471	2.38	12,836	2.02	+5,635	+4.01
Total Community Area #15			53,639	6.91	37,593	5.92	+16,046	+11.41
		S-1	—	—	1,169	0.18	−1,169	−0.83
Total City			775,357	100.00	634,536	100.00	+140,821	100.00

Source: Census of Population: 1950.
* Less than .01 percent.

TABLE A-4

OAKLAND'S POPULATION, BY CENSUS TRACTS, 1940 AND 1950

Tract Number	1950		1940		Change: 1940–50	
	Number	Percent	Number	Percent	Amount	Percent
1	702	0.18	527	0.17	+175	0.21
2	3,992	1.04	3,873	1.28	+119	0.14
3	4,862	1.26	4,766	1.58	+96	0.12
4	5,070	1.32	4,829	1.60	+241	0.29
5	6,236	1.62	5,666	1.87	+570	0.69
6	5,249	1.37	4,784	1.58	+465	0.56
7	6,650	1.73	5,271	1.74	+1,379	1.67
8	5,930	1.54	5,882	1.95	+48	0.06
9	4,243	1.10	4,239	1.40	+4	*
10	5,185	1.35	5,000	1.65	+185	0.22
11	6,786	1.76	5,880	1.95	+906	1.10
12	5,075	1.32	4,478	1.48	+597	0.72
13	3,399	0.88	3,282	1.09	+117	0.14
14	8,008	2.08	5,458	1.81	+2,550	3.09
15	10,970	2.85	4,377	1.45	+6,593	8.00
16	8,907	2.32	4,658	1.54	+4,249	5.16
17	8,601	2.24	5,966	1.97	+2,635	3.20
18	8,029	2.09	6,756	2.24	+1,273	1.54
19	3,122	0.81	3,120	1.03	+2	*
20	2,370	0.62	2,246	0.74	+124	0.15
21	10,871	2.83	5,640	1.87	+5,231	6.35
22	1,413	0.37	1,582	0.52	−169	−0.21
23	2,136	0.55	1,604	0.53	+532	0.65
24	4,788	1.24	3,652	1.21	+1,136	1.38
25	3,890	1.01	4,038	1.34	−148	−0.18
26	5,004	1.30	4,633	1.53	+371	0.45
27	4,119	1.07	3,660	1.21	+459	0.56
28	2,661	0.69	2,818	0.93	−157	−0.19
29	1,765	0.46	2,166	0.72	−401	−0.49
30	4,719	1.23	4,360	1.44	+359	0.44
31	4,875	1.27	4,429	1.47	+446	0.54
32	4,412	1.15	4,070	1.35	+342	0.41
33	5,879	1.53	5,262	1.74	+617	0.75
34	4,720	1.23	4,544	1.50	+176	0.21
35	4,876	1.27	4,936	1.63	−60	0.07
36	3,817	0.99	3,663	1.21	+154	0.19
37	5,147	1.34	4,215	1.40	+932	1.13
38	4,634	1.21	4,438	1.47	+196	0.24
39	5,913	1.54	4,655	1.54	+1,248	1.53
40	2,914	0.76	2,264	0.75	+650	0.79
41	3,527	0.92	1,466	0.48	+2,061	2.50
42	3,338	0.87	1,717	0.57	+1,621	1.97
43	6,315	1.64	4,771	1.58	+1,544	1.87
44	5,026	1.31	3,738	1.24	+1,288	1.56
45	6,171	1.60	5,797	1.92	+374	0.45
46	7,149	1.86	6,441	2.13	+708	0.86
47	5,993	1.56	5,066	1.68	+927	1.12
48	6,104	1.59	5,319	1.76	+785	0.95
49	5,054	1.31	4,437	1.47	+617	0.75
50	5,710	1.48	5,465	1.81	+245	0.30
51	3,987	1.04	3,622	1.20	+365	0.44
52	5,385	1.40	5,049	1.67	+336	0.41
53	5,056	1.31	4,735	1.57	+321	0.39
54	4,643	1.21	4,615	1.53	+28	0.03
55	5,276	1.37	5,449	1.80	−173	−0.21
56	4,764	1.24	2,241	0.74	+2,523	3.06
57	5,736	1.49	5,067	1.68	+669	0.81
58	5,105	1.33	4,547	1.50	+558	0.68
59	5,053	1.31	5,293	1.75	−240	−0.29
60	5,642	1.47	3,419	1.13	+2,223	2.70
61	2,719	0.71	638	0.21	+2,081	2.53
62	8,124	2.11	5,459	1.81	+2,665	3.23
63	7,105	1.85	5,967	1.98	+1,138	1.38
64	4,783	1.24	4,486	1.48	+297	0.36
65	5,821	1.51	5,357	1.77	+464	0.56
66	7,916	2.06	4,136	1.37	+3,780	4.59
67	8,877	2.31	686	0.23	+8,191	9.94
68	9,954	2.59	5,383	1.78	+4,571	5.55
69	7,475	1.94	6,277	2.08	+1,198	1.45
70	8,008	2.08	5,127	1.70	+2,881	3.50
71	4,734	1.23	2,072	0.69	+2,662	3.23
72	2,086	0.54	634	0.21	+1,452	1.76
Total	384,575	100.00	302,163	100.00	+82,412	100.00

Source: Census of Population: 1950.

* Less than .01 percent.

TABLE A-5

CENSUS TRACT POPULATION FOR BERKELEY, RICHMOND, ALAMEDA, SAN LEANDRO, EL CERRITO, AND ALBANY, 1940 AND 1950

City and Tract No.	1950		1940		Change: 1940–50	
	Number	Percent	Number	Percent	Amount	Percent
Berkeley						
Tract 1A	7,554	6.64	2,582	3.02	+4,972	17.60
1B	4,322	3.80	3,545	4.14	+777	2.75
2A	2,825	2.48	1,941	2.27	+884	3.13
2B	5,018	4.41	3,563	4.17	+1,455	5.15
2C	3,658	3.21	2,920	3.41	+738	2.61
2D	3,156	2.77	2,665	3.12	+491	1.74
3A	6,221	5.47	4,829	5.64	+1,392	4.93
3B	3,814	3.35	3,304	3.86	+510	1.80
3C	5,137	4.51	4,407	5.15	+730	2.58
3D	5,090	4.47	4,601	5.38	+489	1.73
3E	1,974	1.74	2,013	2.35	−39	−0.14
4A	3,708	3.26	3,028	3.54	+680	2.41
4B	4,615	4.05	4,266	4.99	+349	1.23
4C	5,994	5.27	5,443	6.36	+551	1.95
4D	3,313	2.91	2,598	3.04	+715	2.53
4E	4,785	4.20	3,297	3.85	+1,488	5.27
5A	2,277	2.00	1,887	2.21	+390	1.38
5B	15,009	13.19	6,535	7.64	+8,474	29.99
5C	3,461	3.04	2,409	2.82	+1,052	3.72
5D	3,112	2.74	2,666	3.12	+446	1.58
5E	3,465	3.05	2,836	3.31	+629	2.23
6A	1,978	1.74	1,966	2.30	+12	0.04
6B	2,629	2.31	2,061	2.41	+568	2.01
6C	1,789	1.57	1,491	1.74	+298	1.05
6D	4,151	3.65	3,885	4.54	+266	0.94
6E	4,750	4.17	4,809	5.62	−59	−0.21
Total	113,805	100.00	85,547	100.00	+28,258	100.00
Richmond						
Tract CCC–1	7,462	7.50	2,378	10.06	+5,084	6.70
CCC–2	8,876	8.92	1,580	6.68	+7,296	9.61
CCC–3	10,767	10.82	3,065	12.96	+7,702	10.15
CCC–4	5,240	5.26	4,298	18.18	+942	1.24
CCC–5	6,284	6.30	3,729	15.77	+2,555	3.37
CCC–6	26,369	26.49	2,683	11.35	+23,686	31.20
CCC–7	6,100	6.13	4,057	17.16	+2,043	2.69
CCC–8	28,447	28.58	1,852	7.83	+26,595	35.04
Total	99,545	100.00	23,642	100.00	+75,903	100.00
Alameda						
Tract AC–9	4,219	6.55	3,396	9.37	+823	2.92
AC–10	13,299	20.64	6,746	18.61	+6,553	23.26
AC–11	20,991	32.58	3,598	9.92	+17,393	61.73
AC–12	5,156	8.00	4,476	12.34	+680	2.41
AC–13	5,256	8.16	4,421	12.19	+835	2.96
AC–14	5,570	8.65	4,850	13.38	+720	2.56
AC–15	4,511	7.00	3,878	10.70	+633	2.25
AC–16	5,428	8.42	4,891	13.49	+537	1.91
Total	64,430	100.00	36,256	100.00	+28,174	100.00
San Leandro						
Tract AC–17	6,965	25.29	4,027	27.58	+2,938	22.70
AC–18	7,415	26.92	6,248	42.79	+1,167	9.02
AC–19	6,020	21.86	4,326	29.63	+1,694	13.09
AC–20	7,142	25.93	0	0.00	+7,142	55.19
Total	27,542	100.00	14,601	100.00	+12,941	100.00
El Cerrito						
Tract CCC–9	3,249	18.04	1,118	18.22	+2,131	17.95
CCC–10	5,957	33.08	1,358	22.13	+4,599	38.73
CCC–11	4,986	27.68	2,112	34.41	+2,874	24.20
CCC–12	3,819	21.20	1,549	25.24	+2,270	19.12
Total	18,011	100.00	6,137	100.00	+11,874	100.00
Albany						
Tract AC–1	3,841	21.84	3,503	30.48	+338	5.54
AC–2	2,750	15.63	2,591	22.55	+159	2.61
AC–3	2,434	13.84	2,054	17.87	+380	6.23
AC–4	2,355	13.39	1,991	17.32	+364	5.97
AC–5	6,210	35.30	1,354	11.78	+4,856	79.65
Total	17,590	100.00	11,493	100.00	+6,097	100.00

Source: Census of Population: 1950.

TABLE A-6

NUMBER OF MANUFACTURING ESTABLISHMENTS IN SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES AND PRINCIPAL CITIES; SELECTED YEARS, 1919–1947

County and City	1919	1929	1931	1933	1935	1937	1939	1947
Total, Metropolitan Area	3,651	3,952	3,545	2,680	3,183	3,299	3,213	3,671
Alameda								
Alameda	52	50	38	36	46	43	37	48
Albany	*	*	*	*	*	*	2	5
Berkeley	113	173	168	113	142	159	135	187
Oakland	593	738	656	499	594	600	549	701
San Leandro	*	*	*	*	13	16	16	36
Remainder	117	155	137	115	136	141	154	209
Total	875	1,116	999	763	931	959	893	1,186
Contra Costa								
Richmond	40	36	39	27	37	49	46	64
Remainder	123	77	69	55	83	71	69	104
Total	163	113	108	82	120	120	115	168
Marin	66	50	38	30	37	47	42	57
San Francisco	2,360	2,526	2,263	1,698	1,959	2,030	2,032	1,990
San Mateo								
Burlingame	*	12	11	8	8	8	6	17
Redwood City	*	*	*	*	*	*	11	32
San Mateo	*	16	12	8	10	11	5	18
Remainder	117	70	74	60	77	86	75	161
Total	117	98	97	76	95	105	97	228
Solano								
Vallejo	32	*	*	*	18	16	*	*
Remainder	38	49	40	31	23	22	34	42
Total	70	49	40	31	41	38	34	42

Source: U. S. Bureau of the Census. * Included in "Remainder."

TABLE A-7

AVERAGE NUMBER OF MANUFACTURING WAGE EARNERS IN SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES AND PRINCIPAL CITIES; SELECTED YEARS, 1919–1947

County and City	1919	1929	1931	1933	1935	1937	1939	1947
Total, Metropolitan Area	107,080	94,669	71,273	67,041	79,634	89,303	76,044	131,161
Alameda								
Alameda	6,787	1,166	763	730	834	881	867	7,418
Albany	*	*	*	*	*	*	*	17
Berkeley	2,319	3,435	2,560	1,994	2,723	3,441	2,746	6,162
Oakland	23,347	19,096	12,954	12,731	15,895	17,928	15,935	25,601
San Leandro	*	*	*	479	339	658	673	2,988
Remainder	3,456	7,014	4,776	3,903	6,102	7,123	6,625	11,852
Total	35,909	30,711	21,053	19,837	25,893	30,031	26,846	54,038
Contra Costa								
Richmond	4,305	3,715	3,849	3,658	4,091	4,666	3,703	7,612
Remainder	9,129	9,314	7,658	8,151	9,966	10,030	9,613	12,477
Total	13,434	13,029	11,507	11,809	14,057	14,696	13,316	20,089
Marin	583	785	450	342	339	365	253	594
San Francisco	48,550	45,482	34,502	30,996	34,399	39,082	31,440	47,781
San Mateo								
Burlingame	*	50	42	33	41	50	48	117
Redwood City	*	*	*	*	*	*	223	1,084
San Mateo	*	103	72	73	57	82	46	120
Remainder	6,837	3,637	2,942	3,223	3,904	4,109	3,130	6,331
Total	6,837	3,790	3,056	3,329	4,002	4,241	3,447	7,652
Solano								
Vallejo	478	*	*	257	264	227	*	*
Remainder	1,289	872	705	471	680	661	742	1,007
Total	1,767	872	705	728	944	888	742	1,007

Source: U. S. Bureau of the Census. * Included in "Remainder."

TABLE A-8

DOLLAR VALUE ADDED BY MANUFACTURING IN SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES AND PRINCIPAL CITIES, SELECTED YEARS, 1929–1947 (THOUSAND DOLLARS)

County and City	1929	1931	1933	1935	1937	1939	1947
Total, Metropolitan Area	467,044	311,987	234,263	298,894	361,596	361,966	1,049,490
Alameda							
Alameda	3,811	2,128	1,352	1,992	2,709	2,798	31,484
Albany	*	*	*	*	*	*	101
Berkeley	19,693	14,441	9,095	15,430	16,739	15,101	54,123
Oakland	91,574	40,478	40,478	48,348	62,995	67,668	207,569
San Leandro	*	*	1,086	680	1,486	1,932	17,913
Remainder	37,164	29,509	14,587	25,846	34,536	34,521	98,016
Total	152,242	86,556	66,598	92,296	118,465	122,020	409,206
Contra Costa							
Richmond	14,277	14,812	13,397	*	20,625	20,262	50,834
Remainder	53,839	34,984	33,379	60,977	52,522	61,195	104,308
Total	70,116	49,796	46,776	60,977	73,147	81,457	155,142
Marin	2,642	1,216	753	942	1,191	1,142	3,333
San Francisco	221,801	158,465	107,641	128,033	146,955	136,843	410,326
San Mateo							
Burlingame	232	216	140	152	183	221	778
Redwood City	*	*	*	*	*	725	5,992
San Mateo	443	368	210	292	358	278	1,572
Remainder	15,583	12,384	9,910	12,188	16,523	13,951	51,886
Total	16,258	12,968	10,260	12,632	17,064	15,175	60,228
Solano	3,985	2,986	2,235	4,014	4,774	5,329	11,255

Source: U. S. Bureau of the Census.
* Included in "Remainder."

