

DEPARTMENT OF ECONOMICS, FINANCE AND ADMINISTRATION

Recent Population Trends and Their Highway Implications

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Recent years have brought an ever-increasing attention to transportation in urban areas. The 1960 Census returns not only show why this interest in urban transportation has been generated, but also lead to a conclusion that the urban transportation problem will continue to mount as the population continues to shift to expanding urban areas.

• THE MOST impressive facts emerging thus far from the 1960 Census are as follows:

1. The population increase over the past decade was the largest in the history of the United States and proceeded at the most rapid rate since the days of heavy immigration at the beginning of the 20th century.

2. Americans continued to be the most mobile people in the world, resulting in a vast redistribution of the population; westward, to the industrial centers of the Great Lakes, to large metropolitan areas everywhere, and toward the areas of the most salubrious climate.

3. Despite its size and rapid rate, population increase has been amazingly concentrated so that the brunt of the impact has fallen on relatively few areas.

4. Moreover, population increase

has been concentrated in the suburban segments of metropolitan areas. Most large central cities are either actually declining in population or avoiding decline only by annexing expanding suburbs; in central cities generally, the growth rate was only one-fifth of that of the metropolitan area outside.

5. One-half of the counties of the United States, about 1,500 in number, lost population over the decade.

6. The entire increase in population took place in urban areas; rural United States actually lost in population for the first time.

SIZE AND RATE OF POPULATION INCREASE

The latest release of the Census Bureau indicates that the population of the United States increased by 28 million between 1950 and 1960, al-

most 9 million more than the increment of the preceding decade, and the largest increase in the country's history (1). In terms of rate of increase, the 18.5 percent growth rate was the most rapid since the 1900-1910 decade. Only about 10 percent of the most recent increase is attributable to net immigration. The unprecedented size and rate of increase, therefore, was caused by the earlier steady decline in the death rate from 17.2 per thousand in 1900 to about 9.5 in 1950 and thereafter, and by growth in the birth rate, which climbed back up from the low rate of 16.9 per thousand during the Great Depression and has been at or close to 25.0 per thousand during the 1950-1960 decade.

In discussing the implications of this tremendous increase, Bogue (2) says:

As of 1960 the United States will have been in existence 170 years, and will have gained 175 million persons. If it continues to grow at the present rates, only about 50 additional years would be required to gain another 175 million persons. After that, the third set of 175 million persons would be produced in only 25 years, and a fourth set would require only 12 years, etc. This spiraling numerical growth results, of course, from the continuous increase in the base population to which the vital rates apply; even a moderate *rate* of increase applied to a huge base gives a sizeable *amount* of growth.

Within a hundred years, or by 2060, the national population would surpass 1.0 billion persons.

Bogue carefully points out that this projection is an illustration of the projection of past trends and that the rate of growth can be sharply reduced under certain conditions. He states:

In fact, population growth could be reduced to zero within a period as short as 5 years under conditions of acute economic hardship.

A projection of a population of such magnitude is the bogy of Mal-

thusianism which haunts students of long-range population problems.

As noted by Bogue and from the experience garnered from population growth trends in the 1930's, when it was confidently expected that the United States population would level off at about 165 million, it can be assumed that economic hardship will reduce the growth rate.

REDISTRIBUTION THROUGH MIGRATION

If the processes of natural increase alone were to determine the pattern of population growth, the result would be almost opposite from what has been happening. Rural-farm and non-metropolitan birth rates tend to be higher than urban, but are offset by out-migration. Analysis of the population increase by Census divisions reveals how the process has worked. Three divisions (West North Central, East South Central, and West South Central) have experienced net out-migration during the past decade, the East South Central States lost 1.5 million persons, while New England about held its own. The approximate relative importance of migration in total population change by Census division is indicated in Table 1. Figure 1 shows the population shifts by Census divisions.

On the Pacific Coast, population growth through in-migration was substantially greater than that through natural increase; the Mountain States owed one-third of their growth to migration; the South Atlantic and East North Central only about one-sixth; and the Middle Atlantic division about one-tenth. The causes of migration have been demonstrated by Goodrich (3), Bogue (2, pp. 416-418), and others to be economic opportunity and relative levels of well-being. Much migration is based on the individual's expectation that he will better his status. Without internal migration, population would

TABLE 1
ILLUSTRATIVE COMPONENTS OF POPULATION CHANGE BY CENSUS DIVISION, 1950-1960

Census Division	Total Increase		Net Natural Increase ($\times 10^6$)			Implied Net Migration ($\times 10^6$)
	Number ($\times 10^6$)	(%)	Births	Deaths	Gain	
New England	1.2	12.8	2.2	1.0	1.2	0.0
Middle Atlantic	4.0	13.3	6.9	3.3	3.6	0.4
East North Central	5.8	19.2	8.2	3.2	5.0	0.8
West North Central	1.3	9.5	3.5	1.4	2.1	-0.8
South Atlantic	4.8	22.6	6.1	2.0	4.1	0.7
East South Central	0.6	5.0	3.1	1.0	2.1	-1.5
West South Central	2.4	16.6	4.2	1.3	2.9	-0.5
Mountain	1.8	35.1	1.7	0.5	1.2	0.6
Pacific	6.1	40.2	4.0	1.5	2.5	3.6
Continental U.S. ¹	28.0	18.5	39.9	15.2	24.7	3.3

¹ Excludes Alaska.

tend to pile up in areas of high fertility, which are often areas of continuing low economic opportunity. Much of the nation's economic advance must be attributed to the working of the labor market, which attracts persons toward the areas of better pay and higher productivity of economic goods.

All Census divisions and all but three States gained population during the past ten years; the growth rates for Census divisions varied from 5 percent in the East South Central to 40 percent in the Pacific. Nine States grew by 30 percent or more, as follows:

Florida	79	Delaware	40
Nevada	78	New Mexico	40
Alaska	76	Colorado	32
Arizona	74	Maryland	32
California	49		

The most rapid growth took place in the contiguous States comprising California, the south and central tiers of the Mountain States, and the three States occupying most of the Gulf Coast. Other rapid advances were made by the Great Lakes States, especially Michigan and Ohio, and four relatively small States in the area affected by the great population concentrations of the Atlantic urban belt. The detail by individual States is given in Table 8 (Appendix).

CONCENTRATION OF POPULATION INCREASE

The population increase in the United States during the past decade has been concentrated in very small geographical areas. Hansen (4) sees "the sweeping increase in urbanization" as the most serious economic problem which will confront the United States in the next 20 years. He says: "This tidal wave will throw up economic, fiscal, and social problems the magnitude of which we have scarcely yet caught a glimpse." Similar pessimism is expressed by Isaac (5). Approximately 85 percent of the increase took place in the 212 Standard Metropolitan Statistical Areas (hereafter referred to as SMSA's) officially defined by the Bureau of the Budget (6). In 1950 there were only 168 areas which met the standards established for Metropolitan Areas. Although part of the increase has been due to changes in definition, most of it was due to population increase. In turn, of this increase of 23.0 million persons, only 4.9 million was in the central cities, while 18.1 million occurred in the outlying parts of the metropolitan areas, largely suburban in character.

Figure 2 shows the concentration of this increase. The suburban areas accounted for two-thirds of the population increase in the United States

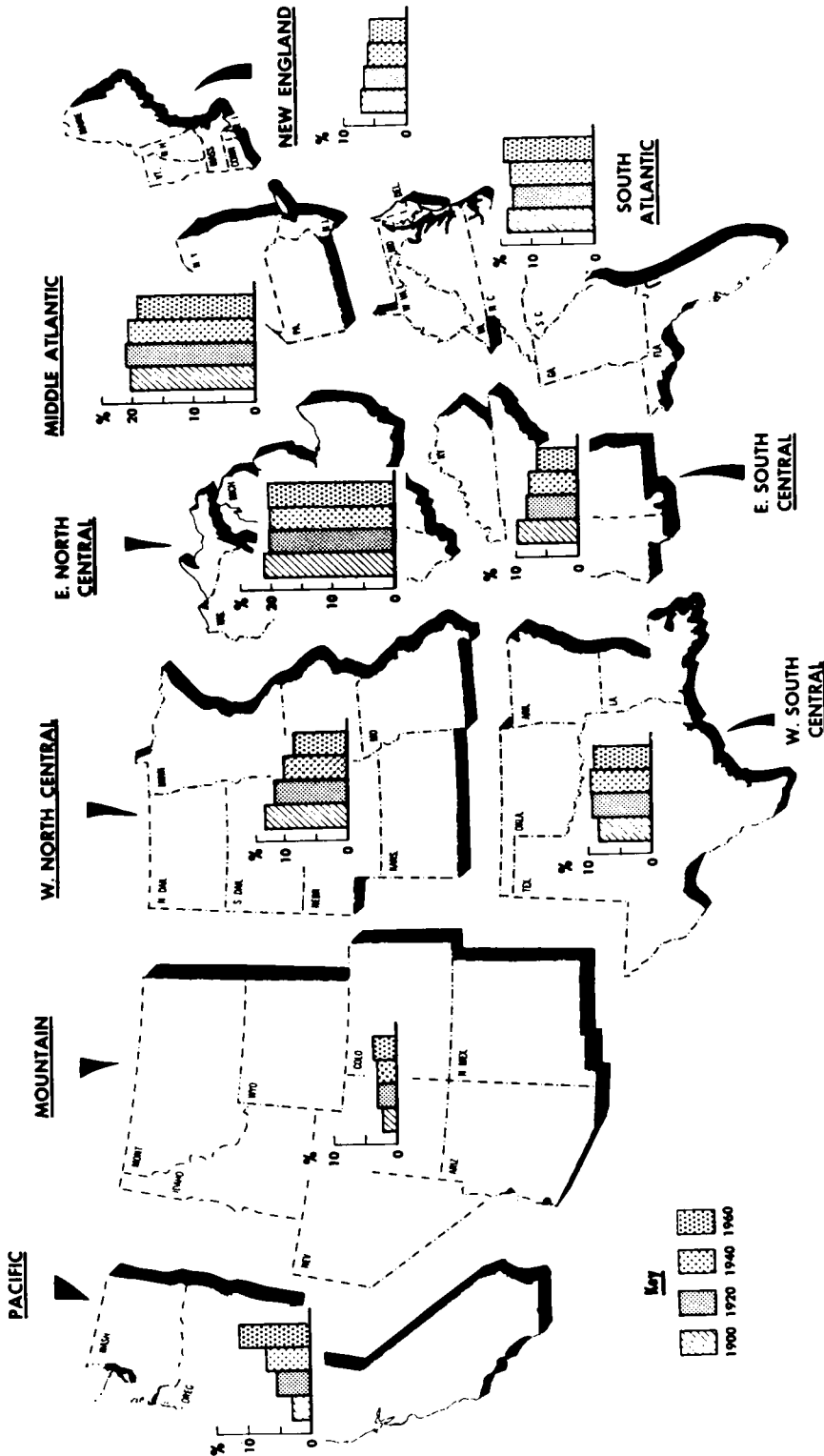


Figure 1. Percent of United States population (excluding Alaska and Hawaii) in Census regions: 1900-1920-1940-1960. (Data from Bureau of the Census.)

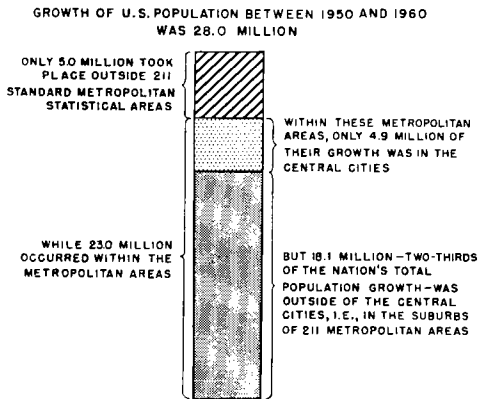


Figure 2. United States population growth, 1950-1960.

during the past decade. In terms of rate of increase, the SMSA's grew four times the rate of the territory outside. Of course, the SMSA's still include substantial sections which are rural, while smaller but important urban areas still exist in large numbers outside of the SMSA's. Both the

SMSA's and the territory outside increased at a slightly faster rate than they had during the decade 1940-1950. Within the metropolitan areas, however, more striking changes in growth pattern occurred. The growth rate of the suburban ring jumped from 35 to nearly 50 percent, while that of the central cities slackened from about 14 percent to 9 percent over the past decade. In short, central-city growth is letting up. This is more striking when examined by region (Table 2).

