

# AN APPROACH TO THE STUDY OF POPULATION MIGRATION WITHIN A STABLE METROPOLITAN REGION<sup>1</sup>

RICHARD E. PRESTON  
*San Fernando Valley State College*

JOHN E. RICKERT  
*University of Pittsburgh*

The migration of people between central cities and surrounding suburbs is presently an outstanding fact associated with numerous metropolitan regions in the United States. The importance of this development, and of consequent increases in social, economic, and political interdependence between cities and their suburbs, is reflected both by a proliferation of general works on the subject and by a tendency toward a regional approach in urban analysis.<sup>2</sup> However, available treatments of intra-regional migration fail to provide an adequate basis for the interpretation of many of its dynamic and specific characteristics.<sup>3</sup> For example, detailed findings concerning the distributional aspects of city-to-suburb population migration are particularly lacking. It appears that a fuller comprehension of this specific topic and of the entire process of intra-regional migration will not

<sup>1</sup> The following operational definitions are used in this study:

*Metropolitan Region.*—This term expresses the concept of metropolitan dominance. A metropolitan region usually consists of a prominent central city and the surrounding suburban areas which are economically and socially integrated with the central city.

*A Stable Metropolitan Region.*—A stable metropolitan region is here defined as an area of metropolitan dominance in which population growth is primarily a result of natural increase. Such regions are characterized by very little migration to or from areas beyond their boundaries.

*Intra-regional Migration.*—The term Intra-regional Migration is used simply as another expression of the idea of population migration within a specific metropolitan region.

<sup>2</sup> For general works, see, Chauncy D. Harris, "Suburbs," *American Journal of Sociology*, XLIX (July, 1943), pp. 829-40; Leo F. Schnore, "Metropolitan Growth and Decentralization," *American Journal of Sociology*, LXIII (September, 1957), pp. 171-182; Donald J. Bogue, "Urbanism and Metropolitanism," *American Journal of Sociology*, LX (March, 1955), pp. 471-486; Leo F. Schnore, "The Growth of Metropolitan Suburbs," in William Dorbriner, ed., *The Suburban Community* (New York: G. P. Putnam & Sons, 1958), pp. 26-44; William H. Whyte, Jr., "Urban Sprawl," in The Editors of Fortune, *The Exploding Metropolis* (New York: Doubleday and Co., 1957), pp. 115-139; and, Amos H. Hawley, *The Changing Shape of Metropolitan America* (Glencoe: The Free Press, 1956). For methodological works, see, Walter Isard, *Methods of Regional Analysis: An Introduction to Regional Science* (New York: John Wiley and Sons, 1960), pp. 51-79, especially see the excellent bibliography on migration estimation, pp. 70-79.

<sup>3</sup> Planning Advisory Service, *Population Forecasting*, Information Report No. 17 August, 1950. p. 16; Isard, *op. cit.*, p. 69; Leo F. Schnore, "Satellites and Suburbs," in William Dorbriner, ed., *The Suburban Community* (New York: G.P. Putnam and Sons, 1958), pp. 116-118; Leo F. Schnore, "The Growth of Metropolitan Suburbs," in William Dorbriner, ed., *The Suburban Community*, (New York: G.P. Putnam and Sons, 1958), pp. 40-41; F. Stuart Chapin, *Urban Land Use Planning* (New York: Harper & Brothers, 1957), pp. 155-159.

be achieved until practicable and comparable approaches are developed which will facilitate the identification and measurement of particular population shifts within individual urban regions. With this need in view an attempt is therefore made in this paper to present a comparable technique for the identification and measurement of *one type of intra-regional population migration*, namely, that which is characteristic of a stable metropolitan region, and to demonstrate this by a brief study of migration within the urban region of Worcester, Massachusetts.

#### MAJOR FACTORS IN THE STUDY OF INTRA-REGIONAL POPULATION MIGRATION

A study of the geographic aspects of intra-regional migration must take into account at least two major factors. The first is the change in population numbers between the base and terminal years of a given study period, a change occurring both within the central city and within those suburban centers which are economically and socially integrated with it. The second is the path and volume of population migration between the central city and particular suburbs.

In most cases population change has been adequately treated by the analysis and projection of federal and local census statistics; for example, population forecasting, which is perhaps the most complex task associated with the study of population change, has been accomplished through the use of the cohort-survival method, logistic curve, arithmetic projection, and geometric projection.<sup>4</sup> However, the study of intra-regional migration has proven more difficult. The problem of coming to grips with this phenomenon is reflected by the fact that in the past a general idea of population shifts within urban regions was often derived from the study of such indirect indicators as school enrollment. On occasion, the cohort-survival method has been used in conjunction with school enrollment in order to obtain added accuracy—a procedure which is, however, long and complex and becomes increasingly so as the number of persons involved in migration within a metropolitan region increases.<sup>5</sup> A sample of the complications associated with approaches based on school enrollment data is provided by any area with a population characterized by an irregular age structure. Under those circumstances the data do not reveal the actual numerical changes and areal shifts—as for instance in Long Beach, California, where the changes in the number and distribution of the large retired population would have no relationship to school enrollment. It is necessary to emphasize, therefore, that although present techniques enable fairly reliable measurement and forecasting of changes in population numbers, they do not give adequate coverage of intra-regional migration. Consequently, much of the local migration data currently available is not reliable, and, moreover, it appears that accurate information concerning such migration can be approached only by the use of complex and laborious processes which are usually beyond the resources of most urban researchers or individual planning operations.<sup>6</sup>

<sup>4</sup> Chapin, *op. cit.*, pp. 166-183, and Isard, *op. cit.*, pp. 5-50; especially see the excellent bibliography on population projection, pp. 33-50.

