

CALIFORNIA REDISTRICTING

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## INTRODUCTION

This volume is designed to provide useful general information on redistricting.

Redistricting involves many questions of law; and, over the past two decades, the courts have played an increasing role in redistricting, even imposing court-drawn plans on state legislatures. Thus, the first section of the volume, "Redistricting and the Law," provides summaries of major cases, a survey of judicial doctrines, and commentary on current trends in litigation. There are sub-sections on congressional districting, State legislative districting and local districting, and the legal problems of each.

The histories of redistricting (in the U.S. and in California) are covered in the second and third sections of the volume. These historical materials have much more than academic interest: time and again, contemporary redistricting controversies have revolved around questions of historical fact and interpretation. Not only the courts, but the press and media have fastened on historical justifications of different redistricting approaches. It is important, therefore, to have some familiarity with the major historical themes and trends. There are two sections: "A Brief History of

Apportionment and Districting in the United States;"

"A Brief History of Reapportionment and Redistricting in California."

A fourth section, "The Census and Redistricting," offers a brief account of the organization of the U.S. Bureau of the Census, its procedures and recent developments affecting the Census of 1980. A listing of key census terms, together with their definitions, is provided. Again, this section is intended as no more than an overview, in non-technical language, of an important aspect of the redistricting process.

A fifth section, "Computerized Redistricting", provides a general introduction to the technology and computer-assisted techniques of contemporary redistricting systems.

A final section, "The Politics of Redistricting and Future Trends", is intended to introduce readers to some major new developments. Redistricting, as is made clear in the historical materials in the third section of the volume, has always been a thoroughly political process. In this final section, however, the new political factors that are likely to come into play in the early 1980's are explored. Attention is also given to the current movements of "redistricting reform," to the arguments that are used by proponents and opponents of reform, and to the likely roles



of different groups in the 1981-82 redistricting process.

A "Selected Bibliography" and "Shorter Bibliography of Key Works" are included at the end of the volume.

## REDISTRICTING AND THE LAW

### I. OVERVIEW.

Beginning in 1962, the U. S. Supreme Court took jurisdiction over complaints against "malapportionment" and quickly developed population standards for redistricting state legislative, congressional and other electoral districts. It was a dramatic turnabout; as recently as 1947, in Colegrove v. Green<sup>1</sup>, the Court had denied relief in a case challenging an Illinois Congressional districting plan that gave one district nine times as many people as another. In dismissing the challenge, the Court had then held that malapportionment was not "justiciable"—not appropriate for resolution by a court. "The courts," said Justice Felix Frankfurter in presenting the Colegrove opinion, "ought not to enter this political thicket."

Key Decisions. The major decisions through which the Court entered the reapportionment thicket" are:

Baker v. Carr (1962).<sup>2</sup> A group of urban residents of Tennessee had challenged the make-up of the rurally-controlled state legislature. Although the Tennessee constitution provided for a population-based apportionment and required decennial reapportionments, no apportionment changes had been made since 1901—despite great population growth and shifts. By 1960,

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<sup>1</sup>328 U. S. 549.

<sup>2</sup>369 U. S. 186.

lower house districts ranged from 3,454 to 79,301 in population—a disparity of 23 to 1; Senate districts ranged from 39,727 to 237,905—a 6 to 1 disparity. The Court held that the issue was justiciable, that the federal courts had jurisdiction over complaints against malapportioned legislatures. The Court refused, however, to specify what lesser population disparity might be constitutional or to consider appropriate remedies; the case was remanded to the lower court.

(Note: Justice Felix Frankfurter's dissenting opinion read, in part: "What, then, is this question of legislative apportionment? Appellants invoke the right to vote and have their votes counted. But they are permitted to vote and their votes are counted. They go to the polls, they cast their ballots, they send their representatives to the state councils. Their complaint is simply that the representatives are not sufficiently numerous or powerful—in short, that Tennessee has adopted a basis of representation with which they are dissatisfied . . . What is actually asked of the Court in this case is to choose among competing bases of representation, really, among competing theories of political philosophy." Appeal for relief, Frankfurter insisted, should not be made in the courts but rather "to an informed, civically militant electorate.").

Gray v. Sanders (1963).<sup>3</sup> The case presented a challenge to Georgia's county unit system of voting in statewide and

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<sup>3</sup>372 U. S. 268

congressional primary elections, which gave each county a certain number of votes, usually the number of its seats in the state legislature. The court held that use of the system deprived city residents of equal protection of the laws and ruled that "within a given constituency, there can be room but for a single constitutional rule—one voter, one vote."

(Note: The majority opinion, written by Justice William O. Douglas, emphasized that the decision did not reach the question of state or federal legislative districts of unequal size. But the ground was laid: "The concept of 'we the people' under the Constitution visualizes no preferred class of voters, but equality among those who meet the basic qualifications." In dissent, Justice John M. Harlan said that the decision "surely flies in the face of history": the principle of "one person, one vote" had "never been the universally accepted political philosophy of England, the American colonies or the United States." He said a state should have the authority to grant more voice to rural areas, either in election of state legislators or statewide officials "in order to assure against a predominantly 'city point of view' in the administration of the state's affairs.")

Wesberry v. Sanders (1964).<sup>4</sup> The Court struck down Georgia's Congressional districting plan, holding that Article 1, Section 2 of the Constitution required that "as nearly as is practicable one man's vote in a

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<sup>4</sup>376 U. S. 1.

congressional election is to be worth as much as another's."

(Note: Commenting on this case in a later decision, Chief Justice Warren stated: "Wesberry clearly established that the fundamental principle of representative government in this country is one of equal representation for equal numbers of people, without regard to race, sex, economic status, or place of residence within a state.")

Reynolds v. Sims (1964).<sup>5</sup> The Court announced decisions in six reapportionment cases on June 15, 1964, which came to be known collectively by the name of the first case, Reynolds v. Sims, from Alabama. The rulings held all six state reapportionments unconstitutional and established several major points:

- \*The Equal Protection clause of the XIVth Amendment to the U.S. Constitution "requires that the seats in both houses of a bicameral state legislature must be apportioned on a population basis."

- \*Legislative districts must be substantially equal.

- \*Mathematical "exactness of precision" may be impossible, but apportionment must be "based substantially on population."

- \*Even if approved by a majority of the people in an initiative or referendum, an apportionment that is not based on substantial equality of population is

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<sup>5</sup>377 U.S. 533.

unconstitutional. "A citizen's constitutional rights can hardly be infringed upon because a majority of the people choose to do so."

\*Any other basis for representation, other than population, is discriminatory. "Legislators represent people, not trees or acres." They are "elected by voters, not farms or cities or economic interests."

Swann v. Adams (1967).<sup>6</sup> In this case, the Court began to elaborate its definition of equality of population. Florida's state legislative reapportionment plan was overturned because it contained senate districts ranging from 15.09 percent above the average district and 10.56 below, and house districts ranging from 18.28 percent above to 15.27 percent below.

Kirkpatrick v. Preisler (1969).<sup>7</sup> The Court ruled that "the 'as nearly equal as practicable' standard requires that the State make good-faith effort to achieve precise mathematical equality. Unless population variances among congressional districts are shown to have resulted despite such effort, the State must justify each variance, no matter how small." The Court held that Missouri had failed to justify the deviations in its 1967 redistricting plan, and overturned it. The deviations were very small; the most populous district was 3.13 percent above the average

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<sup>6</sup>385 U.S. 440.

<sup>7</sup>394 U.S. 526.

district and the least populous was 2.84 percent below.

Whitcomb v. Chavis (1971).<sup>8</sup> A challenge was presented to a state legislative reapportionment in Indiana on the basis that the use of multi-member districts resulted in invidious discrimination against the black voters of Indianapolis. The Court held that the challengers had not proved that the multi-member districts had operated unconstitutionally to dilute or cancel the voting strength of racial or political elements in the State.

(Note: In a 1960 case, Gomillion v. Lightfoot, the Court had outlawed racial gerrymandering, finding that the city boundaries of Tuskagee, Alabama had been drawn to exclude Negro voters in violation of the 15th Amendment. In 1964, in Wright v. Rockefeller, however, the Court dismissed a challenge to New York's Congressional districts brought by voters who charged that Manhattan's 17th "silk stocking" District was gerrymandered to exclude Negroes and Puerto Rican citizens. Wright and Whitcomb were widely cited as evidence that the Court was unwilling to deal with the whole problem of gerrymandering, whether racial or partisan gerrymanders.)

Manhan v. Howell (1973).<sup>9</sup> Justified deviations in population of state legislative districts were set at

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<sup>8</sup>403 U.S. 124.

<sup>9</sup>410 U.S. 315.

a significantly higher level than in the Kirkpatrick ruling on Congressional districts. The Court upheld a 1971 Virginia state legislative reapportionment plan with a population deviation from the largest to the smallest district of 16.4 percent: the Court indicated, however, that "this percentage may well approach tolerable limits." The Court noted that the plan "may reasonably be said to achieve the rational state policy of respecting the boundaries of political subdivisions."

(Note: In two other cases in 1973 the Court hinted at further guidelines on the meaning of "equality." In Gaffney v. Cummings, Connecticut's 1971 state legislative reapportionment plan was upheld, despite a deviation of 7.83 percent between the largest and smallest districts, and despite rather clear evidence of the use of partisan data in the drawing of district lines. The court ruled that "minor deviations from mathematical equality among state legislative districts are insufficient to make out a prima facie case of invidious discrimination under the Fourteenth Amendment so as to require justification by the state." In White v. Weiser, however, the Court overturned a Texas Congressional districting plan with maximum deviations of 2.43 percent above and 1.7 percent below the average on grounds that the deviations "were not 'unavoidable', and the districts were not as mathematically equal as reasonably possible.")



Chapman v. Meier (1975).<sup>10</sup> The Court rejected a court-ordered state legislative redistricting plan in North Dakota involving multi-member districts. The ruling was that "unless there are persuasive justifications," a court-ordered reapportionment plan of a state legislature must avoid use of multi-member districts. The Court carefully noted that it was not ruling that multi-member districts were unconstitutional, but merely exercising its supervisory powers over lower federal courts.

United Jewish Organizations v. Carey (1977).<sup>11</sup> Legislative modification of a New York redistricting plan (in order to bring it into compliance with the 1965 Voting Rights Act) had divided a community of Hasidic Jews to establish several substantially non-white districts in Kings County. The Court upheld the plan, ruling that such a use of racial criteria did not violate either the XIVth or the XVth Amendments.

Response to Court Decisions. The Court's decision on Baker v. Carr in 1962 was followed by a flurry of citizen suits challenging malapportionment in state legislatures. By March 1964, 26 states had approved new apportionment plans. Alabama, Oklahoma, and Tennessee were redistricted under court-drafted plans; several states redistricted under court threats of postponement of elections or at-large elections. In Delaware, a court order gave the legislature 12 days to reapportion; Wisconsin was given 19 days, and Michigan 33 days. Faced with these

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<sup>10</sup>420 U.S. 1.

<sup>11</sup>97 U.S. 996.

examples of judicial severity, most states now voluntarily undertook reapportionments.

At the time of the Reynolds decisions in June 1964, court action on reapportionment was underway in 39 states. The 1964 decisions further accelerated the process. Two years later, legislatures in 46 of the 50 states had brought their apportionments into some degree of compliance with judicial standards of population equality.<sup>12</sup> Indeed, by this point, several states were experiencing their second reapportionment of the decade: legislatures that had been reapportioned after Baker now adopted their own new plans. In a few states, reapportionment had been handed over to specially created commissions, established by statute or by constitutional amendment. In some states too, constitutional provisions requiring geographic or other modifications to population-based apportionments were abandoned or amended. Elsewhere, states created multi-member and floater districts in order to preserve the boundaries of traditional political subdivisions in their districting systems. A number of states actually changed the size of their state legislatures in order to accommodate to population-based apportionments.

Although in the period 1963 through 1965 there had been movements in Congress (principally, the so-called "Dirksen Amendment") and in the states (backed by groups such as the American Farm Bureau Federation) to limit the effect of the court decisions, these faltered and faded from sight by the late 1960's. By 1970, the state legislatures were all effectively based on equal population; thus there was no longer any impetus in the movement to resist "one-man-one-vote." The "Reapportionment Revolution," a dramatic judicially-imposed change in the character

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<sup>12</sup>See Congressional Quarterly, June 17, 1966. At the time of this CQ survey, only four states (Hawaii, Louisiana, Maine, Mississippi) had legislative districts that varied widely from their average district population.

of the representative system, was apparently complete.

In the sections that follow, more detailed commentary is provided on Court actions in the period 1962-79. There are three areas of focus: Congressional redistricting, State Legislative redistricting, and redistricting on the local level.

## II. CONGRESSIONAL REDISTRICTING

Of the three levels of reapportionment litigation, congressional equal representation cases show the Court in its most exacting and demanding posture. One-man-one-vote guides in this area have been extremely tight from their beginning in 1964, and later cases have served further to tighten some of the guides by fending off any attempted linkages between state legislative and congressional reapportionments. In this area, the Court has remained unyielding in preserving "as nearly as is practicable"<sup>13</sup> equality of population standards. The Court has not been willing to set a specific maximum allowable deviation, but has required that any deviations may be justified only after the test of a "good faith effort" has been applied against the state.<sup>14</sup>

The adamancy of the Court in these cases seems to be explained best in light of certain key concepts: (1) the Federal Government possesses "sovereignty" over the constitution of the House of Representatives, which is one of the arms of the Federal Government; (2) the right of the Court to review these cases is based on the time-tested case of Marbury v. Madison;<sup>15</sup> (3) the foundation for the Court's intervention comes not from an amendment to the Constitution, but from the Constitution itself, Article I, Section 2.<sup>16</sup>

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<sup>13</sup>Wesberry v. Sanders 376 U.S. 1 at 7-8 (1964).