Metropolitan area growth was much faster in the relatively new cities of the West and in the South, and central city growth was also above the national average in those regions, partly because of heavy territorial annexation. In the Northeast, alone, the rate of growth outside of metropolitan areas was slightly greater than within. Suburban growth in these areas is often an old story, and it has become necessary for the developer to move farther

TABLE 2
POPULATION IN STANDARD METROPOLITAN AREAS AND OUTSIDE BY CENSUS
REGIONS, 1950 AND 1960, AND PERCENT CHANGE, 1950-1960¹
(Population in Thousands)

Area	Census Region				United States
	Northeast	North Central	South	West	
<i>1950</i>					
In metropolitan areas.....	31,034.3	25,074.7	19,417.8	13,557.3	89,084.0
Central cities.....	17,754.0	15,836.7	11,720.8	6,932.4	52,243.9
Outside.....	13,280.2	9,238.0	7,696.9	6,624.9	36,840.1
Other territory.....	8,443.7	19,386.1	27,779.3	6,632.7	62,241.8
Total.....	39,478.0	44,460.8	47,197.1	20,190.0	151,325.8
<i>1960</i>					
In metropolitan areas.....	34,791.8	30,768.3	26,141.0	19,889.1	111,590.2
Central cities.....	17,001.9	16,378.2	14,828.8	8,964.6	57,173.5
Outside.....	17,789.9	14,390.2	11,312.1	10,924.4	54,416.6
Other territory.....	9,566.9	20,540.0	28,322.1	7,854.8	66,283.9
Total.....	44,358.7	51,308.4	54,463.1	27,743.9	177,874.0
<i>Percent change, 1950-1960</i>					
In metropolitan areas.....	12.1	22.7	34.6	46.7	25.3
Central cities.....	-4.2	3.4	26.5	29.3	9.4
Outside.....	34.0	55.8	47.0	64.9	47.7
Other territory.....	13.3	6.0	2.0	18.4	6.5
Total.....	12.4	15.4	15.4	37.4	17.5

¹ As of publication, the Bureau of the Census had only published these summary data on a preliminary basis. The final figures indicate a total increase of 28.0 million, or 18.5 percent. This preliminary population summary, PC(PC)-4, October 1960, includes 209 metropolitan areas. It omits Meriden, Norwalk, and New London-Groton-Norwich, all in Connecticut, which were subsequently added. Figures will not add due to rounding.

TABLE 3
POPULATION TRENDS IN THE 24 STANDARD METROPOLITAN STATISTICAL AREAS HAVING A POPULATION OF MORE THAN 1 MILLION IN 1960

Area ¹	Population (×10 ⁵)			Percent Change							
	1940	1950	1960 ²	Entire Area			Central City			Outside Central City	
				1940-50	1950-60	1950-60	1940-50	1950-60	1940-50	1950-60	
New York, N. Y. ³	8,706.9	9,555.9	10,694.6	9.8	11.9	11.9	5.9	-1.4	32.9	44.8	75.0
Los Angeles-Long Beach, Cal.	2,916.4	4,327.9	6,742.7	49.8	54.4	54.4	33.1	27.1	72.0	82.6	82.6
Chicago, Ill. ⁴	4,569.6	5,177.9	6,920.9	13.3	20.1	20.1	6.6	-1.9	32.7	46.3	71.5
Philadelphia, Pa.-N. J.	3,199.6	3,671.0	4,342.9	14.7	18.3	18.3	7.3	-3.3	26.1	46.3	46.3
Detroit, Mich.	2,377.3	3,016.2	3,762.4	26.9	24.7	24.7	13.9	-9.7	54.8	79.3	79.3
San Francisco-Oakland, Cal.	1,461.8	2,240.8	2,783.4	53.3	24.2	24.2	23.8	-4.3	105.8	54.8	54.8
Boston, Mass.	2,209.6	2,410.6	2,589.3	9.1	7.4	7.4	4.0	-13.0	11.8	17.6	17.6
Pittsburgh, Pa.	2,082.6	2,213.2	2,405.4	6.3	8.7	8.7	0.8	-10.7	8.9	17.2	17.2
St. Louis, Mo.-Ill.	1,464.1	1,719.3	2,060.1	17.4	19.8	19.8	5.0	-12.5	33.1	51.9	51.9
Washington, D. C.-Md.-Va.	968.0	1,464.1	2,061.9	51.3	36.7	36.7	21.0	-4.8	117.1	87.0	87.0
Cleveland, Ohio	1,267.3	1,465.5	1,796.6	15.6	22.6	22.6	4.2	-4.2	41.6	67.2	67.2
Baltimore, Md.	1,139.5	1,405.4	1,727.0	23.3	22.9	22.9	10.5	-1.1	62.5	72.6	72.6
Newark, N. J. ³	1,291.4	1,468.5	1,689.4	13.7	15.0	15.0	2.1	-7.6	19.5	24.7	24.7
Minneapolis-St. Paul, Minn.	967.4	1,151.1	1,482.0	19.0	28.8	28.8	6.8	-4.4	69.8	115.7	115.7
Buffalo, N. Y.	958.5	1,089.2	1,307.0	13.6	20.0	20.0	0.7	-8.2	33.1	52.1	52.1
Houston, Tex. ⁵	529.0	806.7	1,243.2	52.5	54.1	54.1	55.0	57.4	45.8	44.8	44.8
Milwaukee, Wis.	829.6	956.9	1,194.3	15.3	24.8	24.8	8.5	16.3	32.0	41.7	41.7
Paterson-Clifton-Passaic, N. J. ³	719.0	876.2	1,186.9	21.9	35.5	35.5	4.7	6.9	31.0	47.6	47.6
Seattle, Wash. ⁵	593.7	844.6	1,107.2	42.2	31.1	31.1	27.0	19.1	97.2	45.9	45.9
Dallas, Tex. ⁵	527.1	743.5	1,083.6	41.0	45.7	45.7	47.4	56.4	33.0	30.7	30.7
Cincinnati, Ohio-Ky.	787.1	904.4	1,071.6	14.9	18.5	18.5	10.6	-0.3	20.8	42.1	42.1
Kansas City, Mo.-Kan. ⁵	686.7	814.4	1,039.5	18.6	27.6	27.6	14.4	4.1	24.4	57.6	57.6
San Diego, Cal. ⁵	289.4	556.8	1,093.0	92.4	85.5	85.5	64.4	71.4	158.6	106.7	106.7
Atlanta, Ga. ⁵	558.8	727.0	1,017.2	30.1	39.9	39.9	9.6	47.1	54.2	33.9	33.9
Total	41,100.4	49,647.1	61,582.1	20.8	24.0	24.0	11.2	2.8	38.6	55.6	55.6

¹ As defined in December 1959.

² Final Population Counts, PC(A1-) Series (Dec. 1960).

³ The New York area includes only the New York State portion of the old New York-Northeastern New Jersey area.

⁴ The old Chicago area has also been broken up into Illinois and Indiana components. The Chicago area now includes only the Illinois portion.

⁵ Important annexation of territory and population between 1950 and 1960 by central city.

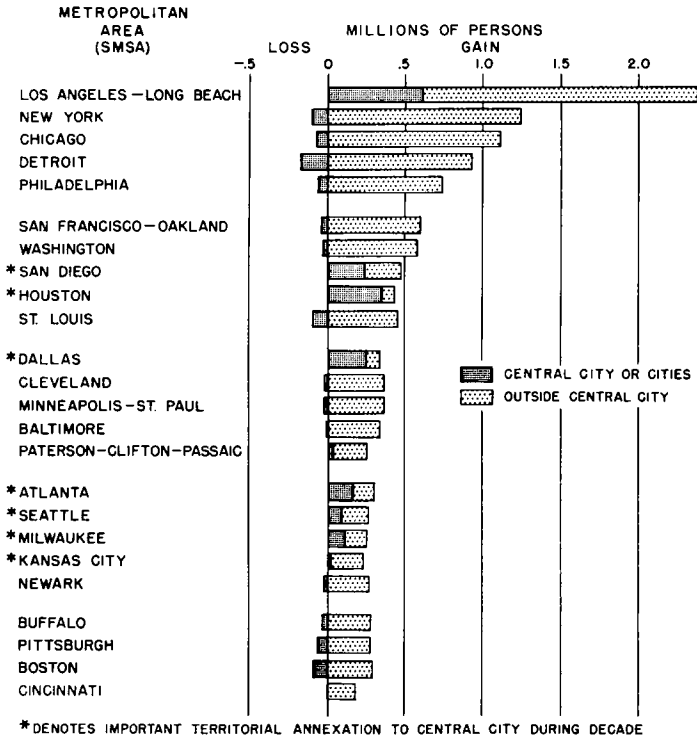


Figure 3. Gain or loss in population areas in central city and outside (arranged in order of absolute growth).

out into the country. There is no exception, however, to the universally rapid development of the suburbs in any region.

The reasons for this phenomenon of suburban growth are pointed out by Hauser (7), as follows:

Why is our population becoming increasingly concentrated in urban and metropolitan areas? The answer is to be found in the basic forces which determine the distribution of our population—technological, economic, social and political. Our population is crowding into urban and metropolitan areas because, in brief, such a clumping of people and economic activities constitutes an efficient producer and consumer unit. Such agglomerations of people and economic activities, to draw on the economist, permit increased division of labor, specialization, technological development, economics of scale, external economics, the reduction of frictions of space, the sharing of risks, and stimulus to entrepreneurship that underwrite our relatively great productivity and

the highest mass level of living ever achieved by any nation in the history of man. . . .

The fundamental forces at work, which have produced our urban and metropolitan pattern of living, may be expected to operate during the 1960's.

GROWTH IN LARGE METROPOLITAN AREAS

From the standpoint of size, the concentration of growth can be readily seen. More than one-half (11.9 million) of the growth in the SMSA's took place in the areas with 1 million or more population in 1960. This also represented more than 40 percent of the total national increase. It was precisely in the huge metropolitan agglomerations that the central cities' growth was weakest. The heavy suburban growth of the large

cities (Table 3 and Fig. 3) was one of the most noteworthy features of recent population movement. It will be noted that of the 15 largest metropolitan areas, Los Angeles was the only central city which did not decrease in population, and, of course, the political boundaries of Los Angeles have already been extended to include what would be suburbs in most other areas.

There are now 24 metropolitan areas in the United States with populations of 1 million or more; in 1950 there were only 15. The nine new areas which exceeded 1 million in 1960 are: Houston, Milwaukee, Paterson-Clifton-Passaic (formerly part of the New York-Northeastern New Jersey area), Seattle, Dallas, Cincinnati, Kansas City, San Diego and Atlanta. The most amazing of these is San Diego, which, under the stimulation of Navy and aircraft boom, grew from 289,000 in 1940 to 557,000 in 1950 and 1,033,000 in 1960. It would have taken a bold forecaster to have predicted San Diego's growth, and perhaps an even bolder one to forecast future continued growth at the rate of the past two decades.

GROWTH TRENDS BY COUNTIES

The concentration of the population increase can be seen by an examination of the trend in individual counties. There are some 3,000 counties in the United States and approximately one-half of them lost population during the last decade. Twenty-five gained 200,000 or more persons and 47 gained between 100,000 and 200,000. Details of the population gain of these 72 counties are given in Table 9 (Appendix), in which the counties are arranged in order of absolute gain.

