

## CHAPTER II

### DEFINING GEOGRAPHIC AREAS

The enumeration of the entire population of the United States in a short period of time required specific delineation of the area each enumerator was to cover. The most efficient way to define each enumerator's area and to control the progress of the job was to provide a series of maps of small administrative areas, called enumeration districts. The enumeration district was used as the work unit and the control unit, not only in the field operation, but also in the various processing operations.

To simplify the compilation of totals, these enumeration districts were planned so that they could be added together to make other areas for which statistics were to be shown. Thus, data for enumeration districts were added together to obtain totals for cities, towns, and villages. To these areas were added other enumeration districts to form minor civil divisions. Minor civil divisions were added together to form totals for counties. Totals for other areas were obtained in similar fashion.

The areas for which statistics were to be presented had to be determined in advance so that enumeration districts could be formed and used as building blocks to make up those areas. The formation of the enumeration districts also had to take into account coverage problems which might require special attention, such as military installations, hospitals, and large apartment houses.

To develop this aspect of the Census properly, the Bureau started geographic planning early. Most of the work, however, was concentrated in the 3-year period before the 1950 Census. In addition to defining new areas for which statistics were to be shown, maps were obtained, boundaries were checked and plotted, and special coverage problems were located. The areas then were subdivided into enumeration districts so that work assignments for each of the enumerators would be clear and specific.

#### Maps and Political Boundaries

To obtain the best maps available for planning enumeration districts, the Bureau explored the map resources of the country and secured the most suitable maps. These maps covered every county and almost every incorporated place in the United States.

For the areas outside of cities, the desirable scale for the maps was one mile to the inch; this was large enough to show the road pattern. Certain other features on the maps which would help establish the boundaries of areas in the field and would help the enumerator identify locations, were also considered desirable. For the most part, the maps used were those prepared by State Highway Departments according to specifications of the U. S. Bureau of Public Roads. Wherever possible, the Bureau secured special negatives (van dyke) of the maps. From these, it could readily reproduce the additional copies needed for the field canvass.

Collecting the maps continued from the latter half of 1947 almost to the time of enumeration. About 10,000 map sheets covering more than 3,000 counties or county equivalents were obtained. Additional maps at larger scales were also secured from various sources for many urban fringe areas.

To secure minor civil division information, the Bureau sent questionnaires and copies of the county maps to the appropriate county officials during the latter half of 1948 and early 1949. The latest known boundaries of the minor civil divisions and incorporated places were shown on the maps and the names of these places were also listed on the questionnaires. The officials were asked to correct spelling and names if necessary, to list any changes in the boundaries, to note new minor civil divisions created or old minor civil divisions abolished, and to indicate any new municipal incorporations or disincorporations. The officials were especially requested to indicate on the map the correct boundaries of the county and the minor civil divisions and to certify to their correctness. Finally, they were asked to keep the Bureau informed of any changes made before April 1, 1950.

The changes submitted were reviewed and verified. The new information was compared with that previously obtained to see which changes resulted from legal action and which ones resulted from new and better maps or more accurate reporting. Doubtful cases were cleared up by correspondence. This review was needed so that comparisons could be made with results from previous censuses. The detailed changes are shown in footnotes to the appropriate areas in Volume I of the U. S. Census of Population, 1950.

The United States has more than 17,000 incorporated places. Boundaries had to be checked so that population coverage would be accurate as of the Census date. Starting in July 1947, letter-questionnaires were sent to officials of these places. The letter requested a copy of the latest map showing the corporate limits, the limits of any existing wards, and any county or minor civil division lines within the corporate limits. Maps and boundary



Checking enumerators assignments. Photo by San Antonio (Texas) Express.

information were obtained for about 13,000 incorporated places including almost every one with 2,500 or more inhabitants. The Bureau compared the revised maps and boundaries with previous information and wrote to the municipal officials where changes appeared questionable. The field staff secured maps and boundary information for many incorporated places which failed to answer the questionnaire. Information was also obtained from other sources. Where the maps so obtained were not satisfactory for census purposes, new maps had to be acquired or compiled. Boundaries of the 435 congressional districts had been obtained from each State immediately after the enactment of each new districting law. Copies of the laws were generally supplied by the Secretary of State in each State. Where counties were split by congressional district limits, further correspondence was sometimes required to establish the exact boundaries.