<sup>5</sup> Chapin, *op. cit.*, pp. 172-175.

<sup>6</sup> Chapin *op. cit.*, pp. 151-183; Isard, *op. cit.*, pp. 51-59, and Planning Advisory Service, *op. cit.*

## THE MEASUREMENT OF INTRA-REGIONAL POPULATION MIGRATION

The technique here proposed for the identification, measurement, and prediction of intra-regional population migration has several distinct strengths. It is (1) reasonably objective and therefore subject to replication; (2) a simplified yet effective way to analyze such migration; (3) useful in the establishment of past, present, and future population distribution and migration patterns; and (4) it appears to be of particular value in the study of the hitherto elusive process of city-to-suburb migration. Its application to preceding time-periods has the value of not only making apparent the migration patterns for the past, but of providing insight into the development of present and future population distributions.

However, it should be clearly understood that the information and methodological findings presented below are limited in at least two ways. On the one hand, the method has been effectively applied only to a reasonably stable situation where inter-regional migration was small, and on the other hand, only one such region was studied; its degree of accuracy is unknown with respect to unstable metropolitan areas characterized by large inter-regional migration. The method, therefore, is currently recommended for use only in stable metropolitan situations. These restrictions do not, of course, nullify the value of the method; they serve rather to identify the type of situation in which it has been so far demonstrated as useful, and to enhance its value as a specific tool to help in the interpretation of a very complex process.

Implementation of this technique depends neither upon the complex mathematical formulas or indices necessary in other methods of measuring this same phenomenon nor upon the availability of unusual information. Rather, it provides a reasonably accurate picture of population migration within an urban region on the basis of a simple bookkeeping technique, and requires no more information than that available from the *United States Census of Population* and various vital statistics reports.<sup>7</sup> In brief, the method here presented is a simplified one based upon the tabulation of certain readily available statistics, and the result is a statement of the balance of net in- or out-migration for any municipality within the region considered, as well as a strong indication of the previous residence of most of the migrants. In addition to the statistical information designated above it is only necessary to accept the following assumptions:

1. That the population of an area at the close of a period is equal to its population at the start of the period plus natural increase during the period, plus net migration during the period.
2. That the population of a given urban center will change at a particular rate of natural increase: 
$$\frac{\text{Births—Deaths}}{1000}$$
3. That census of population figures for urban centers may be projected with reasonable accuracy for a ten-year study period.<sup>8</sup>

<sup>7</sup> Data for most urban centers may be procured from *Vital Statistics of the United States* published annually by the United States Department of Health, Education, and Welfare. However, when necessary data is not found at this source it may be obtained from individual state health departments or vital statistics offices or from local health agencies.

<sup>8</sup> Chapin, *op. cit.*, pp. 166-183, and Isard, *op. cit.*, pp. 5-50.

4. That a population figure for the base year of a ten-year study period plus natural increase for the same study period will yield a total which may be considered to be the population of an urban center not characterized by in- or out-migration.
5. That the difference between the ten-year population projection and the sum of a base population, plus natural increase for the same study period, may be considered to be *the net-migration in or out of a particular urban center.*

The following step-by-step explanation of the method will, for reasons of clarity, be largely graphic; furthermore, only three urban centers (Worcester, Holden, and Northbridge, Massachusetts) will be used, and the

**Table I. Part One: Work Sheet for Measurement of Intra-Regional Population Migration**

Urban Centers	Population	Population (Estimate)	Mean Population for Study Period	Rate of Natural Increase†	Natural Increase for Study Period	
	1950	1960				
	(I)	(II)	(III)	(IV)	(V)	(VI)
Worcester . . . . . (The Central City)	203,486	193,500	198,500	.0094	18,650	
Holden . . . . .	5,975	10,350	8,200	.0124	1,000	
Northbridge . . . . .	10,476	10,650	10,600	.0124	1,300	Forward

†Source: Annual Report of the Vital Statistics Office of Massachusetts, 1955.

time span 1950 to 1960 will serve as a sample study period. Table 1, which is the first section of a three-section work-sheet used in this explanation, is interpreted as follows:<sup>9</sup>

*Column I* (Population 1950) is based on data taken directly from the *United States Census of Population* for the base year of the study period.

*Column II* (Population Estimate for 1960) is a population projection for the terminal year of the study period.<sup>10</sup>

*Column III* (Mean Population for the Study Period) is derived as follows:  $\frac{\text{Column I (Pop. 1950)} - \text{Column II (Pop. 1960)}}{2}$

*Column IV* (Rate of Natural Increase) is the mean rate of natural increase for the study period. Because of the different growth patterns

<sup>9</sup> Tables 1, 2, and 3 are extractions from Table 4, which is a table representing the complete numerical analysis of population migration within the metropolitan region of Worcester, Massachusetts.