It will be observed that the increase in 3 counties (Los Angeles, Calif.; Nassau, N. Y.; and Cook, Ill.) amounted to 3.1 million persons and

11.2 percent of the entire national increase. The next 6 counties accounted for an increase of 2.6 million and 9.2 percent of the total. Ten additional counties had a total increase of 2.7 million and 9.8 percent. Fourteen additional counties added the same amount as the preceding 10. The next 17 counties added 2.6 million and 9.2 percent of the total.

Of these 50 counties which contributed 13.7 million persons, or almost one-half of the total population increase in the United States, 23 are located in four States, as follows:

California	8	New York	5
Florida	6	Texas	4

These 72 counties include all or part of about 60 standard metropolitan areas. The exact count is confused because SMSA's are defined on a town basis in New England. Many of these counties are entirely suburban in character; in a number of others loss in the central city was more than offset by rapid population growth elsewhere in the county.

DECLINE OF CENTRAL CITIES

The relative decline of the central city in 22 of the 24 largest metropolitan areas is given in Table 4. In 1960, for the first time, less than one-half of the population of American metropolitan areas with more than 1 million persons resided in their central cities, and in seven (San Francisco, Boston, Pittsburgh, St. Louis, Washington, Newark, and Paterson) the proportion remaining in the central cities was less than 40 percent. The declines in Washington, Detroit, St. Louis, Minneapolis-St. Paul, San Francisco-Oakland, Buffalo, Cleveland, Baltimore, Kansas City, Philadelphia, and Chicago, were particularly rapid and exceeded 10 percentage points in each case. In Minneapolis-St. Paul, the loss approached 20 percentage points.

TABLE 4

1960 POPULATION OF STANDARD METROPOLITAN STATISTICAL AREAS WITH 1 MILLION OR MORE INHABITANTS, AND NUMBER AND PERCENT OF AREA POPULATION IN CENTRAL CITY, 1950 AND 1960

Rank	Standard Metropolitan Statistical Area	Population 1960		Percent of Area Population in Central City	
		Entire Area	Central City	1950	1960
1	New York, N. Y.	10,694,634	7,781,984	82.6	72.8
2	Los Angeles-Long Beach, Cal.	6,742,696	2,823,183	50.9	41.9
3	Chicago, Ill.	6,220,913	3,550,404	69.9	57.1
4	Philadelphia, Pa.-N. J.	4,342,897	2,002,512	56.4	46.1
5	Detroit, Mich.	3,762,360	1,670,144	61.3	44.4
6	San Francisco-Oakland, Cal.	2,783,359	1,110,403	51.8	39.9
7	Boston, Mass.	2,589,301	697,197	33.2	26.9
8	Pittsburgh, Pa.	2,405,435	604,332	30.6	25.1
9	St. Louis, Mo.-Ill.	2,060,103	750,026	49.8	36.4
10	Washington, D. C.-Md.-Va.	2,001,897	763,956	54.8	38.2
11	Cleveland, Ohio.	1,796,595	876,050	62.4	48.8
12	Baltimore, Md.	1,727,023	939,024	67.6	54.4
13	Newark, N. J.	1,689,420	405,220	29.9	24.0
14	Minneapolis-St. Paul, Minn.	1,482,030	796,283	72.4	53.7
15	Buffalo, N. Y.	1,306,957	532,759	53.3	40.8
16	Houston, Tex.*	1,243,158	938,219	73.9	75.5
17	Milwaukee, Wis.*	1,194,290	741,324	66.6	62.1
18	Paterson-Clifton-Passaic, N. J.	1,186,873	279,710	29.8	23.6
19	Seattle, Wash.*	1,107,213	557,087	55.4	50.3
20	Dallas, Tex.*	1,083,601	679,684	58.4	62.7
21	Cincinnati, Ohio-Ky.	1,071,624	502,550	55.7	46.9
22	Kansas City, Mo.-Kan.*	1,039,493	475,539	56.1	45.7
23	San Diego, Cal.*	1,033,011	573,224	60.1	55.5
24	Atlanta, Ga.*	1,017,188	487,455	45.6	47.9
Total 24 areas		61,582,070	30,538,269	59.8	49.6

* Important annexation by city.

Source: PC—AI Final Population Counts Dec. 1960.

INCREASING URBANIZATION

For the first time in history the population of the United States classified as "rural" failed to increase. The proportion of urban inhabitants, of course, has been rising steadily—the growth rate has been about twice as fast as the rural element between 1790 and 1950. By 1920 the Nation had become predominantly urban. In 1950 important changes in definition were made to permit inclusion of the so-called urban fringe around cities of 50,000 population or more. This change added an estimated 7.5 million to the urban category; 6.2 million in the urban fringe and 1.3 million in outlying unincorporated areas.

Between 1950 and 1960 the population in urban areas increased by 28.0

million persons* in comparison with the 14.5 million added according to the old definition between 1940 and 1950 and the 7.5 million added through the change in Census definition.

All States experienced gains in urban population, the heaviest occurring in the following (in millions).

California	5.04	Ohio	1.54
Texas	2.35	Illinois	1.37
Florida	1.85	Michigan	1.24
New York	1.65	New Jersey	1.17

The remarkable record of California in building its freeway system to

* Excluding Alaska and Hawaii. The change in definition added to urban areas substantial numbers of persons in the densely settled urban fringe surrounding large cities.

permit movement of its almost incredible population growth is a tremendous story in itself. The State now proposes to undertake a vast expansion of its declared freeway system from 4,286 miles to 12,250 miles, backed by a comprehensive county-city plan (8). In discussing the future of California, the report states:

Based on these growth trends—and there is no compelling contrary evidence—California may well anticipate a population in 1980 of some 31,000,000 persons, more than double its present number. The expected population will expand the existing metropolitan areas and convert areas that are now either suburban or rural in character to dense urban centers. . . .

The traffic patterns and principal points of traffic generation throughout the state have been in existence for a long time, and will continue in much their same geographic location, although most of them will grow in size and importance. Thus, it is possible to rather clearly outline a long-range system through the rural areas, although many locations will not be constructed as full freeways by 1980.

For urban areas, however, the growth patterns are changing so rapidly that there may be major changes from current estimates. Most of the metropolitan area freeway routes are, therefore, proposed as full freeways with complete access control by 1980 for the presently established needs and those which are reasonably certain in the foreseeable future. The building of the proposed freeway system in urban areas is a tremendous undertaking.

Of the 72 counties listed in Table 9, 10 are in California. The freeway system needs of these 10 counties amount to \$6.2 billion, about three-fifths of the total. In 1960 these counties, comprising 25 percent of the State's area, contained 73 percent of its population, and in 1958, 72 percent of its motor vehicles.

DECREASING RURAL POPULATION

Under the old Census definition, rural population between 1940 and 1950 increased by 4.5 million (7.9 percent). Bogue (2, p. 26, Table 2-1) estimates that under the new defini-

tion a slight increase (3.4 percent) would have occurred. During the past decade rural areas of the Nation—rural farm and nonfarm—lost almost 0.5 million persons (0.8 percent).

Not all sections of the country, however, participated in this loss. In the Northeast, both the New England and North Atlantic States experienced substantial rural population gain, perhaps because the region was the most heavily urbanized in the United States. Indiana, Michigan, and Ohio also gained about 200,000 rural dwellers.

In 3 States (Oklahoma, Arkansas and Texas) rural population fell 15 percent or more and each lost at least 200,000 rural inhabitants. All of the South Central States, except Louisiana, experienced heavy losses in rural population. Of the heavy losers in actual numbers, only West Virginia is outside the South Central States.

It is interesting to compare the rate of urban growth with the rural loss over the decade, as shown in Table 8. Thus, the striking population gain of Texas emerges as the net result of a population loss of almost 0.5 million (17 percent) rural residents and a jump of 2.3 million (48 percent) in urban inhabitants, concentrated in the rapidly growing metropolitan areas of Houston, Dallas, Fort Worth, San Antonio, and El Paso, and in a steadily increasing number of new metropolitan areas.

POPULATION DENSITY AND POPULATION CHANGE

To analyze more closely the changing relationship of people and space in the United States, a sample of 12 States representative of geographic location, rural-urban composition, rate of growth, size of State, and industrial development was chosen. The States in the sample (Alabama, Arkansas, California, Colorado, Indiana, Iowa, Maine, Minnesota, Mis-

TABLE 5

DISTRIBUTION OF POPULATION BY COUNTY DENSITY GROUPS IN 12 SELECTED STATES,¹ 1950-1960

County Density Group (pop./sq mi)	Number of Counties	Population		Distribution (%)		Change, 1950-1960 (%)
		1950	1960	1950	1960	
Over 10,000	6	9,332,555	8,952,720	18.5	15.0	-4.1
1,000 to 9,999.9	13	10,596,386	14,503,852	21.0	24.2	36.9
200 to 999.9	47	8,480,788	12,026,811	16.8	20.1	41.8
50 to 199.9	226	10,905,378	12,802,982	21.6	21.4	17.4
25 to 49.9	254	6,617,738	6,877,952	13.1	11.5	3.9
Under 25.0	312	4,538,578	4,640,968	9.0	7.8	2.3
Total	858	50,471,423	59,805,285	100.0	100.0	18.5

¹ Alabama, Arkansas, California, Colorado, Indiana, Iowa, Maine, Minnesota, Missouri, New York, North Carolina and Wyoming.

Preliminary data, Series PC(P1).

souri, New York, North Carolina, and Wyoming) increased 18.5 percent in population, as compared with 17.5 percent for the United States*; were 71 percent urban, as compared with the United States total of about 70 percent; and were well scattered geographically.

These twelve States include about one-third of the United States population and 858 of the 3,047 counties. Table 5 gives the distribution and rate of change of population by density groups.

The proportion of the population living in the most densely and least densely populated areas was coming down, whereas those counties in the middle density range were just about holding their own. Moreover, without some of the California counties, with their peculiar mixture of urban densities and desert (that is, San Bernardino and Riverside), both of the lower groups would have shown population declines.

These data demonstrate, again, the peculiar problems created by population movement. As noted previously, in one-half of the counties in the United States, population was declining. Yet, in many of the States the population losses of many rural counties were more than offset by the

tremendous gain that occurred in a few urban counties. This is demonstrated in the next series of figures.

DOMINANCE OF METROPOLITAN AREA GROWTH

For the selected 12 States, the metropolitan area growth amounted to 87 percent of the total; in the United States it was 85 percent. Among the 12 States, it ranged from zero in Wyoming, in which there were no SMSA's, to more than 100 percent in the States in which the non-metropolitan areas of the States lost population. A summary of the population growth for these States is given in Table 6.

It will be observed that in three States the growth in SMSA's was actually greater than the total increase in the entire State, indicating the magnitude of the changing complex of the population components.

In four States the growth in SMSA's was small in comparison with total State growth, ranging from 58.0 percent in Indiana to 0 in Wyoming, which has no SMSA's. In the last five States shown in Table 6, the growth in SMSA's constituted more than 80 percent of the total State growth. For the 12-State total, SMSA growth amounted to 86.8 percent of the total growth of 9.8 million persons.

* Based on preliminary data. The increase for the U.S., according to final data, moved up to 18.5 percent.