TABLE A-9

AUTOMOBILES REGISTERED IN SAN FRANCISCO-OAKLAND METROPOLITAN AREA, BY COUNTIES, 1914–1952*

Year	Alameda		Contra Costa		Marin		San Francisco		San Mateo		Solano		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
1914	8,449	34.8	930	3.8	686	2.8	12,081	49.8	1,258	5.2	848	3.5	24,252	100.0
1915	11,440	33.9	1,232	3.6	833	2.5	17,763	52.6	1,500	4.4	1,011	3.0	33,779	100.0
1916	15,997	33.6	2,045	4.3	1,221	2.6	24,783	52.0	2,054	4.3	1,562	3.3	47,662	100.0
1917	20,257	32.9	2,971	4.8	1,566	2.5	31,817	51.7	2,659	4.3	2,305	3.7	61,575	100.0
1918	24,623	33.8	3,917	5.4	1,830	2.5	35,831	49.2	3,349	4.6	3,309	4.5	72,859	100.0
1919	33,878	34.5	5,494	5.6	2,563	2.6	47,550	48.4	4,046	4.1	4,747	4.8	98,278	100.0
1920 (1/1–1/31/21)	36,139	35.5	5,815	5.7	2,638	2.6	47,969	47.1	4,138	4.1	5,059	5.0	101,758	100.0
1921	42,018	35.3	6,803	5.7	3,397	2.9	56,104	47.2	5,025	4.2	5,616	4.7	118,963	100.0
1922 (2/1–1/31/23)	55,096	37.0	8,375	5.6	4,320	2.9	67,844	45.6	6,663	4.5	6,415	4.3	148,713	100.0
1923 (2/1–1/31/24)	70,297	38.0	11,144	6.0	5,343	2.9	82,048	44.4	8,621	4.7	7,316	4.0	184,769	100.0
1924	77,282	39.3	11,937	6.1	5,648	2.9	84,656	43.0	9,859	5.0	7,414	3.8	196,796	100.0
1925	89,552	39.9	13,924	6.2	6,360	2.8	94,320	41.9	12,199	5.4	8,257	3.7	224,612	100.0
1926	102,966	40.0	16,911	6.6	7,441	2.9	106,367	41.3	14,467	5.6	9,347	3.6	257,499	100.0
1927	109,945	39.8	18,356	6.6	7,952	2.9	114,122	41.3	15,999	5.8	9,814	3.6	276,188	100.0
1928	117,462	39.7	19,191	6.5	8,574	2.9	122,175	41.3	18,002	6.1	10,514	3.6	295,918	100.0
1929†	135,892	39.0	23,289	6.7	10,439	3.0	143,430	41.2	22,503	6.5	12,707	3.6	348,260	100.0
1930	139,885	39.0	24,329	6.8	10,836	3.0	146,182	40.7	24,427	6.8	13,334	3.7	358,993	100.0
1931	139,771	38.8	24,525	6.8	11,164	3.1	145,753	40.5	25,733	7.1	13,169	3.7	360,115	100.0
1932	135,994	38.9	23,520	6.7	11,444	3.3	140,075	40.0	26,169	7.5	12,649	3.6	349,851	100.0
1933	134,334	38.8	23,573	6.8	11,782	3.4	136,000	39.3	27,300	7.9	13,049	3.8	346,038	100.0
1934	136,296	39.1	24,721	7.1	12,035	3.4	134,864	38.6	27,859	8.0	13,174	3.8	348,949	100.0
1935	145,126	39.1	26,923	7.3	12,804	3.5	142,746	38.5	29,714	8.0	13,766	3.7	371,079	100.0
1936	157,769	39.2	29,358	7.3	13,740	3.4	154,183	38.3	32,009	8.0	15,173	3.8	402,232	100.0
1937	167,066	39.1	31,408	7.4	14,547	3.4	163,174	38.2	34,601	8.1	16,095	3.8	426,891	100.0
1938	167,485	39.1	32,276	7.5	14,815	3.5	163,097	38.0	35,503	8.3	15,607	3.6	428,783	100.0
1939	172,000	38.6	34,188	7.7	15,675	3.5	168,256	37.8	38,604	8.7	16,505	3.7	445,228	100.0
1940	182,383	38.6	37,468	7.9	16,753	3.5	176,290	37.3	41,799	8.8	18,333	3.9	473,026	100.0
1941	192,777	38.1	42,357	8.4	17,937	3.6	183,297	36.3	45,689	9.0	22,988	4.6	505,045	100.0
1942	187,779	38.0	47,042	9.5	16,573	3.4	170,364	34.5	44,762	9.1	27,378	5.5	493,898	100.0
1943	189,804	37.4	58,498	11.5	18,503	3.7	165,598	32.7	45,381	9.0	29,124	5.7	506,908	100.0
1944	186,651	37.1	64,024	12.7	18,716	3.7	159,583	31.7	46,255	9.2	28,489	5.7	503,718	100.0
1945	188,196	37.0	64,406	12.7	18,937	3.7	161,202	31.7	47,358	9.3	28,310	5.6	508,409	100.0
1946	191,718	36.6	61,727	11.8	19,359	3.7	172,031	32.8	51,129	9.8	28,270	5.4	524,234	100.0
1947	207,307	36.1	68,860	12.0	21,639	3.8	189,397	33.0	58,230	10.1	29,060	5.1	574,493	100.0
1948	221,667	35.6	76,805	12.3	23,897	3.8	203,322	32.6	66,597	10.7	30,531	4.9	622,819	100.0
1949	241,441	35.2	87,493	12.8	27,142	4.0	218,669	31.9	77,337	11.3	33,114	4.8	685,196	100.0
1950	265,183	34.9	99,992	13.1	30,747	4.0	237,574	31.2	90,700	11.9	36,657	4.8	760,853	100.0
1951	279,922	34.7	110,464	13.7	32,688	4.0	244,551	30.3	99,901	12.4	39,751	4.9	807,277	100.0
1952 (1/1–6/30/52)	268,262	34.6	109,894	14.2	32,405	4.2	224,410	29.0	100,617	13.0	38,827	5.0	774,415	100.0

Source: California Department of Motor Vehicle Registrations.
* Excludes fee-exempt registrations; also dealers in certain years.
† Light trucks classified as "autos" under new state law beginning in 1929.

TABLE A-10

TRUCKS REGISTERED IN SAN FRANCISCO-OAKLAND METROPOLITAN AREAS, BY COUNTIES, 1920–1952*

Year	Alameda		Contra Costa		Marin		San Francisco		San Mateo		Solano		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
1920 (1/1–1/31/21)	2,111		371		164		4,894		335		301		8,176	100.0
1921	2,221		415		170		5,135		364		278		8,583	100.0
1922 (2/1–1/31/23)	2,665		444		212		5,616		431		323		9,691	100.0
1923 (2/1–1/31/24)	3,052		452		238		6,206		508		313		10,769	100.0
1924	12,313		1,963		1,396		18,800		2,168		1,557		38,197	100.0
1925	13,919		2,329		1,503		19,210		2,543		1,706		41,210	100.0
1926	14,451		2,370		1,502		20,149		2,672		1,563		42,707	100.0
1927	14,110		2,357		1,465		20,066		2,683		1,460		42,141	100.0
1928	13,805		2,356		1,480		20,390		2,669		1,470		42,170	100.0
1929†	5,093	28.1	946	5.2	452	2.5	10,073	55.6	1,069	5.9	485	2.7	18,118	100.0
1930	5,811	30.4	1,066	5.6	512	2.7	9,906	51.7	1,233	6.4	617	3.2	19,145	100.0
1931	6,044	30.7	1,176	6.0	577	2.9	9,956	50.6	1,232	6.3	673	3.4	19,658	100.0
1932	6,302	31.6	1,226	6.1	600	3.0	9,655	48.4	1,437	7.2	737	3.7	19,957	100.0
1933	6,250	31.2	1,270	6.3	614	3.1	9,676	48.3	1,439	7.2	775	3.9	20,024	100.0
1934	6,773	32.0	1,382	6.5	656	3.1	10,016	47.3	1,516	7.2	853	4.0	21,196	100.0
1935	7,839	31.8	1,568	6.4	782	3.2	11,752	47.7	1,725	7.0	957	3.9	24,623	100.0
1936	8,465	30.8	1,691	6.2	811	3.0	13,643	49.6	1,847	6.7	1,023	3.7	27,480	100.0
1937	9,512	31.8	1,893	6.3	930	3.1	14,422	48.2	1,991	6.7	1,166	3.9	29,914	100.0
1938	9,728	32.1	2,099	6.9	977	3.2	14,236	46.9	2,079	6.9	1,211	4.0	30,330	100.0
1939	10,304	32.2	2,319	7.2	1,068	3.3	14,820	46.3	2,221	6.9	1,297	4.1	32,029	100.0
1940	11,188	32.1	2,520	7.2	1,226	3.5	16,108	46.2	2,412	6.9	1,415	4.1	34,869	100.0
1941	12,351	31.8	2,804	7.2	1,391	3.6	17,888	46.0	2,688	6.9	1,728	4.4	38,850	100.0
1942	12,155	31.5	3,020	7.8	1,344	3.5	17,549	45.5	2,615	6.8	1,875	4.9	38,558	100.0
1943	12,178	31.3	3,563	9.1	1,365	3.5	17,319	44.4	2,544	6.5	1,999	5.1	38,968	100.0
1944	12,631	31.5	3,837	9.6	1,392	3.5	17,587	43.9	2,578	6.4	2,029	5.1	40,054	100.0
1945	13,630	31.7	4,224	9.8	1,501	3.5	18,553	43.1	2,823	6.6	2,276	5.3	43,007	100.0
1946	16,058	31.5	4,989	9.8	1,864	3.7	21,802	42.8	3,693	7.2	2,543	5.0	50,949	100.0
1947	20,286	32.8	6,050	9.8	2,306	3.7	25,649	41.5	4,591	7.4	2,992	4.8	61,874	100.0
1948	21,696	31.4	6,189	8.9	2,337	3.4	30,760	44.5	5,182	7.5	2,991	4.3	69,155	100.0
1949	22,830	31.6	7,384	10.2	2,678	3.7	29,971	41.5	6,073	8.4	3,365	4.7	72,301	100.0
1950	25,685	32.4	9,075	11.4	3,171	4.0	30,297	38.2	7,137	9.0	3,908	4.9	79,273	100.0
1951	28,369	32.2	10,424	11.8	3,525	4.0	33,006	37.5	8,253	9.4	4,440	5.0	88,017	100.0
1952 (1/1–6/30/52)	27,623	32.3	10,439	12.2	3,627	4.2	30,778	36.0	8,499	9.9	4,533	5.3	85,499	100.0

Source: California Department of Motor Vehicle Registrations.

* Excludes fee-exempt registrations; also dealers in certain years.

† Light trucks classified as "autos" under new state law beginning in this year.

TABLE A-11

SUMMARY OF KEY SYSTEM TRANSBAY BUS AND TRAIN OPERATIONS—JULY 1, 1953

Route	Number of Runs			Headway (Mon.–Friday only)–Minutes				Daily Running Time (Range)—Minutes	
	Daily, Mon.–Friday	Sat. Only	Sunday Only	A.M. Rush	P.M. Rush	Non-Rush Day	Non-Rush Evening	To San Francisco	From San Francisco
Transbay Trains									
"A" Train—(Oakland–12th St.)	56–57	51–52	41	15–20	20	20	30	27–34	26–32
"B" Train—(Oakland–Grand Ave.)	33–35	32	19	20	15	30	60	37–43	36–45
"C" Train—(Piedmont–40th St.)	30	25–27	19	20–21	11–20	40	60	31–37	32–36
"E" Train—(Claremont–55th St.)	28–30	25–26	19	15–25	21–27	40	60	31–37	31–35
"F" Train—(Berkeley–Shattuck Ave.)	54–56	50–51	36–38	10–15	5–10	20	30	36–44	37–42

Route	Number of Runs			Headway (Mon.–Friday only)–Minutes				Daily Running Time (Range)—Minutes	
	Monday–Friday		Sat. Only	A.M. Rush	P.M. Rush	Non-Rush Day	Non-Rush Evening	To San Francisco	From San Francisco
	Local	Express							
Transbay Buses									
"G" Line (Thousand Oaks–Solano Ave.)	21–23	12–14	19	4–16	4–15	40	No service	33–43	32–38
"H" Line (Berkeley–Sacramento St.)	27–30	9–10	18	3–14	3–15	45	No service	28–35	28–34
"J" Line (Richmond Housing)	7–8	—	No service	4–27	8–18	No service	No service	37–47	34–47
"K" Line (Havens Court Blvd.)	39, 44	10, 11	31, 32	4–16	5–15	30	60	36–48	33–51
"L" Line (Richmond)	48	10	37	5–15	4–15	30	30–60	41–49	41–53
"N" Line (East Oakland)	55, 60	13	30, 32	5–20	3–20	30	30–60	47–58	46–55
"O" Line (Alameda–Santa Clara Ave.)	36, 39	12, 13	24, 25	6–18	4–18	30	60	39–69	40–54
"R" Line (Hayward)	33, 34	10, 13	24, 25	6–18	5–18	40	60–70	56–69	55–70

Source: Key System schedules in effect, July 1, 1953.

APPENDIX B

Classification of Kinds of Business, by Principal Classes

MANUFACTURES

I. *Ordnance and Accessories*—artillery, small arms and related equipment, ammunition, tanks and tank parts, etc.
II. *Food and Kindred Products.*
III. *Tobacco Manufactures* — cigarettes, cigars, smoking and chewing tobacco, etc.
IV. *Textile Mill Products.*
V. *Apparel and Other Finished Products Made from Fabrics and Similar Materials.*
VI. *Lumber and Wood Products* (except furniture)—logging camps, merchant sawmills, etc., and finished articles manufacturing establishments.
VII. *Furniture and Fixtures*—household, office, public building furniture, etc.
VIII. *Paper and Allied Products*—manufacturer of pulp, conversion of pulp into any kind of paper or paperboard, and manufacturer of paper and paperboard into certain kinds of converted paper products.
IX. *Printing, Publishing and Allied Industries.*
X. *Chemicals and Allied Products*—basic chemicals, chemical products to be used in further manufacture, and finished chemical products to be used for ultimate consumption.
XI. *Products of Petroleum and Coal.*
XII. *Rubber Products.*
XIII. *Leather and Leather Products.*
XIV. *Stone, Clay and Glass Products.*
XV. *Primary Metal Industries*—blast furnaces, steel works, and rolling mills; iron and steel foundries; primary smelting and refining of nonferrous metals; secondary smelting, etc.; miscellaneous primary metal industries.
XVI. *Fabricated Metal Products* (except ordnance, machinery and transportation equipment)—tin cans and other tinware; cutlery, hand tools and general hardware; heating apparatus and plumber's supplies; fabricated structural metal products; metal stamping, coating and engraving; lighting fixtures; fabricated wire products; and miscellaneous and unclassified.
XVII. *Machinery* (except electrical).
XVIII. *Electrical Machinery, Equipment and Supplies.*
XIX. *Transportation Equipment*—motor vehicles and motor-vehicle equipment; aircraft and parts; ship and boat building and repairing; railroad equipment; motorcycles, bicycles and parts; and miscellaneous and unclassified.
XX. *Professional, Scientific and Controlling Instruments; Photographic and Optical Goods; Watches and Clocks.*
XXI. *Miscellaneous Manufacturing Industries*—Jewelry, etc.; musical instruments; toys, sporting and athletic goods; pens, pencils, etc.; buttons, costume novelties, miscellaneous notions, etc.