<sup>10</sup> Geometric projection (see Chapin, *op. cit.*, pp. 181-183) was the principal technique used to derive the 1960 population estimates presented in Table 4 for each municipality within the metropolitan region. Each curve, however, was further adjusted on the basis of four factors, each of which was analyzed for the entire study period. These factors were: (1) the number of building permits granted; (2) school enrollment; (3) employment opportunities both within the central city and within each urban center; and (4) the average family size peculiar to each community in relation to each of the preceding three factors. In addition, each 1960 estimate was cross-checked against estimates for 1960 made on the basis of the cohort-survival method. In practically all cases the results of the cross-checks were favorable.

exhibited by the central city and the surrounding urban centers it proved necessary to compute two separate rates of natural increase—one for the central city and one for the surrounding centers.<sup>11</sup> So far as the central city was concerned, its own mean-rate of natural increase for the study period was used; however, the mean-rate of natural increase for the surrounding centers was derived from an average of the mean-rates for all such urban centers.

*Column V* (Natural increase for the Study Period) is derived by multiplying the mean population for the study period (*Column III*) by the rate of natural increase (*Column IV*), and these results by the number of years in the study period (in this example, ten).

The first section of the work-sheet is now complete; the next step is to apply the principal formula which was developed to identify the net in- or out-migration for particular urban centers. The formula and its factors are:

$$M = (P_b - P_a) - (N \cdot P_m)n$$

where  $M =$  Net migration for a given study period. In-migration is represented by a net gain in population by the municipality, and out-migration by a net loss in population by the community.

$P_b =$  Population estimate for the last year of the study period (*Column II*)

$P_a =$  Population for the first, or base year, of the study period (*Column I*)

$N =$  Natural Increase per 1,000 population or

$$\frac{B_t - D_t}{1,000}$$

where  $B_t =$  Total births for a given period

$D_t =$  Total deaths for a given period

$P_m =$  Mean population for the study period (*Column III*)

$n =$  Number of years in the study period (in this case, ten)

Implementation of this formula results in the addition of three columns to the work-sheet. These additions are shown in Table 2 and are explained as follows:

*Column VI* (1960 Population based on Natural Increase alone) is the sum of the 1950 population (*Column I*) plus natural increase for the study period (*Column V*).

*Column VII* (Net-in-migration 1950-1960) is derived by subtracting the projected 1960 population based on natural increase alone (*Column VI*) from the population estimate for 1960 (*Column II*).

*Column VIII* (Net-out migration 1950-1960) is derived by subtracting the population estimate for 1960 (*Column II*) from the projected 1960 population based on natural increase alone (*Column VI*).

At this point the statistical information needed to establish the spatial distribution of migrants within a stable urban region is complete. As indicated above, in-migration and out-migration for each urban center are pre-

<sup>11</sup> Allocated birth rates rather than registered birth rates were used in this case because most of the children were born in hospitals located within the urban centers.

sented in Columns VII and VIII, respectively. If mapped, these data would illustrate a pattern of numerical distribution which could be utilized in the development of current migration patterns, or, if similar data were developed for past periods, they could provide either a means of studying aspects of past migration or a basis for the projection of such patterns.

The next problem is to approximate as closely as possible the pattern of population movement within a specific urban region. For this purpose, a second formula was developed. This formula distinguishes the in-mi-

**Table 2. Part Two: Work Sheet for Measuring of Intra-Regional Population Migration**

Urban Centers	Population for 1960 based on an Estimate of Natural In- crease Alone	Net In-migration 1950-1960	Net Out-migration 1950-1960	
	(V)	(VII)	(VIII)	(IX)
Worcester . . . . . (The Central City)	222,000	—	28,500	
Holden . . . . .	7,000	3,350	—	
Northbridge . . .	11,800	—	1,150	
			Total 30,150 (See Table 4)	

grants that originated in the central city from those originating elsewhere, thereby providing an indication of the specific urban centers where in-migrants were previously resident, as well as a reasonable basis for establishing flow lines between the central city and particular urban centers. The second formula and its factors are as follows:

$$\frac{I_i \cdot O_c}{O_t} = \text{the number of migrants found in a specific urban center which are assumed to have originated in the central city (Column IX)}$$

- where
- $I_i$  = in-migration to a specific urban center (Column VII)
  - $O_c$  = out-migration from the central city (the figure for Worcester in Column VIII)
  - $O_t$  = total out-migration within the study area (the total of Column VIII)

The implementation of this second formula results in two additional columns on the work sheet. These are shown in Table 3 and are explained as follows:

*Column IX* (The number of in-migrants found in a specific urban center assumed to have originated in the central city) is derived by multiplying the total in-migration to a specific urban center (Column VII) by the net-out-migration from the central city (Column VIII), and then dividing the answer by the total number of out-migrants within the study area (the total of Column VIII).

*Column X* (Number of Migrants not from the Central City) is derived by subtracting the number of migrants who moved from the central city to a specific urban center (Column IX) from its net number of in-migrants for the period 1950-1960 (Column VII).