TABLE 6
SUMMARY OF TOTAL POPULATION GROWTH AND GROWTH IN STANDARD METROPOLITAN
STATISTICAL AREAS FOR 12 SELECTED STATES, 1950-1960

State	Population			In Standard Metropolitan Statistical Areas				
	1950	1960	Gain or Loss	Number in 1960	Population 1950	Population 1960	Gain or Loss	Percent of State Growth
Alabama	3,061,743	3,266,740	204,997	6	1,189,885	1,441,750	251,865	122.9
Arkansas	1,909,511	1,786,272	-123,239	2	260,887	309,665	48,778	(¹)
Missouri	3,954,653	4,319,813	365,160	4	* 2,118,891	* 2,507,092	388,201	106.3
Indiana	3,934,224	4,662,498	728,274	7	* 1,704,619	* 2,127,313	422,694	58.0
North Carolina	4,061,929	4,556,155	494,226	6	896,736	1,119,210	222,474	45.0
Maine	913,774	969,265	55,491	2	188,368	190,950	2,582	4.7
Wyoming	290,529	330,066	39,537	0	0	0	0	0.0
Colorado	1,325,089	1,753,947	428,858	3	⁴ 776,839	1,191,832	414,993	96.8
Iowa	2,621,073	2,757,537	136,464	6	706,684	⁴ 835,121	128,437	94.1
California	10,586,223	15,717,204	5,130,981	10	8,988,655	13,590,821	4,602,166	89.7
Minnesota	2,982,483	3,413,864	431,381	3	⁵ 1,387,478	⁶ 1,752,698	365,220	84.7
New York	14,830,192	16,782,304	1,952,112	7	12,656,238	14,352,693	1,696,455	86.9
Total	50,471,423	60,315,665	9,844,242	56	30,875,280	39,419,145	8,543,865	86.8

¹ Growth in SMSA's did not offset decrease in total population.

² Excludes Kansas portion of Kansas City area and Illinois portion of St. Louis area.

³ Excludes Kentucky portion of Evansville area.

⁴ Excludes Illinois portion of Davenport-Rock Island-Moline area.

⁵ Excludes North Dakota portion of Fargo-Moorhead area and Wisconsin portion of Duluth-Superior area.

PATTERN OF POPULATION SHIFTS

As stated previously, the growth of the urban areas has been the dominant factor in the population changes of the past decade. According to most authorities in the field, it will also be the dominant factor of this decade. The emerging pattern of population shifts can be clearly seen by an examination of the following series of figures for three States. The States selected were California (rapid growth rate), Missouri (moderate growth rate), and Arkansas, which lost population during the 1950's.

To illustrate the significant pattern of the population shift from rural to urban areas, the first two figures for each State show the population changes (1950-1960) and county population densities for 1960. The third figure for each State shows the emergence of metropolitan areas from 1950 to 1960 with projections through 1980 of possible new metropolitan areas. The Interstate Highway System has been superimposed on each figure.

California

The rate of growth in California has been phenomenal in the last decade. As shown in Figure 4, all but 7 counties showed population increases. With the exception of San Francisco County, those that lost population were sparsely populated. The loss of population in San Francisco County was more than offset by large increases in all counties surrounding it, ranging from an increase of 22.4 percent in Alameda to 88.1 percent in San Mateo. With the exception of Kern County, the population of the counties surrounding Los Angeles increased at a much faster rate than did Los Angeles, the percentage increases ranging from 73.7 percent in Ventura to 225.9 percent in Orange.

Figure 5 shows the population density of the California counties based on the 1960 Census. It can be observed that the rural counties which have extremely low population densities are among those that lost population during the last decade. It can also be observed that the counties with the highest densities

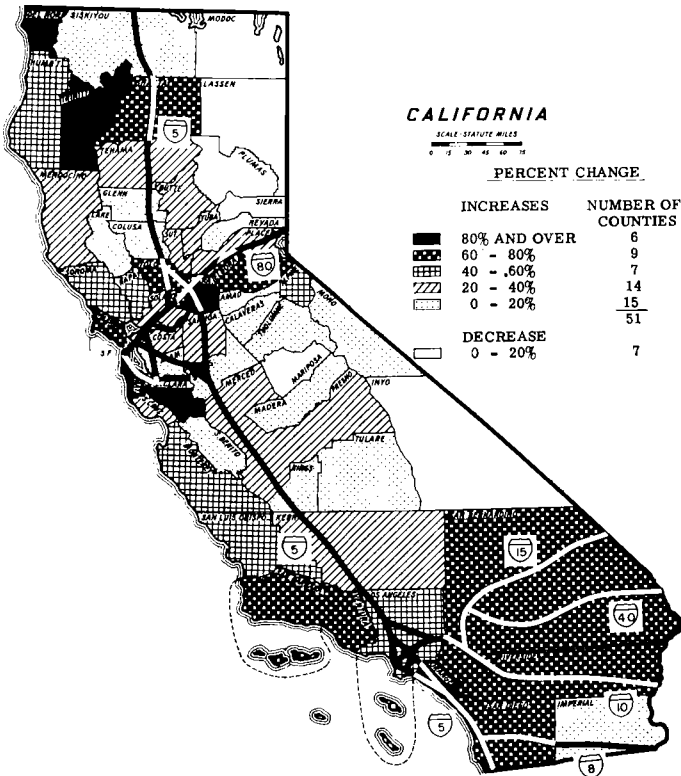


Figure 4. Population change in California counties, 1950-1960.

(Alameda, Los Angeles, and San Francisco) experienced smaller percentage increases than the areas surrounding them. San Francisco, which is considered a central city, suffered an actual loss in population, while Los Angeles had a larger rate of growth than Kern County.

Figure 6 traces the development of SMSA's in California from 1950 to 1960 and projects such developments through 1980. According to these data, a substantial portion of the designated Interstate System in the State is now or may be within SMSA's in the near future.

The anticipated development of SMSA's in the coastal counties between Los Angeles and San Francisco is almost certain to result in highway problems of considerable magnitude.

The State, in developing the proposed freeway system, has placed the construction of freeways through this area in the second group of priority, the first being the connecting routes between the largest cities (8, p. 21).

Missouri

The next three figures tell the same story for Missouri, a State which showed only a moderate rate of growth in the last decade.

Figure 7 shows that in Missouri, unlike California, a substantial number (86 out of 115) of counties experienced population decreases during the 1950's with 11 of them losing more than 20 percent. Again, the largest increases in population occurred in the periphery of the larger

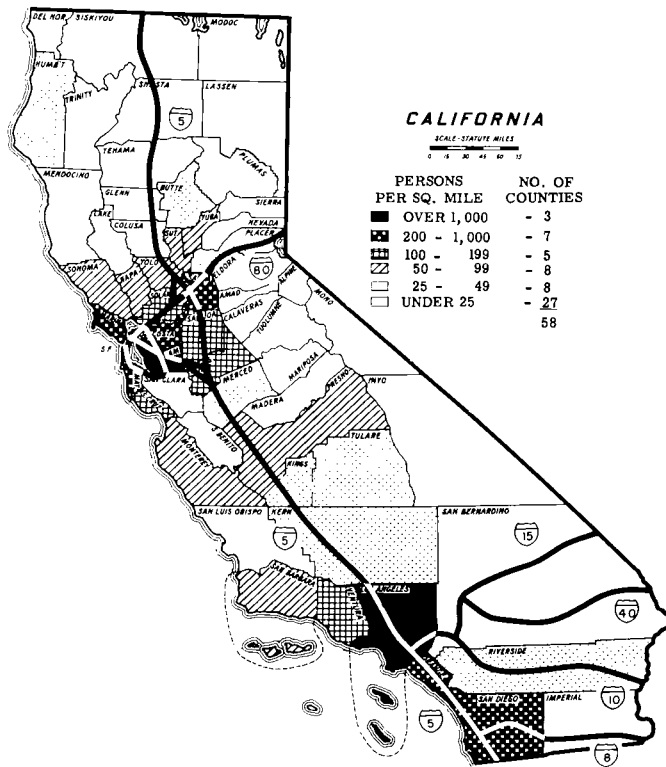


Figure 5. Population density of California counties, 1960.

urban areas, with the more rural counties, for the most part, showing decreases.

Figure 8 shows the population density of the Missouri counties. It can be observed that those counties with relatively sparse population were also the ones which suffered losses during the decade. It will also be noted that, with the exception of Cole County (Jefferson City) all counties having a population density of more than 100 persons per square mile are served by the Interstate System.

Figure 9 shows the emerging pattern of metropolitan areas in Missouri. It is expected that four counties may attain metropolitan area status by 1970, of which two, Cass

and Cole, will not be directly served by the Interstate System.

Arkansas

The next series of three figures shows similar information for Arkansas. Figure 10 shows that 69 of the 75 counties in the State experienced population decreases, 4 losing more than 30 percent and 20 losing between 20 and 30 percent. Six counties gained population during the decade, the highest gain being about 22 percent in Pulaski County. The growth pattern in the State reveals that only those counties containing urban areas or those adjacent to urban areas gained in population. Figure 11 shows county population



Figure 6. Development of Standard Metropolitan Statistical Areas in California, 1950-1980.

densities, and it can be noted again that the more sparsely settled counties suffered the greatest relative losses in population. Figure 12, depicting the metropolitan area development, shows that probably three counties will attain metropolitan status by 1980 with only one, Jefferson (Pine Bluff) not being directly served by the Interstate System.

Figures 4 through 12, tracing the population developments in these three States of varying growth patterns reveal a single dominant fact—that the major portion of the population growth occurred in urban areas around the larger central cores. This centripetal movement is accompanied by population decreases or extremely

small gains in the more rural and sparsely settled counties.

North Carolina

The possible and likely course of events in a State in which most of the population growth has been outside of metropolitan areas, as in North Carolina, is shown in Figures 13 and 14. By coalescing of present metropolitan areas in the North Carolina Piedmont and growth of others to metropolitan status, well over one-half of that State's population could reside in metropolitan areas before 1980. Thus, even in some States where relatively small cities and rural populations have been

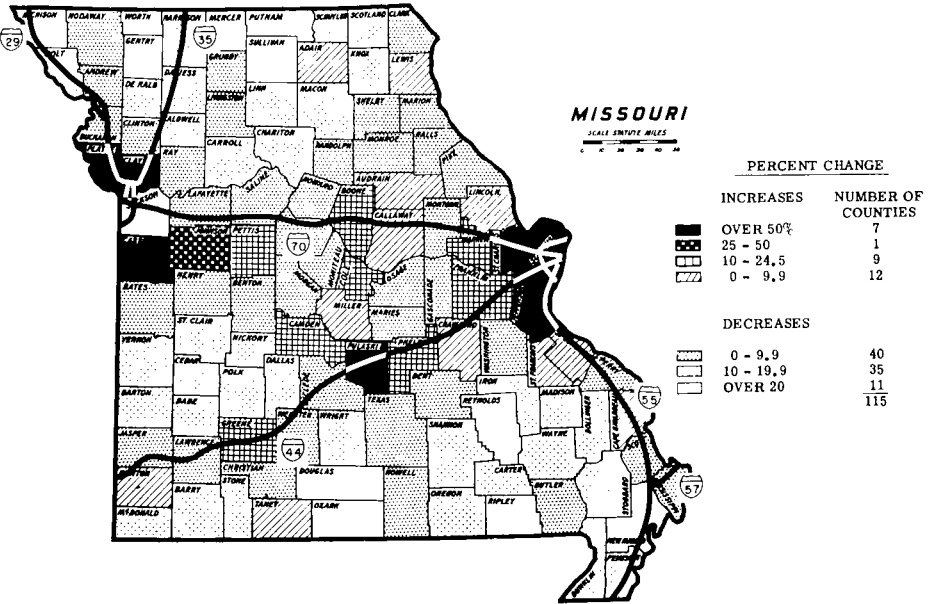


Figure 7. Population change in Missouri counties, 1950-1960.