<sup>14</sup>Kirkpatrick v. Preisler 394 U.S. at 531 (1969).

<sup>15</sup>376 U.S. 1 at 6.

<sup>16</sup>Ibid., at 3.

The line of cases to be analyzed here begins with Wesberry v. Sanders in 1964.<sup>17</sup> The case concerned itself with alleged malapportionment in Georgia's congressional districts, involving a ratio between the largest and the smallest districts of over three-to-one. It was in this case that the Court interpreted Article I, Section 2 of the Constitution to mean that "as nearly as practicable each man's vote in a congressional election shall count just as much as another's."<sup>18</sup> The Court went on to argue that the debates at the Constitutional Convention clearly showed that the Framers intended apportionment to be based squarely on equal numbers of people in each district. Mr. Justice Black drove the point home when he wrote for the Court in the Wesberry decision:

While it may not be possible to draw congressional districts with mathematical precision, that is not excuse for ignoring our Constitution's plain objective of making equal representation of the people the fundamental goal for the House of Representatives. That is the high standard of justice and common sense which the Founders set for us.<sup>19</sup>

From the beginning, the Court made it known that in congressional districting, anything less than exact equality in population would not be allowed.

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<sup>17</sup>376 U.S. 1 (1964).

<sup>18</sup>Ibid., at 7-8.

<sup>19</sup>Ibid., at 18.

This hard line was strengthened and continued in two cases decided on the same day in 1969, Kirkpatrick v. Preisler<sup>20</sup> and Wells v. Rockefeller.<sup>21</sup> Kirkpatrick concerned itself with an alleged malapportionment of the Missouri Congressional Districts (involving a maximum deviation of 5.97%), and Wells dealt with malapportionment in New York (a congressional plan involving a deviation of 13.086%). The two cases served to: (1) eliminate speculation as to maximum allowable unjustified population variance; (2) make clear the parameters by which variances would be measured; and (3) eliminate various arguments that were then being used to justify deviations in both state legislative and congressional reapportionment schemes. Essentially, the cases involved an explication of the meaning of "as nearly as practicable" as enunciated in Wesberry.

The Court rejected a de minimis population deviation--a level below which population deviations will not be questioned--at the outset of the Kirkpatrick opinion. Mr. Justice Brennan wrote for the Court:

The whole thrust of the "as nearly as practicable" approach is inconsistent with adoption of fixed numerical standards which excuse population variances without regard to the circumstances of each particular case.<sup>22</sup>

Brennan further argued that the setting of a de minimis level would: (1) be an arbitrary action; and (2) involve setting a target range toward which legislators would work, rather than true population equality.<sup>23</sup>

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<sup>20</sup>394 U.S. 526 (1969).

<sup>22</sup>394 U.S. 526 at 530.

<sup>21</sup>394 U.S. 542 (1969).

<sup>23</sup>*Ibid.*, at 531.

Instead of setting a specific de minimis level, the Court indicated that all variances from population equality had to be shown to be unavoidable "despite a good faith effort to achieve absolute equality."<sup>24</sup> If a good faith effort could not be shown, then justification for the variances was required. Should the state be unable to justify variances, absent proving a good faith effort, the Court claimed its right to void the plan on the grounds of violation of the Federal Constitution.

Missouri and New York were unable to show evidence of a good faith effort in the drawing of their respective reapportionment plans and, as a result, they had to attempt to justify the deviations as the outgrowth of a policy or other consideration that the Court would deem nonviolative of the Constitution.<sup>25</sup> Kirkpatrick presented a number of interests that Missouri thought would justify the population variances. The criteria that Missouri employed were: (1) preservation of political subdivision integrity; (2) preservation of political balance; and (3) compactness of the districts themselves.<sup>26</sup> The Court ruled against all three of these claims. As to the first two, the Court was of the opinion that partisan politics should not enter into the equation:

Problems created by partisan politics cannot justify an apportionment which does not otherwise pass constitutional muster.<sup>27</sup>

...an argument that deviations from equality are justified in order to inhibit legislators from engaging in partisan gerry-

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<sup>24</sup> Ibid.

<sup>26</sup> Ibid., at 533.

<sup>25</sup> Ibid.

<sup>27</sup> Ibid.

mandering is no more than a variant of the argument, already rejected, that considerations of practical politics can justify population disparities.<sup>28</sup>

The Court continued on to reject the third criterion by citing Reynolds to show that contemporary communication techniques have outdated the notion that distance prevents constituents from maintaining close contact with their representatives.<sup>29</sup> The Court then specifically addressed the Missouri plan, noting that "a state's preference for pleasingly shaped districts can hardly justify population variances."<sup>30</sup>

The opinions in Kirkpatrick and Wells gave greater clarity to the considerations that may permissibly be taken into account in congressional districting. The rejection of political considerations and standards of compactness served to reinforce the Court's unyielding position that population exactness is the overriding consideration. All variances must be shown to be "unavoidable or otherwise justified by reasons other than subdivision integrity, political fairness, compactness, or anticipation of expected population shifts.

The Kirkpatrick and Wells opinions have stood basically unchallenged and intact since they were handed down in 1969.<sup>31</sup> An interpretation of the "good faith effort" requirement by a lower court is found in the case of Drum v. Scott,<sup>32</sup> decided in 1971.

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<sup>28</sup>Ibid., at 534.

<sup>29</sup>Reynolds v. Simms 377 U.S. 533 at 580.

<sup>30</sup>394 U.S. 526 at 536.

<sup>31</sup>The case of Hensley v. Wood 329 F. Supp. 787 (1971) did comment on the soundness of the Kirkpatrick and Wells decisions.

## Footnotes

31 (continued)

The District Court questioned the notion that the decennial census figures were the only acceptable figures upon which to base apportionment. The main contention was that the census is not dynamic and that schemes drawn according to the decennial census are inherently malapportioned. "Mathematical precision, if achieved, is destined to have an ephemeral existence." 329 F. Supp. 787 at 791. The Court has commented on the use of census enumerations and projections in Kirkpatrick and the lower courts have commented in Dixon v. Hassler 412 F. Supp. 1036 (1976) and Graves v. Barnes 446 F. Supp. 560. All three cases note objection to the use of census projections. Dixon states that to let census estimates stand would allow legislatures to justify malapportionments on the basis of later adjustments. Dixon, supra, at 1041. The Dixon case did show a slight softening, however, in that it cited a 1964 case as saying that courts may take projections in account if they are well substantiated and large shifts in population are known to have occurred. Calkins v. Hare 228 F. Supp. 824. The Dixon case was affirmed without comment, by the Supreme Court. 429 U.S. 934.

<sup>32</sup>337 F. Supp. 588 (1972).



The District Court considered a good faith effort to have been made because:

Unlike Missouri, the North Carolina Legislature considered and debated alternate plans and did not reject without consideration a plan which would have markedly reduced population variances among the states.<sup>33</sup>

This is a slight departure from the line pursued in Kirkpatrick. Although it was not appealed to the Supreme Court, it may be significant in that: (1) since the total maximum deviation was only 3.79%, it may indicate a quasi de minimis level below which less justification is required; and (2) there appeared to be a slight shift in the burden of proof toward those who seek to show that a plan is not representative.

Two of the most recent Supreme Court cases concerning a de minimis level, White v. Weiser<sup>34</sup> and Chapman v. Meier,<sup>35</sup> however, have served to strengthen the refusal to adopt a de minimis position. Mr. Justice White, in writing for the Court in the Texas case of White v. Weiser, upheld a lower court ruling that struck down a plan with 4.13% population deviation and called for a plan with .149% total maximum deviation. In a tight application of Kirkpatrick and Wells to deviations, White noted:

...we agree with the District Court that under the standards of those cases, they [deviations] were not

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<sup>33</sup>337 F. Supp. 588 (1972).

<sup>34</sup>Ibid., at 591.

<sup>35</sup>420 U.S. 1 (1975).

unavoidable, and the districts were not as mathematically equal as reasonably possible.<sup>36</sup>

Speaking directly to those who desire a de minimis variance level to be set, White commented:

It is clear, however, that at some point or level in size, population variances do import invidious devaluation...and represent a failure to accord him (the voter) fair and effective representation.<sup>37</sup>

It is significant to note, however, that the Court remanded the case back to the District Court because the plan that the Court had ordered to be implemented was counter to established state policy. Nevertheless, any hopes that the Court would greatly soften its position on allowable population deviations were squelched in the last paragraph of the opinion.

The District Court should not, in the name of state policy, refrain from providing remedies fully adequate to redressing constitutional violations which have been adjudicated and must be rectified.<sup>38</sup>

One of the last cases to speak directly to congressional reapportionment was Chapman in 1975. Mr. Justice Blackmun made it clear that the Court would still pursue in the future

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<sup>36</sup>412 U.S. 783, at 790.

<sup>37</sup>Ibid., at 793.

<sup>38</sup>Ibid., at 797.

the highest of standards as to equipopulous representation in the House of Representatives.

We have acknowledged that some leeway in the equal-population requirement should be afforded States in devising their legislative reapportionment plans. As contrasted to congressional districting, where population equality appears to be the preeminent, if not the sole, criterion, on which to adjudge constitutionality.<sup>39</sup>

#### Summary on Congressional Redistricting

From the beginning of the congressional reapportionment cases in Wesberry v. Sanders, to the most recent opinion about them in Chapman v. Meier, the Court has remained steadfast in its position that one man--one vote is to mean exactly that. The Court began in 1964 by striking down plans with a three-to-one population variance and has continued to the point where it now orders to be put into effect plans with a total maximum deviation of .149%.<sup>40</sup> Moreover, no clear end is in sight to this tendency, for the Court continues to refuse to indicate a de minimis level below which

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<sup>39</sup>420 U.S. 1, at 23.

<sup>40</sup>As to plans constructed and ordered by the courts, the exactitude demanded in congressional reapportionment is mind-boggling. The case of Dunnell v. Austin 334 F. Supp. 210 (1972) illustrates this point. The court disallowed a plan with approximately 2.5% total maximum deviation. It instead constructed its own plan where the ideal district had a population of 467,543 persons, the largest districts had 467,547 persons and the smallest districts had 467,535 persons living in it. The ratio of the largest to the smallest was 1.000026:1 with a total maximum deviation of .00257%.

population deviations would not have to be justified. (Kirkpatrick, Wells, White, and Chapman.) Indeed, any justifications for congressional district deviations are hard to find in the opinions of the Court. Unlike state legislative reapportionment cases, the Court has refused to count the preservation of political subdivision integrity as a viable policy by which to determine congressional representation. One man - one vote has truly reached its zenith in congressional districting. It remains, of course, to be seen if equally populous congressional districts in each state will greatly improve representation.

### III. STATE LEGISLATIVE REDISTRICTING

State legislative reapportionment has been at the forefront of the apportionment debate from the time that the questions of redistricting were first deemed justiciable. It was in Baker v. Carr<sup>41</sup> that the Court, speaking through Mr. Justice Brennan, took the reapportionment question from its traditional political setting. Although the Court did not move to redistrict the Tennessee legislature itself, by sending the case back to the District Court for appropriate action, it took the first and decisive step into "the political thicket." In the paragraphs that follow, we will investigate the path that the courts have followed in defining "equality" as a voting standard in state legislative districting.

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<sup>41</sup>369 U.S. 186 (1962).

The first cases decided with respect to state reapportionment<sup>42</sup> were not aimed at establishing an exact standard to define population equality, but were pointed toward setting the "ground rules" by which future cases would be decided. The most prominent of the cases decided in 1964 was Reynolds v. Sims.<sup>43</sup> It was in that case that the Court: (1) significantly strengthened its argument for dealing with problems of reapportionment and barriers to representation;<sup>44</sup> (2) established distinctions between congressional and state legislative apportionment;<sup>45</sup> and (3) announced some tentative and preliminary standards by which equality in population would be defined and determined.<sup>46</sup> The third point is of chief importance for our purposes.

Three statements of great import for the future development of equality standards were made by Mr. Chief Justice Warren in the Reynolds decision. "Legislators represent people," he declared, "not trees or acres."<sup>47</sup> By this first statement, the Court appeared

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<sup>42</sup>A group of six cases were decided on June 15, 1964, all of which dealt with state legislative districting schemes. The cases are listed below with the population variances in parenthesis if stated. Reynolds v. Sims 377 U.S. 533, WMCA v. Lomenzo 377 U.S. 633 (Assembly 11.9 to 1), Maryland Committee v. Tawes 377 U.S. 656, Davis v. Mann 377 U.S. 678 (Senate: 2.65 to 1, House: 4.36 to 1), Roman v. Sincock 377 U.S. 695 (Senate: 15 to 1, House: 35 to 1), and Lucas v. 44th General Assembly (Senate: 3.6 to 1).

<sup>43</sup>Supra, n. 2.

<sup>44</sup>Ibid., 556-557.

<sup>45</sup>Ibid., 571-577.

<sup>46</sup>Ibid., 577-581.