Any surplus of in-migrants that are not assumed to be from the central city (Column X) are presumed to have originated elsewhere. This

last conclusion, although seemingly gross, does not appear to pose a serious difficulty when studying a stable region; for example, in the case of Worcester (see Table 4) there were approximately 30,000 people involved in intra-regional migration during the decade 1950-1960, but of this number, it appears that at most only about 2,000 could have originated outside the metropolitan region. Clearly, this condition provides a strong basis for

**Table 3. Part Three: Work Sheet for Measurement of Intra-Regional Population Migration**

Urban Centers	(VIII)	Number of Migrants from Central City (IX)	Number of Migrants NOT from Central City (X)
Worcester . . . . . (The Central City)	-----	-----	-----
Holden . . . . .	-----	3,150	200
Northbridge . . . . .	-----	-----	-----

the recommendations that this technique be used in reasonably stable situations, and not in those where the impact of inter-regional migration is unknown.

Since the preceding example demonstrates the basic workings of a method developed for the study of intra-regional population migration within a stable metropolitan region, it is fitting that there be some further mention of the situations in which this technique seems applicable. It would seem relevant:

1. For the measurement of past, present, and future migration patterns within stable metropolitan regions.
2. For the establishment of migration trends for the urban region as a whole, or for any of its component parts.
3. As an alternative or supplementary approach to the forecasting of spatial aspects of future population distribution within metropolitan regions.
4. As an alternative or supplementary method for the identification and forecasting of present and future traffic flow between the central city and its suburbs.

#### POPULATION MIGRATION WITHIN THE WORCESTER METROPOLITAN REGION<sup>12</sup>

The method may now be exemplified by a brief view of such migration within the metropolitan region of Worcester, Massachusetts, during the decade 1950-1960. The study area is located at the western corner of a triangle based on Boston, Worcester, and Providence, Rhode Island. The region lies within Massachusetts and includes Worcester (which is the central city) and the surrounding municipalities of Holden, West Boylston, Shrewsbury, Northboro, Westboro, Grafton, Millbury, Auburn, Leicester,

<sup>12</sup> The Worcester metropolitan region is used to demonstrate this technique because it was for the purpose of analyzing population migration within that region that the technique was developed. Migration was but one section of an over-all population study of the Worcester region conducted by the authors during the late 1950's while they were employed by the Worcester City Planning Department.



Spencer, East Brookfield, North Brookfield, Paxton, Berlin, Northbridge, Upton, Sutton, Oxford, and Brookfield. Worcester is principally a manufacturing city which also serves as a retail and wholesale center for its region.<sup>13</sup> The surrounding centers have little industry of their own (with the exception of Millbury, which is an outstanding example of an old mill town) and are in large part the by-product of the expansion of Worcester's urban economic base. The outstanding characteristic therefore, of the suburban centers is their dormitory function.<sup>14</sup>

The Worcester region has a stable population in that growth is principally by natural increase; there is little in- or out-migration to or from areas beyond the metropolitan region. However, dynamic shifts of population are evident within the region, and principal among them is out-migration from the central city. As indicated above, such out-migration is by no means matched by employment opportunities in the expanding suburban areas; thus, the majority of those who migrate to the surrounding suburbs continue to work in the central city.

The conclusions concerning intra-regional migration within the Worcester Metropolitan Region produced by the application of the method described in this paper are found in Table 4 and Figure 1, respectively. Specific numerical conclusions are presented in columns VII through X in Table 4.

These figures are net-balances of people. There was, of course, some migration between all centers within the region; however, it was felt that the over-all distribution of migrants could be clearly indicated in this manner. The information presented in Table 4 may also be usefully illustrated cartographically, thus showing the approximate pattern of movement within the urban region (see Figure 1). In this case the pattern is shown for only one study period; however, it is clear that a sequence of such flow maps could be constructed for selected time intervals in the past or future, and that these maps could be used to illustrate either trends or probable migration patterns.

---

<sup>13</sup> According to the economic classification of cities presented in the Municipal Yearbook for 1959, Worcester is a manufacturing city. This designation is based upon the following criteria: that the employment in manufacturing is 50 per cent or more of aggregate employment in manufacturing, trade, and service establishments (excluding hotels and amusements) and employment in retail trade is less than 30 per cent. Table VI, "Governmental and Economic Data for all Central Cities Over 10,000: 1959," *Municipal Yearbook*, 1959. That Worcester is the major retailing and wholesaling center for its metropolitan region is clearly demonstrated by statistics from the 1958 Census of Business. Of the 2,989 retail establishments in the Worcester SMSA, 1,968 were located in Worcester; of the 16,014 employed in retail trade in the SMSA, 12,653 were employed in Worcester. U.S., Bureau of the Census, *Census of Business*; 1958. Vol. II, Retail Trade-Area Statistics (Table 103—Retail Trade: 1958, SMSAs). Of the 499 wholesale establishments in the Worcester SMSA, 436 were located in Worcester; and of the 5,132 employed in wholesale trade in the SMSA, 4,635 were employed in Worcester. U.S. Bureau of the Census, *Census of Business* 1958, Vol. IV, Wholesale Trade-Area Statistics (Table 103—Wholesale Trade: 1958, SMSAs.)

<sup>14</sup> Richard E. Preston and John E. Rickert, "City-Region Interdependence as Illustrated by the Worcester Metropolitan Region." (Unpublished Report for the Worcester Planning Department, 1960).