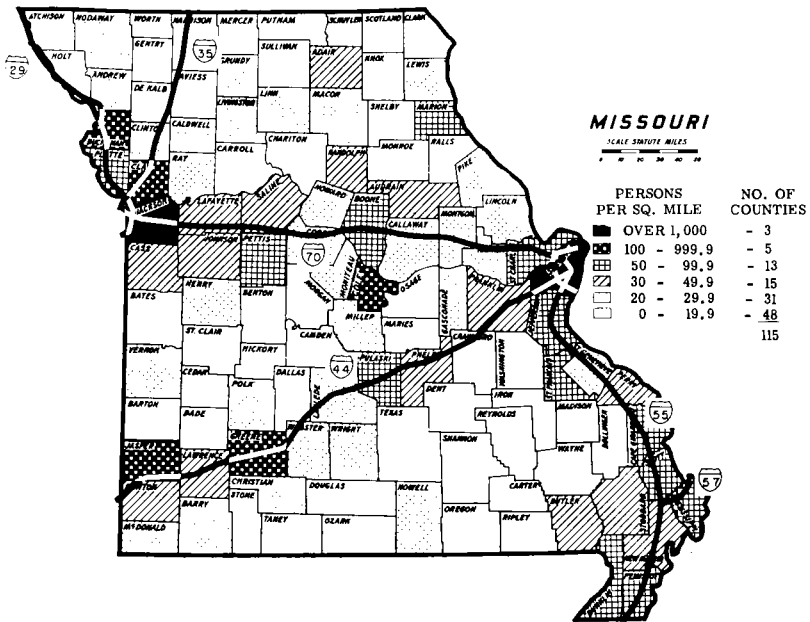


Figure 8. Population density of Missouri counties, 1960.

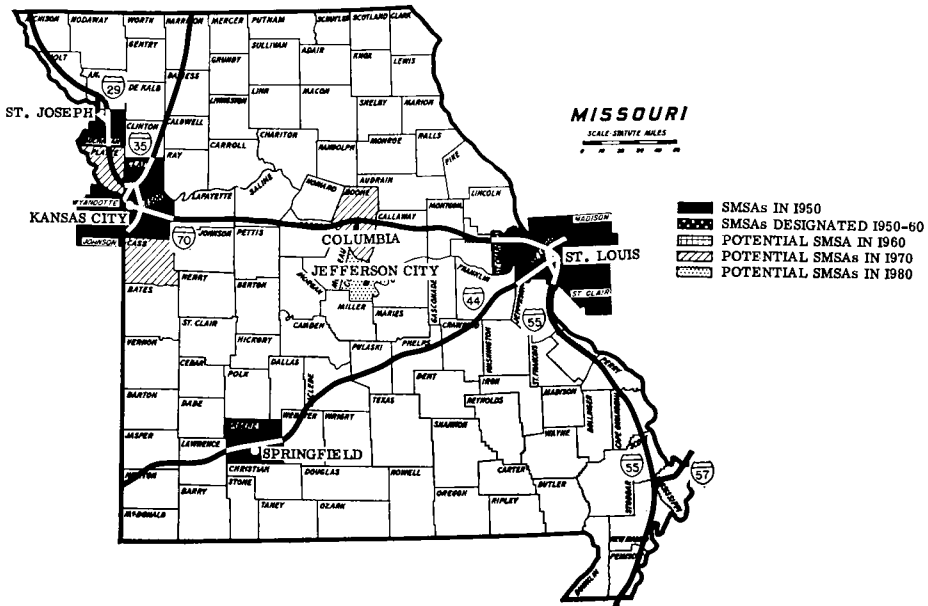


Figure 9. Development of Standard Metropolitan Statistical Areas in Missouri, 1950-1980.

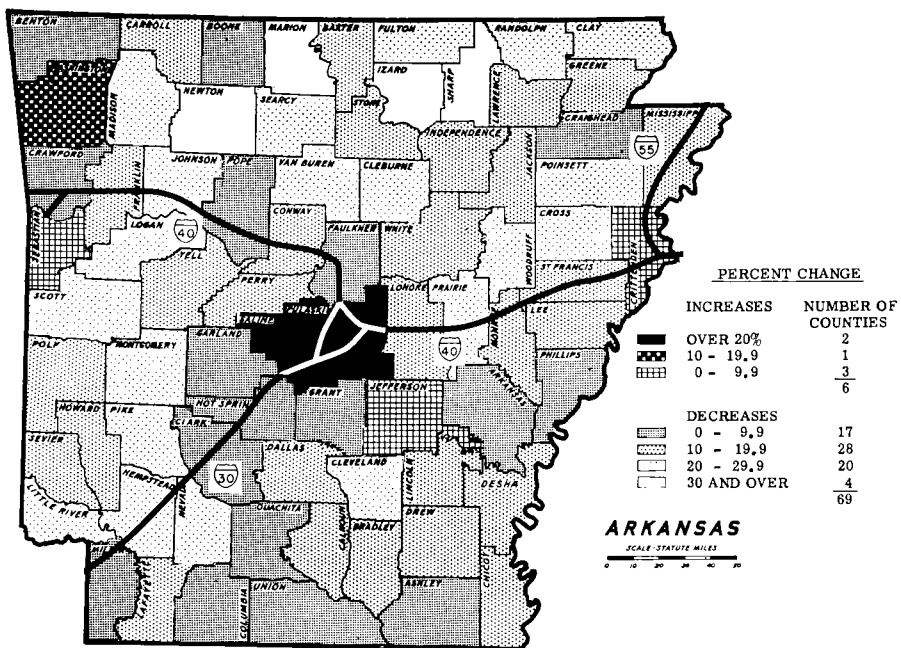


Figure 10. Population change in Arkansas counties, 1950-1960.

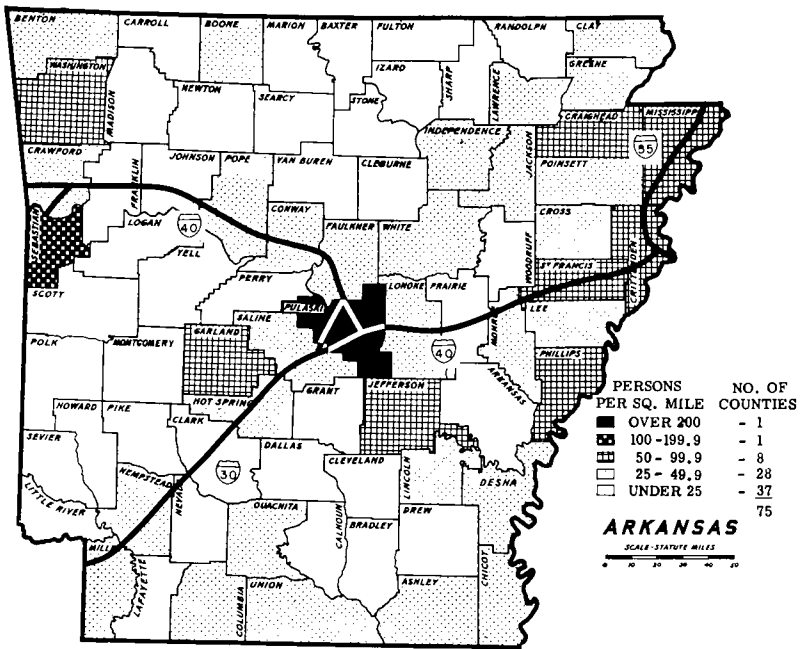


Figure 11. Population density of Arkansas counties, 1960.

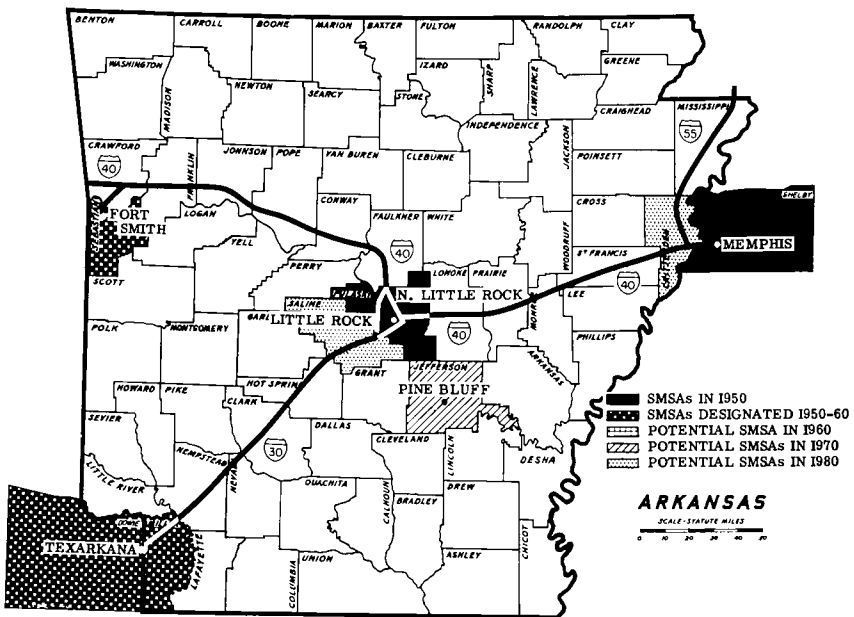


Figure 12. Development of Standard Metropolitan Statistical Areas in Arkansas, 1950-1980.

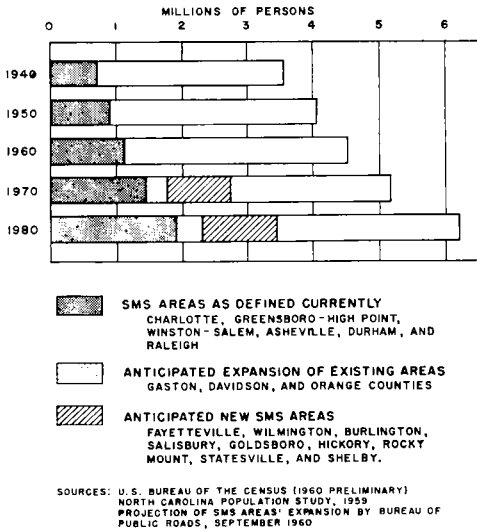


Figure 13. Population of North Carolina in SMSA's and outside (actual 1940-1960, estimated 1970-1980).

dominant, large metropolitan areas approaching 1 million or more appear to be emerging. Figure 14 shows the relationship of the Interstate System to the State's emerging metropolitan areas.

District of Columbia

It is often lost sight of that several factors are operating to reduce the

populations of cities. The extension of office buildings, warehouses, garages, parking lots, etc., is constantly reducing the land area available for residential use. Concomitantly, vacant land in most cities is disappearing.

For example, in the District of Columbia, the central core and peripheral precincts have declined in population for 20 years and the area in which this decline is occurring has been spreading outward. Between 1940 and 1960 the central and peripheral cores lost almost 80,000 inhabitants. This loss has been offset by a gain of 132,000 people in the outlying east area, and 49,000 in the northwest area. Table 7 gives these data by precinct and Figure 15 shows this striking shift in population.

It has been said that American cities such as Los Angeles and Detroit cannot be remade, but during the 1950-1960 decade much has happened to reshape their metropolitan areas. The center of Detroit is undergoing a tremendous and expensive face-lifting involving construction of new commercial, cultural, governmental, educational and medical centers. Detroit admittedly has one of the best systems of urban expressways, with express buses which provide rapid travel from suburbs to

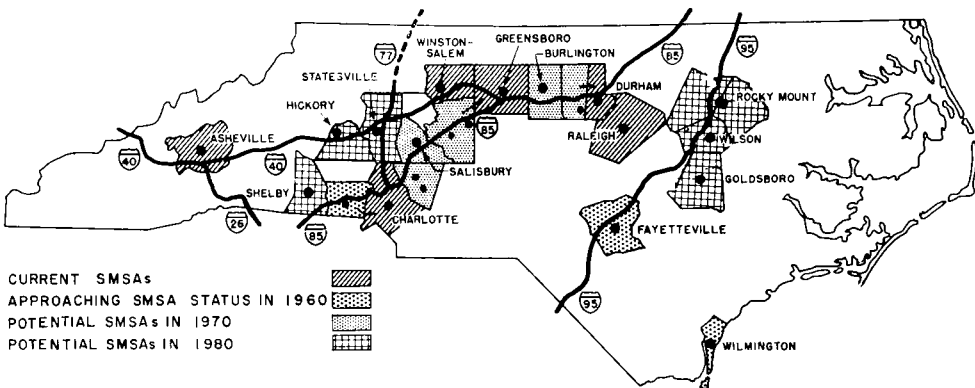


Figure 14. Relation of Interstate Highway System to current and developing SMSA's in North Carolina, 1950-1980.