<sup>47</sup>Ibid., 562.

to be discounting all other factors except population when determining "equality." Warren argued that the bedrock of the American political system was the ability of the people to elect representatives in an unobstructed manner--and that this bedrock was protected by the Equal Protection Clause of the 14th Amendment. The representation of interests, it was implied, would act as an obstruction to free elections.<sup>48</sup> (The argument was taken to the point that bicameralism not totally based on population equality was held to be forbidden by the Equal Protection Clause.)<sup>49</sup>

Warren's second key statement was that mathematical exactness was not a requirement in state apportionment questions.<sup>50</sup> Here we have what appears in retrospect to be the first evidence that the Court would be less strict in judging population equality in state plans than in congressional plans.

Warren's third key statement somewhat softened the tone of his first:

So long as the divergences from a strict population standard are based on a rational state policy, some deviations from the equal-population principle are constitutionally permissible...<sup>51</sup>

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<sup>48</sup>Ibid., 563-568.

<sup>49</sup>Ibid., 568-576.

<sup>50</sup>Ibid., 577.

<sup>51</sup>Ibid., 579.

Here the Court seemed to leave itself open to a flexible standard of allowable deviation that would be applied to each state individually.

In rather general terms, one may say that Warren's second and third points still stand today, indeed have strengthened; but various decisions of the courts have tended to dilute his first point on the absolute primacy of population as a criterion.

Following Reynolds, the next major case in this line was Swann v. Adams.<sup>52</sup> The case concerned itself with the Florida State Legislature, which had maximum population deviations in the Senate of 25.65% and 34.55% in the House. Swann employed the "rational state policy" test enunciated in Reynolds and found that Florida had failed to justify the deviations. The State's justification, an attempt "to follow congressional district lines,"<sup>53</sup> was not convincing to the Court, for it found that Florida could have remained close to the boundaries of its congressional subdivisions without allowing such large deviations.<sup>54</sup> Swann also followed Reynolds in its argument that accepted variation norms in one state have little relevance to those in other states.<sup>55</sup> Yet, despite the holding against the Florida plan, the Court made clear its willingness to take particular circumstances and the desires of a state legislature

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<sup>52</sup>385 U.S. 440 (1967).

<sup>53</sup>*Ibid.*, 445.

<sup>54</sup>*Ibid.*, 444.

<sup>55</sup>*Ibid.*, 455-446. Further comment on the nontransferability of standards may be found in Gerard Casper, "Apportionment and the Right to Vote," 1973 Supreme Court Review 16.

into account. From this point forward, the representation of "interests" begins to gain somewhat greater acceptance on the Court, and the strict interpretation of the Reynolds finding that "legislators represent people..." begins to weaken. While Swann failed to set definitive barriers for maximum population deviation, it did further define the rules and tests by which future state apportionment cases would be measured.

The post-1970 state reapportionment cases have dealt with a wide range of issues that, taken as a whole, reflect not only a certain relaxation of the one man - one vote standards of the 1960's, but that are in general a reflection of a growing reluctance to interfere in the affairs of the states. Beginning with Mahan v. Howell<sup>56</sup> in 1973 and continuing up through Connor v. Finch<sup>57</sup> in 1977, the Court exhibited determination to settle on "tolerable" limits of population deviation and to define the tools with which to measure deviation. Some of the old measures going back to Reynolds have been enhanced, and some new measures have been developed.

The most prominent of the post-1970 cases is Mahan v. Howell. The case arose from a claim of malapportionment in the Virginia State Legislature, where the population deviation totaled 16.4%. The District Court disallowed the plan, relying on Kirkpatrick v. Preisler<sup>58</sup> and Wells v. Rockefeller.<sup>59</sup> The Supreme Court took the

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<sup>56</sup>410 U.S. 315 (1973).

<sup>57</sup>431 U.S. 407 (1977).

<sup>58</sup>394 U.S. 526 (1969).

<sup>59</sup>394 U.S. 542 (1969).



case and made the following points, while ruling in favor of the status quo plan: (1) Standards for congressional reapportionment are not applicable to those for the states; (2) the desire to maintain the integrity of the boundaries of political subdivisions is permissible, and may be considered part of a rational state policy. Thus the Virginia plan with its 16.4% deviation was approved, despite allegations made in the District Court that multi-member districting diluted voting power and constituted racial gerrymandering and that the plan racially isolated negroes.<sup>60</sup>

The inapplicability of congressional standards to state plans was not a novel concept--indeed, it had been brought up as early as Reynolds and Davis--but Mahan served to give permanence to the split in classifications. The opinion stated:

It is the conclusion of this Court that the absolute equality in population test of Kirkpatrick is not applicable to bicameral state legislatures and the "rational policy" test....<sup>61</sup>

Earlier in its opinion the Court had championed the peculiarities of state and local governments, noting that application of absolute equality to state legislatures may impair the functioning of state and local governments.<sup>62</sup>

The Court, as to the second point, made it known that maintenance of the integrity of political subdivisions would be considered a rational state policy.<sup>63</sup> It is here that the Court begins to make

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<sup>60</sup>Howell v. Mahan 330 F. Supp. 1138 (1971).

<sup>61</sup>410 U.S. 315 at 324.

<sup>62</sup>Ibid., 323.

<sup>63</sup>Ibid., 328.

clear the point that, while legislators may not represent trees and acres,<sup>64</sup> state legislatures do have to be concerned with local interests and other factors; and that, therefore, population deviations beyond those permitted under the strictest interpretation of the Equal Protection Clause may be permitted. Thus, the preservation of integrity of political subdivisions becomes embedded as a rational state policy and as a justification for population deviations.

Some commentators have raised the question of tolerable limits--how much deviation from exact equality will now be allowed, given that the Virginia plan with its 16.4% variation glided so easily past the Court? This is a question that cannot be fully answered, of course, particularly if the dictum in Swann of nontransferability of standards between states is sustained. A partial answer seemed to be given, however, when the Court vacated a District Court ruling on apportionment in Idaho later in 1973. The case Summers v. Cenarussa<sup>65</sup> concerned itself with an apportionment scheme of the Idaho Legislature that permitted a 19.41% maximum total deviation. The state in framing its plan claimed to have adhered to a policy of maintaining the integrity of subdivisions and anticipating increases in population. The District Court had upheld the plan; but the Supreme court vacated the decision of the lower court without comment.<sup>66</sup> While this state policy is not

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<sup>64</sup>Reynolds 377 U.S. 533 and Davis v. Mann 377 U.S. 678.

<sup>65</sup>342 F. Supp. 288 (1972).

<sup>66</sup>413 U.S. 906 (1973).

exactly commensurable with that in Mahan, some gross indication may have been given as to the maximum range of allowable population deviation.

Shortly after the Mahan decision the Court took the opportunity further to define the parameters of what would be considered equal representation as dictated by the Equal Protection Clause. The opportunity came in the form of two cases, Gaffney v. Cummings<sup>67</sup> and White v. Regester.<sup>68</sup> Gaffney was concerned with the Connecticut Legislature, where the maximum total deviation was 7.83%. White concerned itself with the Texas Legislature, where the maximum total deviation was 9.9%. The question asked in both cases was at what level does a plan lose its prima facie validity and thus have to justify itself with a rational state policy? Alternatively, what is required to build a prima facie case of invidious discrimination? In the two cases, the Court very clearly increased the burden of proof on those who seek to overturn state reapportionment plans. In effect, the Court ruled that the 7.83% deviation of Gaffney was not on its face a violation of any one man - one vote guidelines and that extensive documentation must be submitted to show that the plan causes invidious discrimination. With reference to Mahan, Mr. Justice White states in the Gaffney opinion:

We did not hold that in state legislative cases any deviations from perfect population equality in the districts, however small, make out prima facie equal

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<sup>67</sup>412 U.S. 735 (1973).

<sup>68</sup>412 U.S. 755 (1973).

protection violations and require that the contested reapportionments be struck down absent adequate state justification.<sup>69</sup>

He went on to say:

It is now time to recognize...that minor deviations from mathematical equality...are insufficient to make out a prima facie case of invidious discrimination under the Fourteenth Amendment....<sup>70</sup>

It can be seen, therefore, that the Court is loosening the stringent requirements of one man - one vote that characterized some of its earlier decisions.<sup>71</sup>

This approach, combined with what is said in Gaffney and in Mahan on preservation of the integrity of political subdivisions, suggests that equality in population is moving out of its position as the sole determinant of equal representation. Instead, other factors, such as the preservation of subdivision boundaries and the "political fairness" doctrine of Gaffney,<sup>72</sup> are edging forward. Our view of this tendency is supported by various commentators on reapportionment law. Irwin Rubin, in "Malapportionment: Inequality and the Individual's Vote,"<sup>73</sup> states that:

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<sup>69</sup>412 U.S. 635 at 743.

<sup>70</sup>Ibid., 745.

<sup>71</sup>An up-to-date article on the loosening of standards may be found in Samuel R. Dolgow, "Political Representation: The Search for Judicial Standards," 43 Brooklyn Law Review 431 at 445-448.

<sup>72</sup>412 U.S. 735 at 751. Essentially, Connecticut's "political fairness principle" was an attempt to reflect in the legislature the balance of the various political parties around the state. Formulation of the plan involved consultation with a bi-partisan committee.

<sup>73</sup>5 North Carolina Law Journal 308.

Taken together, Mahan and Gaffney indicate a retreat from the strict "one man, one vote" principle initiated almost a decade earlier.<sup>74</sup>

Another writer takes a similar view of the situation:

Mahan v. Howell...simply allows the Court more flexibility in looking at factors other than population in determining the constitutionality of an apportionment plan.<sup>75</sup>

The various doctrines and trends of Mahan and Gaffney have been continued in lower court cases up to the present. The case of Graves v. Barnes<sup>76</sup> further supports the prima facie arguments of Gaffney. It notes that, as opposed to court-ordered plans, those that are originated by the state will receive a certain amount of "indulgence from the adjudicating court."<sup>77</sup> Graves does not, however, leave the door wide open, but notes that avoidance of voter confusion and encouragement of voter participation are not to be considered overriding state interests. This caveat is included at the end of the case:

It will serve no one for us to ignore constitutional norms in the name of convenience and administrative inertia.<sup>78</sup>

The political fairness principle of Gaffney is continued in the Illinois City Council districting case of Russo v. Vacin.<sup>79</sup>

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<sup>74</sup>Ibid., 320.

<sup>75</sup>Clem Hyland, "Constitutional Law--Mahan v. Howell. Forward or Backward for the One Man--One Vote Rule," 22 De Paul Law Review 912 at 924.

<sup>76</sup>446 F. Supp. 560 (1977).

<sup>77</sup>Ibid., 569.

<sup>78</sup>Ibid., 571.

<sup>79</sup>528 F2d. 27 (1976).

This case quotes Gaffney on the notion that districting and apportionment of a political nature, designed to "reflect the political balance" of the elements in the community, will be allowed.<sup>80</sup>

The integrity of boundaries doctrine that extends from Reynolds through Mahan, Gaffney, and White is noted in the Tennessee case of Sullivan v. Crowell.<sup>81</sup> The Court wrote:

...we are of the opinion that the elimination of split precincts would be a valid reason for increasing population disparities among legislative districts to the 12.51% level demonstrated here...if no less severe method is possible.<sup>82</sup>

The Court in this case ruled that deviations of 12.51% are permissible in the drive to retain a certain type of territorial integrity.

Before concluding these comments, it would be well to discuss the status of one man - one vote in relation to plans devised by the courts. Although Graves and Sullivan comment on the subject briefly, the Supreme Court case of Connor v. Finch<sup>83</sup> gives what seems to be the currently definitive word on court-ordered plans. The court quite clearly states that court-ordered reapportionment plans must be more fully justified (as to deviations from a strict

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<sup>80</sup>Ibid., 29.

<sup>81</sup>444 F. Supp. 606 (1978). The total maximum population deviation in this case is 21.78%.

<sup>82</sup>Ibid., 614.

<sup>83</sup>431 U.S. 407 (1977). This case originates from a reapportionment dispute in Mississippi that began in 1964. The Mississippi Legislature failed to promulgate a constitutional plan and so the District Court for the State was assigned the task. As of mid-1978 the District Court itself had not yet devised a constitutionally acceptable plan.

equal population application) than those promulgated by a state legislature. Two quotations follow:

With a Court plan, any deviation from approximate population equality must be supported by enunciation of historically significant state policy or unique features.<sup>84</sup>

...a state legislature is the institution that is by far the best situated to identify and then reconcile traditional state policies within the constitutionally mandated framework of substantial population equality. The federal courts by contrast possess no distinctive mandate to compromise sometimes conflicting state apportionment policies in the people's name.<sup>85</sup>

It can be seen that, should the courts deem it necessary to reapportion a governmental unit themselves, the most stringent one man - one vote standards will be applied.

#### Summary of State Legislative Redistricting

Court attitudes toward state legislative apportionment have undergone some important changes since the Reynolds decision was handed down in 1964. From what was once a strict interpretation of the population requirements of the Equal Protection Clause, the Court's definition of "equal representation" has begun to assume a modified, softer form. In addition to equal population, the

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<sup>84</sup>Ibid., 417.

<sup>85</sup>Ibid., 414-415.

states may now also consider such policies as the preservation of political subdivision integrity, the preservation of political balance, and the rights of states qua states to determine the specific policy considerations they will integrate into their reapportionment efforts. There has also been a slight lessening of the burden of proof laid upon the states to show that their plans do not violate the Equal Protection Clause. Gaffney and White permitted deviations up to 9.9% without justification, other than the fact that a state policy was present. As to court devised and implemented plans, however, the Supreme Court, in Connor, made it clear that should a reapportionment come to the point where a court drawn plan must be implemented, the most stringent interpretation of the Equal Protection Clause will be applied.