WHOLESALE TRADE

I. *Classification, by Type of Operation*
  A. *Merchant Wholesalers:* service wholesalers; industrial distributors; exporters and importers; cash-and-carry wholesalers, drop or direct mill shippers; truck distributors (wagon jobbers); retailer-owned wholesalers, etc.
  B. *Manufacturer's Sales Branches with Stocks.*
  C. *Manufacturer's Sales Offices without Stocks.*
  D. *Petroleum Bulk Stations, Terminals.*
  E. *Agents and Brokers:* Auction companies; brokers; commission merchants; export and import agents; manufacturers' agents; selling agents; resident or syndicate buyers; coöporative sales agencies.
  F. *Assemblers* (mainly form products): assemblers, dealing one account; commission buyers; cooperative marketing associations; cream stations; and country grain elevators.
II. *Classification, by Major Kinds of Business*
  A. *Groceries:* General line; confectionery; fish, sea foods; meats, meat products; other grocery, food specialties.
  B. *Farm Products* (edible): dairy, poultry products; fruits, vegetables (fresh).
  C. *Beer, Wines, Distilled Spirits.*
  D. *Drugs, Chemicals, Allied Products:* General-line drugs; specialty drugs, drug sundries; industrial chemicals; paints, varnishes.
  E. *Tobacco and Products* (except leaf).
  F. *Dry Goods, Apparels.*
  G. *Furniture, Home Furnishings.*
  H. *Paper and its Products.*
  I. *Farm Products* (raw materials).
  J. *Automotive Equipment, Tires and Tubes.*
  K. *Electrical Goods:* general-line electrical goods;

wiring supplies, etc.; electrical appliances, specialties.

L. *Hardware, Plumbing, Heating.*
M. *Lumber, Construction Materials.*
N. *Machinery, Equipment, Supplies:* commercial machines, equipment; construction machinery, equipment; farm-dairy machinery, equipment; industrial machinery, equipment, supplies; professional equipment, supplies; service establishment equipment, supplies; and transportation (except automobiles) equipment, supplies.
O. *Metal, Metal Work* (except scrap).
P. *Waste Materials.*
Q. *Other Kinds of Business:* automobiles, etc., amusement, sporting goods; books, periodicals, newspapers; coal, coke; farm supplies; jewelry; petroleum and products; and other kinds.

RETAIL TRADE

I. *Classification, by Types of Operation.*
  A. *Independent Proprietor.*
  B. *Department Stores:* independent; branch; chain.
  C. *Corporate Chains.*
  D. *Mail-order Houses.*
  E. *Voluntary Chains:* retailer-sponsored; wholesaler-sponsored; coöperative
  F. *Leased Department.*
  G. *Supermarkets.*
  H. *Consumers' Cooperatives.*
II. *Classification, by Major Kinds of Business.*
  A. *Food Group:* grocery stores, with and without fresh meats; meat markets; fish markets; fruit and vegetable stores; confectionery stores; bakery products stores, etc.
  B. *Eating and Drinking Places.*
  C. *General Stores.*
  D. *General Merchandise Group:* department stores; dry goods, general merchandise stores; variety stores.
  E. *Apparel Group:* men's and boy's stores; family clothing stores; women's ready-to-wear stores, etc.
  F. *Furniture, Furnishings, Appliance Group.*
  G. *Automotive Group.*
  H. *Gasoline Service Stations.*
  I. *Lumber, Building, Hardware Group.*
  J. *Drug and Properietary Stores.*
  K. *Liquor Stores.*
  L. *Second-hand Stores.*
  M. *Other Retail Stores:* fuel, fuel oil dealers; ice dealers; jewelry stores; book, stationery stores, sporting goods and bicycle stores; florists; cigar stores and stands; etc.

SELECTED SERVICE TRADES

I. *Personal Services.*
  A. *Barber, Beauty Shops.*
  B. *Cleaning, Dyeing Plants.*
  C. *Funeral Services, Crematories.*
  D. *Laundries, Laundry Services.*
  E. *Photographic Studios:* commercial and others.
  F. *Pressing, Alteration, Garment Repair Shops.*
  G. *Shoe Repair Shops, Shoeshine Parlors, Hat Cleaning Shops.*
  H. *Miscellaneous:* self-service laundries; costume and dress suit rentals; etc.
II. *Business Services.*
  A. *Advertising Agencies.*
  B. *Consumer Credit Reporting Agencies; Mercantile Reporting Agencies, etc.*
  C. *Duplicating, Addressing, Blueprinting, Photostating, Mailing, Mailing List, Stenographic Services.*
  D. *Employment Agencies, Private.*
  E. *News Syndicates.*
  F. *Services to Buildings and Dwellings.*
  G. *Other Business Services:* auctioneers; coin-operated machines, rental and repairs; detective agencies; interior decorating services; photofinishing laboratories; sign painting shops; etc.
III. *Auto Repair Services and Garages.*
IV. *Miscellaneous Repair Services.*
  A. *Blacksmith Shops.*
  B. *Electrical Repair Shops.*
  C. *Upholstery, Furniture, Repair Shops.*
  D. *Watch, Clock, Jewelry Repair Shops.*
  E. *Miscellaneous Repair Shops.*
V. *Amusements*
  A. *Motion Picture Theatres.*
  B. *Bands, Orchestras and Entertainers.*
  C. *Bowling Alleys, Billiards, Pool Parlors.*
  D. *Dance Halls, Studios and Schools.*
  E. *Race Track Operation.*
  F. *Sports Promoters and Commercial Promoters.*
  G. *Theatres and Theatrical Producers.*
  H. *Miscellaneous Amusement and Recreation Services.*
VI. *Hotels.*
VII. *Motor Courts* (motels).

Bibliography

GENERAL MATERIALS

Books, Government Publications, etc.

Burgess, E. W. (ed). *The Urban Community*. Chicago: The University of Chicago Press, 1926.

Clements, Frederic E., and Victor E. Shelford. *Bio-Ecology*. New York: John Wiley & Sons, Inc., 1939.

Dorau, H. B., and A. G. Hinman. *Urban Land Economics*. New York: The Macmillan Co., 1928.

Ely, R. T., and G. S. Wehrwein. *Land Economics*. New York: The Macmillan Co., 1940.

Gallion, Arthur B. *The Urban Pattern*. New York: D. Van Nostrand, 1950.

Gist, Noel P., and L. A. Halbert. *Urban Society*. New York: The Thomas Y. Crowell Co., 1933. Revised Edition, 1948.

Hallenbeck, Wilbur C. *American Urban Communities*. New York: Harper and Bros., 1951.

Hawley, Amos H. *Human Ecology: A Theory of Community Structure*. New York: The Renald Press Co., 1950.

Holleran, O. C. *Industrial Market Data Handbook of the United States*, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce. Washington, D. C.: Government Printing Office, 1939.

Hoover, Edgar M. *Introduction to Geographic Economics*. Mexico City: Fondo du Cultura Economics, 1942.

—— *The Location of Economic Activity*. New York: McGraw-Hill Book Co., Inc., 1948.

Howe, Frederic C. *The City, the Hope of Democracy*. New York: Charles Scribners Sons, 1906.

Kirkland, E. C. *Men, Cities, and Transportation—A Study in New England History, 1820–1900*. 2 volumes. Cambridge, Mass.: Harvard University Press, 1948.

Muntz, Earl E. *Urban Sociology*. New York: The Macmillan Co., 1938.

McCarty, H. H. *The Geographic Basis of American Economic Life*. New York: Harper and Brothers, 1940.

McKenzie, Roderick D. *The Metropolitan Community*. New York: McGraw-Hill Book Co., Inc., 1933.

National Industrial Conference Board. *Economic Expansion, Patterns, Problems, Potentials: The Graphic Record of American Enterprise, 1950*. New York: National Industrial Conference Board, 1950.

National Resources Committee. *Our Cities: Their Role in the National Economy*. Washington, D. C.: Government Printing Office, June, 1937.

Ogburn, William F. *Social Characteristics of Cities: A Basis for New Interpretations of the Role of the City in American Life*. Chicago: The International City Managers' Association, 1937.

Park, Robert E. *et al.* (eds.). *The City*. Chicago: The University of Chicago Press, 1925.

Ratcliff, Richard U., *Urban Land Economics*. New York: McGraw-Hill Book Co., Inc., 1949.

Sanders, S. E., and A. J. Rabuck. *New City Patterns*. New York: Reinhold Publishing Co., 1946.

Schlesinger, Arthur M. *The Rise of the City, 1878–1898*. New York: The Macmillan Co., 1933.

Taylor, Griffith. *Urban Geography*. New York: E. P. Dutton and Co., 1949.

Thompson, John G. *Urbanization: Its Effect on Government and Society*. New York: E. P. Dutton & Co., 1927.

Weber, Adna F. *The Growth of Cities in the Nineteenth Century*. New York: The Macmillan Co., 1929.

Weimer, Arthur and Homer Hoyt. *Principles of Urban Real Estate*. New York: The Ronald Press Co., 1939. Revised edition, 1948.

Wright, F. L. *The Disappearing City*. New York: W. F. Payson, 1932.

Wu, Pek Si. *Social Characteristics of Increasing, Stable, and Decreasing Cities*, unpublished Ph.D. dissertation, Department of Sociology. Chicago: The University of Chicago Libraries, 1945.

Articles, etc.

Annals of the American Academy of Political and Social Science, "Building the Future City," CCXLII (November, 1945), entire issue.

Aurousseau, M., "Recent Contributions to Urban Geography." *Geographical Review*, XLV. (1924), 444–55.

Beard, Charles A., "The City's Place in Civilization," *American City*, XXXIX (Nov. 1928), 101–03. Also *National Municipal Review*, December, 1928.

Bogardus, Emory S., "The City: Spatial Measures and Social Distance," in *Sociology and Social Research*, XIII (1928–29), 572–77.

Chase, Stuart, "The Future of the Great City," *Harper's Magazine*, CLX (1929–30), 82–90.

Douglass, H. Paul, "Suburbs," in *Encyclopedia of the Social Sciences*, Volume 14, pp. 433–35. New York: The Macmillan Co., 1934.

Green, Howard Whipple, "Composition and Characteristics of a Typical City Analyzed by Census Tracts," *The Journal of American Statistical Association*, XXVII (March, 1932), pp. 80–91.

Haig, R. M., "Toward an Understanding of the Metropolis," *The Quarterly Journal of Economics*, XL (February, 1926), 179–208; XL (May, 1926), 402–34.

Hart, Alfred B., "The Rise of American Cities," *The Quarterly Journal of Economics*, IV (January, 1890), 129–57; IV (April, 1890), 241–44.

Hawley, Amos H., "An Ecological Study of Urban Service Institutions," *American Sociological Review*, VI (October, 1941), 631–32.

—— "Ecology and Human Ecology." *Social Forces*, (May, 1944).

Hoyt, Homer, "The Structure of American Cities in the Postwar Era," *American Journal of Sociology*, (January, 1943), 475–81.

Isard, Walter, "The General Theory of Location and Space-Economy," *The Quarterly Journal of Economics*, LXIII (November, 1949), 475–506.

Isard, Walter, and Vincent Whitney, "Metropolitan Site Selection," *Social Forces*, XXVII (March, 1949), 263–69.

Lyon, Leverett S., "Economic Problems of American Cities," *American Economic Review*, XXXII (March, 1942), Supplement, 307–22.

McKenzie, Roderick D., "The Ecological Approach to the Study of the Human Community," *American Journal of Sociology*, (November, 1924), 287–361.

—— "The Field and Problems of Demography, Human Geography, and Human Ecology," in L. L. Bernard (ed), *The Fields and Methods of Sociology*. New York: Ray Land and Richard R. Smith, Inc., 1934.

—— "Human Ecology," *Encyclopedia of the Social Sciences*, Vol. 5, pp. 314–15.

—— "The Rise of Metropolitan Communities," in *Recent Social Trends in the United States*. New York: Whittlesey House, 1934.

—— "The Scope of Human Ecology," *American Journal of Sociology*, (July, 1926), 141–54.
—— "Spatial Distance and Community Organization Pattern," *Social Forces*, V (June, 1927), 623–27.
Munro, William B., "City," in *Encyclopedia of the Social Sciences*, Vol. 3, pp. 474–82. New York: The Macmillan Co., 1930.
Park, Orland, "Concerning Community Symmetry," *Ecology*, XXII (April, 1941), 165.
Perroux, Francois, "Economic Space: Theory and Applications," *The Quarterly Journal of Economics*, LXIV (February, 1950), 89–104.
Predohl, Andreas, "The Theory of Location in Its Relation to General Economics," *The Journal of Political Economy*, XXXVI (June, 1928), 371–90.
Quinn, J. A., "The Hypothesis of Median Location," *American Sociological Review*, VIII (April, 1943), 148–56.
Reed, Thomas H., "Metropolitan Areas," in *Encyclopedia of the Social Sciences*, Vol. 10, pp. 396–401. New York: The Macmillan Co., 1933.
Resnick, William C., "Social Characteristics of Cities," *The Appraisal Journal*, VI (October, 1938), 329–339.
Schlesinger, Arthur M., "The City in American History," *Mississippi Valley Historical Review*, XXVII (June, 1940), 43–66.
Smithies, Arthur, "Optimum Location in Spatial Competition," *The Journal of Political Economy*, XLIX (June, 1941), 423–39.
Stamp, L. Dudley, "The Geographical Approach to the Study of Some Business Problems," *Harvard Business Review*, X (October, 1931), 69–77.
Thompson, Warren S., "Urbanization," in *Encyclopedia of the Social Sciences*, Vol. 15, pp. 189–192. New York: The Macmillan Co., 1935.
Trewartha, Glenn T., "The Unincorporated Hamlet: One Element in the American Settlement Fabric," *Annals of the Association of American Geographers*, XXXIII (March, 1943), 32–81.
Van Cleef, Eugene, "Hinterland and Inland," *Geographical Review*, (April, 1941), 308–311.
Williams, Leslie, "Our Cities are Worth Saving," *Stores*, March, 1948, 19.
Wirth, Louis, "Urbanism as a Way of Life," *American Journal of Sociology*, XLIV (July, 1938), 1–24.
Woolston, H. B., "The Urban Habit of Mind," *American Journal of Sociology*, XVII (1911–1912), 602–14.

FUNCTIONS OF THE CITY

Books, Government Publications, etc.