TABLE 7
POPULATION TRENDS IN THE DISTRICT OF COLUMBIA BY POLICE PRECINCTS, 1940-1960

Area and Precinct	Population			Change					
	1940	1950	1960	1940-50		1950-60		1940-60	
				No.	%	No.	%	No.	%
<i>Central core:</i>									
Precinct 1	22,408	18,705	10,682	-3,703	-16.5	-8,023	-42.9	-11,726	-52.3
Precinct 2	62,824	58,850	45,061	-3,974	-6.3	-13,789	-23.4	-17,763	-28.3
Precinct 3	55,257	49,864	33,940	-5,393	-9.8	-15,924	-31.9	-21,317	-38.6
Precinct 4	29,343	30,082	7,480	739	2.5	-22,602	-75.1	-21,863	-74.5
Total	169,832	157,501	97,163	-12,331	-7.3	-60,338	-38.3	-72,669	-42.8
<i>Peripheral core:</i>									
Precinct 5	51,072	51,292	45,222	220	0.4	-6,070	-11.8	-5,850	-11.5
Precinct 7	31,660	35,607	32,664	3,947	12.5	-2,943	-8.3	1,004	3.2
Precinct 9	76,405	89,326	82,256	12,921	16.9	-7,070	-7.9	5,851	7.7
Precinct 10	78,855	82,012	79,118	3,157	4.0	-2,894	-3.5	263	0.3
Precinct 13	60,316	61,569	51,838	1,253	2.1	-9,731	-15.8	-8,478	-14.1
Total	298,308	319,806	291,098	21,498	7.2	-28,708	-9.0	-7,210	-2.4
<i>Outlying, east:</i>									
Precinct 11	51,839	86,344	102,939	}	(1)	16,595	19.2	}	(1)
Precinct 14	(1)	66,169	80,474			14,305	21.6		
Total	51,839	152,513	183,413	100,674	194.2	30,900	20.3	131,574	253.8
<i>Outlying west:</i>									
Precinct 6	54,965	62,396	65,156	7,431	13.5	2,760	4.4	10,191	18.5
Precinct 8	46,050	56,030	63,629	9,980	21.7	7,599	13.6	17,579	38.2
Precinct 12	42,097	53,932	63,497	11,835	28.1	9,565	17.7	21,400	50.8
Total	143,112	172,358	192,282	29,246	20.4	19,924	11.6	49,170	34.4
Total outlying	194,951	324,871	375,695	129,920	66.6	50,824	15.6	180,744	92.7
Grand total	663,091	802,178	763,956	139,087	21.0	-38,222	-4.8	100,865	15.2

¹ Precinct 14 was part of Precinct 11 in 1940.

Source: PC(A-1)-10 Final Population Counts (Oct. 1960).

downtown. Suburban development has been encouraged by these factors. This is reflected in the population shifts during the decade. The area grew by a healthy 25 percent; the central city lost 179,000 people while the suburbs in Wayne, Macomb, and Oakland counties added 926,000. The relative positions as places of residence of central city and outlying territory were reversed.

HIGHWAY IMPLICATIONS OF RECENT POPULATION CHANGES

It is several years now since Owen (9) propounded his perplexing question as to whether the United States could continue to motorize and urbanize itself at the same time. The population statistics resulting from the 1960 Census, taken together with

recent information on motor vehicle registrations and travel, seem to indicate, however, that is exactly what has been happening.

The Census data so far available show that the population increase over the last decade was concentrated in urban areas, and that 85 percent of the national growth occurred in 212 metropolitan areas. In turn, three-fourths of the metropolitan growth took place outside of the central cities. These statistics mean that the residence of the urban dwellers is being decentralized into suburban areas at a great rate, while the farming and other rural areas, including the small towns, are, in general, losing population to the larger urban places.

The Census will eventually tell much more—such as place of work

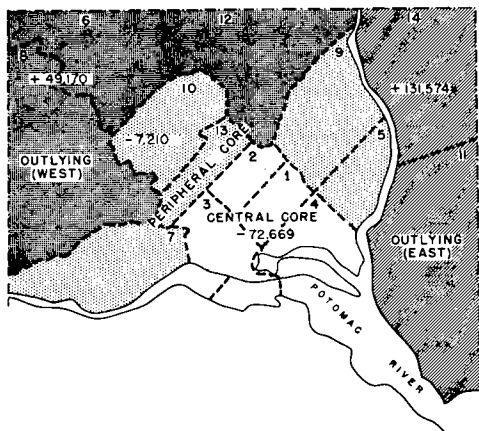


Figure 15. Change in District of Columbia population by precinct groups, 1940-1960.

in relation to residence, the means used in getting to work (but not the distance from home to work)—but this information is not yet ready. These data and others which will be released in the ensuing months will provide much additional information that will be of value to highway planners and administrators.

The changes in the size, composition, distribution, and other characteristics of the population which have been revealed by the 1960 Census information contain many highway implications. The Census shows that population is increasing fastest in those areas in which automobile ownership tends to be most dense; that suburban growth, made possible by the ever-increasing ownership of the automobile, has largely dominated population movement, and there is no apparent indication of a decrease in this trend within the foreseeable future.

More people and more vehicles mean more traffic, and unless the facilities provided to move this traffic are greatly improved, the existing traffic congestion in and near the urban centers may be expected not only to continue but also to become worse. Problems of the large metropolitan

areas are not only the magnified problems of the smaller areas, but they also are different in many fundamental respects. Important long-range planning problems are involved—city-wide, area-wide, State-wide, and even Nation-wide. No single group of government officials, nor any one discipline of knowledge, can hope to solve these problems alone; their solution will depend on the concerted cooperative action of all.

In discussing the emerging problem of urban transportation, Seburn and Marsh (10) have this to say:

The demand for new transportation facilities increases independently and at a faster rate than the population. One factor is the continuing shift to the use of the private automobile, which is a prominent characteristic of urban society today. . . . Rural land is presently being converted to urban use at the rate of a million acres per year. New transportation demands created by suburbanized industries and other traffic generators require added facilities to meet new travel desire lines. . . . A complicating factor for the central city is that many of the residents of the outlying jurisdictions work in the central city. The street system of the central city is overloaded by traffic generated in areas outside its control. This requires heavy expenditures for controls, improvements, maintenance, enforcement, and parking. The central city finds little opportunity for extracting tax revenues from those creating the need for these expenditures.

If Seburn and Marsh are correct in their statement that the demand for new transportation facilities increases at a faster rate than population, it can be assumed that the future highway problem in the rapidly developing metropolitan areas will surpass even the complex ones that are now facing highway administrators.

There is need for an immediate, long, and careful look ahead in urban highway planning to take into account the metropolitan needs of at least the next 15 or 20 years. The planning, location, and design of the country's urban highway system must be carefully oriented toward the highway needs of a nation in

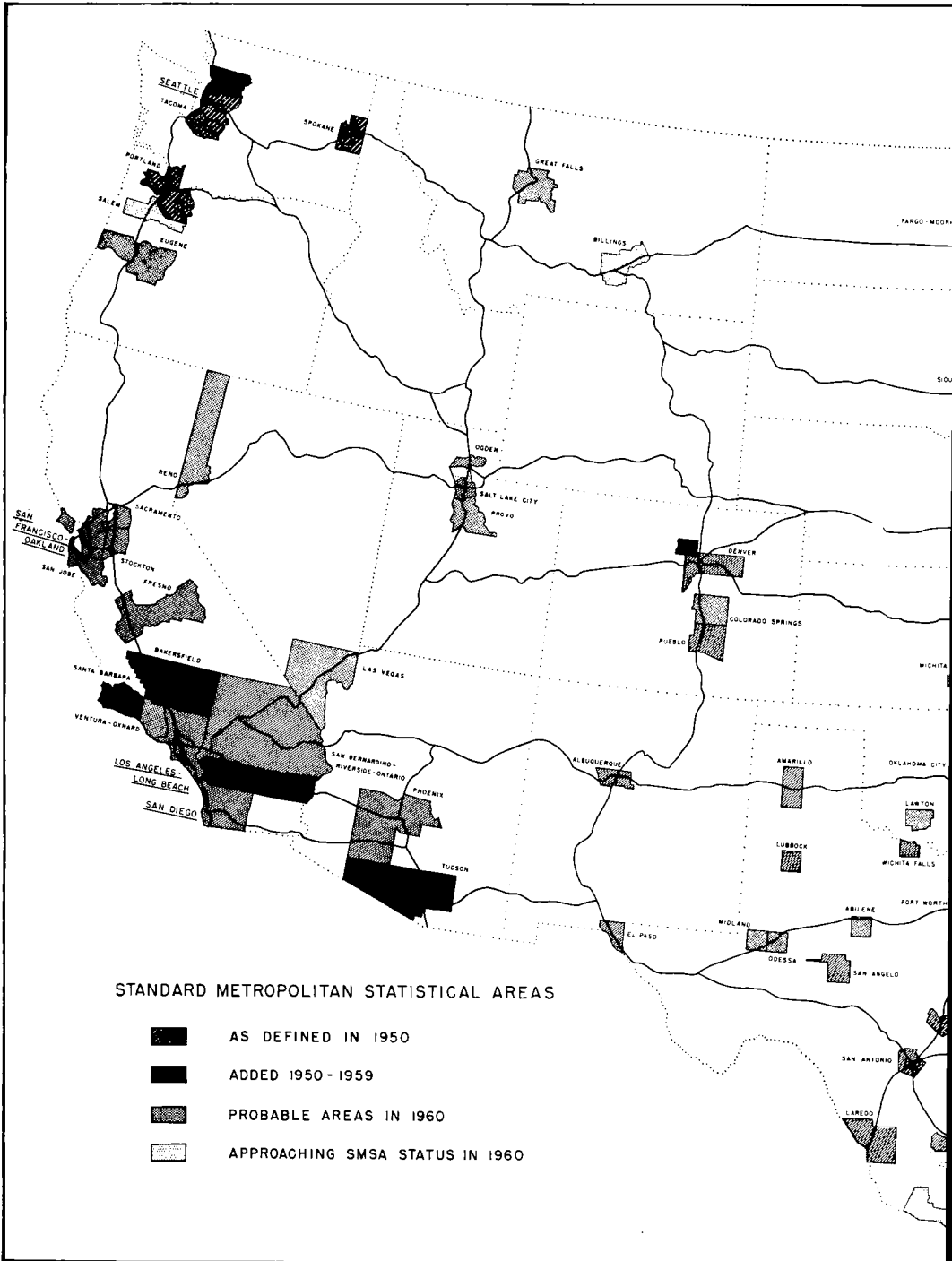
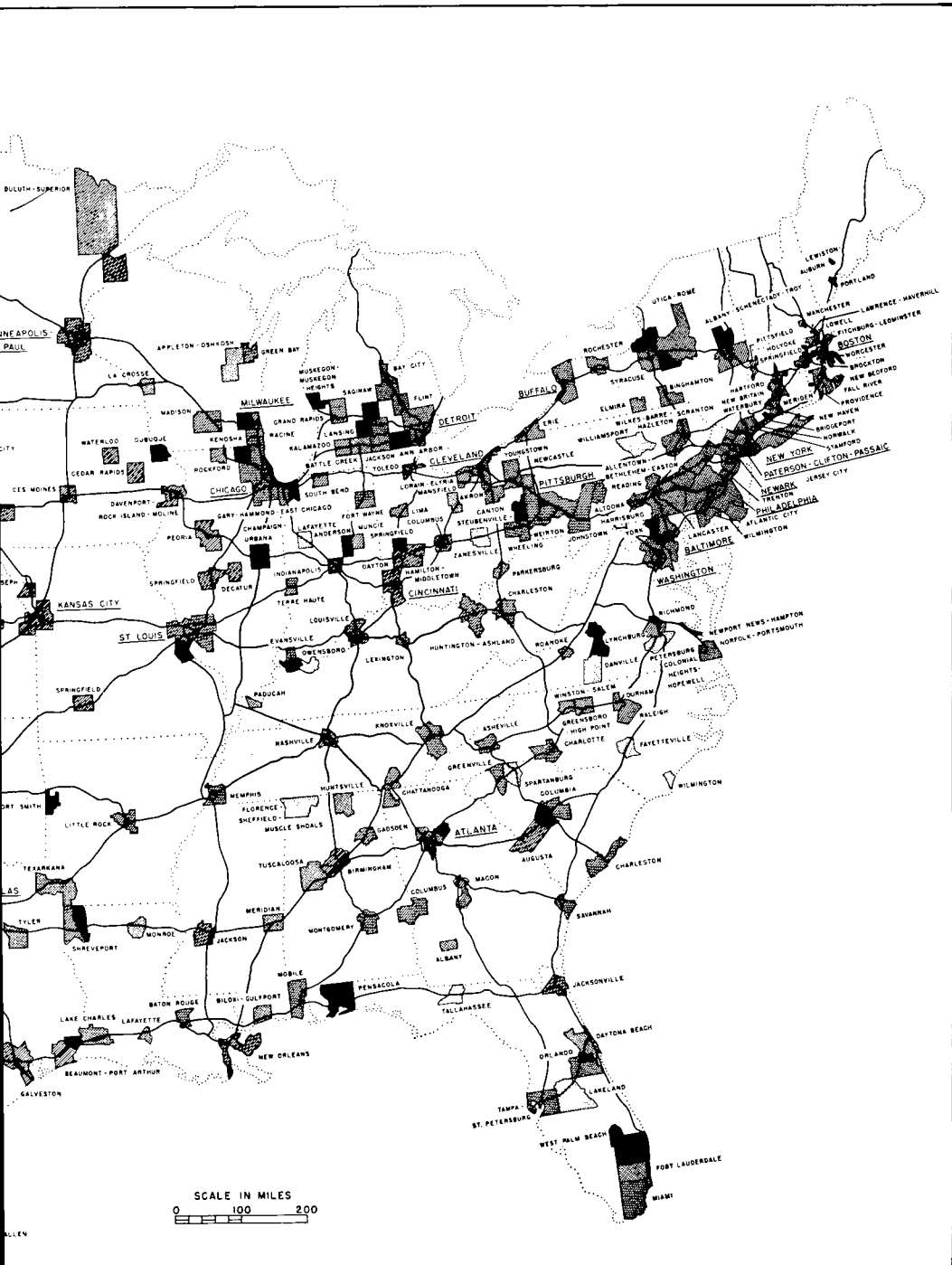