Thus, a contemporary summary definition of one man - one vote in state legislative districting would involve the requirement of adherence to equal population, but supplemented by provisions for consideration of political subdivision integrity and political fairness.

#### IV. REDISTRICTING AT THE LOCAL LEVEL

The debate on apportionment of voting rights in local political divisions was a relative late-comer in the history of apportionment/reapportionment litigation. The first case to deal specifically with the area, and which set many of the basic and continuing lines of the Court's approach to local representation, was Sailors v. Board of Education.<sup>86</sup> From this case there followed

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<sup>86</sup>387 U.S. 105 (1967).



a wide-ranging set of arguments that concerned themselves with such issues as: (1) whether one man - one vote applies to local districts; (2) what constitutes the exercise of governmental powers; and (3) what are the special requirements of local and special district governments as compared with other types of governing bodies.<sup>87</sup>

The first issue to confront the Court on the local level was the basic one of whether the so called "one man - one vote" rule did indeed apply. In the Sailors decision, Mr. Justice Douglas, writing for the Court, used both Gray v. Sanders and Reynolds v. Sims to support his contention that regardless of the level of government, each voter has the right to participate equally in the electoral process.<sup>88</sup> The finding opened the door for judicial activity in local reapportionment. This application of the one man - one vote principle was further reinforced in Avery v. Midland County<sup>89</sup> and Hadley v. Junior College District.<sup>90</sup> In these decisions, the Court drew on the power of the Equal Protection Clause of the 14th Amendment.

From the beginning, however, there seemed to be a certain hesitancy to apply one man - one vote to local units of government.

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<sup>87</sup>For a general essay on local reapportionment, see Gerhard Casper, "Apportionment and the Right to Vote: Standards of Judicial Scrutiny," 1973 Supreme Court Review 1. Also see James J. Doody III, "Equal Protection and Connecticut's Regional School Boards: The Parameters of 'One Person, One Vote'" 51 Connecticut Bar Journal 243.

<sup>88</sup>387 U.S. 105 at 107.

<sup>89</sup>390 U.S. 474 (1968).

<sup>90</sup>397 U.S. 50 (1970).

In the Sailors decision, for example, Mr. Justice Douglas made a distinction between legislative and administrative bodies.<sup>91</sup> Although, in the summation, Douglas refused to classify the school board in question as either legislative or administrative--he claimed they were not actually elected--the distinction indicated a certain willingness to let the states determine the quality of voting strengths in state political subdivisions. (This distinction reappears later on in one of the most recent local reapportionment cases.)<sup>92</sup> Douglas noted in Sailors:

Viable local governments may need many innovations, numerous combinations of old and new devices, great flexibility in municipal arrangements to meet changing urban conditions. We see nothing in the Constitution to prevent experimentation.<sup>93</sup>

In other words, it appeared that the Court was willing to allow deviations beyond those accepted for state and congressional apportionments and, further, that the states would be allowed at least some say as to the degree of deviation.

After deciding that one man - one vote does indeed apply to local districts, the next issue to confront the Court was the definition of governmental powers and what constitutes a government.

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<sup>91</sup>387 U.S. 105 at 110.

<sup>92</sup>Burton v. Whittier Vocational School District, 587 F2d 66 at 69 (1978).

<sup>93</sup>387 U.S. 105 at 110-111.

For, so the reasoning went, if a political subdivision was determined not to have governmental powers, then it could not be considered to be subject to one man - one vote strictures. The question was given a partial answer when the Supreme Court decided in Avery v. Midland County<sup>94</sup> that local political subdivisions having "general governmental powers" were subject to the provisions of the Equal Protection Clause.<sup>95</sup> The Court did not define, however, what it meant by "general governmental powers"--merely saying that these powers must extend "over the entire geographic area served by such a body."<sup>96</sup>

Such a definition was hardly "operational" and, as a consequence, a number of later cases shaped, modified, and remodified a definition of governmental powers. The first Supreme Court case to follow Avery on this subject was Hadley v. Junior College District.<sup>97</sup> The opinion noted that the college district had the power to

levy and collect taxes, issue bonds..., hire and fire teachers, make contracts, collect fees, supervise and discipline students, pass on petitions to annex school districts, acquire property by condemnation, and in general manage the operation of the junior college.<sup>98</sup>

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<sup>94</sup>Supra, n. 4.

<sup>95</sup>Ibid., at 1120.

<sup>96</sup>Ibid.

<sup>97</sup>Supra, n. 5.

<sup>98</sup>Ibid., at 53.

After this listing the Court stated:

...we think these powers are general enough and have sufficient impact throughout the district to justify the conclusion...

that the district board was actually a governmental body, and thus subject to one man - one vote.<sup>99</sup> It can readily be seen that a rather broad definition of governmental powers was used.

Hadley was the last case in which the Court took the opportunity to define governmental powers with respect to local reapportionment.<sup>100</sup> Various District Court and Appeals Court opinions have both broadened and restricted the Hadley definition.<sup>101</sup>

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<sup>99</sup>Ibid., at 54. '

<sup>100</sup>Two cases decided in early 1973 touched on the subject of government powers, but appear to have only limited application. The cases, Salver v. Tulare Water Storage District 410 U.S. 719 and Associated Enterprises v. Toltec Watershed 410 U.S. 742, concerned themselves with the apportioning of votes according to acreage owned. The Court ruled that one man - one vote did not apply because of the authority of the districts and lack of "governmentality," 410 U.S. 719 at 728.

<sup>101</sup>Leopold v. Young 340 F. Supp. 1014 (1972); Powers v. Maine School District 359 F. Supp. 30 (1973); Barnes v. Board of Directors, Mount Anthony Union High School District 418 F. Supp. 845 (1975); and Baker v. Regional High School District, 520 F2d 799 (1975) have all indicated that the definition of governmental powers should be broadened so as to include many more state political subdivisions in the one man - one vote apportionment category. Lockport, New York v. Citizens for Community Action 430 U.S. 259 (1977) touched briefly on the subject, but did not fully investigate it so as to make a change in the definition. Burton v. Whittier Vocational School District 587 F2d 66 (1978) has restricted the definition of governmental powers to the point of excluding taxing powers as a qualification.

In 1975, the Court had the opportunity to rule on a rather restrictive definition of governmental powers, but denied a writ of certiorari without comment.<sup>102</sup> In 1978, the Appeals Court<sup>103</sup> for Michigan affirmed a District Court opinion<sup>104</sup> which stated that the power to tax does not constitute an exercise of governmental power:

The committee here is no more "legislative" in character than the County School Board in Sailors which had the power to levy taxes.<sup>105</sup>

Today, there is a clear opportunity for the Court to refine its definition of "government" on the local level.<sup>106</sup>

Aside from questions of the applicability of one man - one vote to local bodies and the various caveats that arise with respect to the opinions and definitions that are formulated, there is the question of the numbers involved--how large a deviation in population in each district is allowed in these representative bodies. Unlike state and congressional apportionment cases, those that deal with local apportionment have given little attention to "exactitude." Perhaps one may surmise that the courts feel that local bodies are more closely based on interests and, therefore, that one man - one vote rules need not be applied so vigorously.<sup>107</sup>

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<sup>102</sup>Baker v. Regional High School District 520 F2D 799, at 800. Certiorari was granted in 96 S. Ct. 422.

<sup>103</sup>Burton v. Whittier 587 F2d 66.

<sup>104</sup>Burton v. Whittier 449 F. Supp. 37.

<sup>105</sup>Ibid., at 39.

<sup>106</sup>Tangential to the definition of governmental powers is the sense of the Court as to the degree of discretion local bodies should be allowed in their duties. In Lockport v. Citizens 430 U.S. 259, the Court made clear the "wide discretion" that state governments have in forming and allocating governmental tasks. 430 U.S. 259 at 269.

<sup>107</sup>cf. earlier discussion on Sailors and Burton v. Whittier 587 F2d 66 at 69.

The cases that have presented quantitative limits are Abate v. Mundt,<sup>108</sup> Leopold v. Young,<sup>109</sup> and Burton v. Whittier.<sup>110</sup> Abate upheld a county legislative plan that allowed 11.9% population deviation.<sup>111</sup> (That the Court gave no indication of an upper limit may have shown a certain willingness to compensate for future population changes and shifts.)<sup>112</sup> Leopold concerned itself with a unified high school district comprised of small constituent towns: the largest district was underrepresented by 43.0% and the smallest district was overrepresented by 31.0%.<sup>113</sup> The district apportionment plan was struck down in this case. Burton concerned itself with a school district in which one of the constituent towns held 41% of the population but had only 15% of the representation.<sup>114</sup> This plan was upheld by the Court of Appeals and has not yet been taken to the Supreme Court. Both Leopold and Burton were based on different definitions of governmental power, and were decided by lower courts. For all practical

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<sup>108</sup>403 U.S. 182 (1971).

<sup>109</sup>340 F. Supp. 1014 (1972).

<sup>110</sup>587 F2d 66 (1978).

<sup>111</sup>403 U.S. 182 at 184.

<sup>112</sup>Ibid., at 186

<sup>113</sup>340 F. Supp. 1014 at 1017.

<sup>114</sup>587 F2d 66 at 67.

purposes, therefore, standing total maximum population deviation seems to be indicated in Abate at 11.9%

In the local apportionment debate, the Court has devised several tests, each of which is in various stages of development. The administrative/legislative distinction, which surfaced in Sailors, continued in slightly changed form two years later when the governmental functions debate began in Hadley. Sailors also began the elective/appointive distinction: this doctrine still survives in good shape in Burton v. Whittier. A third test, general function v. special function, surfaced most recently on the Supreme Court level in 1973:<sup>115</sup> while it may lead to some unwanted entanglements for the Court, it appears that it may be more viable than the elective/appointive test.

#### Summary of Local Redistricting

As compared with state legislative and congressional reapportionment, the Court has: (1) shown less interest; and (2) not applied one man - one vote guides with such precision (or fervor). While Sailors did establish that the Equal Protection Clause does extend to local governmental bodies, later cases have continued to raise questions that weaken the position of the Clause in relation to local units. The cases do not center around the applicability of the Clause to local units, but rather around definitions of local government and questions of the power that states should have in deciding the duties of local political subdivisions.

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<sup>115</sup>cf. n. 15.

The debate as to what constitutes a governing body has continued and grown since its inception in 1968. After discarding several early definitions, the Court has begun to settle on a definition of general governmental powers that includes, most significantly, the power to levy taxes and set budgets.<sup>116</sup> (Recent lower court opinions, however, denied to some bodies the title to governmental powers even though they have the power to tax.)<sup>117</sup>

One man - one vote, therefore, exists on the local level; but in a much looser form. Population equality is a factor; but local interests and traditions have also been allowed to play a part in the determination of the representative nature of local governing bodies.

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<sup>116</sup>Abate, supra, n. 4.

<sup>117</sup>Burton, Supra, n. 25.



A BRIEF HISTORY  
OF  
APPORTIONMENT AND DISTRICTING IN THE UNITED STATES

OVERVIEW

The "Reapportionment Revolution" of the 1960's--a series of Supreme Court decisions that enforced equal population as the basis for the allocation of legislative and congressional seats--marks a watershed in the theory and practice of representative government in this country. Population was only one basis for apportionment prior to 1964. Land--units of territory, such as counties or parishes or townships--had served as another, often competing basis.

The proper weight that should be given to population or to land in apportionment had always troubled representative governments. In England, the "rotten borough"--Old Sarum, a medieval town that had lost its population, but not its parliamentary representatives, was the classic example--became an issue of controversy as early as the 17th Century.<sup>1</sup> In America, the colonies also used both population and land units as bases for apportionment. Controversies arose, even then, over the population inequities of land-based systems. Thomas Jefferson, for example, sharply criticized Virginia's county-based system (in which the smallest county had 951 voters, while the largest had 22,105), because "among those who share the representation, the shares are unequal."<sup>2</sup>

The Northwest Ordinance of 1787 established a population basis for the apportionment of territorial legislative seats ("one for every 500 free male inhabitants"). But the U.S. Constitution, guaranteeing two U.S. Senators to each state, regardless of population, returned to a partially land-based system.

After 1787, state legislatures differed widely in apportionment practices. A majority of the states admitted to the Union employed population as the basis for apportionment; but several states followed the "national plan" of basing one house on population, the other on land units; and others, although they employed population as the principal basis for apportionment, modified it with requirements that each county have a minimum of one representative or that no county have more than some set maximum of representatives.

In the 20th Century, land-based systems of representation came under increasing pressure: mass movements of population and the growth of great industrial centers produced ever greater population disparities among counties and other electoral units in the states. Yet state legislators, because they owed their election to the existent system, were often unwilling to reapportion. Indeed, in several states, rurally-dominated legislatures sought to perpetuate themselves by adopting new land-based apportionment schemes or by freezing existing plans into law.

Finally, in the 1960's the U.S. Supreme Court acted to impose population as the basis of representation. The doctrine of "one man - one vote" was used to compel states to apportion both houses of their legislatures on population and to create substantially

equal state legislative and congressional districts. Land units--with the exception of the states, whose status was guaranteed in the Constitution--lost their role in the federal-state representative system.