Bartholomew, Harland. *Urban Land Uses*, Harvard City Planning Studies, IV. Cambridge, Mass.: Harvard University Press, 1932.
Bogue, Don J. *The Structure of the Metropolitan Community: A Study of Dominance and Subdominance*. Ann Arbor: The University of Michigan Press, 1949.
Breese, Gerald W. *Industrial Land Use in Burlington County, New Jersey*. Princeton: Bureau of Urban Research, Princeton University, 1951.
Brockton Committee for Economic Development. *A Report on the Economic Base of the Brockton, Massachusetts, Area*. Brockton, Mass.: Brockton Committee for Development and Homer Hoyt Associates, 1949.
Chicago Plan Commission. *Building New Neighborhoods*. Chicago: Chicago Plan Commission, 1943.
Chicago Regional Planning Association. *The Relation of Business Frontage to Population in the Region of Chicago*. Chicago: The Chicago Regional Planning Assn., Dec., 1936.
Cincinnati City Planning Commission. *Communities: A Study of Community and Neighborhood Development*. Cincinnati, Ohio: City Planning Commission, December, 1947.
Federal Housing Administration. *The Structure and Growth of Residential Neighborhoods in American Cities*. Washington, D. C.: Government Printing Office, 1939.
Firey, Walter. *Land Uses in Central Boston*. Cambridge, Mass.: Harvard University Press, 1947.
Haig, R. M. *Major Economic Factors in Metropolitan Growth and Arrangement*. Vol. I. New York: Regional Plan Association, 1927.
Hoyt, Homer. *One Hundred Years of Land Values in Chicago, 1830–1933*. Chicago: University of Chicago Press, 1935.
Kolb, J. H. and R. A. Polson. *Trends in Town-Country Relations*, Research Bulletin No. 117, Agricultural Experiment Station, University of Wisconsin. Madison, Wisconsin: University of Wisconsin, Sept., 1933.
National Resources Committee. *Urban Planning and Land Policies*. Washington, D. C.: Government Printing Office, 1939.
Regional Plan Association. *Economic Status of the New York Metropolitan Region in 1944*. New York: Regional Plan Association, 1945.
Thomas, Lewis F., *The Localization of Business Activities in Metropolitan St. Louis*, Washington University Studies (New Series), Social and Philosophical Sciences, No. 1. St. Louis, Mo.: Washington University, October, 1927.
University of New Mexico. *The Economy of Albuquerque, New Mexico*. Albuquerque, New Mexico: The University of New Mexico, 1949.
Villaneuva, Marcel. *Planning Neighborhood Shopping Centers*. Washington, D. C.: National Planning Association, 1945.
Voss, J. Ellis. *Ocean City: An Ecological Analysis of a Satellite Community*. Philadelphia, 1941.

Articles, etc.

Bacon, Edward N., "A Diagnosis and Suggested Treatment of an Urban Community's Land Problems (Flint, Michigan)," *Journal of Land and Public Utility Economics*, XVI (February, 1940), 81.
Baumgarten, Walter C. K., "The Location and Planning of Industrial Areas," *City Planning*, IX (April, 1933), 56–72.
Carmichael, F. L., "Dewes Real Property Studies," *Journal of American Statistical Association*, XXIX, Supplement, (March, 1934), 111–17.
Clark, Colin, "The Economic Functions of a City," *The Appraisal Journal*, XIV (January, 1946), 69–76.
Conklin, Howard E., "The Rural-Urban Economy of the Elmira-Corning Region," *Journal of Land and Public Utility Economics*, XX (February, 1944), 3–19.
Fink, Orman S. and Coleman Woodbury, "Area Requirements of Cities in the Region of Chicago," *Journal of Land and Public Utility Economics*, IV (August, 1928), 273–82.
Harris, Chauncey, "A Functional Classification of Cities in the United States," *The Geographical Review*, XXXIII (January, 1943), 86–89.
Hoyt, Homer, "Economic Background of Cities," *Journal of Land and Public Utility Economics*, XVII (May, 1941), 188–95.
Kneedler, Grace, "An Economic Classification of Cities," *Municipal Year Book, 1945*. Chicago: The International City Managers Association, 1945, 30–38.
McLaughlin, Glenn E., "Industrial Diversification in American Cities," *The Quarterly Journal of Economics*, XLV (November, 1930), 131–49.
Proudfoot, Malcolm J., "City Retail Structure," *Economic Geography*, XIII (October, 1937), 425–28.
Upson, Lent D., "The Future Service Structure of Cities," *Municipal Finance*, (May, 1942), 22–27.

Wilson, L. S., "Functional Areas in Detroit, 1890–1933," *Papers Michigan Academy of Science, Arts and Letters*. XXII.

MEANING OF CENTRALIZATION, DECENTRALIZATION AND DISPERSION

Books, Government Publications, etc.

American Management Association. *Population Shifts and Postwar Markets*, Marketing Series, No. 52. New York: American Management Association, 1943.

Creamer, Daniel B. *Is Industry Decentralizing?* Philadelphia: University of Pennsylvania Press, 1945.

Douglass, H. Paul. *The Suburban Trend*. New York: The Century Co., 1925.

Freedman, Ronald. *Recent Migration to Chicago*. Chicago: The University of Chicago Press, 1936.

Goodrich, Carter, *et al. Migration and Economic Opportunity*, Report of Study of Population Redistribution. Philadelphia: University of Pennsylvania Press, 1936.

Green, Howard Whipple. *Movements of Families Within the Cleveland Metropolitan District, 1935*, Real Property Inventory of Metropolitan Cleveland, Report No. 7. Cleveland: Cleveland Real Property Inventory, 1936.

Keir, Malcolm, "Localization and Decentralization of Industry," in *Manufacturing*, ch. VI. New York: The Ronald Press Co., 1928.

Mitchell, William N. *Trends in Industrial Location in the Chicago Region Since 1920*, Studies in Business Administration, Vol. IV, No. 1. Chicago: The University of Chicago Press, 1933.

McCarty, H. H. *Industrial Migration in the United States, 1914–1927*. Iowa City, Iowa: The University of Iowa, 1930.

National Resources Planning Board, *Industrial Location and National Resources*. Washington, D. C.: Government Printing Office, 1943.

Nebraska, University of, Committee on Business Research. *The Influence of Automobiles and Roads on Retailing Trading Centers*, Studies in Business, No. 18. Lincoln, Nebr.: University of Nebraska, March, 1927.

Tableman, Betty. *Intra-Community Migration in the Flint Metropolitan District*, University of Michigan, Social Science Research Project, mimeographed. Ann Arbor, Mich.: University of Michigan, 1948.

Taylor, G. R. *Satellite Cities: A Study of Industrial Suburbs*. New York: D. Appleton & Co., 1915.

U. S. Bureau of the Census. *The Growth of Metropolitan District in the United States: 1900–1940*. Washington, D. C.: Government Printing Office, 1948.

Wardwell, Charles A. R. *Regional Trends in the United States Economy*. Washington D. C.: Government Printing Office 1951.

Warren Herbert, and W. R. Davidge, editors. *Decentralization of Population and Industry*. London: P. S. King and Son, Ltd. 1930.

Whetten, N. L., and E. C. Devereux, Jr., *Studies of Suburbanization in Connecticut: 1, Windsor: A Highly Developed Agricultural Area*, Storrs Agricultural Station Bulletin no. 212. Storrs: Conn.: University of Conn., 1936.

Articles, etc.

Achinstein, Asher, "Some Economic Characteristics of Blighted Areas," *Journal of Land and Public Utility Economics*, XI (February, 1935), 38–47.

Alderson, Wroe, "The Concentration of the American Market in Metropolitan Areas," *Printer's Ink*, October 27, 1950, 27–31 ff.

—— and Leonard Kent, "The Concentration of the American Wholesale and Retail Markets in Metropolitan Areas," *Printer's Ink*, April 13, 1951, 29+.

American Business, "Why Downtown Shopping Declines," August, 1940, 18–21.

Andrews, Richard B., "Elements in the Urban-Fringe Patterns," *Journal of Land and Public Utility Economics*, XVIII (May, 1942), 169–83.

——, "Urban-Fringe Studies of Two Wisconsin Cities," *Journal of Land and Public Utility Economics*, XXI (November, 1945), 375–82.

Architectural Forum, "Big Industry Moves to the Country," July, 1951.

Arpke, Frederick, "Land-Use Control in the Urban Fringe of Portland, Oregon," *Journal of Land and Public Economics*, XVIII (November, 1942), 468–80.

Augur, Tracy B., "Decentralization Can't Wait," *The Appraisal Journal*, XVII (Jan. 1949) 103–13.

Babcock, Henry A., "City Growth and Transportation," *The Appraisal Journal*, VI (July, 1938), 249–256.

Ballert, Albert G., "The Rises and Declines of American Urban Centers During the 1940's," *Land Economics*, XXVIII (August, 1952), 203–11.

Blythin, Edward, "The Dangers of Metropolitan Decentralization," *National Municipal Review*, XXI (September, 1942), 442–44.

Bowden, William K., and Ralph Cassady, Jr., "Decentralization of Retail Trade in the Metropolitan Market Area," *The Journal of Marketing*, V (January, 1941), 270–75.

Boyd, Carl, "Growth of Cities in the United States During the Decade, 1880–1890," *The Journal of American Statistical Association*, III (September, 1893), 416–25.

Bushee, Frederick A., "The Growth of the Population of Boston," *Journal of the American Statistical Association*, XIV (September, 1915), 654–71.

Business Week, "New York: How Big Can You Get Anyway?" Feb. 16, 1952, 136+.

—— "Pittsburgh Rebuilds from the Bottom Up," June 21, 1952, 171.

—— "There Are Lots of People Downtown," October 6, 1951, 138.

—— "U. S. Moves West and to the Suburbs," December 22, 1951, 73+.

—— "Where People Will Live in 1960," January 12, 1952, 130.

Case, Mason, "Outlying Business Districts: Causes of Their Recent Growth: Their Effect on Downtown Real Estate Values," *National Real Estate Journal*, September 15, 1930, 27–30.

Cassady, Ralph, Jr., and W. K. Bowden, "Shifting Trade Within the Los Angeles Metropolitan Area," *The Journal of Marketing*, VIII (April, 1944), 398–404.

Clark, Earle, "Contributions to Urban Growth," *Journal of the American Statistical Association*," XIV (September, 1915), 654–71.

Converse, Paul D., "The Automobile and the Village Merchant," *Bureau of Business Research*, Bulletin no. 19. Urbana: University of Illinois, 1928.

—— and Robert V. Mitchell, "The Movement of Retail Trade Within a Metropolitan Area," *The Journal of Marketing*, II (July, 1937), 61–67.

Cressey, Paul F., "Population Succession in Chicago, 1898–1930," *American Journal of Sociology*, XLIV (July, 1938), 59–69.

Davie, M. R., "The Pattern of Urban Growth," in G. P. Murdock (ed.), *Studies in the Science of Society*. New Haven: Yale University Press, 1937.

Dewey, Richard, "Peripheral Expansion in Milwaukee County," *American Journal of Sociology*, LIV (September, 1948), 118–125.

Dickinson, Robert E., "The Metropolitan Regions of the United States," *The Geographical Review*, (April, 1934), 278–91.

Diehl, Larry F., "Major Aspects of Urbanization in the Philadelphia Metropolitan Area," *Journal of Land and Public Utility Economics*, XIX, (August, 1943), 316–28.

Doherty, Richard P., "Decentralization of Retail Trade in Boston," *The Journal of Marketing*, VI (January, 1942), 281–86.

—— "The Movement and Concentration of Retail Trade in Metropolitan Areas," *The Journal of Marketing*, V (April, 1941), 395–401.

Eberle, George J., "Metropolitan Decentralization and the Retailers," *The Journal of Retailing*, XXII (December, 1946), 91–94.

Emmons, C. D., "The Development of American Street Railways," *AERA*, XII, (1923–24), 1148–66.

Erskine, R. C., "Business Sub-Centers, Their Early Future and Wealth Producing Possibilities," *National Real Estate Journal*, September, 1936, 37–38.

—— "Valuing Business Subcenter Property," *Journal of the American Institute of Real Estate Appraisers*, October, 1938, 340.

Fisher, Ernest M., "Economics of Decentralization," *The Appraisal Journal*, X (April, 1942), pp. 135–42.

Ford, James, "Residential and Industrial Decentralization," in John Nolen, ed., *City Planning*, 2nd ed., chap. XV. New York: 1929.

Fortune, "The Race to the Suburbs," December, 1951.

Garth, J., "Where Industry is Moving and Growing," *American Business*, December, 1951.

Gillette, John M., and George R. Davies, "Measure of Rural Migration and Other Factors of Urban Increase in the United States," *Journal of the American Statistical Association*, XIV (September, 1915), 642–53.

Hall, Joseph B., "Business Districts in Motion," *The Appraisal Journal*, IX (January, 1941), 34–40.

Hardware Age, "Move from Downtown Catches Auto Trade," June 16, 1949, 72.

Hauser, Philip M., "Population Shifts," *The Appraisal Journal*, XI (July, 1943), 223–230.

—— "How Declining Urban Growth Affects City Activities," *Public Management* (December, 1940).

Hawley, Amos H., and Don J. Bogue, "Recent Shifts in Population: The Drift Toward the Metropolitan District, 1930–40," *Review of Economics and Statistics*, XXIV (August, 1942), 143–148.

Hayford, John F., "What is the Center of an Area, or the Center of a Population?" *Journal of the American Statistical Association*, VIII (June, 1902), 47–58.

Heidingsfeld, Myron S., "Why Do People Shop in Downtown Department Stores?" *The Journal of Marketing*, XIII (April, 1949), 510–12.

Hoover, Edgar M., "Interstate Redistribution of Population, 1850–1940," *Journal of Economic History*, (May, 1941), 199–205.

Hoyt, Homer, "Forces of Centralization and Decentralization," *American Journal of Sociology*, XLVI (May, 1941), 843–852.

—— "Is City Growth Controlled by Mathematics or Physical Laws?" *Land Economics*, XXVII (August, 1951), 259–62.

—— "Urban Decentralization," *Journal of Land and Public Utility Economics*, XVI (August, 1940), 270–76.

—— "Urban Growth and Real Estate Values," *The Appraisal Journal*, VIII (October, 1940), 332–340.

Hubert, Giles A., "A Framework for the Study of Peripheral Areas," *The Journal of Farm Economics*, XXVIII (August, 1946), 804–20.

Jaffe, A. J., "Population Trends and City Growth," *Annals of the American Academy of Political and Social Science*, CCXLII (November, 1945), 18–24.

Jefferson, Mark, "Great Cities in the United States in 1930," *Geographical Review*, (January, 1933), 90–100.

Klove, Robert C., "A Technique for Delimiting Chicago's Blighted Areas," *Journal of Land and Public Utility Economics*, XVIII (November, 1941), 483–84.

Laronge, Joseph, "Should We Get Excited About Retail Decentralization?" *National Real Estate and Building Journal*, December, 1938, 22.

Management Review, "Suburban Trend," December, 1929, 420.

Mayer, Harold M., "Patterns and Recent Trends of Chicago's Outlying Business Center," *Journal of Land and Public Utility Economics*, XVIII (February, 1942), 4–16.

Meserole, W. H., "What Do You Mean—Rural and Urban," *The Journal of Marketing*, II (January, 1938), 233–35.

New York State *Commerce Review*, "Business Aspects of Suburban Growth," V (November, 1951), 8–17.

Nirenstein, Nathan, "There'll Always Be a Main Street," *The Appraisal Journal*, XV (January, 1947), 105–09.

Park, Robert E., "Urbanization as Measured by Newspaper Circulation," *American Journal of Sociology*, XXXV (July, 1929), 60–79.

Peters, William S., "Concepts and Measures of Retail Centralization and Decentralization in Metropolitan Areas," in *Theory in Marketing*, pp. 281–96. Chicago: Richard D. Irwin, Inc., 1950.

Plimpton, R. D., "Distribution Advances with the Motor Truck," *Journal of Land and Public Utility Economics*, VII (August, 1931), 262–81.

Porter, Russell, "City Trade Grows, Belying Pessimists and Rivals Claims," *New York Times*, May 4, 5, 1952.

Proudfoot, Malcolm J., "Intra-city Business Areas for Principal Cities," *The Journal of Marketing*, I, (January, 1937), 231–35.

—— "The Outlying Business Centers of Chicago," *Journal of Land and Public Utility Economics*, XIII (February, 1937), 57–70.