Figure 16. The National System of Interstate and Defense Highways



in Relation to Standard Metropolitan Statistical Areas, 1950-60.

which it has been estimated that as much as 80 percent of the total population will either be urbanites or living on the fringes of major metropolitan areas within this period.

Many of the problems involved, such as the proper place of mass transit facilities in the metropolitan transportation plan, are not only extremely difficult of solution but also extremely controversial. They must, however, be faced, and it behooves the highway planner and administrator to be fully aware of them.

As highway officials engaged in either research or administration, it must be recognized that not everyone views the Interstate System as warmly as does this group. For example, it is regarded in some quarters as merely another device of the automobile which will compound the congestion in the center of the city by extending the volume and distance of commuting (11). This in turn will create a governmental and financial crisis of prime magnitude because of the concomitant nuisance of noise, dirt, air pollution, crowding, destruction of recreation areas, parking mess, loss of time in traffic, dilution of education, and deterioration of water supply.

The process of reshaping the pattern and structure of the metropolitan areas to fit the new mobility provided by the automobile and the truck is quite possibly just getting under way and may be expected to continue into the foreseeable future. In this regard, Wurster (12) states that:

In recent years, the new freeways have made a spectacular change in our environment. They have opened up vast areas of cheap land for needed development and recreation, increased the job radius, and permitted many people to fulfill their desire for a private home.

But there is another side to the balance sheet. For many people, commuting costs and time have mounted, and consume a large share of their increased incomes and leisure. The total national expenditure on non-military transportation is now roughly

\$100 billion a year, or 20 percent of the gross national product, with something like \$25 billion devoted to passenger transport in urban and metropolitan areas. We spend almost as much to move around home as we do on housing itself. The public costs are enormous, in terms of local and state budgets and debt. And no leveling off is in sight. Traffic congestion often appears to be only temporarily relieved in outlying areas, and is creating an overwhelming crisis in central business districts.

The rigid old form of the city does not seem to fit in well with the new ideas. The American metropolitan area is being reshaped, primarily because of change in the technology of transportation. With it is changing the shape and location of the factory, the shopping center, the location of many office buildings and apartments. In effect, the sharp differences between city and country are being equalized by the automobile.

In the prototype of American urban bigness, perhaps the pattern of things to come and the attendant highway problems may be seen most clearly. In New York City the population of Manhattan has been declining since 1910. In the last decade both Brooklyn and the Bronx lost population, and with them, New York City as a whole. At the same time, the suburban counties on Long Island grew with extreme rapidity, and the New York suburbs as a whole increased an amazing 75 percent. Employment-wise, there has been little change in the level of jobs in New York City. Increases in some industries are offset by losses in manufacturing and trade. New York City now has a rapid transit system of such speed, extensiveness, and moderate fare that it would be impossible to create a system like it *de novo*. It has had an urban renewal program involving Federal, State, local, and private expenditures totaling billions of dollars, and operating for many decades. Without these things, the flight from New York might have become a rout.

Population Distribution and Highway Classification

The fundamental aim of the designated highway systems—Interstate, primary, secondary, local—is to provide a network of highways which will meet the public demand. The rapidly changing complexion of the population distribution may require major shifts in emphasis and attention as between rural and urban portions of the various highway systems, but it is less likely to change the fundamental concepts of highway system classification. Probably, however, specific roads, streets, and highways will be shifted from one system to another, including primary, secondary, and tertiary systems.

The Interstate System

Census returns indicate that the Interstate System has been rather well selected with respect to rendering service to the Nation's major metropolitan areas.

Of the 168 areas defined by the Bureau of the Census in 1950 as Standard Metropolitan Areas, only 19 were originally not directly located on the Interstate Highway System and one of these has since been included. For purposes of this analysis direct service is considered to be provided when the center of the principal city is not more than 10 miles off the Interstate location by existing road connections.

Between 1950 and 1959, 20 new Standard Metropolitan Statistical Areas were established by official action; since then 24 additional areas have qualified under the regulations established for such classifications. However, final figures on many of these areas had not been received at the time the investigations were made so the study was limited to the original 168 areas and the 20 areas designated as Standard Metropolitan Statistical Areas between 1950 and

1959. Figure 16 shows the 188 areas and their relative position as compared to the Interstate System.

The proportion of the 20 areas not on the Interstate System was higher than in the original group, because seven of the new areas were not located on the System. Population-wise, however, the coverage of the Interstate System would be higher with these 20 standard metropolitan areas included than it was on the 1950 basis, because the new areas added since 1950 have only recently met the basic population requirements, while many of the larger SMSA's which were already included in the 1950 designation have since increased tremendously in population. Of the additional 24 areas which have only recently qualified, 19 are on the Interstate System.

Other Primary Highways

Primary highways, other than Interstate, already reach all of the major urban population concentrations, so it is doubtful that much additional route mileage will need to be placed on these systems to provide service to the urban areas, although additional lane mileage might be needed. Several States have, within the past few years, made comprehensive Statewide highway needs studies, and it seems safe to assume that the highway departments have given consideration to the changing pattern of urbanization in planning their improvement needs programs. Inasmuch as the States are already aware of the need for continually, or at least periodically, re-evaluating their long-range improvement programs, it may probably be assumed that the improvement needs of the primary systems in all States will be re-appraised at frequent intervals, at which time due consideration should be given to such population trends as are then occurring.

Secondary and Local Roads and Streets in Urban Areas

Although it is perhaps in the area of providing city expressways and other expensive primary-level facilities that the greatest problems will occur, the provision of adequate secondary and local roads and streets will also be fraught with complexities. As new suburbs develop, new local streets will be built, in most instances either by the governmental jurisdiction having responsibility for the area in which the subdivision is located or by the subdivision developer. Secondary or arterial streets will also need to be developed to serve these rapidly growing areas. In some instances these arterials will be the responsibility of the State government; in others, of a county or a single local jurisdiction; and in others they will be the joint responsibility of two or more levels of government.

The growth of these suburban street networks will pose important problems of management and financing. Even though the construction costs of new land-service streets may be borne in the long run by the purchasers of the property, there will be a continuing requirement upon some governmental unit for maintenance and an eventual requirement for reconstruction. The cost of building the arterials will, almost certainly, fall largely, if not almost entirely, on some governmental jurisdiction or jurisdictions, rather than on owners of affected property, along with continuing costs for maintenance and eventual costs for reconstruction.

Thus, the States, counties, and local units can be expected to find themselves facing many new financial problems in connection with this continuing urban growth. There will, of course, be an accompanying, although not necessarily a proportionate, growth in the tax base; more vehicles on which registration fees and fuel taxes will be paid, and more

highly improved and therefore more valuable real property against which *ad valorem* taxes can be levied—to mention only two instances—so that the entire burden of financing these additional facilities will not have to be borne entirely by existing tax bases.

Secondary and Local Rural Roads

At the other end of the spectrum are the secondary and local roads in rural areas. Forecasts by the State highway departments have indicated almost without exception that travel on these roads will continue to increase, although not as rapidly, perhaps, as on the streets in urban areas, or as on the Interstate and primary highways which predominantly serve through traffic. In the case of these secondary and local or land-service roads, however, it is possible that a declining rural population may eventually result in declining traffic on these roads and, consequently, some decrease in their physical and financial needs.

Highway administrators will certainly want to keep close watch over the changes in the demand for highways in rural areas within the next few years. If these changes appear to warrant reclassification, or changes in administrative or fiscal responsibility for various roads, they should not hesitate to make their convictions known to legislatures and other governmental authorities who are in a position to take such action as is desirable.

FUTURE PATTERNS OF URBAN LIVING

A whole new way of life has unfolded in the United States. Shorter hours, higher real wages, and a greatly enlarged middle class have been largely responsible for the adoption of "suburbia" as a way of life. With more time and money available,

families seek more informal and casual ways of living. As noted earlier, the rigid, old forms of the central city do not seem to fit in well with the new ideas. It is the flexibility in personal transportation made possible by the availability and relative inexpensiveness of the private automobile that has probably been the principal factor responsible for this.

It has also been noted previously that with these changes in living habits are occurring concomitant changes in the shape and location of the factory, the shopping center, apartments, and even office buildings, and that to a large degree the past sharp differences between city and country living are being equalized by the automobile.

City and regional planners, conservationists, and many others outside the highway field are becoming seriously concerned about these developments. Various plans are being proposed for the future development of these areas. One possibility would be a continuation of the more or less unregulated sprawl that characterizes the present development. Another would be to control development so that it would be concentrated in "fingers" along existing and proposed transportation routes, highway and other. The third possibility would be to circumscribe the area, about as it is now developed, with a "green belt" beyond which satellite cities would be developed to take care of population increases beyond those which could be accommodated by the area inside the "green belt." No one can yet predict which of these plans, if any, is likely to be adopted; or when adopted, if it can or will be put into effect.