Judicial intervention failed to end the controversy surrounding questions of representation. Indeed, new issues, debated with no less heat than in former eras, followed fast upon the Court's decisions. Today, reapportionment and redistricting remain at the center of political battles in every state in the Union.

The purpose of this brief history is to introduce the general reader to some of the main themes in redistricting, from the earliest times forward.

#### The Early View: What is Representation or What Should be Represented?

To understand the early American view of apportionment, it is first necessary to gain some perspective on what Americans then meant by the concept of "representation." The justification of modern representative government rested then, as it does now, on the ideals of direct, participatory democracy--but, at the same time, on its absolute impracticality. The people are sovereign; but if they attempt to exercise that sovereignty by deliberating as a collective body, government would be utterly impossible. The people are therefore understood to select representatives who are their surrogates and by virtue of that status accountable to the people. In this sense, the representative is not so much a representative of "the people" as he is a representative of the opinions, attitudes, and the interests of a particular people who live in a particular place.<sup>3</sup>

Consistent with this view of representative government, the early Americans seemed to recognize three principal bases for the apportionment of representation: population, taxable income and local communities. Controversy arose on the question of what role each of these should play in a particular system of representation.

The usual arguments for representing territory or political subdivisions as well as relative population turned on the perceived differences within each state. The social and economic and political interests of the coastal towns and counties, for example, were seen as different from those of the hinterlands. What was considered significant to the larger cities was quite different from the smaller towns and rural areas, since one was the center of trade and commerce and the other of agriculture. The population of the cities might also be composed of a greater percentage of "newcomers." Similarly, the urban and rural areas might have different understandings of how to distribute the unsettled land of the state or of the future of "the western lands." To link representation to population alone, then, would be to give the larger cities disproportionate influence in deciding policies that would affect the entire population of the state. As was noted by John McMahon in 1813 in his description of the government of the State of Maryland:

...for a long time anterior to the Revolution the same equality of county representation prevailed, and the same number of delegates were allotted to each county. This was the system under which the

Framers of the Constitution had grown up....

It was also accommodated to their shore and county jealousies;...It is probable that any attempt to repudiate it, and to substitute in its stead a representation based upon territory, property, or population, or on a ratio compounded on any or all of these, would have alienated the affections of many of the inhabitants, would have alerted the jealousies of the smaller counties and would have left the state the prey of internal dissensions.<sup>4</sup>

The representation of territory, therefore, was thought to be the necessary means to secure the loyalty of the citizens and to insure an adequate representation of the variety of opinions throughout the state. To add to the representation of counties or other political subdivisions, in this perspective, was no more than to affirm their "right to be heard."

The issue of malapportionment, or blatant overrepresentation of the rural areas, was only occasionally raised in the early period. Always, in those days, there were more rural than urban counties in a state: the smaller counties were therefore indeed more "representative" of the population of a particular state than the cities or commercially oriented counties.

There is evidence of wide popular support for the broad notion that representation should somehow be allocated by reference to areas and interests of the state as well as by reference to population. Yet the precise balancing of the factors of geographic area and population was recurrently an issue of controversy.

Almost all the states were sharply divided into urban and rural areas; and the adjustments necessary to achieve an appropriate balance between them were difficult and frequently controverted. From the very beginning, then, the battle over apportionment was drawn over the competing interests of these two camps.

Even though there was a general consensus regarding the nature and needs of representation, the disputes as to how to implement the particular districting plans promoted substantial variations in practice. To explore these differences and to broaden our perspective on the period, it is instructive to review the constitutional provisions of the original states in some detail.

#### The Original 13 State Constitutions

The original apportionment provisions, as we have already suggested, generally aimed to balance three factors: (1) population, (2) citizens with some financial stake in the state, and (3) significant divisions of interest or opinion identified with particular areas or political subdivisions. Reflecting these concerns, most states chose, in one or both legislative chambers, to guarantee to their important political subdivisions either equality of representation, or at least, a degree of representation, irrespective of the distribution of population. (See Chart 1.) The only consistent rule in this period, however, was the rule of variety and experimentation. Delaware, for example, guaranteed each county equal representation in both houses. Since Delaware had ten counties, this formula meant a Senate of 30 members (3 per county) and a Lower House of 70 representatives (7 per county).<sup>5</sup> Both the Upper and Lower House legislators were elected at-large within their counties. In four other states

# CHART 1

## Apportionment Formulae of the Thirteen Original States (1790)

<u>Apportionment Formulae</u>	<u>Upper House</u>	%	<u>Lower House</u>	%
Equality of County or Town	Delaware North Carolina Rhode Island Georgia New Jersey	38%	Delaware Connecticut New Jersey	23%
Combination of (1) County guarantee of <u>minimum</u> representation	Maryland South Carolina Virginia	23%	New Hampshire Georgia Maryland Massachusetts New York North Carolina South Carolina Virginia Rhode Island	70%
By District, apportioned to taxable inhabitants. Each County guaranteed minimum representation	Massachusetts New Hampshire Pennsylvania	23%	Pennsylvania	7%
By District, apportioned by population of freeholders	New York	7%		
Elected at-large	Connecticut	7%		

Sources: Benjamin Poore, The Federal and State Constitutions, Colonial Charters, and other Organic Laws of the United States (1878).

Francis N. Thorpe, The Federal and State Constitutions, Colonial Charters, and other Organic Laws of the States . . . (1906).

(Georgia, New Jersey, North Carolina, Rhode Island) political subdivisions were guaranteed equal representation only in the upper house. Probably the most frequent practice was to guarantee each county (or town in Massachusetts, New Hampshire and Connecticut) at least one representative and then to apportion more representatives as population disparities required. This usage varied in both directions, but two examples will illustrate: in Pennsylvania, a state with a population of 300,000 dispersed over eleven counties, the lower house was apportioned in two stages. The first stage was to guarantee to each county and to the City of Philadelphia at least one representative; the second stage allotted additional representation to counties on the basis of the number of taxable inhabitants.<sup>6</sup> In the Constitution of South Carolina, on the other hand, each parish was given from one to three representatives, depending on population, with an additional guarantee that the parish of Charleston--the largest metropolitan area of the South--would receive fifteen representatives.<sup>7</sup>

In all of these constitutional schemes, the essential ingredient was the provision for as broad a basis of representation as practicable. Recognizing the striking differences, both social and economic, among the many heterogeneous areas within the states, and given their different and often conflicting political interests, representation seemed to require much more than attention to the number of voters. The interests of the coastal towns were frequently in tension with, and, indeed, sometimes in direct competition with the counties and towns of the



hinterlands. What was considered necessary policy to the centers of trade and commerce was, therefore, often contradictory to the fundamental needs of the agricultural areas. Equally threatening, the population of the cities might be composed of a greater percentage of "newcomers," leading the cities to take a different interest in distributing the unsettled lands of the state or in negotiating with other states over the use and development of the disputed "Western Lands." It was then generally thought that, if representation were linked solely to population, the larger cities (the ports of entry) would have disproportionate influence in deciding policy affecting the entire state. More specifically, if policy in any way adversely affected the value of land, it might drastically affect the fortunes of less populous areas and counties of the state.

#### THE ISSUE OF MALAPPORTIONMENT AND DISTRICTING

The question remains: did these complex early apportionment formulae lead to malapportionment or to large disparities in population in the various legislative districts?

#### The State Legislatures.

In the four most populous states--Massachusetts, Pennsylvania, Virginia and North Carolina--there can be no question that malapportionment was significant. In the remaining smaller states there is, with the exception of Rhode Island, some doubt.<sup>8</sup> Although relevant information is scanty, the great majority of the states rarely drew radically new district lines. Generally, they chose to follow established county and city boundaries; this was done even in those states where counties or cities were not

guaranteed equal or minimal representation.<sup>9</sup> These original counties, of course, had generally been drawn with some reference to population--when estimates were available--but they also recognized geographical restraints (mountains, forests, rivers and other natural obstacles to transportation and commerce). Legislative districts conformed to such traditional political boundaries, then, rarely possessed exactly equal population. It would be unfair, however, to be too critical of these practices. Population estimates in the period were either unavailable or unreliable; only two state constitutions required periodic censuses (and their methodology is unknown). Moreover, the counties were the basic units of state administration and, as such, were designed for the convenience of their residents: since voting booths were located at the County Court House or Sheriff's office, the general rule of thumb seems to have been that all voters should be within a half-day's travel of these centers of local government.<sup>10</sup>

In the less populous states, therefore, the process of districting did not seem to give rise to significant malapportionment. At least, it appears that rural counties, and thereby the majority of legislative districts, were roughly equal in population. In the larger states with the high density urban areas along the coast and inland port towns, however, malapportionment was frequently the rule:<sup>11</sup>

<u>State</u>	<u>Smallest County</u>	<u>Largest County</u>	<u>Ratio</u>
New Jersey	2,571	20,153	7.8 to 1
Maryland	4,809	30,791	6.4 to 1
North Carolina	3,071	15,828	5.6 to 1
Virginia	951	22,105	23.2 to 1

It should be noted, of course, that population totals were not the prime consideration in this period. Until the 1830's, all the states restricted suffrage to male, twenty-one year olds (in two states, eighteen if married) who had resided in the state for usually more than three months (in six states, one year), and who could also demonstrate some financial stake in the community (generally, cash or property valued at 50L or more). The net effect of these restrictions, of course, varied from state to state or from region to region within the state, depending on the economy and character of the population. In Georgia, where rural land was relatively inexpensive, a county of 200 people might have only ten "rateable polls" (qualified voters); the other extreme might be found in the State of Massachusetts, where in a town of 250 males, there might be 150 qualified voters.

#### Congressional Districts and Malapportionment.

What was true for the state legislative districts was frequently untrue for the congressional districts. Each state was guaranteed in Article I of the U.S. Constitution one congressional representative regardless of population. In the less populous states, then, congressmen were elected at-large; but, even in states where the delegation included as many as four representatives (for example, in New Jersey and Georgia), congressmen were frequently elected without use of districts. It was not until 1842, and then only as the result of a federal statute, that all the states elected their congressmen by districts. The states (Virginia, Massachusetts, Pennsylvania, North Carolina and New York) that chose to assign districts followed the pattern used

for state legislative districting: thus the levels of congressional malapportionment were in these cases generally similar to those in the state legislatures.

#### The Processes of Reapportionment and Redistricting.

Despite the presence of significant malapportionment, only four states (New Jersey, New York, Virginia and Connecticut) constitutionally provided for legislative adjustment of apportionment formulae or districts.<sup>12</sup> In the remaining nine states, it was possible to alter the apportionment formula only through the extraordinary means of constitutional convention.

#### THE POLITICS OF APPORTIONMENT: THE EARLY PERIOD

Whatever political consensus was reflected in these early constitutional provisions was, at best, tenuous. In many states, significant controversy soon arose, even in the same year the constitution was ratified. Political, geographic or economic interests became disenchanted and then organized attempts to amend or to abandon the constitutional formulae. The controversies often turned on population: either the formula did not accurately reflect population or it gave it too much influence. Again, conflict between urban and rural counties was generally at the nub of the matter.

This fundamental conflict--traditionally referred to as Piedmont (rural areas) versus Tidewater (coastal areas)--is visible in American politics from the earliest colonial periods. The classical example of the struggle is found in Virginia and in the Carolinas; but most elements of the struggle were also present

in Maryland, Pennsylvania, New Jersey and Georgia--indeed, to some degree, in nearly all of the states.

Georgia, a Case History.

One of the best examples of such struggles is the apportionment battles of Georgia and the rivalries between the tidewater area along the coast, the pine barrens or coastal plains just beyond, and the piedmont extending into the wilderness above the fall-line.<sup>13</sup> The conflict of these areas furnished the basis for the sectional struggles of Georgian politics from colonial times to the Civil War. As soon as the settlers were allowed to introduce slavery into the colony, and the low lands were laid out into plantations, the yeoman found it to his advantage to push further into the pine barrens where land was cheaper, though often less fertile. While the piedmont region was not ceded to Georgia by the Indians until 1773, the upper two regions of the State increased rapidly in population during the course of the Revolutionary War and the early 19th century. As early as 1790, the center of population in the State had changed from the tidewater to the up-country.

In the wake of this transformation of the State, Georgia adopted four constitutions in the first 22 years of independence. But even these maneuvers did not defuse the issue: the problem of apportionment remained a central problem well into the 1840's. The controversy continued to rage around the central political problem of apportioning representation among the three geographical areas.

The first Constitution of Georgia in 1777 created 8 counties: 5 in the coast country, 2 in the middle region between Savannah and Augusta, and 1 in upper Georgia. In this arrangement, the coast country dominated in legislative representation, since apportionment was based on representation by county (see chart 1 ). In this scheme, each county was apportioned ten representatives, with the exception of Liberty, the seat of Savannah, which sent 14. Realizing that this formula ran in the face of the increasing population growth of the upper and middle regions, the up-country people quickly became dissatisfied with the unequal position they held in the affairs of the State. Unable to change the apportionment formula, however, they at least succeeded in transferring the state capital from Savannah (Tidewater) to Augusta (the middle region) in 1783-84.