Reeves, Cuthberg E., "Shifts in Location of a Retail District," *Journal of the American Institute of Real Estate Appraisers*, July, 1938, 267. Also, *The Appraisal Journal*, VI (July, 1938), 267–276.

Ross, Don, "Main Street Extends to the Open Country," *Printer's Ink*, August 4, 1950, 29+.

Runkle, Jay D., "A Downtown Merchant Looks at the Future of Downtown Shopping Areas," *Stores*, November, 1947, 13.

Sales Management, "Metropolitan America: How It's Changed Since '39," May 10, 1950, 136 ff.

—— "Population Shifts in Metropolitan Areas, 1940-1950," January 1, 1951, 70+.

—— "St. Paul to 'Redesign' Downtown Area to Halt Shoppers' Strike," January 1, 1945.

Sheperd, Geoffrey, "Decentralization in Agricultural Marketing—Causes and Consequences," *The Journal of Marketing*, VI (April, 1942), 341–48.

Shryock, Henry S., Jr., "Internal Migration and the War," *Journal of American Statistical Association*, XXXVIII (March, 1943), 16–30.

Smith, George C., "Trends Affecting Commercial and Industrial Properties," *The Appraisal Journal*, VII (July, 1939), 245–251.

Smith, George C., Jr., "Lorenz Curve Analysis of Industrial Decentralization," *Journal of the American Statistical Association*, XLII (December, 1947), 591–96.

Spencer, G. H., and J. Walter Thompson, "How Population Shifts Have Reshaped Markets," *Advertising and Selling*, September, 1941, 32.

Thompson, Warren S., "Future Population Growth and Real Estate Values," *The Appraisal Journal*, III (October, 1934), 34–41.

—— and P. K. Whelpton, "Changes in Regional and Urban Patterns of Population Growth," *American Sociological Review*, V (December, 1940), 921–29.

True, Wallace W., "Population Analysis and Population Trends," *The Appraisal Journal*, VI (July, 1938), 207–219.

Tylor, W. Russell, "Recent Trends in City and Country Populations," *Journal of Land and Public Utility Economics*, IX (February, 1933), 63–74.

Welch, Kenneth C., "The Relocation of Commercial Areas," *The Appraisal Journal*, XVII (January, 1949,) 45–52.

—— "Where are Department Stores Going?" *Architectural Record*, November, 1944.

Whitnall, Gordon, "Disintegrating Commercial Centers," *The Appraisal Journal*, IX (January, 1941), 9–18.

—— "Urban Disintegration and the Future of Land Investments," *Journal of Land and Public Utility Economics*, XVII (November, 1941), 440–51.

Wolff, R. P., and F. H. Blair, "Are We Reaching City Limits?" *Dun's Review*, April, 1951.

Zeckendorf, William, "Cities versus Suburbs: A Struggle for Survival," *The Atlantic Monthly*, July, 1952, 24–28.

LOCATION OF MANUFACTURING ACTIVITIES

Books, Government Publications, etc.

Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce. *Basic Industrial Markets in the United States*. Washington, D. C.: Government Printing Office, 1937.

Bush, Ada L., *Suggestions for Outline of a City Survey*, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Domestic Commerce Series, no. 45. Washington, D. C.: Government Printing Office, 1931.

Friederich, Carl (ed.), *Alfred Weber's Theory of the Location of Industries*, English ed. Chicago: University of Chicago Press, 1929.

Garver, F. B., F. M. Buddy, and A. J. Nixon. *The Location of Manufacturers in the United States, 1899–1929*, Bulletins of Employment Stabilization Research Institute, Vol. II, no. 6. Minneapolis: University of Minnesota Press, 1933.

Holmes, W. Gerald, *Plant Location*, New York: McGraw-Hill Book Co., 1930.

McLaughlin, Glenn E. *Growth of American Manufacturing Areas*, Bureau of Business Research, Monograph no. 7. Pittsburgh: Bureau of Business Research, University of Pittsburgh, 1938.

—— and Stefan Robock. *Why Industry Moves South: A Study of Factors Influencing the Recent Location of Manufacturing Plants in the South*. Washington, D. C.: National Planning Association, 1949.

Parker, Margaret T. *Lowell: A Study of Industrial Development*. New York: The Macmillan Co., 1940.

U. S. Bureau of the Census. *Location of Manufacturers, 1899–1929*. Washington, D. C.: Government Printing Office, 1933.

Articles, etc.

Drennan, George W., "Industrial Plant Trends," *The Appraisal Journal*, XVII (January, 1949), 83–85.

Greenhut, Melvin L., "Integrating the Leading Theories of Plant Location," *The Southern Economic Journal*, XVIII (April, 1952), 526–38.

Hall, Frederick S., "The Localization of Industries," *Twelfth Census: Part 1, Manufactures, United States, by Industries*, Census Reports XII. Washington, D. C.: Government Printing Office, 1902.

Isard, W., and W. M. Capron, "The Future Locational Pattern of Iron and Steel Production in the United States," *The Journal of Political Economy*. LXII (April, 1949), 118–33.

Krzyanowski, Witold, "Review of the Literature of the Location of Industries," *The Journal of Political Economy*, XXXV (April, 1927), 278–91.

McCallum, E. D., "The Location of the Industry," in *The Iron and Steel Industry in the United States*, pp. 34–57. London: P. S. King & Son, Ltd., 1931.

McGuire, D. C., "Factors in Industrial Location," *The Appraisal Journal*, X (April, 1942), 120–124.

Mitchell, William N., and Michael J. Jucius, "Industrial Districts of the Chicago Region and Their Influence on Plant Location," *The Journal of Business of the University of Chicago*, V (April, 1933), 139–56.

New York State *Commerce Review*, "Manufacturing in Economic Areas; Part One; Niagara Frontiers and Rochester Area", Feb., 1952, 16–21, 24.

Palmer. Dwight, "The Location of Industry," *The Appraisal Journal;* XV (April, 1948), 125–30.

Ross, E. A., "The Location of Industries," *The Quarterly Journal of Economics*, X (April, 1896), 247–68.

Schumacher, Hermann, "Location of Industry," *Encyclopedia of the Social Sciences*, Vol. IX, pp. 585–93. New York: The Macmillan Co., 1933.

Swan, Herbert S., "The Economic Location of Industrial Plants," *National Real Estate Journal*, April, 1939.

Vanderblue, Homer W., "Changes in the Localization of the Pig-Iron Industry," *Harvard Business Review*, IV (July, 1926), 417–24.

Wood, Charles P., "The Location of Industry," *The Appraisal Journal*, XIII (October, 1945), 339–347.

Woodard, Donald B., "Long Term Trends in Industry," *The Appraisal Journal*, XVI (April, 1948), 148–55.

LOCATION OF WHOLESALE TRADE

Books, Government Publications, etc.

Cassady, Ralph, Jr., and Wylie L. Jones. *The Changing Competitive Structure in the Wholesale Grocery Trade: A Case Study of the Los Angeles Market, 1920–1946*. Berkeley and Los Angeles, Calif.: University of California Press, 1949.

Duddy, Edward A., and David A. Revzan. *The Changing Relative Importance of the Central Livestock Market*, Studies in Business Administration, Vol. VIII, no. 4. Chicago: University of Chicago Press, August, 1938.

—— —— *The Use of Transportation Facilities in the Chicago Fruit and Vegetable Market*, Studies in Business Administration, Vol. X, no, 4. Chicago: University of Chicago Press, 1940.

Millard, J. W. *Atlas of Wholesale Grocery Territories*, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Domestic Commerce Series No. 7. Washington, D. C.: Government Printing Office, 1926.

Moulton, Elma S. *Atlas of Wholesale Dry Goods Trading Areas*, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Economic Series no. 12. Washington, D. C.: Government Printing Office, 1941.

Articles, etc.

Calhoun, W. T.; H. E. Erdman; and G. Mehren. *Improving the San Franciso Wholesale Fruit and Vegetable Market*. U. S. Department of Agriculture, Bureau of Agricultural Economics, in cooperation with the University of California, College of Agriculture. Agricultural Experiment Station, February, 1943.

Clewett, Richard M., "The Clustering of Firms in a Wholesale Fruit and Vegetable Market," in *Theory in Marketing*, pp. 297–306. Chicago: Richard D. Irwin, Inc., 1950.

Duddy, Edward A., and David A. Revzan, "The Location of

the South Water Wholesale Fruit and Vegetable Market in Chicago," *Journal of Business of the University of Chicago*, XII (October, 1939), 386–412; XIII (January, 1940), 39–55.

—— —— "Transportation and Marketing Facilities for Fresh Fruits and Vegetables in Chicago," *Journal of Business of the University of Chicago*, XII (July, 1939), 280–97.

Fetter, Frank A., "The Economic Law of Market Areas," *The Quarterly Journal of Economics*, XXXVIII (May, 1924), 520–29.

Grether, E. T., "Trends in the Wholesale Grocery Trade in San Francisco," *Harvard Business Review*, VIII (July, 1930) 443–50.

—— "Trends in the Wholesale Meat Business of San Francisco," *Journal of Business of the University of Chicago*, VII (April, 1934), 124–32.

Hyson, C. D., and W. P. Hyson, "The Economic Law of Market Areas," *The Quarterly Journal of Economics*, LXIV (May, 1950), 319–27.

Jones, Fred M., "The Decline of Chicago as a Futures Market," *The Journal of Marketing*, XII (July, 1947), 61–65.

Journal of Retailing, The, "Chicago Distribution Census," III (January, 1928), 19–21.

Knapp, Joseph G., "A Review of Chicago Stock Yards History," *Journal of Business of the University of Chicago*, II (June, 1924), 331–46.

Lewis, Edwin H., "Wholesale Market Patterns," *The Journal of Marketing*, XII, (January, 1948), 317–26.

Miller, Nelson A., "Wholesale Centers and Marketing Areas in the United States," *The Journal of Marketing*, XIV (September, 1949), 156–68.

Mitchell, Harry A., "The Development of New Orleans as a Wholesale Trading Center," *Louisiana Historical Quarterly*, XXVII (October, 1944), 3–33.

Peterson, Elmore, "Solving Wholesaler's Problems through Trading Area Research," *The Journal of Marketing*, IV (April, 1940), 39–45. *Discussion*, by W. W. Leigh, 45–46.

Rasmussen, E. Guy, "Hardware Wholesale Trading Centers and Trading Territories in Nine Southeastern States," *The Journal of Marketing*, VIII (October, 1943), 165–71.

Sielaff, Richard O., "Wholesale Clothing Markets Centered in Duluth," *The Journal of Marketing*, XV (July, 1950), 64–66.

Wales, Hugh G., "The Kansas City Wholesale Fruit and Vegetable Market," *Journal of Business of the University of Chicago*, XIX (July, 1940), 161–75.

LOCATION OF RETAIL TRADE

Books, Government Publications, etc.

Baker, Geoffrey, and Bruno Funaro. *Shopping Centers*. New York: Reinhold Publishing Co., 1951.

Bratcher, Austin S., *A Method of Delineating Retail Trade Zones*. School of Business and Public Administration, University of Arizona, 1939.

Brennan, John. *Urban Markets and Retail Sales*. New York: Outdoor Advertising Inc., 1938.

Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce. *Analyzing a Retail Market*, Trade Information Bulletin No. 272. Washington, D. C.: Government Printing Office, 1924.

—— *Retail Store Location*, Trade Information Bulletin, No. 269. Washington, D. C.: Government Printing Office, 1924.

Canoyer, Helen G., *Selecting a Store Location*, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Economic Series, No. 56, Washington, D. C.: Government Printing Office, 1946.

Cassady, Ralph, Jr., and Harry J. Ostlund. *The Retail Distribution Structure of the Small City*, University of Minnesota Studies in Economics and Business, No. 12. Minneapolis: University of Minnesota Press, 1935.

Chamber of Commerce, U. S. Domestic Distribution Department. *How to Make a Local Area Survey*. Washington, D. C.: Chamber of Commerce of the United States, 1948.

Converse, Paul D. *Consumer Buying Habits in Selected South Central Illinois Communities*, University of Illinois Business Studies, No. 6. Urbana, Ill.: University of Illinois, 1948.

—— *County Incomes and Trade Movements in Illinois*, Special Bulletins, No. 4. Urbana, Ill.: Bureau of Business and Economic Research, University of Illinois, 1945.

—— *Retail Trade Areas in Illinois*, Bureau of Economic and Business Research, University of Illinois, Business Studies, No. 6. Urbana, Ill.: University of Illinois, 1948.

—— *A Study of Retail Trade Areas in East Central Illinois*, Bureau of Economic and Business Research, Business Studies, No. 2. College of Commerce and Business Administration. Urbana, Ill.: University of Illinois, 1943.

—— *Survey of the Kankakee Retail Trade Area*. Urbana, Ill.: Bureau of Economic and Business Research, University of Illinois, 1949.

Curtis Publishing Co. *Market Areas for Shopping Lines*. Philadelphia: Curtis Publishing Co., 1947.

DeBoer, S. R. *Shopping Districts*, Studies in City Planning. Washington, D. C.: American Planning and Civic Association, 1937.

DeLeuw, Cather and Co., *Report on Revenues—Proposed Lexington Market, Baltimore, Md.* Chicago: DeLeuw, Cather and Co., 1937.

Dewhurst, J. Frederic, *Commercial Survey of Philadelphia Marketing Area*, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Domestic Commerce Series, No. 1. Washington, D. C.: Government Printing Office, 1925.

Doherty, Richard P. *Trends in Retail Trade and Consumer Buying Habits in the Metropolitan Boston Retail Trade Area*. Boston: Bureau of Business Research, Boston University, 1941.

Green, Howard Whipple. *Shopping Centers and Street Frontage*, annual. Cleveland, Ohio: Real Property Inventory of Metropolitan Cleveland.

Greensboro Chamber of Commerce. *A Survey of the Greensboro Retail Trading Area*. Greensboro, N. C.: Greensboro Chamber of Commerce, 1933.

Hartsough, Mildred L. *The Twin Cities as a Metropolitan Market*, University of Minnesota, Studies in Social Science, No. 18. St. Paul: University of Minnesota Press, 1925.

Hoffer, C. R. *Changes in the Retail and Service Facilities of Rural Trade Centers in Michigan, 1900 and 1930*, Michigan State College, Special Bulletin No. 261. East Lansing, Mich.: Michigan State College, 1935.

Hoyt, Homer. *Market Analysis of Shopping Centers*, Technical Bulletin No. 12. Washington, D. C.: The Urban Land Institute, 1949.

Jones, Fred. M., *A Survey of Retail Trading Area*, Bureau of Business Research Bulletin, No. 44. Urbana, Ill.: University of Illinois, 1932.

Ketchum, Morris, Jr. *Shops and Stores*. New York: Reinhold Publishing Co., 1948.

Luck, David J., *Bloomington Trade Area Survey Report*, Urbana, Ill.: Bureau of Economic and Business Research, University of Illinois, 1949.

—— *Harvey, Illinois, as a Retailing Center*. Urbana, Ill.: Bureau of Economic and Business Research, University of Illinois, 1949.

Maurer, J. M., and Daniel Starch. *Analysis of the Tulsa Retail Trade Area*. Tulsa, Okla.: Tulsa Chamber of Commerce, 1931.

Metropolitan Life Insurance Co., Policy Holders' Service Bureau. *Selecting Locations for Retail Stores*. New York: Metropolitan Life Insurance Co., 1935.