**Table 4: Complete Work Sheet for the Worcester Metropolitan Region†**

Column Headings: (I) Population, 1950; (II) Population, Estimate, 1960; (III) Mean Population for Study Period; (IV) Rate of Natural Increase; (V) Natural Increase for Study Period; (VI) Population for 1960 Based on an Estimate of Natural Increase Alone; (VII) Net In-migration, 1950-1960; (VIII) Net Out-migration, 1950-1960; (IX) Number of Migrants From Central City; and, (X) Number of Migrants NOT From Central City.

Urban Centers	I	II	III	IV	V	VI	VII	VIII	IX	X
Holden . . . . .	5975	10350	8200	.0124	1000	7000	3350	—	3150	200
W. Boylston ..	2570	5500	4000	.0124	500	3050	2450	—	2300	150
Shrewsbury ...	10594	16550	13600	.0124	1700	12300	4350	—	4000	250
Northboro ....	3122	6650	4900	.0124	600	3750	2900	—	2750	150
Westboro ....	7378	10000	8700	.0124	1100	8500	1500	—	1400	100
Grafton . . . . .	8281	10400	9400	.0124	1150	9450	950	—	900	*100
Millbury . . . . .	8347	9600	9000	.0124	1100	9450	150	—	150	* 50
Auburn . . . . .	8840	14050	11400	.0124	1400	10250	3800	—	3600	200
Leicester . . . . .	6029	8150	7100	.0124	900	6900	1250	—	1200	*100
Spencer . . . . .	7027	7750	7400	.0124	900	7950	—	200	—	—
E. Brookfield ..	1243	1500	1400	.0124	150	1400	100	—	100	* 50
N. Brookfield ..	3444	3600	3500	.0124	450	3900	—	300	—	—
Paxton . . . . .	1066	2400	1700	.0124	200	1250	1150	—	1100	*100
Berlin . . . . .	1349	1750	1500	.0124	200	1550	200	—	200	* 50
Northbridge ..	10476	10650	10600	.0124	1300	11800	—	1150	—	—
Upton . . . . .	2656	3100	2900	.0124	350	3000	100	—	100	* 50
Sutton . . . . .	3102	5450	4300	.0124	550	3650	1800	—	1700	100
Oxford . . . . .	5851	9250	7500	.0124	950	6800	2450	—	2300	150
Brookfield ....	1567	1750	1650	.0124	200	1750	—	—	—	—
Worcester ....	203486	193500	198500	.0093	18650	222000	—	28500	—	—
						Totals:	26400	30150	24950	1950

\* Less than

† Since they are estimates, Columns II, III, V, VI, VII, VIII, XI, and X have been rounded.

### CONCLUSION

The measurement and prediction of intra-regional population migration represents a very important area in contemporary urban research. Central city losses and increased suburban growth have put both professional and political pressure on researchers not only to interpret the process itself but to forecast its implications for metropolitan areas of the future. Thus far, however, few practicable approaches to the study of any aspect of this phenomenon have appeared. The result has been that a substantial number of the questions posed concerning the process of intra-regional population migration have been answered in only a most general and unsatisfactory manner, and the impact of increased suburbanization on the urban structure of the future remains virtually unknown. Therefore, since the approach presented in this paper proved effective in the case study of migration within the urban region of Worcester, Massachusetts, it is offered as a partial solution to the over-all question: "How does one study intra-regional population migration?" Specifically, this approach appears to provide new strength in three ways; firstly, it has comparability, and therefore provides a "model" for similar studies in other urban regions; secondly, it enables the identification and measurement of numerous spatial and temporal aspects of one type of intra-regional population migration; and thirdly, it provides a degree of accuracy unattained thus far by comparable expenditures of time and money.

# THE SETTLEMENT PATTERN OF MODERN ROME

EDWARD KARABENICK

*California State College, Long Beach*

Following the disintegration of the Roman Empire the population of the city of Rome declined steadily from over 1,000,000 to a low of 17,000 during the Middle Ages. Subsequent to this period the growing influence of the papacy provided the basis for modest population growth, but it was Rome's selection as the capital of the newly-united Italy in 1871 that made possible its re-emergence as a great city. Since that date its population has grown rapidly, increasing from 200,000 to over 2,000,000 (Table 1). However the settlement pattern coincident with this growth has been unusual.