Dissatisfaction with the first constitution finally led to a call for a new constitution in 1789. Ostensibly, the State wished to harmonize the State constitution with the new national Constitution; but, again, the real purpose was to adjust the original apportionment formula. The Constitution of 1789 increased the number of counties to 11. Of the three new counties added, two were in the up-country and one in the middle-country. It also provided that new counties could be added by simple vote of the legislature. Despite this reformation of the apportionment formula, it is quite clear that the Tidewater retained its advantage. A study of Chart 1A shows that the middle and up-country counties combined approximately five-times as many white inhabitants and one-and-one-quarter-times as many slaves as the Tidewater, but

CHART 1-A

	<u>Tidewater</u>	<u>Middle Country</u>	<u>Up-Country</u>
Whole Population	21,536	25,336	37,946
White Population	9,025	17,584	29,145
Slave Population	12,511	7,952	8,801
Federal Numbers*	1,631	22,155	33,426
Representatives in State Assembly	13	12	9
State Senators	5	3	3

\*"Federal Numbers" is the basis of apportionment used in apportioning representatives in Congress: total free population plus three-fifths slave population.

Source: Lucien Roberts, Studies in Georgia History and Government, p. 96.

had only one-and-one-half-times as many representatives in the lower branch of the legislature. In the state senate, the Tidewater had 5 members and the other two sections combined had only 6.

With these new provisions 7 new counties were created between 1790 and 1795. Three of these were in the up-country, 2 in the middle country, and 2 in the Tidewater. The new middle and upper counties were created in newly settled territory; the old counties of the Tidewater were beginning to carve themselves into small units, not because of population increase or convenience in government, but for the purpose of maintaining the section's influence in legislation. Here, perhaps, is the beginning of the clear use of districting for political advantage.

In 1795 a new constitutional convention was convened to address the issue of representation. No less than four proposals for representation to give the up-country counties a fair apportionment were defeated before a workable compromise was reached. A proposal to abolish the bicameral system of representation and to return to unicameralism was defeated by a vote of 44-11. A proposal that representation in the Senate be based on population was defeated by a margin of only 10 votes. It was then proposed that representation be placed on the basis of a census. This method was voted down by a much narrower margin, 28-27. A struggle then began to separate the state into two representative districts, the upper with 28 members and the lower with 24 members. This plan, also, was defeated by a narrow margin. Finally, by a vote of 29-26 it was decided to apportion representation to the counties without regard to population. On this basis, the lower counties



received 25 representatives and the upper counties received 26. The Tidewater won a moral victory in maintaining that representation should not be based on population, and the up-country gained a material advantage of a one-vote margin in the House of Representatives.

The Convention of 1795 specified that a convention for the consideration of further changes in the constitution should meet in 1798. Again the issue was representation, and again the up-country succeeded in altering the formula to its advantage. In this new formulation the constitution provided that a Senate should be elected annually and composed of one member from each county. The House of Representatives was to contain members chosen from the counties according to the principles of Federal districts. Reapportionment, based on a state census, was provided for every seven years. According to this provision each county containing 3,000 population was entitled to 2 representatives, each county containing 7,000, 3 representatives, and those containing 12,000, 4 representatives. Each county received at least one representative and no county was allowed more than four.

The Federal census of 1800 revealed that the five low-country counties had a population of approximately 14,000, and the seven up-country counties had a population of approximately 50,000. Such figures clearly indicated that, in the process of admitting new counties, the Tidewater had managed to maintain the same system of inequalities in evidence since 1790. By the end of the century, however, the tendency seemed to be toward a gradual increase in up-country power. The larger number of new counties

had been created there, and even the actual apportionment of the convention of 1798 gave an advantage to the newly created low-country counties. The provisions for the future apportionment made it possible for the up-country gradually to increase in power by the creation of new frontier counties.

#### THE NORTHWEST ORDINANCE OF 1787

The Northwest Ordinance is popularly regarded as the first "national" statement on the issue of apportionment in state legislatures. Passed by the Congress constituted under the Articles of Confederation, the Ordinance is held by many commentators to represent a decisive watershed, for it mandated that apportionment be determined by population.<sup>14</sup> The Warren Court has further enhanced this view, for it centered much of its historical analysis on the Ordinance.<sup>15</sup> Whether this version of the importance of the Ordinance is justified is, however, more than a little questionable.

If the standard of "apportionment by population" is not too rigorously defined, the document certainly deserves its reputation. The Ordinance specified that the "inhabitants of set Territories shall always be entitled to the benefits . . . of a proportionate representation of the people in the legislatures," and provided the following mechanics of apportionment:

So soon as there shall be 5,000 free male inhabitants of full age, in the districts, upon giving proof thereon to the governor, they shall receive authority, with time and place, to elect representatives from their counties or townships to represent them in general assembly:

Provided, That for every 5000 free male inhabitants there shall be one representative, and so on, progressively, with the number of free male inhabitants, shall the right of representation increase, until the number of representatives shall amount to 25; afterwards the number and proportion of representatives shall be regulated by the legislature--....<sup>16</sup>

This represents the first formal and official proclamation that population should form the sole basis for apportioning legislative representation. When this document is coupled with the rise of Jacksonianism--the extension of the suffrage and the "direct democracy" movements of the 1830's--it does, indeed, seem to represent a decisive, even momentous step toward a new system of apportionment.

In the wake of the reapportionment cases of the 1960's, this interpretation gained a considerable following. It was argued that subsequent to the new formula of apportionment, the state legislatures were "almost completely or predominantly" apportioned according to population; whatever malapportionment later emerged in the states, therefore, emerged in violation of an accepted basic principle. The analysis is supported by only part of the available evidence. (See Chart 2.)

The Institutions of Apportionment and the Northwest Territories.

The Ordinance's reliance on population as the one significant element in determining apportionment was partly a response to the controversies raging in the original states. Congress clearly hoped that the settlements, and the states eventually to be carved out

# CHART 2

## Apportionment Formulae of State Legislatures in Original Constitutions

<u>Apportionment Formulae</u>	<u>Upper House</u>	<u>%</u>	<u>Lower House</u>	<u>%</u>
Representation of subdivisions No regard for Population	Connecticut (1662) Delaware (1776) Louisiana (1812) Montana (1889) New Jersey (1776) North Carolina (1776) Rhode Island (1663) Virginia (1776)	16%	Connecticut Delaware New Jersey North Carolina	8%
Representation of subdivisions Some provisions for Population	Arizona (1912) Hawaii (1959) Maryland (1776) South Carolina (1790)	8%	Georgia Maryland Vermont Virginia	8%
Representation based on Population	Illinois (1818) Indiana (1816) Kansas (1848) Nevada (1867) New Mexico (1912) New York (1777) Ohio (1805) South Dakota (1889)	16%	Illinois Indiana Kentucky Louisiana Minnesota Nevada New Hampshire New Mexico New York Ohio Pennsylvania South Dakota Tennessee Texas Washington	30%
Combination of (1) Population (2) Political subdivision, where subdivision predominates.	Alabama (1819) Arkansas (1836) California (1850) Colorado (1876) Florida (1845) Idaho (1890) Iowa (1846) Kentucky (1792) Maine (1820) Massachusetts (1780) Michigan (1837) Mississippi (1871) Missouri (1821) North Dakota (1889) Oklahoma (1907) Oregon (1859) Tennessee (1796) Texas (1845) Utah (1889) West Virginia (1863) Wyoming (1890)	42%	Alabama Arizona Arkansas California Colorado Florida Hawaii Idaho Iowa Kansas Kentucky Maine Massachusetts Michigan Mississippi Missouri Montana North Dakota Oklahoma Oregon Rhode Island Utah Wyoming	46%

## CHART 2

(Cont.)

<u>Apportionment Formulae</u>	<u>Upper House</u>	<u>%</u>	<u>Lower House</u>	<u>%</u>
Combination of	Alaska	(1959)	Alaska	10%
(1) Population	Minnesota	(1858)	Nebraska	
(2) Political	Nebraska	(1867)	South Carolina	
subdivision, where	New Hampshire	(1784)	West Virginia	
population predominates	Washington	(1889)	Wisconsin	
	Wisconsin	(1848)		

of this territory, would avoid the conflict that had arisen elsewhere. But this does not necessarily mean that population was considered by the Ordinance the sole factor appropriate to apportioning representation. It should not be forgotten, for example, that the Northwest Ordinance devised a plan of government for a sparsely settled territory largely devoid of political tradition, of established local units, of deep-seated sectional loyalties and of the other multifarious elements that complicated apportionment in longer established societies. In this era, the only readily identifiable factor in the territory would have been population; but the document is relatively clear that this "population" was to "elect representatives from their counties or townships," thus creating a system of representation not unlike those of the original states. A review of the actual practice of apportionment and districting in these original territories and in the states that emerged from them confirms this view.

The original constitutions of the five states carved from the Northwest Territory--Ohio, Indiana, Illinois, Michigan and Wisconsin--shows that the principle of "apportionment representation" was interpreted quite loosely. The constitutional provisions of all these states stipulated that apportionment was to be based on population; but they simultaneously imposed the following restrictions:

- \* County lines could not be violated in drawing district lines.

- \* The provision of equal representation was approximated by grouping less populous counties into one district.

\* Populous counties elected representatives in multi-member districts.

#### The Issue of Malapportionment and Districting.

The constitutional provisions of these new states rarely produced significant malapportionment. Again, we lack much of the necessary information; but we do know that county lines were frequently redrawn to reflect increases in population. Most of the evidence suggests that the most extreme population variance ratios in legislative districts did not exceed 2.5-1. Compared with the situation in the original states, the districts in the Ordinance territories and state were indeed "as equal as possible."

#### The Politics of Apportionment.

Since the population and economies of the five states were generally homogeneous, they rarely experienced the complex political intrigues involved in the apportionment politics of the original thirteen states. The new states complied with their constitutional provisions and reapportioned--or more precisely, redistricted--as each five-year or ten-year census demanded. There seemed to be little or no controversy surrounding such compliance.

In the absence of heated controversy, history rarely provides details. For this reason, we know very little about these early periodic redistrictings. By 1850, however, some level of economic, political or social diversity had begun to appear in the states of the former Northwest Territory. Imitating the older and established states, the new states now began to alter their formulae of apportionment and districting--and did so with

an eye to political advantage. Ohio, for example, and by 1870, Illinois,<sup>17</sup> changed their constitutions to guarantee each county at least one representative in the lower house, regardless of population. Employing the same arguments used by the original states in the early period, the new states changed their apportionment formulae to guarantee certain interests within the state some "right to be heard." Interestingly, however, these changes generated little controversy. Indeed, apportionment did not really emerge as a controversial issue in these states until the second decade of the twentieth century.

THE FORMULAE OF APPORTIONMENT ADOPTED IN AREAS NOT DIRECTLY  
AFFECTED BY THE NORTHWEST ORDINANCE: 1812-1889

In many respects, this is the most difficult part of our brief history. The years spanned here constituted one of the most turbulent periods in American history; and more states (20) were added to the Union than in any other era. Our principal focus is on the states admitted to the Union that were not directly influenced by the provisions of the Northwest Ordinance. Institutions of Apportionment.

Although the Northwest Ordinance was originally written to affect only the first states organized and admitted into the Union, it became the model for all such legislation. It was used to organize the territories that later became Alabama, Mississippi and Arkansas; the territories acquired in the Louisiana Purchase (14 states); the territories purchased from Spain (Florida); and the territory acquired through the Mexican-American War (3 states).



The legislation organizing the Territory of Alabama is an example:

The government when formed shall be republican, and not repugnant to the principles of the Northwest Ordinance of 1787 (Article II) which provided for a "proportional representation of the people in the legislature."<sup>18</sup>

The spirit, and frequently the letter, of the Northwest Ordinance apportionment formulae were also reproduced in these states' original constitutions. Louisiana's Constitution of 1812 (the first territory absorbed as a state) included the following provision governing representation:

Representation shall be equal and uniform in this state, and shall be forever regulated and ascertained by the number of qualified electors therein.<sup>19</sup>

To implement the provision, Louisiana became the first state to require a census every four years; for the first time, reapportionment and redistricting of a state legislature were constitutionally tied to population. There was also some effort made to prevent the legislature from failing to reapportion: the Louisiana Constitution of 1812, for example, intentionally restricted the size of the lower house and limited the creation of new counties.

Similar or identical provisions were faithfully employed by a number of states created in this era. Whether the reapportionment formulae were accurately translated into practice, however, and whether the districts could be described as "nearly equal as practicable," is unknown, for the census data is simply unavailable.

Even though the states admitted into the Union during this era were substantially affected by the proportionate representation standards of the Northwest Ordinance, this era also saw experiments with a number of other factors. Some analysts have argued that "between 1790 and 1889 no state was admitted to the Union in which the original constitution did not provide for representation principally based on population in both houses of the legislatures;"<sup>20</sup> unfortunately, the record does not substantiate the claim.

The states that were admitted prior to the 1840's, and that used apportionment provisions based on population, had altered these formulae by the mid-19th century. Louisiana, for example, changed her original provisions to: (1) guarantee that each parish should have at least one representative; and (2) prohibit the creation of new parishes or alterations in the boundaries of established parishes. The net effect of these changes was to protect those regions of the state that were declining in population.

Even before mid-century, moreover, there was a distinct tendency to move away from population as the sole factor in apportionment. The states of Alabama (1819), Maine (1820), Missouri (1821), Arkansas (1836), Texas (1845), Florida (1845), Iowa (1845), California (1850), all linked representation to their counties in some way, in most cases with restrictions that each county would be guaranteed at least one representative. The obvious intention of these provisions was to reduce the impact of population growth: and, of course, malapportionment was the

result. These later constitutions also coupled such provisions with restrictions on districting (for example, no rotation of county lines, or if a county was to be represented by more than one representative, no violation of city boundaries) that tended to exacerbate the malapportionment.