### Urbanized Areas

In the 1950 Censuses, the Bureau presented statistics for 157 new statistical areas. They were called urbanized areas. To delineate these areas, the limits were determined for the closely-settled urban fringe around cities with 50,000 or more inhabitants in 1940 or in a subsequent special census.

A major objective in delineating these areas was to separate the urban from the rural population in the vicinity of larger cities. All persons living within urbanized areas were classified as a part of the urban population in 1950. In 1940, however, many persons living under distinctly urban conditions in fringe areas were classified as rural.

To insure comparable information throughout the country, the Bureau established criteria for defining the urbanized areas and applied them consistently. The following types of areas were included in a city's urbanized area if they were contiguous to the central city or cities, or if they were contiguous to any area already included in the urbanized area:

(a) Incorporated places with 2,500 or more inhabitants in 1940 or in a subsequent special census.

(b) Incorporated places with fewer than 2,500 inhabitants if the place had at least 100 dwelling units so close together that the density was 500 units or more per square mile. This density represents about 2,000 persons per square mile and is the minimum normally associated with a closely-spaced street pattern.

(c) Unincorporated territory with at least 500 dwelling units per square mile.

(d) Territory devoted to commercial, industrial, transportation, recreational, and other uses functionally related to the central city.

The urbanized area included outlying noncontiguous areas if they had the required dwelling unit density and if they were located within  $1\frac{1}{2}$  miles of the main urbanized part measured along the shortest connecting highway. Other outlying areas with the required dwelling unit density were also included if they were within  $\frac{1}{2}$  mile of such noncontiguous areas.

The terminology adopted applied the term "urbanized area" to the entire aggregate. Such areas were made up of the central city and an urban fringe.

The boundaries of the urbanized areas were determined after carefully examining all available maps, aerial photographs, and other materials. Trained investigators then checked the boundaries in the field to insure that the criteria were followed, and that the boundaries were identifiable. The boundaries of unincorporated territory were selected to follow observable features, such as roads, railroads, and streams.

Discussions and experimental work on the delineation of the urbanized areas started in early 1947, but final techniques for bounding the areas were not determined until mid-1948. The delineation of areas for use in the 1950 Census was completed by April 1, 1949 so that the boundaries could be integrated into the enumeration district pattern.

### Unincorporated Places

Because the large unincorporated places were becoming increasingly important in the population distribution of the Nation, the Bureau decided to identify those which were not in the new urbanized areas.<sup>1</sup> This was another step in separating the urban and rural population in a meaningful manner. The technique for delimiting these places was determined early in 1947 and was an amplification of the procedures developed in connection with the 1940 Censuses.

Each unincorporated place possessed a definite nucleus of residences and was so defined that it included, if feasible, all the surrounding closely-settled area. Aerial photographs, the latest State highway planning maps, and other source materials were examined in the actual delimitation. Census personnel supplemented this work with field inspection. Many State Highway Departments gave considerable aid in mapping and in field delimitation.

The Bureau planned to publish statistics for all unincorporated places (not in urbanized areas) with a population of 1,000 or more. To be sure that it included all such places, it identified, before the 1950 Census was taken, all places that had estimated populations of 800 or more. About 2,400 unincorporated places were so identified, and 1,430 of them had 1,000 or more inhabitants in the 1950 Census.