TABLE 1: Population Growth of Rome

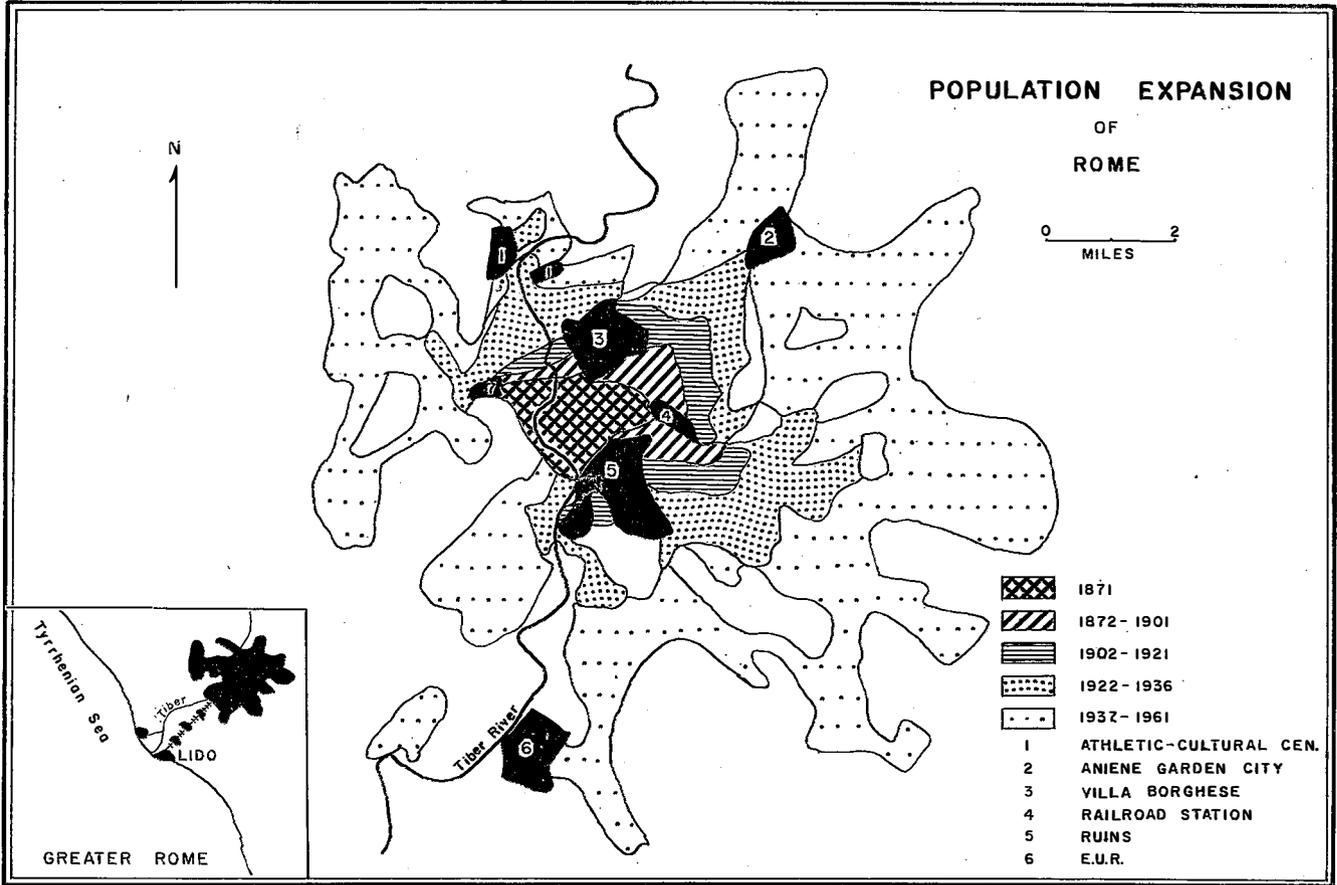
Year	Population
1871 . . . . .	213,633
1881 . . . . .	275,637
1891 . . . . .	386,626
1901 . . . . .	424,943
1911 . . . . .	546,002
1921 . . . . .	664,373
1931 . . . . .	942,206
1941 . . . . .	1,403,307
1951 . . . . .	1,653,163
1961 . . . . .	2,170,386

Source: Commune of Rome, *Annuario Statistico della Citta di Roma 1952-54*, and Commune of Rome, *Bolettino Statistico 1962*.

The present-day distribution of Rome's population strongly suggests that expansion from the urban core has occurred in a normal radial pattern (Figure 1). Actually, however, each of the cardinal directions of expansion was added in a separate period. In 1871 most of the population was clustered on the left bank of the Tiber. For the next 30 years virtually all settlement occurred in a generally eastward direction. Only by the turn of the century, when Romans began to move northward, did large-scale settlement begin to unfold in other directions. It was not until the end of World War II that people began to move in large numbers to the west and south of the urban core. The explanation for this unusual growth pattern lies in a complex of physical and cultural factors.

## EASTWARD SETTLEMENT

The early heavy eastward settlement can best be explained by the difficulties of growth in other directions. Since expansion was blocked by the rugged Sabatine Hills to the west, the vast Villa Borghese estate to the north, and by broad expanses of marshes and ruins to the south, the gently-rolling lands east of the urban core were especially inviting to new settlement. Still another important stimulus for an early eastward growth was the construction of Rome's major railroad station a mile east of the urban core. Completed in 1871, the station served as a principal focal point for several newly-constructed thoroughfares, the most important being the via Nazionale. As government expenditures increased with Rome's new



role as the national capital, the rate of in-migration to the city rapidly increased, and these new boulevards became the guidelines for the heavy eastward settlement. This dynamic early population burst established an eastward expansion momentum which has persisted to the present day, despite the fact that obstacles to expansion in other directions have been gradually overcome.