Mott, Seward H., and Max S. Wehrly (eds.). *Shopping Centers: An Analysis*, Technical Bulletin No. 11. Washington, D. C.: The Urban Land Institute, 1949.

New York State Department of Commerce. *Picking a Location for a Small Business*, Small Business Series, No. 3. Albany, N. Y.: New York State Department of Commerce, 1945.

—— *Shopping Center Development*. Albany, N. Y.: New York Department of Commerce, 1949.

Nichols, J. C. *Mistakes We Have Made in Developing Shopping Centers*, Technical Bulletin No. 4. Washington, D. C.: The Urban Land Institute, 1945.

Paver, John, and Miller McClintock. *Traffic and Trade: An Introduction to the Analysis of the Relationship Between the Daily Habitual Movements of People and Their Trade Activities in Markets*. New York: McGraw-Hill Book Co., Inc., 1935.

Pfanner, John A. *A Statistical Study of the Drawing Power of Cities for Retail Trade*, Studies in Business Administration, Vol. X, No. 3. Chicago: University of Chicago Press, 1940.

Platzker, Joseph. *Creating a Modern Shopping Center for Manhattan's Growing Civic Center*. New York: East Side Chamber of Commerce, October, 1948.

Ratcliff, Richard U. *The Problem of Retail Site Location*, Michigan Business Studies, Vol. IX, No. I, Bureau of Business Research, School of Business Administration. Ann Arbor, Mich.: University of Michigan, 1939.

Read, Eaton V. W. *An Analysis of Retail Trading Relationships of Elgin, Illinois; A Satellite City, Studies in Business Administration*, Vol. IX, No. 1. Chicago: University of Chicago Press, 1938.

Reilly, William J. *The Law of Retail Gravitation*. New York: W. J. Reilly Inc. New York: W. J. Reilly, Inc., 1931.

Reilly, William J. *Methods for the Study of Retail Relationships*, Texas University Bulletin, No. 2944, Austin, Texas: University of Texas, 1929.

Rolph, Inez K. *The Location Structure of Retail Trade Based upon a Study of Baltimore*, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Domestic Commerce Series No. 80. Washington, D. C.: Government Printing Office, 1933.

Sales Managers' Bureau, St. Louis. *Neighborhood Shopping Centers in St. Louis and St. Louis County*. St. Louis, Mo.: Sales Managers Bureau, 1947.

Secrist, Horace. *The Widening Retail Market and Consumers' Buying Habits*, Northwestern University Business Studies. Chicago: A. W. Shaw Co., 1926.

Thompson Co., J. Walter. *Retail Shopping Areas*. New York: J. Walter Thompson Co., 1927.

Weaver, Henry G. *Territorial Market Analysis*, American Management Association, Sales Executives' Series No. 32. New York: American Management Association, 1926.

Yocum, James C., and Sam Arnold. *Sales of Ohio Retailers, 1935–1947*, Bureau of Business Research, Research Monograph, No. 52. Columbus, Ohio: Ohio State University, 1948.

Articles, etc.

Alexander, C. W., "How to Establish a Business by the Side of the Road: Check List for Selecting the Location," *Printer's Ink*, December 1, 1944, 25–26; December 8, 1944, 25–26.

Abrams, Charles, "The New Gresham's Law of Neighborhoods," *The Appraisal Journal*, XIX (July, 1951), 324–37.

American Builder, "Colonial Shops, Evanston, Ill.," November, 1947, 73.

—— "Delaware Park Shopping Center, Buffalo, N. Y.," May, 1949, 118.

—— "Edmonson Village Shopping Center, Baltimore, Md.," February, 1948, 114.

—— "Mercer Island Shopping Center," Seattle, Wash., November, 1948, 94.

—— (and *Building Age*), "Postwar Shopping Center the Hub of Midwest City's Land Planning," May, 1944.

—— "Ridgeway Shopping Center, Stanford Conn.," November, 1948, 114.

American Business, "Weigil Proves the Beaten Path Theory," November, 1939, 21.

American City, The, "Framingham New Shopping Center Site," February, 1948, 135.

—— "Large-Scale Shopping Center Develops," December, 1946, 69.

—— "A Mammoth New Shopping Center for Livingston," February, 1949, 78.

—— "Neighborhood Shopping Centers," June, 1945, 105.

—— "North Shore Shopping Center (Beverly, Mass.,)," July, 1947, 124.

—— "Port Edwards Shopping Center," December, 1948, 98.

—— "Shopping Center Designed to Attract Shoppers," August, 1945, 87.

—— "Thirty-Three Cars to a Store," June, 1947.

—— "Unique Shopping Center Proposed," September, 1946, 117.

Annalist, "Must the Small Storekeeper Go?" I (March 3, 1913), 196–98.

Architectural Forum, "Bellevue, Washington, Is a Smoothly Designed, Expertly Handled Exercise in Modern Real Estate Development," April, 1937, 76.

—— "Euclid, Ohio, Shopping Center: Main Street Under One Roof, Built Around a Big Parking Area," May, 1948, 132.

—— "$50,000,000 Retail Center Planned for Flushing, N. Y.," November, 1946, 100.

—— "Markets in the Meadows (Shopping Centers—Levittown, Long Island; Bellevue, Wash.; Seattle, Wash.; Framingham, Mass.,)," March, 1949, 114.

—— "100 Per cent Locations: A NAREB Inventory of the Tops in Shopping Centers," June, 1938.

—— "Replanning of Shopping Centers, Rye, N. Y.," August, 1946, 76.

—— "Shopping Center for the Altgeld Gardens Housing Project: Essential Services for 1,500 Families," May, 1948, 133.

—— "Shopping Center for College Park Shopping Center, Inc.," March, 1946, 137.

—— "Shopping Center (North Shore Center) near Beverly, Mass., Uses Location, Unlimited Parking, a Pedestrian Mall, and Modern Design to Safeguard a $6 Million Investment," June, 1947, 84.

Architectural Record, "Five Retail Stores Planned for a Motor Age." September, 1940, 31–42.

—— "Proposed Shopping Center for Great Neck, Long Island," May, 1950, 159.

—— "Ridgeway Shopping Center, Stamford, Connecticut," December, 1947, 112.

—— "Shopping Centers," August, 1949, 110.

—— "Shopping Terminals and Stores, Building Types Study," February, 1945, 85–95.

Bader, Louis, "Census Data as a Basis for Increasing the Retail Trade of a Community," *The Journal of Retailing*, XIV (April, 1938), 43–46.

Bennett, Victor W., "Consumer Buying Habits in a Small Town Located Between Two Large Cities," *The Journal of Marketing*, VIII (April, 1944), 405–16.

Blankertz, D. F., "Customer Patronage of a Parent and New

Branch Store," *The Journal of Marketing*, XVI (October, 1951), 152–57.

Bratcher, Austin S., "A Method of Delineating Retail Trade Zones," *The Journal of Marketing*, III (January, 1939), 262–64.

Breyer, Ralph F., "Some Preliminary Problems of a Sample Design for a Survey of Retail Trade Flow," *The Journal of Marketing*, X (April, 1946), 343–53.

Business Week, "A $5 Million Shopping Center is Slated for Levittown, L. I.," January 14, 1950, 52.

—— "Oft in the Stilly Night (Evening Shopping)," January 5, 1952, 76.

—— "Realtors Move Tenants Around to Fit Their Balanced Shopping Center," January 21, 1939, 18.

—— "Shopping Center: 1949 Model," July 23, 1949, 47.

—— "Sizing up the Branch Store," February 9, 1952, 114.

—— "Small Cities are Turning Traffic Jams into Profits," March 22, 1952, 98.

—— "A $30 Million Shopping Center Will Go Up in Lakeside District of San Francisco," February, 4, 1950, 70.

—— "What's Needed in a Shopping Center," March 4, 1950, 66.

Carmichael, F. L., "Pedestrian Traffic in Downtown Denver," *University of Denver Reports*, Business Study No. 119, XXVII (August, 1951), 1–12.

Chain Store Age, Administration Edition, "Shopping Center Round-Up," July 1950, 26.

—— "Shopping Centers in the Spot Lights," April, 1949, 46–7.

—— "Target for Traffic," August, 1949, 21.

—— "Yardstick for Shopping Centers," February, 1950, 23.

Changing Times, "Blueprint for a Shopping Center," April, 1947, 1.

Coles, Jessie, V., "The Pattern of Retail Food Stores in a Small City," *The Journal of Marketing*, XIII (October, 1948), 163–71.

Converse, Paul D., "Is There a Law of Retail Gravitation?" *Printers' Ink*, September 10, 1943, 36.

—— "New Laws of Retail Gravitation," *The Journal of Marketing*, XIV (October, 1949), 379–84.

Davies, D. R., "How to Submit Locations to Chain Store Companies," *National Real Estate Journal*, January 6, 1930, 23–25.

Domestic Commerce, "Further Analysis of Traffic and Customer Visits to Neighborhood Drug Stores," February 20, 1935.

—— "Pedestrian Traffic Analyzed at Seven Neighborhood Drug Store Locations," December 10, 1934.

—— "The Relation of Traffic with Trade by Time of Day," January 30, 1935.

Domestic Engineering, "How to Choose a Store Location," May 16, 1931, 48.

—— "Selecting the Proper Location for a Retail Store," March 22, 1930, 59.

Dowling, R. W., "Neighborhood Shopping Centers," *Architectural Forum*, October, 1943, 76–78.

Douglas, Edna, "Buying Practices of Out-of-Town Customers," *The Journal of Business of the University of Chicago*, XXIII (October, 1950), 259–72.

—— "Measuring the General Retail Trading Area—A Case Study," Part I, *The Journal of Marketing*, XIII (April, 1949), 481–97; Part II, XIV (July, 1949), 46–60.

Dun's Review (Formerly Dun's International Review), "Selecting a Desirable Location for a Retail Store," November, 1927, 36–41.

Economist, "Shopping Center," March 20, 1943.

Ellwood, Leon W., and Robert H. Armstrong, "Shops, Stores and Shopping Centers," *The Appraisal Journal*, Part I, XX (January, 1952), 13–19; Part II, XX (April, 1952), 194–205.

Engineering News-Record, "The Shopping Center—Logical Adjunct of Group Housing in Suburban Areas," April 12, 1948, 16.

Fisher, Howard T., "The Impact of New Shopping Centers upon Established Business Districts," *Talk*, May 15, 1950. Washington, D. C.: National Citizens Conference on Planning, 1950.

Fitzpatrick, Paul J., "What Factors Make a Successful Store Location?" *The Journal of Retailing*, IX (October, 1933), 90–92.

Flint, Lucius, S., "How Chains are Selecting Locations," *Chain Store Age*, Administration Edition, January, 1950, 13.

Ford, P., "Excessive Competition in the Retail Trades—Changes in the Number of Shops, 1901–1931," *The Quarterly Journal of Economics*, XLV (September, 1935), 501–08.

Furst, Russell L., "Relationships between the Numbers of Chain and Individually Owned Grocery Stores in Fort Wayne," *Journal of Business of the University of Chicago*, V (October, 1932), 335–45.

Gibbs, M. G., "How a Prominent Chain (Peoples Drug Stores) Picks Its Locations," *Printers' Ink*, November 10, 1927, 108.

Goldsen, Joseph M., and Alberta Curtis, "Montclair Studies the Shopping Experiences and Attitudes of Its Residents," *The Journal of Marketing*, X (October, 1945), 165–70.

Green, Harold E., "Want New Outlets by the Side of the Road?" *Printers' Ink*, August 18, 1950, 20–25.

Green, Howard Whipple, "Neighborhood Retail Outlets and Family Stability," *The Journal of Marketing*, I (July, 1936), 40–45.

—— "Retail Outlets in Shopping Centers Stop Decreasing," *The Journal of Marketing*, X (January, 1946), 281–82.

—— "Retail Outlets per 1,000 Families: Cleveland Real Property Inventory," *Architectural Record*, August, 1936.

Green, Stanley K., "How to Submit Your Location to the Chain Store," *National Real Estate Journal*, November 25, 1929, 13–14.

Hardware Age, "Hardware Firm Cashes in on Shopping Center Traffic," December 4, 1947, 80.

—— "New Shopping Center Store Shows Weekly Sales Jump," March 23, 1950, 141.

—— "New Suburban Seattle Store a Magnet for Motoring Shoppers," September, 1947, 174.

—— "Operates Two Stores More Efficiently Than One," April 7, 1949.

—— "Move from Downtown Catches Auto Trade," June 19, 1949, 72.

—— "A Shopping Center in a Shopping Center," August 28, 1947, 68.

Henderson, James D., "Gasoline Service Stations," *The Appraisal Journal*, I (January, 1933), 140–141.

Hollander, Sidney, Jr., "A Technique for Spotting Retail Outlets," *The Journal of Marketing*, XI (January, 1942), 280–281.

Holsinger, Zelda, "Attitudes of Women Toward Types of Stores," *The Journal of Retailing*, XIV (December, 1938), 104–107.

Hower, Ralph M., "Urban Retailing 100 Years Ago," *Bulletin of the Business Hisotrical Society*, XII (December, 1938), 91–101.

Hoyt, John R., "Appraisal of Department Stores," *The Appraisal Journal*, VII (October, 1939), 358–361.

Hutchinson, Kenneth D., "Traffic and Trade Correlations: A Technique in Store Location," *The Journal of Marketing*, V (October, 1940), 137–43.

Iglauer, Jay, "Department Store Distribution," *The Journal of Marketing*, VIII (January, 1944), 326–28.

Jones, Fred M., "Retail Stores in the United States, 1800–1860," *The Journal of Marketing*, I (October, 1936), 134–42.

Jones, L., "Traffic Counts at the Place of Purchase," *Modern Packaging*, November, 1941, 78.

Kahn, Edward, "This Changing Retail Picture," *The Journal of Retailing*, XII (April, 1936), 18–20.

Ketchum, Morris, Jr., "What to Look for in Shopping Centers," *Chain Store Age*, Administration Edition, July, 1948, 23.

Kravitz, Morris A., "Outlying Shopping Centers," *The Appraisal Journal*, XVI (October, 1948), 478.

Kunis, Manuel, "Retail Trade in the New York Metropolitan Area," *The Journal of Retailing*, XVII (October, 1941), 85–89.

Laronge, Joseph, "Submitting Locations," *National Real Estate Journal*, January 19, 1931, 39–41.

LeBow, Victor J., "The Nature of Postwar Retail Competition," *The Journal of Marketing*, IX (July, 1944), 11–18.

Levy, Mark, "List of 100 per cent Locations in 152 leading cities of the U. S. and Canada," *Journal of Real Estate Management*, February, 1938.

Lifshey, Earl, "Postwar Merchandising Plans of the Firm Chains," *Retailing* (Home Furnishings), February 12, 1945; February 15; February 19; February 22; February 26; and March 5, 1945.

Lillibridge, Robert M., "Shopping Centers in Urban Redevelopment," *Land Economics* (May, 1948), 137–60.

Lonberg-Holm, K., "Planning the Retail Store," *Architectural Record*, June, 1931, 69–499.

Lurie, Ira A., "What's the Best Location?" *System*, October, 1922.

Martin, Harry E., "Spreading Location Risks," *Chain Store Age*, Administration Edition, January, 1950, 15.