### Urban-Rural Classification Changes

One of the basic groupings for presenting census data divides the population into urban and rural segments. The urban population, according to the definition used in previous censuses,

including all persons living in incorporated places of 2,500 or more inhabitants and selected areas (usually minor civil divisions) which were classified as urban under special rules. The need for a definition that would effect a more realistic division of urban and rural areas had been discussed for a considerable period of time. The development of the urbanized area and the delineation of unincorporated places made possible a new definition of urban area for the 1950 Censuses.

Under the new definition, the urban population included all persons living in (a) places of 2,500 or more inhabitants incorporated as cities, boroughs, towns,<sup>2</sup> and villages; (b) the densely-settled urban fringe, including both incorporated and unincorporated areas, around cities of 50,000 or more inhabitants; and (c) unincorporated places of 2,500 or more inhabitants not in the urban fringe. The remaining population was classified as rural.

In both old and new definitions, the most important component of the urban territory was the group of incorporated places having 2,500 or more inhabitants. A definition of urban territory restricted to such places, however, excluded a number of equally large and densely-settled places, merely because they were not incorporated. Under the old definition, the more obvious omissions were avoided by defining places as urban under special rules. Even with these rules, however, many large and closely-settled places were excluded from the urban territory. To improve the definition, the Bureau included as urban not only the incorporated places with 2,500 or more inhabitants, but also the urban-fringe areas around cities of 50,000 or more and also other unincorporated places with a population of 2,500 or more. The inclusion of the last two groups made the special rules of the old definition unnecessary.

### Minor Civil Division Lists

Minor civil divisions may be defined, in general, as the primary county divisions that are recognized for statistical purposes by the Bureau of the Census. The minor civil divisions include a variety of county divisions, 39 different types being reported in the 1950 Census. By far the most numerous of all of the minor civil divisions are the civil townships, which are predominant in 17 States and total 20,395 out of the minor civil division total of 48,529.

Minor civil division lists were prepared for all counties or county equivalents in the United States. These lists gave the townships or similar county divisions, incorporated places, unincorporated places, wards, and special enumeration areas in the county. Footnotes explained new areas and changes made since the 1940 Census in names and boundaries.

These lists were used in compiling the total number of people, dwelling units, and farms for each of the smaller publication areas. The field supervisors used them to post the preliminary census returns; and the Washington staff followed them in preparing the final statistical tables. The Bureau also checked the shipment and receipt of materials with these lists.

### Census Tracts

Census tracts are small permanent statistical areas established within many of the larger cities. In some instances, the tract pattern was extended to the area adjacent to the city. In general, the boundaries of tracts are kept constant so that comparisons can be made from one census to another. Census tracts had an average population of about 4,300 inhabitants in 1950, but individual tracts varied considerably from that average. For the most part, each was designed originally to include an area fairly homogeneous with respect to the race, national origin, economic status, and living conditions of its population.

Census tracts are established by local organizations in areas which have at least one city with 50,000 inhabitants or more. Local groups delineate the tracts, and boundaries are subject to modification and review by the Bureau of the Census.

For the 1950 Census, 3,013 new census tracts were established, bringing the total to 12,633. While most of the new tracts were in cities, there was a significant increase in the number in areas adjacent to the cities. There were census tracts in 115 cities with populations of 50,000 or more. For publication, these tracted cities were grouped into 72 areas.

<sup>1</sup>The term, "place," as used in reports of the 1950 Census, refers to a concentration of population, regardless of the existence of legally prescribed limits, powers, or functions. Many places have been incorporated by the State as cities, towns, villages, or boroughs. Those communities which have not are called "unincorporated places."

<sup>2</sup>Except in New England, New York, and Wisconsin, where "towns" are minor civil divisions of counties and are not necessarily densely-settled centers like the towns in other States.