#### NORTHWARD SETTLEMENT

The first of these barriers to give way to the overwhelming pressures of Rome's growing population was the Villa Borghese. This large estate had effectively diverted expansion for 30 years, but by the turn of the twentieth century it began to succumb to the pressures of the city's growth. The initial stage of northern settlement had begun to take form by 1900 but it did not reach maturity for another 30 years. Not until the advent of the Mussolini era was the villa completely surrounded by residences and left behind in the wake of urban expansion.

The credit for radically altering the traditional eastward settlement pattern of Rome must be given to Mussolini. While it is often an oversimplification to associate major changes with one person, in the case of Mussolini his profound influence in Rome's settlement pattern is unmistakable.

Although a northward population drift would certainly have occurred with or without Mussolini, his development of areas north of the urban core accelerated settlement and gave it a more definite course. When Mussolini assumed control of the Italian government in 1921 population growth had advanced only slightly northward, both up the Tiber valley to the west of the Villa Borghese and along the eastern perimeter of the estate itself. The dictator's early announcement of plans for the construction of a large new athletic and cultural center two miles north of the urban center and a large garden city, Monte Sacro, three miles northeast of it provided the necessary impetus for a heavier northward expansion. The prosperity of the Mussolini era also saw the rise of a new wealthy class, which began to move into the Parioli Hills just north of the Villa Borghese. By 1930 a full-fledged northward expansion had been established and the Rome settlement pattern had now assumed a second cardinal direction. Settlement northward, however, was never to equal the vigor and constancy of the eastward expansion. Strangely enough, it was the subsequent growth southward to the sea which was to gain a momentum equalling, and perhaps surpassing, that to the east. This greatly-retarded development most strongly reflected the will of one man. In carrying out his ambitious program in this direction Mussolini was faced with staggering emotional as well as physical barriers.

#### SOUTHWARD SETTLEMENT

The two physical factors primarily responsible for the retarded growth were the previously-mentioned ruins districts and marshes south of the urban core. These remnants of a previous civilization provided more of a psychological than a physical impediment to Rome's growth. People had come to accept the ruins as the southern limit of settlement; to go beyond the ruins was to move beyond the pale. The tales of misery and malaria associated with the marshlands were well known to the Roman, and the

feelings of disgust and fear which he had developed were perhaps the most effective barrier of all to southward settlement. Even as late as World War I only one important residential district had arisen south of the urban core in the Tiber valley. Mussolini's great vision of Rome was one of a vast metropolis stretching all the way to the mouth of the Tiber. Fully aware of the monumental projects that lay before him, he undertook the program with pronounced vigor. The drainage of the marshlands was basic to the success of the entire program, and by 1928 this enormous project was completed, freeing the delta area and much of the Tiber valley from over a thousand years of decay. Shortly afterwards a rail line, and paralleling express highway were completed from central Rome to Lido di Ostia,<sup>1</sup> near the mouth of the Tiber. Having laid the groundwork, Mussolini could now look forward to his most ambitious plan: the construction of an entirely new urban core south of the existing city.

Badly disturbed by the growing difficulty of old Rome to cope with the onslaught of the automobile age, Mussolini conceived the idea of removing all central activity from the existing urban core to a new one four miles south. The new district was to serve first as an exposition area for the 1942 World's Fair, after which major governmental agencies were to occupy the monumental structures. Commerce was to follow later. Upper-income residential districts were then to surround the newly-created zones. The new area, which came to be called simply the E.U.R. (Universal Exposition of Rome), was to be more effectively connected with Rome by an additional express highway and the city's first subway.

Construction was initiated in the 1930's, but the Second World War began before the buildings and the subway were completed. The aftermath of the war brought many changes regarding the magnitude and soundness of the project. Rather than abandon its enormous investment, however, the city decided to complete the E.U.R. with certain modifications. The basic Mussolini concept, freeing central Rome of its congestion, was maintained, but the proposed size of the E.U.R. was curtailed. Several governmental agencies are already housed in the magnificent buildings, and numerous upper-income residential units have been constructed since 1945. At present approximately 10,000<sup>2</sup> people live in the area. The subway, plagued with continual interruptions because of archeological discoveries, was finally completed in 1955 after almost 20 years.

The impact of the rapidly rising E.U.R. district has been strongly felt. The disdain once held for the region south of the ruins has virtually disappeared, and a nearly complete reversal of opinion has followed. Firms and individuals which would have previously shunned the area are now drifting southward towards the E.U.R., partially fulfilling Mussolini's dreams.

Closely correlated with the growth of the Universal Exposition grounds is the emergence of Lido di Roma in the Tiber delta. First connected to Rome in the 1920's by the new railroad, the town became a popular summer resort. Extremely heavy population pressures in the post-

<sup>1</sup> Now called Lido di Roma.

<sup>2</sup> Letter from Mario Figa-Talamanca, Director, Office of Statistics of the Comune of Rome, April 1963.