#### The Politics of Apportionment.

In many ways, this era is best viewed as the "calm before the storm." In the next period of reapportionment, beginning in the late 1880's, the majority of states would begin a great and decided move away from population. Prior to the 1880's, the issues of immigration, the rise of the great metropolitan centers, the increasing effects of the "Industrial Revolution" were still somewhat ambiguous. Nevertheless, it is clear that the direct effect of the standards of population was diminishing even before 1880: even by mid-century, there were harbingers of what was to come.

The radical changes of the reapportionment provisions of the Louisiana Constitution of 1812 are an example. These changes were a direct result of the rural counties' fear of New Orleans. In the first quarter of the 19th Century, as the settlements along the Mississippi began to grow and prosper, New Orleans became one of the great seaports of the United States. The commercial growth attracted population not only from within Louisiana or the South; the City became a haven and workshop for a dozen different nationalities newly arrived on the Continent. As it was expressed at the time, the City was "filling up with all kinds of people"--the kind of people who might subvert the interests of the rural counties to meet their own, sometimes desperate needs.<sup>21</sup> With

representation geared to population, and reapportioned every four years, New Orleans, with 20% of the State's population, was beginning to dominate both houses of the legislature.

The Convention was called by the upstate counties to institute changes before they were overwhelmed. After much heated debate, the Convention focused its attention on two proposals. The first was a "federal plan"--very similar to the form adopted by the states in the early decades of the twentieth century--that would have represented counties equally in the senate and based apportionment according to population in the house. But this did not satisfy the rural counties for it would have guaranteed, and perhaps expanded, the influence of New Orleans.<sup>22</sup> The rural counties would only accept the provision, eventually made law, that each parish should be guaranteed representation. As a consequence, New Orleans was granted only 4 senators and 9 representatives--in a legislature of thirty-two senators and from seventy to one-hundred representatives. This kind of political battle was not restricted to Louisiana. The same events were to occur in Illinois, Tennessee, Virginia, and Pennsylvania.

#### A New Element--the Gerrymander.

In 1812, we have the first clear evidence that the politics of apportionment were not restricted simply to manipulation of the formal mechanics of the formula, but also included the criteria of districting. The story describing the origin of the term "gerrymander" is well-known. It was supposedly coined by Gilbert Stuart, an artist, who, looking at a map of the redistricting of a county in Massachusetts, noticed a strangely shaped

district; sketching in a head, wings and claws, Stuart constructed a dragon. A friend, who was enjoying the scene, disagreed and thought it more resembled a salamander; whereup Stuart is said to have re-named the beast after the then governor of Massachusetts, Elbridge Gerry, "Better call it a 'Gerrymander.'"

Since we only have a few of the electoral results, population figures or numbers of qualified voters recorded by districts from any of these early periods, we can only guess at the full story of the manipulation of districting for political advantage. Nor do we know how prevalent it was, or the degree of abuse. From as early as 1800, however, state constitutions registered some interest in the configurations of districts. Yet, whether this was a result of, or the beginning of, "gerrymandering" is unclear.

The early constitutional criteria were relatively consistent: they required (in Massachusetts, New York, Pennsylvania and New Hampshire) that districts be, among other things, "compact" and "of contiguous territory." The general intent seems to have been that the districts, like the county lines on which they were based, should conform to "natural" communities of interest and involve relatively homogeneous populations.

By the 1840's, these criteria seem to be blended with political interest. By that date, the practice of influencing the electoral results through districting is quite clearly in evidence.

THE "LITTLE FEDERAL PLAN" REVOLUTION AND MALAPPORTIONMENT: 1889-1962

The end of the 19th Century is a critical period in the history of apportionment. The states admitted into the Union after

1889 saw a culmination of the movement away from population that had begun in the mid-19th century; they initiated the formal modelling of state legislative apportionment formulae after the federal plan--an upper house apportioned by non-population factors (counties) and a lower house based on proportionate representation (at least to some extent). Imitating the new states, a number of long established states (Connecticut, Nevada, New Jersey, Rhode Island, South Carolina and Vermont) now changed their constitutional provisions. Similar movements, but using somewhat different formulae techniques, were found in the states of New York, Pennsylvania, Ohio and California. A third factor was also added during this period: instead of formally amending the apportionment formula, a number of states (the best examples are Alabama, Delaware, Tennessee, Texas and Illinois), simply stopped reapportioning.

All of these events had similar causes. In the period from 1870 to 1910, the United States was radically transformed by: (1) immigration; (2) rapid economic growth as the result of the "industrial and commercial revolutions;" and (3) the growth of the great cities and metropolitan centers. In the decade of 1820-1830, the United States admitted only 140,000 immigrants; this total grew rapidly through the middle decades of the 19th century; and, after the Civil War, the level of immigration leaped geometrically. In the decade 1880-1890, the U.S. admitted more than five million immigrants and by the decade 1900-1910, the figure had reached 9 million.<sup>23</sup> After the first decade of the 20th century, of course, the Federal immigration laws were drastically reformed

(bringing the immigration totals back to pre-Civil War levels). The first response of the states was to make voting more difficult by increasing residency requirements and instituting more stringent registration requirements. When this was not sufficient, however, the focus changed to reapportionment.<sup>24</sup>

#### The Institutions of Apportionment.

In 1888, there were thirty-eight states in the Union employing a great variety of apportionment formulae. In almost all the states, as we have seen, apportionment, proportionate to population was combined with some representation of political subdivisions. In 1889, 4 states were admitted to the Union (Montana, North Dakota, South Dakota and Washington). North Dakota, South Dakota, and Washington adopted apportionment provisions that were similar to those of the states admitted in mid-century: the legislature was elected from districts that reflected population, but the less populous areas of the state were given some degree of protection. In Washington and South Dakota, district lines were delineated in the constitutions and the reapportionment process--a legislative responsibility requiring use of Federal Census data--was restricted to increasing or decreasing the number of legislators elected from multi-member (floterial) districts. In North Dakota, districts were drawn by the legislature; but it was required that districts should not unnecessarily violate county lines. In each of the states, the maintenance of relatively equal population in legislative districts was the primary focus--but this requirement was balanced by various geographic factors.

The State of Montana, however, adopted a different model, and its practices became the harbinger of the future. When, in 1889, Congress moved to initiate the proceedings to admit the Territory of Montana as a state, the enabling legislation, like so many statutes before it, stipulated that the State's Constitution be "republican and not repugnant" to the principles of proportionate population. But when the state constitutional convention convened, it agreed upon an entirely different principle-- a principle that was, without substantial debate, accepted by Congress. The State was divided into sixteen counties that were, in turn, guaranteed equal representation in the Senate; the lower chamber was modeled after the House of Representatives, with each county being guaranteed one representative (and additional representation apportioned appropriate to population); there were further provisions that the three largest counties should elect representatives from floterial districts and that city boundaries should not be violated by legislative district lines.<sup>25</sup>

This complex formula was adopted in the wake of population growth that had followed the discovery of copper: the new population had concentrated in the three western counties (Butte, Anaconda and Helena). Composed mainly of eastern and southern Europeans, this new population was viewed with a jaundiced eye by the older settlements: it should not be trusted, they decided, with full legislative powers.

This arrangement came to the attention of a number of states that faced the same situation. Rural counties were losing population, in both relative and actual terms, throughout the country.



Indeed, the Federal Census of 1910 was the last to register a majority of citizens still residing in rural areas. The urban areas were filling up with immigrants who might demand a change in state policy. Montana's constitutional provisions found their way, with only slight modifications, into provisions for the new states of Wyoming and Idaho (1890), Utah (1896), Oklahoma (1907), Arizona and New Mexico (1912)--and even Hawaii (1959).

Equally significant, Montana's example was followed by several existing states. New York, in 1894, adopted one of the most complex formulae in U.S. history to accomplish a similar desired effect.<sup>26</sup> Pennsylvania, which had restricted its most populous city and county (Philadelphia) to a maximum of 4 senators in 1838, and had guaranteed each county a representative in the House in 1873, amended again in 1901 to provide that no more than one-sixth of the senators could come from any one city or county.<sup>27</sup> Ohio adopted a similar amendment in 1900, California in 1926, and Michigan in 1952.

California and Michigan present an interesting perspective on this period, for both states changed their apportionment formulae through the initiative process and, in each case, the voters were given a clear choice between continuing a formula based more or less on population or, alternatively, adopting a federal plan. In both states, the voters chose the new formula (California defeated the proposal to continue a population base and to establish a reapportionment commission by a margin of three to two and approved the "federal plan" by a margin of five to four). Both states' new provisions were tested in court (and in California tested by

initiative again in 1928, 1948 and 1960) and upheld.<sup>28</sup>

The period between 1889 and 1962 comes to an abrupt end with Baker v. Carr. To see this decision in perspective, the range of apportionment formulae in use in the states in 1961 should be reviewed (See chart 3).

#### The Politics of Malapportionment.

An almost equal number of states either changed their constitutional apportionment formulae or simply stopped apportioning. The effect was the same: malapportionment as the result of both approaches became more pronounced than in any period of American history.

The motives behind such approaches were clearly political. The "established" political interests sought to disenfranchise the "new" political forces before they could gain a foothold. Without access to the legislatures, the new constituencies could do little to effect change. (These conditions, in turn, provided the basis for eventual judicial involvement.) Such political motivations, however, should not be over-simplified. The radical changes in the apportionment process were a result of equally radical changes in the political environment. A "higher" motive justifying these changes was articulated in the New York Constitutional Convention of 1894:

I insist, sir, upon the principle which has been adopted in a large number of the States of this Union, in almost every state which has had to deal with the problem of a great city within its borders, and the

# CHART 3

## Apportionment Formulae of State Legislatures, Immediately Prior to Baker v. Carr

\*=changed from original Constitution

Apportionment Formulae	Upper House	%	Lower House	%	
Representation of subdivisions No regard to population	Arizona* Arkansas* Delaware Idaho* Illinois* Michigan* Montana Nevada*	New Jersey New Mexico* No.Dakota* Oklahoma* S.Carolina*	Delaware Vermont*	4%	
Representation of subdivisions with some provisions for population.	Hawaii Maryland Mississippi* Ohio*	8%	NONE		
Representation based on population (with disparity of district not less than 25%)	Colorado* Indiana Kansas Kentucky* Massachusetts* Minnesota* North Carolina* Tennessee* Virginia* Washington* West Virginia* Wisconsin*	24%	Colorado Illinois Indiana Kentucky Massachusetts Michigan Minnesota Tennessee Virginia Washington Wisconsin	22%	
Combination of (1) Population (2) Political subdivision, where subdivision predominates.	Alabama California Connecticut* Florida Georgia* Iowa Louisiana* Maine Rhode Island* Texas Utah Vermont* Wyoming	26%	Alabama Arizona Arkansas California Connecticut* Florida Georgia* Hawaii Idaho Iowa Kansas Louisiana Maine Maryland Mississippi Missouri	Montana Nevada* New Jersey* New Mexico* New York* N.Carolina* N.Dakota Ohio* Oklahoma Tennessee* Rhode Island S.Carolina* Texas* Utah W.Virginia* Wyoming	64%

## CHART 3

(Cont.)

<u>Apportionment Formulae</u>	<u>Upper House</u>	<u>%</u>	<u>Lower House</u>	<u>%</u>
Combination of (1) Population (2) Political subdivision, where population predominates	Alaska Missouri* New Hampshire New York* Oregon* Pennsylvania* South Dakota*	14%	Alaska New Hampshire* Oregon* South Dakota*	8%

relation of that city to an agricultural community, that the problem which we have had to deal with shall be dealt with by us on the same principles; that the small and widely scattered communities, with their feeble power, because of their division, shall, by the distribution of representation, be put on an equal footing, so far as may be, with the concentrated power of the cities. Otherwise we can never have a truly representative and truly republican government.<sup>29</sup>

The alterations in the apportionment process, of course, did not go unnoticed. As the states tried to stabilize their institutions in the wake of the social and economic upheavals of the period, the details of decisions and their consequent effects were scrutinized and recorded. Perhaps this accounts for the overwhelming flow of information that was spontaneously generated, really for the first time, on apportionment and districting.

#### The Malapportionment of Congress.

After 1842, when all the congressional seats were elected by district, congressional malapportionment became increasingly apparent in many states. It is not surprising that this generated rising controversy, for the U.S. Constitution stipulates that the House shall be apportioned, once state minimums are fulfilled, by population within the states. Furthermore, in 1901, Congress stipulated in the Reapportionment Act (which was passed to prescribe the number of representatives assigned to each state) that congressional districts were to be "compact, of contiguous

territory and as nearly of equal population as practicable."<sup>30</sup> It remained uncommon, however, for congressional districts in any state, to range in size from smallest to largest by a factor of greater than 5 to 2. There were blatant exceptions, of course. By 1946, for example, the largest congressional district in Illinois included 914,053 voters while the smallest held only 112,116. Other states that declined to reapportion in the face of growing population disparities were not so egregiously out of line: Georgia (823,680 to 272,154), Ohio (698,650 to 163,561), Maryland (534,568 to 195,427), Texas (528,961 to 230,010), Florida (439,895 to 186,831).<sup>31</sup> When the Supreme Court in Colegrove v. Green<sup>32</sup> refused to mandate reapportionment, most of the states continued their policy of neglect.

Congressional districts throughout this period were drawn by state legislatures, which were themselves "malapportioned." The criteria of districting were not uniform, but most of the states drew congressional districts enclosing several state senate districts--unless, of course, the urban/rural split meant drawing around the metropolitan areas.