### Census County Divisions in the State of Washington

In a number of States the minor civil divisions are not satisfactory units for reporting statistics either because they have lost all local meaning or because they are changed frequently and do not provide comparable areas from one census to the next. For example, most counties in the State of Washington are subdivided into election precincts whose boundaries change frequently. To provide divisions with stable boundaries, the Bureau cooperated with the State Census Board of Washington in establishing specially created census county divisions as permanent statistical areas. The boundary lines were drawn on the basis of established criteria and were reviewed by interested State and local groups and by the Bureau of Agricultural Economics of the U. S. Department of Agriculture. The Bureau of the Census approved the boundaries, and it adopted these areas as the ones to be used in lieu of minor civil divisions in presenting the census results.

All counties in Washington were subdivided, and 642 census county divisions resulted. Every effort was made to establish divisions which were socially, economically, and physiographically homogeneous and which were bounded by easily recognizable features such as roads, railroads, and streams. Each incorporated place with a population of 2,500 or more, according to the 1948 estimate of the Washington State Census Board, was made a separate census county division; and each place with a population of over 10,000 which was not divided into census tracts was divided into census county divisions. Seattle, Tacoma, Spokane, and areas adjacent to Seattle and Tacoma were tracted; and those tracts which were outside incorporated places with populations of over 10,000 were also made census county divisions.

If the use of these divisions is successful in this State, it is planned to form similar areas in those States where existing minor civil divisions are not satisfactory for census purposes.

### Blocks in Cities With 50,000 or More Inhabitants

The smallest areas for which data were published by the Bureau of the Census were blocks. They were used, however, only to present housing data in cities which had a population of 50,000 or more in 1940 or in a subsequent special census taken before 1950.

Each block in these cities was given a number, which was entered on the base maps before reproductions were made for use in the Census. When the enumerator canvassed one of those blocks, he entered the block number on the housing side of the Population and Housing (P1) Schedule for every dwelling unit enumerated in the block.

### Special Coverage Problems

For the most part, the people of the United States live in private homes. Some persons, however, live in hotels, aboard ships, in homes for the aged, and in other special types of living quarters, where they may present unusual enumeration problems. Where people lived in places which were likely to involve such problems, these locations were identified, and arrangements for their enumeration were made in advance to insure complete coverage and efficient operation.

### Defense Installations

The Department of Defense provided information on the location of defense installations. The Departments of the Army and the Air Force indicated the location and boundaries of their installations within the limits of the United States, its Territories, and possessions. The Bureau then prepared maps and asked the commanding officers of these installations to supply missing information. The Navy Department lent the Bureau maps showing the boundaries of naval installations, and the Bureau recorded this information. The locations of the largest Coast Guard installations were also obtained.

Each installation was established as a separate enumeration district, but the boundaries normally were not shown on the enumeration maps.

### Institutions

A survey was made to determine the locations of the following types of institutions so they could be enumerated separately:

- (1) State and Federal prisons, reformatories, and institutions for the insane or feeble-minded.
- (2) All Roman Catholic institutions having 25 or more residents.



Using aerial photographs to check boundaries.

- (3) Veterans hospitals, Public Health hospitals, and other Federal hospitals, excluding hospitals on defense installations.
- (4) Non-Federal hospitals having 1,000 or more beds or providing nurse and interne training.
- (5) All other institutions, such as orphanages and old people's homes, having 100 or more inmates or residents.

Such institutions were established as separate enumeration districts.

### Hotels and Apartment Buildings

Large residential buildings required special enumeration procedures. Lists of the larger hotels and apartment buildings were compiled so that these buildings could be designated as special enumeration districts. All hotels with 100 or more rooms or apartments were included on such lists. Apartment buildings were listed at this stage, however, only if they were located in cities with 500,000 or more inhabitants and if they had 100 or more apartments (see also page 23).

### Colleges

For the 1950 Census of Population, college students were enumerated at the colleges rather than at their parental homes, as was the practice in previous censuses. This procedure brought the enumeration of college students under the general census rule which prescribes that each person should be enumerated at his usual place of residence. Most students live in college communities for as much as nine months of the year, so the college is their usual place of residence.