World War II years changed the destiny of the Lido. As a post-war emergency measure, Lido di Roma, politically a part of Rome, was used to house some of the central city's population. The Lido's population continued to increase, and at present 25,000 people live there. Under the guidance of a master plan the eventual population will reach 135,000.<sup>3</sup> Several smaller settlements have also begun to appear along the Rome-Lido railroad between the E.U.R. and the Lido di Roma. Settlement in the

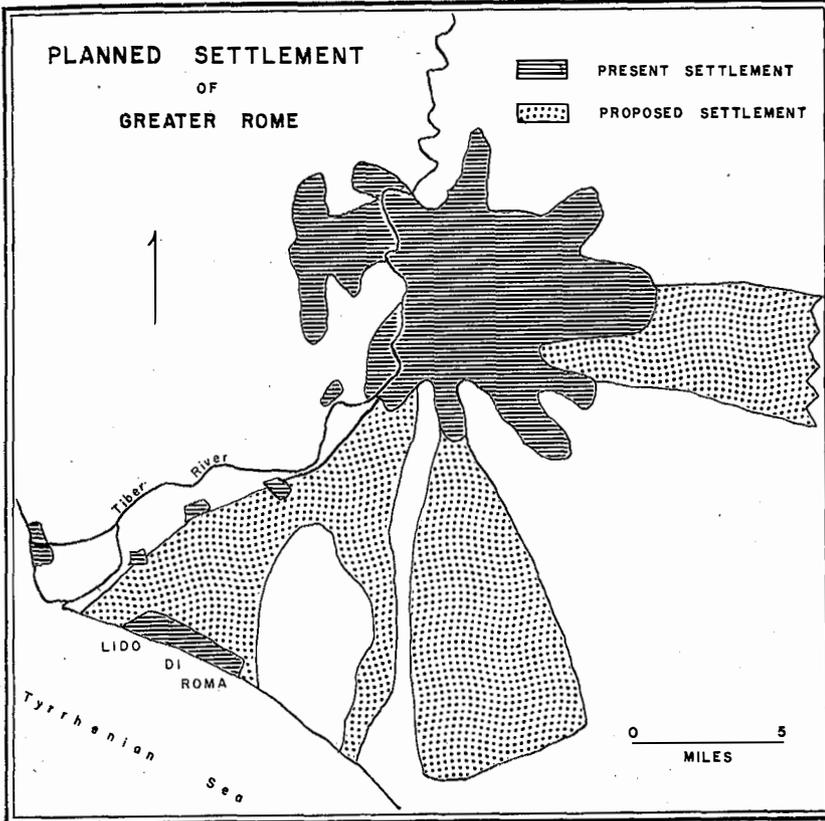


Figure 2

southern portion of metropolitan Rome has, thus, manifested itself in a series of unconnected nuclei along the railroad and highway. In time these nuclei should coalesce with the growing central city.

#### WESTWARD SETTLEMENT

As with expansion southward, the westward growth of Rome has been largely a post-war phenomenon. The rugged terrain west of the Tiber provides the explanation for this retarded development. Beginning almost at the river's banks, the strongly dissected Sabine Hills create a formi-

<sup>3</sup> Robson, W.A., ed., *Great Cities of the World* (London: George Allen & Unwin, 1954), p. 541.

dable barrier to urban expansion. Following World War II the previously prohibitive construction costs were largely offset by post-war conditions in Rome. The extremely critical housing shortage set into motion an almost feverish building program. With places as distant as Lido di Roma participating in the program, the proximity of the hilly western area took on new value and significance. Building contractors renewed their interest in the region as higher construction costs associated with this terrain were being offset by the rising land values resulting from the proximity to central Rome. With the weakening of the western hill barrier, Rome's settlement pattern had acquired its fourth dimension. Like expansion to the north, westward growth will probably always lag somewhat, but it will continue as long as the equilibrium can be maintained between the proximity to the urban core and the higher construction costs on this rugged terrain.

#### THE MASTER PLAN OF ROME

Over the decades the role of planning has assumed continually greater proportions in Rome's settlement pattern. This role promises to increase markedly in the coming years because of the nature of the city's new master plan.<sup>4</sup> While previous master plans have been primarily traffic correctional schemes, the new plan encompasses many new ramifications. The major objectives of the present plan are: to broaden Rome's economic base by promoting several new industrial zones, to make central Rome largely an historical zone by diverting through traffic and removing most economic activity, and to create three vast new residential zones (Figure 2).<sup>5</sup>

These three zones will unfold to the east and south into terrain that offers little resistance to urban growth. Each of the zones will cover approximately 60 square miles and will house primarily low and lower middle income families. In all probability, the principal future settlement of Rome will occur in these planned districts. The northern and western flanks of the city, the traditional upper middle and upper income districts of Rome, have been left to grow "naturally" in the master plan. The relatively higher building costs in these areas, as well as the small number of people in Rome's middle and upper classes, would seem to indicate a continued slow rate of settlement in these directions.

#### SUMMARY

Modern Rome's settlement pattern has been strongly influenced by both physical and cultural factors. The prejudices so long associated with certain areas of the city have been gradually subdued and are no longer a serious factor in discouraging settlement in any direction; the relief of the Roman Campagna has become the principal influence in Rome's settlement pattern. The relatively level lands east and south of the city continue to provide the least costly avenues of expansion to the growing metropolis, and primarily for this reason the new master plan has chosen these directions for future settlement. Because of these factors it would seem that the pattern of Rome's future settlement is quite clear. The city should continue to expand in all directions, with the principal growth occurring towards the east and south.

<sup>4</sup> The present master plan of Rome was made public in 1962.

<sup>5</sup> *Il Popolo* (Rome), November 18, 1962, p. 8.