A related factor that must be considered in the case of most of the larger cities is urban renewal. There are many who believe that through urban renewal, large areas in the downtown sections of the larger cities

can be made considerably more attractive as places to live to the middle- and high-income families, who now seem to be fleeing to the suburbs in ever-increasing numbers, leaving the central city to the lower income groups and to decay. However, it must be remembered that not all of the decline in population in the central cities is the result of the flight to the suburbs; new civic centers, office buildings, and even parking facilities, are taking up areas formerly occupied by residential units of one kind or another. These are, of course, desirable uses, but they do result in a decline in the central city population which even extensive urban renewal may not offset.

Highway planners and administrators will of necessity keep in touch with developments along all of these lines, and be prepared to revise their programs accordingly.

MASS TRANSIT IN URBAN TRANSPORTATION

The question of the position to be occupied by mass transit in the future urbanized America is currently one of the most controversial; in some respects it has assumed many of the aspects of a "cause" in which emotion dominates reason. There are those who seem to feel that a choice must be made between a combination of urban renewal, strict control of city growth, and mass transit, especially rail, on the one hand, or chaotic decentralization on the other. There are many in high places, however, who disagree with this extreme view. It seems most likely that there will continue to be in the future a combination of both improved rail and bus mass transit facilities and continued extensive private transportation by automobile serving the needs of the large metropolitan agglomerations.

Wise planning and zoning, sensitive to the public pulse, would be able to accomplish much toward the

location of future high-density residential areas, shopping centers, industrial parks, and recreational facilities in such a manner as to permit the future metropolitan areas to be served more efficiently by both mass transit and public highway facilities. Where residential densities are high, or where other traffic-generating facilities are concentrated, mass transit can become efficient and economical. The type of transit facility to be provided, whether by rail, or bus, or other means, will be determined largely by factors beyond the scope of this paper. But it may be assumed that each type of transit facility will eventually be given its proper role. It must be remembered, however, that whether or not mass transit facilities are provided, highways will still be needed to serve freight traffic and a great percentage of the passenger traffic within the urban areas: traffic that cannot be efficiently served by mass transit media or which for one reason or another refuses to utilize them.

SUMMARY

The population and other material presented in this paper provide sufficient evidence to indicate that the United States has been rapidly becoming, and is almost certain, for the foreseeable future at least, to continue to become a more and more urbanized nation.

The changing complex of the population in the United States has tremendous implications for highway planners and administrators. It will bring problems in both rural and urban areas, but the indications are that the urban area problems will be more troublesome than those in rural areas, and will be more difficult of solution.

It must always be borne in mind

that the present population migration from the central cities does not imply a corresponding decline in the transportation requirements of these cities. In all instances where the population of the central city declined during the last decade, it was minor in comparison to the population growth of the area outside the city. It would appear that the highway needs of the central cities could not decrease as long as the daytime population continues to exceed the resident population by an ever-increasing margin.

As the outlying areas change in character and become increasingly urban, the demands for arterials, secondary, and local streets, according to some authorities, will increase at a somewhat faster rate than the population. This may be possible, especially in the metropolitan counties of heaviest impact.

The *mores* of urban sociology seem to be creating unnecessary movement of people; thus, the factory worker or the domestic living in the central city moving to his or her job in the outskirts and the suburban white-collar worker moving to and from his or her job in the heart of the city tend to meet each other going in the opposite direction during morning and evening rush hours (13).

It behooves the highway planner and administrator to keep abreast of the changing character of the population—its magnitude, distribution, age, income, and employment characteristics—so that the highway network of tomorrow, for which he is responsible today, will be geared to meet the needs that will be thrust upon it. This may mean that highway and other government officials, and legislatures, may have to reconsider some of their long-established concepts about highway classification, highway financing, and other related matters.

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TABLE 9
 COUNTIES IN THE UNITED STATES WHICH EXPERIENCED POPULATION GAINS OF 100,000 OR MORE BETWEEN 1950 AND 1960
 (Ranked in order of size of increase)

Rank	County	Standard Metropolitan Statistical Area	Land Area (sq mi)	1960 Density (persons/ sq mi)	Population ($\times 10^4$)		Increase 1950-1960		Cumulative Percent of Total U.S. Increase
					1950	1960	Number	Percent	
1	Los Angeles	Los Angeles-Long Beach, Calif.	4,071	1,483.4	4,152	6,039	1,887	45.4	6.7
2	Nassau	New York, N. Y.	300	4,333.3	673	1,300	627	93.2	9.0
3	Cook	Chicago, Ill.	954	5,377.4	4,509	5,130	621	13.8	11.2
4	Orange	Los Angeles-Long Beach, Calif.	782	900.3	216	704	488	225.9	12.9
5	San Diego	San Diego, Calif.	4,258	242.6	557	1,033	476	85.5	14.6
6	Dade	Miami, Fla.	2,054	455.2	495	935	440	88.9	16.2
7	Harris	Houston, Tex.	1,730	718.5	807	1,243	436	54.0	17.8
8	Suffolk	New York, N. Y.	1,922	723.4	276	667	391	141.7	19.2
9	Santa Clara	San Jose, Calif.	1,305	492.0	291	642	351	130.6	20.4
10	Dallas	Dallas, Tex.	893	1,066.1	615	952	337	64.8	21.6
11	Maricopa	Phoenix, Ariz.	9,226	72.0	332	664	332	100.0	22.8
12	St. Louis	St. Louis, Mo.-Ill.	497	1,416.5	406	704	298	73.4	23.9
13	Oakland	Detroit, Mich.	877	780.8	396	696	294	74.2	24.9
14	Queens	New York, N. Y.	113	16,017.7	1,551	1,810	259	16.7	25.8
15	Cuyahoga	Cleveland, Ohio	456	3,614.0	1,390	1,648	258	18.6	26.8
16	Broward	Fort Lauderdale-Hollywood, Fla.	1,218	274.2	84	334	250	207.6	27.7
17	Bergen	Paterson-Clifton-Passaic, N. J.	233	3,347.6	539	780	241	44.7	28.1
18	Wayne	Detroit, Mich.	607	4,392.7	2,435	2,686	251	9.3	29.3
19	Sacramento	Sacramento, Calif.	985	510.7	277	503	226	81.0	30.2
20	San Bernardino	San Bernardino-Riverside-Ontario, Calif.	20,131	25.0	282	504	222	78.7	30.9
21	Baltimore	Baltimore, Md.	610	806.6	270	492	222	82.2	31.7
22	Macomb	Detroit, Mich.	481	844.1	185	406	221	119.5	32.5
23	Pinellas	Tampa-St. Petersburg, Fla.	204	1,420.5	159	375	216	135.8	33.3
24	San Mateo	San Francisco-Oakland, Calif.	454	978.0	236	444	208	85.1	34.0
25	King	Seattle, Wash.	2,134	438.1	733	935	202	27.6	34.8
26	Bexar	San Antonio, Tex.	1,247	550.9	500	687	187	37.4	35.4
27	Westchester	New York, N. Y.	435	1,859.8	626	809	183	29.2	36.1
28	Franklin	Columbus, Ohio	538	1,269.5	503	683	180	35.8	36.7
29	Montgomery	Washington, D. C.-Md.-Va.	494	690.3	164	177	113	107.9	37.4
30	Tarrant	Fort Worth, Tex.	877	613.5	361	538	177	49.0	38.0
31	Fairfax	Washington, D. C.-Md.-Va.	414	664.3	99	275	176	177.8	38.6
32	Middlesex, Mass.	(1)	829	1,494.6	1,065	1,239	174	16.3	39.2
33	Middlesex, N. J.	(2)	312	1,391.0	265	434	169	63.8	39.9
34	Alameda	San Francisco-Oakland, Calif.	733	1,236.0	740	906	166	22.4	40.4
35	Erie	Buffalo, N. Y.	1,054	1,010.4	899	1,065	166	18.5	41.0

36	Hennepin	Minneapolis-St. Paul, Minn.	565	1,492.0	677	843	166	24.5	41.6
37	Milwaukee	Milwaukee, Wis.	239	4,334.7	871	1,036	165	18.9	42.2
38	Bucks	Philadelphia, Pa.-N. J.	617	500.8	145	309	164	113.1	42.8
39	Montgomery	Philadelphia, Pa.-N. J.	492	1,050.8	353	517	163	46.5	43.4
40	Prince Georges	Washington, D. C.-Md.-Va.	485	736.1	194	357	164	84.0	44.0
41	Du Page	Chicago, Ill.	331	945.6	155	313	158	101.9	44.5
42	Duval	Jacksonville, Fla.	777	585.6	304	455	151	49.7	45.1
43	Hartford, Conn.	(1)	740	932.4	540	690	150	27.8	45.6
44	Fairfield, Conn.	(1)	633	1,033.2	504	654	150	29.8	46.1
45	Orange	Orlando, Fla.	916	288.2	115	264	149	129.6	46.7
46	Hillsborough	Tampa-St. Petersburg, Fla.	1,040	382.7	250	398	148	59.2	47.2
47	Honolulu	Honolulu, Hawaii	590	847.5	353	500	147	41.6	47.7
48	Marion	Indianapolis, Ind.	568	1,228.9	552	698	146	26.4	48.3
49	Lake	Gary-Hammond-East Chicago, Ind.	514	998.1	368	513	145	39.4	48.8
50	Shelby	Memphis, Tenn.	751	834.9	482	627	145	30.1	49.3
51	Hamilton	Cincinnati, Ohio	414	2,087.0	724	864	140	10.3	49.8
52	Delaware	Philadelphia, Pa.-N. J.	185	2,980.2	414	553	139	33.6	50.3
53	Riverside	San Bernardino-Riverside-Ontario, Calif.	7,179	42.6	170	309	136	89.0	50.8
54	Montgomery	Dayton, Ohio	465	1,133.3	398	527	129	32.4	51.2
55	Jefferson	Louisville, Ky.-Ind.	375	1,629.3	485	611	126	26.0	51.7
56	Pima	Tucson, Ariz.	9,241	28.8	141	266	125	88.7	52.1
57	De Kalb	Atlanta, Ga.	269	955.4	136	257	121	89.0	52.6
58	Sedgwick	Wichita, Kans.	999	345.3	222	343	121	54.5	53.0
59	El Paso	El Paso, Tex.	1,054	297.9	395	514	119	61.0	53.4
60	Norfolk, Mass.	(1)	398	1,281.4	392	510	118	30.1	53.8
61	Bernalillo	Albuquerque, N. Mex.	1,163	225.3	146	262	116	79.5	54.3
62	Oklahoma	Oklahoma City, Okla.	709	620.5	325	440	115	35.4	54.7
63	Lake	Chicago, Ill.	457	943.3	179	294	115	64.2	55.1
64	New Haven, Conn.	(1)	510	1,082.0	546	660	114	20.9	55.5
65	Allegheny	Pittsburgh, Pa.	730	2,231.5	1,515	1,629	114	7.5	55.9
66	Palm Beach	West Palm Beach, Fla.	1,978	115.3	115	228	113	98.3	56.3
67	Contra Costa	San Francisco-Oakland, Calif.	734	557.2	299	409	110	36.8	56.7
68	Salt Lake	Salt Lake City, Utah	764	501.3	275	383	108	39.3	57.1
69	Union	Newark, N. J.	103	4,893.2	398	504	106	26.6	57.5
70	Jefferson	New Orleans, La.	409	511.0	104	209	105	101.0	57.8
71	Summit	Akron, Ohio	413	1,244.6	410	514	104	25.4	58.2
72	Genesee	Flint, Mich.	644	580.7	271	374	103	38.0	58.6

¹ Standard Metropolitan Statistical Area definition not applicable; SMSA's in New England are comprised of towns and cities.

² Not part of an SMSA.