The 1950 rule for the enumeration of college students was adopted not only because it was in accord with the "usual place of residence rule," but also because the Bureau expected the procedure to result in a more complete enumeration of college students. Such persons were often overlooked in the enumeration of their parental homes.

In planning for this revised enumeration procedure, the Bureau mailed questionnaires to all large educational institutions early in 1948. It asked for information concerning the location and size of the institution, the number of students housed in college dormitories, and the location of these facilities. This survey disclosed that many of the students do not live on the college campus; therefore, educational institutions were not set up as separate enumeration districts. The information on the questionnaire was used, however, to help measure the workload for each enumeration district.

### Indian Reservations

A special enumeration of areas with a large proportion of Indian population was conducted in conjunction with the 1950 Censuses to provide the Bureau of Indian Affairs with information it needed to formulate plans and policies. The Bureau of

Indian Affairs delimited the boundaries of Indian Reservations on maps supplied by the Bureau of the Census; and these areas, with some modifications, were made enumeration districts. The Census enumerator filled a supplementary schedule for Federal Indian Reservations (Form P8) after he had obtained the regular information for the 1950 Censuses. In many cases, personnel from the Bureau of Indian Affairs served as enumerators, and in other cases they helped the enumerators fill the special form.

#### National Parks

National parks were made separate enumeration districts if past experience showed that this procedure was necessary to facilitate the enumeration.

#### Special Local Areas

Local authorities sometimes wanted data for a certain local area. The Bureau enumerated such areas separately if this would not unduly complicate the enumeration.

#### Persons on Vessels

Naval, merchant marine, and other vessels were enumerated with the cooperation of the Navy Department, Coast Guard, Coast and Geodetic Survey, and the Merchant Marine. Mailing registers were established listing the vessels and the approximate number of crew members aboard each vessel. Packages of the special enumeration forms for crews of vessels (P4) with letters of instructions were mailed directly to the captains of all vessels in the Navy and Coast Guard and to other government-operated vessels. Those for the merchant marine were grouped and mailed to the companies operating the ships and then reshipped by them to each vessel.

#### Persons Stationed Abroad

Members of the armed forces (except Military Attaches), civilian employees of the Department of Defense, and members of their households were enumerated by the Department of Defense if they were stationed abroad.

The Department of State was responsible for the enumeration of all other government employees (including Military Attaches) and their households and other civilians residing abroad. Persons residing overseas were self-enumerated on the Overseas Census Report (Form P5).

The Department of State supplied lists of all defense installations outside the territorial limits of the United States and its possessions. The Department of Defense gave the Bureau the addresses of persons stationed abroad and the number of persons at each address. From these lists, the Bureau prepared control cards. It sent special enumeration forms (P5) to each location, and it entered the number of forms and date of mailing on the Transmittal and Receipt Record (Form 17P-15).

#### Island Possessions

The Bureau considered the possibility of extending the 1950 Censuses to the miscellaneous island possessions of the United States and to the Trust Territory of the Pacific Islands. However, in the absence of sufficient legal justification for taking the initiative, and in the absence of provisions by the administrative agencies responsible, the Bureau covered very few such areas.

### Enumeration Districts

Enumeration districts are administrative areas which are used in the censuses taken in the field. Each enumeration district is assigned to one enumerator, and he is responsible for covering that area. Many enumerators completed more than one enumeration district in the 1950 Censuses, but it was a practice not to assign more than one to an enumerator at one time. Approximately 230,000 enumeration districts were established for the 1950 Censuses in the United States, its Territories and possessions. They ranged in size from a part of a city block to hundreds of square miles.

Enumeration districts had to be planned not only so that one enumerator could conveniently canvass a district in the time allowed but also so that, taken together, they would provide the necessary statistics for all publication areas. Thus, a town which had only 20 people and could be canvassed in a few hours had to be set up as a separate enumeration district.