McGarry, Edmund D., "Retail Trade Areas in Buffalo," University of Buffalo, Bureau of Business Research, *Supplementary Statistical Survey*, Vol. VII, No. 8 (April, 1931).

McGill, Kenneth H., "A Method for Delineating Trade Areas," *The Journal of Retailing*, IX (April, 1933), 10–14.

Mertes, John E., "The Shopping Center—A New Trend in Retailing," *The Journal of Marketing*, XIII (January, 1949), 374–79.

Mitchell, Robert V., "The Future of the Small Town Retailer," *University of Illinois Bulletin*, XXXVII (December 12, 1939), 1–7.

Meserole, W. H., "The Qualitative Character of Pedestrian Traffic," *American Marketing Journal* (July, 1935).

Mott, Seward H., "Recent Developments in Suburban Shopping Centers," *The Appraisal Journal*, XVII (January, 1949), 39.

National Grocers Bulletin, "Unusual Facts About Shopping Centers," April, 1950, 34.

National Petroleum News, "Eliminating the Guesswork from Service Station Location and Operation," January 1, 1936, 27–30; January 8, 30–34; January 15, 33–38.

New York State, *Commerce Review*, "Attitudes and Habits of Retail Shoppers," V (February, 1951), 5–10.

Nicholls, Charles C., "The Future of Chain Stores," *The Appraisal Journal*, XI (July, 1943), 210–215.

Nichols, J. C., "The Planning and Control of Outlying Shopping Centers," *Journal of Land and Public Utility Economics*, II (January, 1926), 17–22.

Parkins, A. E., "Profiles of the Retail Business Section of Nashville, Tenn.," *Annals of the Association of American Geographers*, XX (September, 1930), 164–75.

Peabody, S., "A.N.A. Traffic Studies," *Sales Management*, June 15, 1934, 574.

Pearl, John, "How to Woo Customers and Win Friends: The Story of Stuyvesant Town," *The Journal of Retailing*, XXIV (February, 1948), 26–27.

Perry, Robert H., "The First Consideration: Store Location," *Modern Stores*, 1945.

Practical Builder, "Shopping Center Operates as Community Hub," November, 1949, 136.

—— "Shopping Center Planned to Serve Entire Community," November, 1946, 22.

—— "Shopping Center that Can Grow," December, 1948, 108.

—— "Will Your Shopping Center Serve Its Market?" March, 1948, 68.

Printers' Ink, "How Manufacturers Can Help Retailers Select Store Sites," October 9, 1942, 166.

—— "The Part Location Plays in Making Sales," April 25, 1918, 41.

—— "Shopping Centers—A New and Growing Development in Distribution," December 12, 1947, 31.

—— "Traffic Flow, Retail Sales," September 13, 1934.

Progressive Grocer, "How a Chain Chooses Store Location," March, 1940, 206.

Proudfoot, Malcolm J., "The Selection of a Business Site," *The Appraisal Journal*, VII (January, 1939), 61–72.

—— "Selection of a Business Site," *Journal of Land and Public Utility Economics*, XIV (September, 1938), 370–81.

Pyle, John F., "The Determination of Location Standards for Retail Concerns," *Harvard Business Review*, IV (April, 1925), 303–312.

Ratcliff, Richard U., "Notes on the 100-Percent Concept in Retail Location Analysis," *Journal of Land and Public Utility Economics*, XV (August, 1939), 350–353.

—— "Some Principles of Site Selection in Outlying Retail Sub-Centers," *American Marketing Journal*, (Fall, 1935).

Real Estate Record, "Pedestrian Traffic Count," January 29, 1938, 2.

—— "Traffic Count Limitations," May 7, 1928, 45.

Reed, Vergil D., "Some Statistical Possibilities of Defining Market Limits," *The Journal of Marketing*, III (July, 1938), 39–43.

Reiss, Joseph, "Shopping Centers—Their Influence on Advertising," *Printers' Ink*, June 16, 1950, 31.

—— "Shopping Centers—The Pattern of the Future," *Printers' Ink*, June 23, 1950, 34.

—— "Shopping Centers—Retail Result of the Auto Age," *Printers' Ink*, June 9, 1950, 23.

Russell, F. A., and Robert V. Mitchell, "A Retail Trading Area," *The Journal of Marketing*, XII (October, 1942), 160.

Sales Management, "Rank in Population, Retail Sales, Income: All Cities with Sales $20 Million and Over," November 10, 1951, 68–160.

Schultz, Carlton, "Crowds—Just How Valuable is a Traffic Count?" *National Real Estate Journal*, December 10, 1938, 53.

Seltzer, Richard J., "Where Shall I Shop?" *The Appraisal Journal*, XVII (January, 1949), 114–119.

Seubert, Nelson H., "How Big Is a Market Area?" *The Journal of Marketing*, III (July, 1938), 34–38.

Slosson, Frank, "Chain Store Locations," *Annals of Real Estate Practice*, Vol. 6, 1927, 200–220.

—— "The Principles of Locating Chain Stores Successfully," *National Real Estate Journal*, December 12, 1927, 49–54.

—— "The Retail Problem and Solution," *Journal of Certified Property Managers* (now, *Journal of Real Estate Management*), September, 1940.

Stein, Clarence S., and Catherine Bauer, "Store Buildings and Neighborhood Shopping Centers—Planning a Shopping Center in Radburn, N. J., 10,000 Population," *Architectural Record*, February, 1934, 174.

Stellwagen, P. E., "What We Look for in a Shopping Center," *Chain Store Age*, Administration Edition, April, 1950, 28.

Stone, E. L., Jr., "Forecasting the Future Market in a Large Community," *Harvard Business Review*, I (April, 1923), 269–81.

Strohkarck, Frank, and Katherine Phelps, "The Mechanics of Constructing a Market Area Map," *The Journal of Marketing*, XII (April, 1948), 493–96.

Swan, Carroll J., "What's New About the New Shopping Centers? . . .", *Printers' Ink*, November 9, 1951, 37.

Swan, Herbert S., "The Growth of Shopping Areas," *The Appraisal Journal*, XIII (July, 1945), 232.

Tick, Melvin, "A Small-Town Store Studies Its Market," *The Journal of Retailing*, XXIII (October, 1947), 69–76.

Tide, "One-Stop Shopping: Marketing Revolution Hits the Suburbs," September 26, 1952, 36.

True, Wallace W., "Appraising Department Stores," *The Appraisal Journal*, XIV (April, 1946), 159–164.

Turnbull, James, "The Supermarket," *The Appraisal Journal*, VII (October, 1939), 348.

Welch, Kenneth C., "The Modern Shopping Center," *The Tennessee Planner*, August, 1949, 3.

Wenzlick, Delbert S., "Pedestrian Traffic," *National Real Estate Journal*, August 18, 1930, 19–24.

White, Joseph, "Measuring Local Markets," *The Journal of Marketing*, XII (October, 1947), 220–33.

Winston, Clement, and Marie L. Puglisi, "Postwar Regional Department Store Sales Patterns," *Survey of Current Business*, XXVII (September, 1947), 18–23.

—— "Regional Patterns of Department Store Sales," *Survey of Current Business*, XXVI (October, 1946), 18–24.

Wolfe, Harry Deane, "Dispersion of Consumer Purchases Among Competing Retail Outlets," *The Journal of Business of the University of Chicago*, XV (April, 1942), 160–65.

Wolfson, Henry, "Factors Contributing to Creation of 100 Percent Locations," *Real Estate Record*, May 14, 1938, 7.

—— "Factors Which Influence Chain Store Location," *National Real Estate Journal*, March 31, 1930, 34–38.

—— "How Chain Stores Select Real Estate Sites," *Real Estate Record*, March 7, 1931, 11.

—— "Traffic-Location-Trends as Considered by the Chain Store," *National Real Estate Journal*, June 8, 1929, 39–48.

—— "What Chain Stores Consider before Selecting a Location," *National Real Estate Journal*, July 22, 1929, 49.

Woodbury, Coleman, "The Size of Retail Business Districts in the Chicago Metropolitan Region," *Journal of Land and Public Utility Economics*, IV (February, 1928), 85–91.

Young, George A., Jr., "What Chain Stores Want from Real Estate Brokers," *National Real Estate Journal*, December 9, 1929, 35–38.

PARKING, TRAFFIC, AND MASS TRANSPORTATION

Books

American Transit Association. *The Urban Transportation Problem*. New York: The Association, 1932.

—— Committee on Rapid Transit. *Economics of Rapid Transit*. New York: The Association, 1928.

Blake, H. W., and Walter Jackson. *Electric Railway Transportation*, 2nd ed. New York: McGraw-Hill Book Co., Inc., 1924.

Breese, Gerald W. *The Daytime Population of the Central Business District of Chicago, with Particular Reference to the Factor of Transportation*. Chicago: The University of Chicago Press, 1949.

Mason, E. S. *The Street Railway in Massachusetts*, Harvard Economic Studies, Vol. XXXVII. Cambridge, Mass.: Harvard University Press, 1932.

Mossman, Frank L. *Principles of Urban Transportation*. Cleveland: Press of Western Reserve University, 1951.

O'Geran, Graeme. *A History of the Detroit Street Railways*. Detroit: The Conover Press, 1931.

Spengler, Edwin H. *Land Values in New York in Relation to Transit Facilities*. New York: Columbia University Press, 1930.

White, Percival. *Motor Transportation of Merchandise and Passengers*. New York: McGraw-Hill Book Co., Inc., 1923.

Wilcox, D. F. *Analysis of the Street Railway Problem*. New York: 1921.

—— *San Francisco's Street Railway Problem*. San Francisco: 1927.

—— *et al. Municipal Railways in the United States and Canada*. Bulletin No. 18. Chicago: Public Ownership League of America, 1922.

Bulletins, Monographs, and Special Reports

American Automobile Association, Traffic Engineering and Safety Department, *Parking Manual*. Washington, D. C.: The Association, 1946.

Automobile Parking in Central Business Districts, Technical Bulletin No. 6, Urban Land Institute, July, 1946.

Automotive Safety Foundation. *Parking—How It is Financed*. Washington, D. C.: The Foundation, 1952. Also issued by the National Retail Dry Goods Association, New York.

Bartholomew, Harland and Associates. *Off-Street Parking and Traffic Control in Oakland Business Districts*, Prepared for the City Council of Oakland, Vol. II, Oakland Master Plan. St. Louis, Mo.: Harland Bartholomew and Associates, 1947.

—— *A Report on Transit Facilities and Mass Transportation in Eden Township of Alameda County*, Prepared for the Board of Supervisors, County of Alameda, California. St. Louis, Mo.: Harland Bartholomew and Associates, May, 1947.

Bureau of Engineering, Department of Public Works, City and County of San Francisco. *Report to the Parking Authority of San Francisco on Proposed Public Garage in the Central Market Street Area*. San Francisco: The Bureau of Engineering, November, 1951.

California Public Utility Commission. *Key System Transit Lines Application No. 33113, Report on Traffic Checks, Service and Future Mileage Estimates*. San Francisco: The Commission, May 29, 1952.

—— *Key System Transit Lines Application No. 32781, Peak Passengers Carried, Equipment Requirement, and Seats Provided in 1945, 1946, and 1951*. San Francisco: The Commission, November, 1951.

Chamber of Commerce of the United States. *A Bibliography of Publications in the Field of Street and Highway Traffic*. Washington, D. C. The Chamber, March, 1952.

Community Studies, Inc. *Downtown Transportation Survey: A Survey of Methods of Transportation Used by Shoppers to Reach the Downtown Area of Kansas City, Missouri*. Kansas City, Mo.: Community Studies, Inc., May, 1953.

Cordon Count Data for the Metropolitan Traffic District, October, 1947. Prepared by the Technical Committee of the Administrative Transportation Planning Council, with the directive assistance of DeLeuw, Cather & Company, consulting engineers. San Francisco: The Committee, December, 1947.

DeLeuw, Cather & Company, *Preliminary Report to the San Francisco Bay Area Rapid Transit Committee*. San Francisco: The Committee, 1953.

—— *Transportation Plan for San Francisco*, Prepared for the City Planning Commission of San Francisco. San Francisco: The Commission, 1948.

Detroit Rapid Transit Commission. *Rapid Transit System for the City of Detroit*. Detroit: The Commission, 1926.

Eno Foundation for Highway Traffic Control. *Parking Authorities*. Saugatuck, Conn.: The Foundation, 1953.

Highway Research Board. *Off-Street Parking*, Summary Report, Bulletin No. 48, Presented at the 31st Annual Meeting, January 17, 1952. Washington, D. C.: Highway Research Board.

—— *Parking*, Bulletin No. 19. Washington, D. C.: Highway Research Board, July, 1950.

—— *Travel to Commercial Centers*, Bulletin 79, Washington, D. C., Highway Research Board, 1953.

Marr, John, City Planning Engineer, City of Oakland. *The Transit Problem in the East Bay*. Oakland, California: The City, 1951.

McClintock, Miller. *San Francisco City-Wide Traffic Survey*, W. P. A. Project, Prepared for the William H. Worden, Director, Department of Public Works, San Francisco. San Francisco: 1937.

—— *The Street Traffic Control Problem of San Francisco*, Prepared for the San Francisco Traffic Survey Committee. San Francisco: The Committee: 1927.

Mills, Marmion D. *Report on the Rehabilitation of the San Francisco Municipal Railway*. San Francisco: San Francisco Municipal Railway, April 1, 1951.

Mohr, Eric. A. *Fringe Parking: A Report to the Parking Authority of San Francisco*. San Francisco: Coro Foundation, 1950.

Oakland Chamber of Commerce. *Methods of Financing Off-Street Parking Facilities*. Oakland, California: The Chamber, 1951.

Philadelphia Transit Advisory Committee. *Report to General Conference on Transit Situation in Philadelphia*. Philadelphia: The Committee, 1930.

Rebuild America Committee of National Association of Real Estate Boards. "Summary of Urban Development Information Provided by Twenty-Two American Cities," September, 1952.

"Recent Legal Provisions Relative to Off-Street Parking in California," University of California, Institute of Transportation and Traffic Engineering, Information Circular No. 7, October, 1949.

Report of East Bay Mass Transportation Survey, Sponsored by the Oakland City Planning Commission; Vols. I, II. Oakland, California: The City, 1935–1936.

Report on Estimated Traffic and Earnings, Oakland Bay Ridge, Prepared by Coverdale and Colpitts, consulting engineers. New York: Coverdale and Colpitts, July, 1936.

St. Louis Public Service Board. *Report on Rapid Transit for St. Louis*. St. Louis, Mo.: The Board, 1926.

San Francisco Bay Area Rapid Transit Commission. *Preliminary Report*. San Francisco: The Commission, January, 1953.

Smith, Wilbur S., and Charles S. Le Craw. *Parking*. Saugatuck, Conn.: Eno Foundation for Highway Traffic Control, 1946.

U. S. Department of Commerce, Public Roads Administration. *Parking Survey Manual*. Washington, D. C.: U. S. Department of Commerce, 1946.

U. S. Department of Commerce, Bureau of Public Roads. *Parking Study Manual*. Washington, D. C.: U. S. Department of Commerce, 1949.

Zettel, Richard M., "Some Observations on the Economics of Parking, with Particular Reference to Cost Apportionment," University of California, Institute of Transportation and Traffic Engineering, undated.

Articles, etc.

Becker, George, "Parking Lots and Garages in Central Business Districts," *The Appraisal Journal*, VIII (January, 1940), 62–67.