Obtaining maps and determining both political area boundaries and special area boundaries was the first step in establishing enumeration districts. Political areas included States, counties, congressional districts, minor civil divisions, incorporated places, and certain political subdivisions of the larger cities, such as wards. Special areas included urbanized areas, unin-

corporated places, census county divisions, census tracts, and other special areas previously mentioned.

The boundaries of all these areas were drawn on copies of the maps selected as most suitable for enumeration purposes. Some areas (or parts of areas) bounded in this manner on the maps were the right size for an enumeration district (or smaller), and they were set up as enumeration districts without further planning. The areas (or parts of areas) that were too large were subdivided. The approximate population in these large areas was determined from counts of dwelling units made in the field, from the Sanborn maps used by fire insurance companies (which show each structure to scale), and from other materials.

The desired size for an enumeration district in closely-settled areas was 900 inhabitants, and the maximum size was 1,000. In open-country areas, the ideal population size was 1,200, and the maximum was 1,400 inhabitants and 200 farms. With such districts, most enumerators could complete their assignments in two weeks in urban areas and in a month in rural areas; these time limits were provided for in the Census law.

The average population size of all enumeration districts was less than 700 persons. Some districts were small because the boundary lines of political subdivisions and special-purpose census areas crossed in such a way that they enclosed an area with little or no population. About 1,000 enumeration districts had no population. Other districts included only an institution which was considered a special enumeration problem.

For nonpolitical boundaries of enumeration districts, it was necessary to use features which enumerators could locate easily. Streets and roads were the best boundaries, but other identifiable features, such as railroads and streams, were also used.

Each enumeration district was set up so the enumerator could travel directly from one part of it to another. Consequently, a district could not include sections separated by a natural barrier, such as a canyon.

In sparsely populated sections of the country, the area of the enumeration district was limited so the enumerator would not have to travel too many miles to cover his territory.

Finally, the 1940 enumeration districts were used if they did not violate any of the foregoing principles. This was possible in areas where political boundaries had not changed and the population had not grown very much. The chief advantage of using the same districts was that statistics for the two censuses would be comparable in these areas. There was also some saving in the time and cost of laying out new enumeration district boundaries.

Identification numbers were assigned to enumeration districts so that records could be maintained and enumeration could be controlled in terms of area coverage. Within each State, consecutive numbers were given to counties arranged alphabetically and then to cities with 50,000 or more inhabitants, also arranged alphabetically. This was the first part of the enumeration district number. Within each of these counties or cities, the enumeration districts were numbered after a prescribed pattern. This was the second part of the enumeration district number. A designation such as "California, 27-14" thus identified the enumeration district as the fourteenth district in the twenty-seventh county (alphabetically) of California.

Four complete sets of maps which showed the location of the enumeration districts were prepared. The first set was kept in Washington as a permanent record. The second and third sets were sent to the field offices, each District Office receiving two sets of maps for the area it supervised. Ordinarily, the District Supervisor kept one set in the District Office and divided the other set among the Crew Leaders, giving them maps for the areas they covered. The fourth set consisted entirely of individual maps for enumeration districts; normally, they were enlargements of the map held by the District Supervisor. The map for a given enumeration district was placed in the portfolio for that district, for use by the enumerator. No maps were supplied for special enumeration districts, such as institutions, large apartment buildings and defense installations, but they were identified by name and location.

The maps were usually blue-line prints of the county and city maps collected by the Bureau. Boundaries were outlined in appropriate colors. Maps were not available for about 400 enumeration districts in small unincorporated places, so aerial photographs were used.

Typed descriptions of all the enumeration districts and their boundaries accompanied the maps. The boundary description was pasted below the map in the enumerator's portfolio so that boundaries could be checked not only from the map but also from the description. In cities of 50,000 or more population, it had been the practice in past censuses to describe the boundaries of each of the blocks which made up an enumeration district. For the 1950 Census, however, only the outer boundaries of the enumeration districts were described, and the numbers of the blocks included in this area were listed.