Blankenship, Albert B., "The Movement of People: A Field for Market Research," *The Journal of Marketing*, XIII (July, 1948), 44–51.

Blanshard, Paul, and Henry J. Rosner, "Municipal Transit," in *Encyclopedia of the Social Sciences*, Vol. XI, pp. 118–128. New York: The Macmillan Co., 1933.

Business Week, "New Garage Parks Your Car in Three Minutes Flat," January 19, 1952, 92–93 ff.

Crane, D. A., "Urban Congestion Demands a New Planning Technique," *Real Estate Reporter*, January 22, 1938, 8.

Emmons, C. D., "The Development of American Street Railways," *AERA*, XII (1923–1924), 1148–66.

Fisher, Vining T., "The Parking Authority of the City and County of San Francisco—Its Policy, Program, and Progress," for publication in the *Traffic Quarterly*, undated.

——, "San Francisco's Off-Street Parking," *Western City*, June, 1951, 38–39.

Hitchcock, S. T., and R. H. Burrage, "Some Travel and Parking Habits Observed from Parking Studies," *Public Roads*, June, 1950.

Kennedy, Norman, "Study of Municipal Parking Lots in California Cities," Progress Report on the parking research of the University of California, Institute of Transportation and Traffic Engineering for presentation at the Open Meeting on Parking of the Highway Research Board, Washington, D. C., January 17, 1952.

Le Craw, Charles S., and Wilbur S. Smith, "Zoning Applied to Parking," *The Appraisal Journal*, XV (July, 1947), 399–410.

McGavin, C. T., "The Parking Problem," *The Appraisal Journal*, IX (April, 1941), 151–159.

National Municipal Review, Symposium: "Service at Cost for Street Railways," X (1921), 109–139.

"Off-Street Parking in San Francisco," *Western City*, May, 1948, 19–25.

Wilson, Norman D., "Some Problems of Urban Transportation," in H. A. Innes (ed.), *Essays in Transportation*. Toronto, Ontario: University of Toronto, 1941.

Woodbury, Coleman, "Transit and the Trend of Multi-Family Housing," *Journal of Land and Public Utility Economics*, VII (February, 1931), 36–44.

Young, H. W., "Traffic and City Planning as they Affect Business Districts," Review of papers presented at meeting of Western Society of Engineers, *Journal of the western Society of Engineers*, XLV (October, 1940).

Newspaper Articles (arranged in chronological order under each topic)

(All articles appeared in the *San Francisco Chronicle* unless otherwise noted)

Mass Transit

"Elevated, Monorail, and Subway Offered," July 1, 1952.
"Monorail Estimate is Derided," July 2, 1952.
"Transit Must be Fast, Says Expert," July 23, 1952.
"Peninsula Transit Proposals," Sept. 25, 1952.
"Transit Pickup: Bus Trolley Operators Optimistic; Fares Up, Passenger Loss Eases," *The Wall Street Journal*, Sept. 26, 1952.
"Mono-Rail, Super-Fast German Electric Train, Runs on Ball Bearings," *The Wall Street Journal*, Oct. 9, 1952.
"Bay Area Rapid Transit," Oct. 15, 1952.
"Big City Transit," Oct. 15 and 16, 1952.
"One-Track Railway," *The New York Times*, Oct. 19, 1952.
"Abandonment of Key System Trains," Oct. 23, 1952.
"Decision on Transit Group Delayed," Nov. 7, 1952.
"Key System Bus Plan Protested," Nov. 7, 1952.
"Rapid Transit Fight," Nov. 11, 1952.
"Transit Hearing," Nov. 13, 1952.

"Fare Hike Giving Muni Big Surplus," Nov. 13, 1952.
"Bay Area Transit," Dec. 8, 1952.
"Transit Study Funds Approved," Dec. 10, 1952.
"West Bay Transit Bill Due in '53," Dec. 19, 1952.
"State Funds Sought for Transit Study," Jan. 7, 1953.
"Rapid Transit Commute Plan Proposed," Jan. 12, 1953.
"Dolwig's Transit Bills Criticized," Feb. 6, 1953.
"5-Cent Slack-Hour Muni Fare Asked," March 3, 1953.
"Market St. Subway," March 6, 1953.
"5-Cent Muni Fare," March 10, 1953.
"A Choice: Rapid Transit or Slow Strangulation," March 19, 20, 21, 1953.
"Mills Offers Plan on Traffic Jam," March 23, 1953.
"PUC to Hold Hearing on Eliminating Muni Car Stops," March 24, 1953.
"Mayor Blocks S. F. Subway Ballot Move," March 24, 1953.
"Funds Urged for Bay Transit Study," March 27, 1953.
"Five-Cent Muni Fare is Rejected," March 31, 1953.
"Warren Backs State Fund for Bay Area Rapid Transit Study," April 1, 1953.
"Low Fares Mark Toronto Transit," *The New York Times*, April 5, 1953.
"The Answer Is Rapid Transit," Editorial, April 6, 1953.
"New Five-Cent Fare Plan Is Opposed (Downtown Shuttle Buses Proposed)," April 21, 1953.
"PUC Again Asks Subway Study Funds," May 15, 1953.
"Cities Urged to Join In Bay Transit Plan," May 15, 1953.
"Greyhound Asks Boost in Marin Bus Fares," May 19, 1953.
"The Muni Shopper Special," May 21, 1953.
"Key System Threatens to Quit," May 23, 1953.
"Planners Say S. F. 'Lucky' On Transit," May 24, 1953.
"East Bay Commuters Ask U. S. Aid," May 26, 1953.
"Key System Asks Big Fare Increase," May 29, 1953.
"Key System Asks Support On Rate Hike," May 30, 1953.
"PUC Ruling on Rates: Key System, Must File Full Financial Report," June 1, 1953.
"Possible Ballot Issue: Board to Study Muni Transit Authority," June 5, 1953.
"Solving the Bay Transit Muddle," Editorial, June 7, 1953.
"Downtown Nickel Bus Fare Wins Support," June 17, 1953.
"Mills Offers Plan to Hike Muni Revenue," June 19, 1953.
"Warren Signs Road, Transit Bills," June 19, 1953.
"Proposals for the City's Transit: Mills Opposes 5-Cent Shopper Fare Plan," June 23, 1953.
"Cars vs. Buses on Muni Bond Issues," June 25, 1953.
"5 Cities Tell of Low-Fare Bus Success," June 26, 1953.
"Policeman Views the Snarl: Eker Offers Remedies for City's Traffic Ills," June 26, 1953.
"Chamber Is For a Transit Authority," June 26, 1953.
"A Remedy For Crowded Downtown," June 26, 1953.
"Gaffey Asks Downtown Ban on Trucks," June 26, 1953.
"Engineers to Report on Key Trains," June 29, 1953.
"Don't Abandon Bridge Trains," Editorial, June 29, 1953.
"Utility Commission Hearing: Lewis Presents 5¢ 'Shopper Bus' Plan," June 30, 1953.
"Report Calls Buses Impractical," July 2, 1953.
"Muni Agrees To Try 5-Cent Shopper Fare," July 7, 1953.
"The First Since 1947: Muni Reports a Profit of $299,173," July 10, 1953.
"Traffic Tangles: New York Congestion Chains City Drivers to Horse-and-Buggy Pace," *The Wall Street Journal*, July 10, 1953.
"State Quizzes Key on Plans For All Trains," July 17, 1953.
"The City That Forgot How?" Editorial, July 17, 1953.
"Traffic Plan Embellished By DeLeuw," July 17, 1953.
"Captain Eker, Key System Clash on Using More Buses," July 18, 1953.
"Transit Tab: It Moves Up for Bus, Trolley, Subway Riders Across the Country," *The Wall Street Journal*, July 20, 1953.
"Subsidy Asked For Bridge Trains," July 21, 1953.
"Labor Official Asks Return to 10-Cent Muni Fare," July 21, 1953.

Parking

"Commerce Field May Be Parking Lot," July 10, 1952.
"Parking Authority Will Study Bids Tonight: City to Act on Underground Garage," August 25, 1952.
"$1,000 Asked For Parking Site Study," Sept. 25, 1952.
"Municipal Parking: Many Cities Jump Into Parking Business as Auto Glut Worsens," *The Wall Street Journal*, Sept. 29, 1952.
"1250-Car Garage For Downtown," Oct. 23, 1952.
"The Care and Feeding of Parking Meters," 2 parts, Oct. 27, 28, 1952.
"Large Downtown Parking Areas Drive Shoppers Away, Berger Tells Realtors," Press Release, National Association of Real Estate Boards, Nov. 12, 1952.
"5 Downtown Garages Are Proposed," Nov. 13, 1952.
"3 Sites for Downtown Parking Lot," Dec. 11, 1952.
"Waiting for the Light," Jan. 9, 1953.
"Parking Authority to Give Shopping District First Priority on New Garage," Jan. 11, 1953.
"Delay on Downtown Parking Sites," Jan. 13, 1953.
"Downtown Garage Site Ruled Out," Jan. 23, 1953.
"Downtown Assn. for Two Garage Sites," Feb. 5, 1953.
"More Tags Despite High Parking Fines," Feb. 5, 1953.
"Garage Sites Are Endorsed," Feb. 6, 1953.
"Christopher Urges End of City Parking Authority," Feb. 10, 1953.
"1500-Car City Garage Opposed By Parking Lot," Feb. 10, 1953.
"Approval Withheld on Downtown Garage Site," March 3, 1953.
"Parking Group Okays North Beach Lot," and "Parking Unit for North Beach," March 4, 1953.
"Parking Ban Is Key to Newark Traffic," *The New York Times*, March 8, 1953.
"The Cops' Own Downtown Parking Plan," March 8, 1953.
"Parking Authority Proposes Site at Old Commerce High," March 12, 1953.
"Supervisors Approve Powell, Ellis Site for 900-Car Garage," March 24, 1953.
"Ross Asks Ruling on Garage Site," March 31, 1953.
"Compromise on Parking Lot Reported," April 14, 1953.
"Two Downtown Garages For 5000 Cars: Lurie Plan Interests Mayor, Parking Group," April 23, 1953.
"How Lurie's Garages Would Look," April 27, 1953.
"Parking Fines," May 5, 1953.
"School Field Approved as Parking Lot," May 13, 1953.
"Parking Group Backs Lurie's Garage Plan," May 16, 1953.
"Parking Authority Will Prepare New Master Plan," June 11, 1953.
"Garage Funds Question Untangled," June 17, 1953.
"25-Cent Meter Plan For Parking Lots," June 18, 1953.
"Garage Project: Lurie Plans Parking Survey," June 19, 1953.
"Hitch in Funds for Ellis Garage," June 23, 1953.
"$750,000 a Year From Meters: 'Central Parking Fund' Favored by the Authority," June 25, 1953.
"Commerce Parking Pact Approved," June 30, 1953.
"New Plan for Commerce Parking Lot," July 3, 1953.
"Forward Group Urged to Act: New 'High Rates' Plan To Curb Long Parking," July 3, 1953.
"Gouging Won't Solve Parking," Editorial, July 7, 1953.
"Meeting on Civic Center Garage Plan," July 8, 1953.
"Ambitious Plan for Parking Problem," July 10, 1953.

Freeways and Highways

"A $15,000,000 Siphon for East Bay Traffic: Berkeley Debates Best Highway Route," April 20, 1952.
"Here Are The Proposed New Freeway Expansions," *Oakland Tribune*, Aug. 22, 1952.
"Plan for First Link of Embarcadero Freeway," Aug. 24, 1952.
"Bayshore Freeway," Oct. 12, 1952.
"Bayshore Highway," 5 parts, Nov. 20, 21, 24, 25, 26, 1952.
"Seven Years of Makeshift in Marin," Jan. 28, 1953.
"Geary Street Expressway Advocated," March 5, 1953.
"State Proposes Bypassing Lafayette," March 9, 1953.
"Oakland Hill Area Protest On Freeway," May 9, 1953.
"Scramble-Amble Crossing," May 10, 1953.
"The City's Newest Freeway (San Francisco)," May 16, 1953.
"New Link Opens June 5 on Eastshore Freeway," May 28, 1953.
"Tunnel Linking Two Counties Wins Senate OK," May 28, 1953.
"Geary Street May Not Get Expressway," June 10, 1953.
"August Target: Wider Waldo Approach Plan Ready," June 27, 1953.
"Survey for Freeway Sought," July 10, 1953.
"Gate Bridge Approach Plan Okayed," July 11, 1953.

MISCELLANEOUS

Books, Government Publications, etc.

Cornell, Morris. *Census Tract Street Directory for Columbus, Ohio, 1946*, Bulletin R-49. Columbus, Ohio: Ohio State University, 1947.
Eliot, Charles B. *An Aid for Analyzing Markets*. Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce. Washington, D. C.: Government Printing Office, 1932.
Green, Howard Whipple. *Cleveland Fact Book*, several editions. Cleveland: Cleveland Real Property Inventory.
Mott, Seward H., and Max S. Wehrly (Eds.). *The Community Builders Handbook*, rev. Washington, D. C.: The Urban Land Institute, 1948.
Population Association of America. *Proceedings of Annual Meetings*. 1949.
Quinn, James E., and Lois E. Elliott. *Cincinnati Census Tract Directory*. Columbus, Ohio: Ohio State University, 1948.
Rosenquist, Carl M. *Census Tract Street Directory for Austin, Texas*. Austin, Texas: University of Texas, 1949.

Articles, etc.

American Statistical Association, "The Industrial and Commercial Area vs. the Political Area as the Unit for the Collection of Business Statistics," *Journal of American Statistical Association*, XXIX, Supplement (March, 1934), 14–23.
Bailey, William L., "Avoiding 'Census Jitters'," *Journal of Land and Public Utility Economics*, XVI (August, 1940), 349–51.
Batschelet, C. E., "General Principles of Tract Delineation," *The Journal of Statistical Association*, XXXVII (June, 1942), 245–46.
Black, B. J., and E. B. Olos, "A Punched Card Method for Presenting, Analyzing, Comparing Many Series of Statistics for Areas," *Journal of the American Statistical Association*, XLI (September, 1946), 347–55.
Cunningham, Ross M., "Evaluation of Census Tracts," *The Journal of Marketing*, XV (April, 1951), 463–70.
Foley, Donald L., and Gerald Breese, "The Standardization of Data Showing Daily Population Movement into Central Business Districts," *Land Economics*, XXVII (November, 1951), 348–53.
Green, Howard Whipple, "The Use of Census Tracts in Analyzing the Population of a Metropolitan Community," *The Journal of American Statistical Association*, XXVIII (March, 1933), Supplement, 147–53.
Haring, Chester E., "The Haring Indexes of Local Business Conditions," *The Journal of Marketing*, IX (January, 1945), 217–24.
National Petroleum News, "Glimpse into the Future," February 23, 1944.
Olds, Edward B., "The City Block as a Unit fo r Recording and Analyzing Urban Data," *Journal of the American Statistical Association*, XLIV (December, 1949), 485–500.
Printers' Ink, "Census Data for 22 New Standard Metropolitan Areas," February 9, 1951, 29.
Reed, Virgil D., "Business Uses of Data by Census Tracts and Blocks," *Journal of the American Statistical Association*, XXXVII (June, 1942), 238–44.
Super Service Station, "1945 is a Year of Planning," January, 1945.
Watson, Alfred N., "Use of Small Area Census Data in Marketing Analysis," *The Journal of Marketing*, XI (April, 1942), 42–47.