There were, nevertheless, several attempts to rectify congressional malapportionment before the Court intervened in Wesberry v. Sanders in 1964.<sup>33</sup> In 1936, a bill was introduced in Congress that called for at-large congressional elections if the population of the largest congressional district exceeded the smallest in a given state by more than 50%. Other bills, modeled after this first bill, were introduced in the late 1940's and 50's and called for reapportionment, sometimes with and sometimes with-

out specifying appropriate remedies or penalties. In every case, the bills failed to reach the floor of the House.

#### The Malapportionment of the State Legislatures.

In the state legislatures, malapportionment varied widely from state to state. None of the states employed criteria of apportionment for districting that fulfilled the requirement of the Supreme Court's "one-man, one-vote" ruling in Reynolds v. Sims; but neither were all the states equally malapportioned. Only Delaware failed to recognize some degree of population variance in either house and only thirteen states failed to apportion at least one of their houses by population. In addition, only ten states went without apportioning or reapportioning one of their houses for more than forty years. In 1962, then, there were twenty-seven states that made some allowance for population.

The levels of malapportionment were, nevertheless, pronounced. There are two studies that provide national perspective. Research funded by the University of Virginia, revealed that after the 1960 Census, counties with less than 25,000 people had more than double the representative strength of counties with more than 100,000 people in state legislatures.<sup>34</sup> Using somewhat different criteria, the National Municipal League issued a report in 1962 showing that in only six states were both houses of the legislature apportioned so that at least 40% of the state's population was needed to elect a majority of representatives in each.<sup>35</sup> Only twenty states had even one house for which at least 40% of the electorate was required to elect a legislative majority. Finally,

in thirteen states, one-third of the population or less could elect a solid majority of both houses of the legislature (see chart 4 ).

#### THE POLITICS OF REAPPORTIONMENT AND DISTRICTING: 1962-1970's

Only some of the more important issues of this era will be touched on in this account. The complex legal maneuvering is analyzed in a succeeding chapter on "Reapportionment, Redistricting and the Law." Despite the overriding significance of these legal questions, however, political maneuvering played an important part. It is best understood if separated into three periods:

- \* From Baker to Reynolds.
- \* The political response to Reynolds.
- \* The Reapportionment after the 1970 Census.

#### From Baker to Reynolds.

With our acquired historical perspective, Baker v. Carr can be appreciated in its full importance--as a new, sweeping restructuring of the apportionment process. What is equally remarkable, perhaps, is the unprecedented rapidity and scope of the states' responses to Baker. Once the deadlock of the first 60 years of the Twentieth Century was broken, the states quickly concentrated on erecting a new system. By late 1963, reapportionment was on the agenda of all but three of the states (none of these three had scheduled sessions), and twenty-six had approved redistricting plans for at least one of their legislative chambers. Confusion, with equal measures of anger and enthusiasm, abounded; but, in one way and another, the states complied with the Courts' mandates.



Baker itself was a relatively limited decision; although reapportionment was declared a justiciable issue, the Court had not articulated clear criteria for the creation of "equal population districts." The reapportionment revolution would unfold in several stages; and, from 1962 to 1964, the states were given latitude for experimentation. This early stage laid the basis for the modus operandi of the Court's involvement: the states would try to experiment within the horizon of each successive court pronouncement, which would, in turn, give rise to new litigation and new judicial criteria to guide the states' new effort. A short list of the issues first raised in this early period will suffice:

- \* What was the appropriate base population for reapportionment? Would it be constitutional to base it on registered voters, and to exclude students, military personnel or aliens? Was it necessary to use the Federal Census data? ..

- \* What was the minimum allowable ratio of disparity?

- \* What was the status of political or traditional subdivisions?

- \* What was the status of party competition, current districts or party registration?

#### Reynolds v. Sims and the Political Backlash.

This era of relative freedom ended abruptly on July 15, 1964, with Reynolds' decision that declared all geographic and demographic dispersion formulae unconstitutional. More significant to the political history, the Court ruled using the Equal Protection

Clause of the Fourteenth Amendment. Such a ruling severely restricted the options of political opposition. Any limitation on the Court's decision could be achieved only by constitutional amendment or by congressional revocation of judicial jurisdiction in the reapportionment process. Political opposition, therefore, focused on both these alternatives.

#### Congressional Action.

By mid-August, 1964, 130 resolutions and bills had been introduced, supported by 99 members, to a divided Congress.<sup>36</sup> The proposed legislation concentrated on three strategies: congressional restrictions of jurisdiction; delays in state compliance or stays in Court involvement; and the more permanent solution of a constitutional amendment.

The efforts to restrict, either entirely or partially, the Court's jurisdiction in apportionment cases were relatively short-lived. Emmanuel Celler (D., N.Y.), the Chairman of the House Judiciary Committee and a veteran advocate of reapportionment reform, successfully bottled up the legislation. The single exception was a bill, submitted by Representative Tuck of Virginia, proposing to withdraw jurisdiction from all federal courts "seeking to apportion or reapportion the legislature of any State of the Union or branch thereof."<sup>37</sup> Cleverly bypassing Celler's committee, Tuck succeeded in gathering sufficient support for the bill and it became the only House-passed bill relevant to the controversy. In a move that effectively foredoomed this strategy, however, the Senate dismissed the Tuck bill without serious debate.

The effort to stay further Court action was equally short-lived. One effort was led principally by Senator Dirksen (R., Ill.), --but only to "buy time" for his proposed constitutional amendment. The Senator was successful in moving the legislation through the Senate Judiciary Committee, without hearings, and onto the floor. Unable to secure sufficient floor support, however, he was forced to propose it as a rider to the foreign aid bill--a bill that was almost certain to pass. But even in this form, the bill was defeated.

Restrictions on the Court's jurisdiction were controversial (and it was feared that the Court might declare such legislation unconstitutional), but appeared to many the only viable means available to Congress. The House and the Senate were badly split over this issue. To avoid further filibustering in the Senate, and to clear the calendars of both houses, the Senate Majority Leader, Mike Mansfield, submitted a "sense-of-Congress" resolution, passed 44-38, that required the Court to "allow" the state legislatures freedom from further litigation so that they might reapportion themselves (and prescribed a six-month moratorium); it also requested from the Courts a stay of state compliance until after the 1964 elections. For the most part, however, these requests were not honored. The majority of the lower federal courts hurried through their reapportionment plans in time for the 1964 elections, and only a few jurists either delayed judgment or kept their distance from the legislatures' deliberations. By far the most important strategy for overturning the Reynolds decision was the proposed constitutional amendment. Five months

after the decision, the Board of Managers of the Council of State Governments and the Seventeenth Biennial General Assembly of the States both called for an amendment to permit the use of apportionment formulae other than population in at least one house. These resolutions, coupled with the amendments submitted to the House and Senate by Senator Frank Church of Idaho, Senator Jacob Javits of New York and Senator Dirksen gave increased legitimacy to the political opposition to the "legal thicket."

Of all the proposed amendments considered, the Dirksen amendment received the most attention. Although itself amended many times in its two year life-span, it included the following main features:

- \* Authorization for apportionment of one house of a bicameral legislature "upon factors other than population."

- \* Unicameral legislatures should be permitted to give "reasonable weight" to nonpopulation factors.

- \* The apportionment formulae adopted by the state legislatures were to be submitted to popular vote and approved by a majority of those voting in an election that would also pose the alternative choice of a "Reynolds" apportionment formula based on population.<sup>38</sup>

The Senate debated the proposed amendments during the summer of the first anniversary of the Reynolds decision. It was a heated debate that ranged over the entire issue. In the end, however, the Senate rejected the amendment: Dirksen gained a plurality, but not the needed two-thirds majority. The amendment required a state call for a constitutional convention; but this

also failed to attract the necessary support (32 states approved of the needed 34).

The Senate debates, ironically, perhaps, turned on the "history" of apportionment in the United States. Those opposing the amendment relied on the Court's historical analysis and on a number of scholarly reports that claimed that state arrangements frustrating numerical equality in legislative districts were not consistent with that history. Unable to rebut these claims, the argument supporting the amendment appeared untraditional, unfounded, and undemocratic.

#### State Action.

The initial state response was twofold: as it was phrased in California, the "state needed both a "battle and a capitulation plan." <sup>39</sup>

1. The Battle Plan: Because the States' actions depended largely on effective congressional remedies, a number of states led lobbying efforts for bills in Congress. Groups, both official and unofficial, in California, Michigan, Idaho, New York, Pennsylvania, Texas, Florida and other states, formed "flying truth squads" to marshal arguments and political support either for a congressionally-passed amendment or for a call for a constitutional convention. The intent was to "exhaust all possible remedies to allow us to keep the bicameral legislative system as we have known it."<sup>40</sup> Although this activity would continue, at various levels of intensity, through the summer of 1967, it ultimately failed to accomplish its goals.

2. The Capitulation Plan: The States' "capitulation" took the form of tests of the Court's criterion of "as nearly equal as practicable." Chief Justice Earl Warren had justified some experimentation in one part of the Reynolds decision:

A state may legitimately decide to maintain the integrity of various political subdivisions, insofar as possible.... Valid considerations may underlie such aims. Indiscriminate districting, without any regard for political subdivision or natural or historic boundary lines, may be little more than an open invitation to partisan gerrymandering.... So long as the divergencies from a strict population standard are based on legitimate considerations incident to the effectuation of a rational state policy, some deviations from the equal population principle are constitutionally permissible.<sup>41</sup> (emphasis added)

Exploiting this loophole, a number of states--including Montana, New York, and Missouri--tried to discover the "minimum allowable deviations." Other states attempted to satisfy the Court's principle through use of multi-member districts or experimentation with acceptable population bases. Court responses to these plans, already delineated above, continued through the 1970 reapportionment process; but the great majority of all these state efforts were judicially frustrated.

#### The Reapportionment After the 1970 Census.

In the eight years following the first wave of reapportionments, hundreds of cases were decided by federal and state courts

and a series of Supreme Court pronouncements were issued, intended to clarify the constitutional requirements. By 1970, however, there were still no clear-cut guidelines of precisely what was and what was not constitutional; and many substantial issues had not yet been fully reviewed. To add to the confusion, the Court, on the eve of the 1970 Census, delineated the most precise requirements for congressional districting (in Wells<sup>42</sup> and Kirkpatrick),<sup>43</sup> but relaxed some of the requirements for precision in state and local legislative districts (in Abate v. Mundt).<sup>44</sup>

#### Institutions of Apportionment.

The redistricting after the 1970 Census was not as confused and misdirected, of course, as the convulsions of the mid-Sixties. The "political battle plans" had failed to affect materially the Court's dedication to its principle of "equality" and much of the "experimentation" or "testing" of the first wave of state plans was absent. Moreover, many of the States' reapportionment plans had been in effect for only one or two elections and the process generally involved relatively minor up-dating. A total of 62% (31 of the 50 States) of the plans enacted in the wake of the 1970 Census were challenged in the Courts; but, unlike the experience after Baker, few were overturned as unconstitutional.

The uniform application of the principle of "one-man, one-vote" had by 1973, substantially transformed the reapportionment process into a process of redistricting. There was, however, one significant change in some of the States' institutional arrangements. Although forty-one states continued to rely on legislative deliberation, nine states removed the initial responsibility

from their legislatures. Seven states--Arkansas, Hawaii, Michigan, Missouri, New Jersey, Ohio and Pennsylvania--provided for special boards or commissions to redistrict after the 1970 Census. Two states--Alaska and Maryland--required the Governor to submit a plan. One hope from such approaches was that, by removing the process from the legislature, some better degree of equity might be assured; another motive, perhaps more important, was to keep redistricting plans from being drawn in Court.

It may provide further perspective on the period to notice that, in almost every instance, these goals of commission redistricting were at least partially frustrated. The commissions or committees were either "bipartisan" or "nonpartisan;" yet, the plans proposed consistently reflected the partisan interests of the majority party. In five of the states, commission plans were either redrawn by the legislature, drawn as a result of litigation, or redrawn by yet another commission appointed as a substitute. Three of the state reapportionment commissions could not come to any agreement on how to redistrict. There was only marginal success in avoiding the intervention of the Courts; these plans were challenged only half as frequently as legislative plans.

#### The Politics of Apportionment; Redistricting and the Gerrymander.

The Court justified its entrance into the "political thicket" by way of the "Equal Protection Clause," presuming that "equal election districts" were a prerequisite for "equal representation." The argument was, and is, reasonably persuasive--as far as it goes. In the course of their decisions, the Court removed some of the



explicit partisan manipulation that had been near the heart of the apportionment controversy from the very beginning. All state legislative and congressional districts now fulfill the criteria of equality of population. The one area that remained open to political stratagem, however, was the partisan gerrymander; indeed, there is much evidence that the Courts' involvement in reapportionment and redistricting was followed by an unprecedented wave of gerrymanders.

Although the Court, as early as 1964, seemed to oppose the partisan gerrymander as fundamentally inconsistent with "equal protection," it has been reluctant to assume jurisdiction. The only major case where the Court ever confronted the issue was Noun et al v. Turner (Iowa),<sup>45</sup> where litigation was grounded at least in part on the presence of gerrymandering; yet, the Court chose to rule on other grounds. The states are, therefore, still free to protect incumbents, to confine party competition within limits favorable to the majority party and in other ways to introduce purely political considerations into the design of districts.

The net result of this freedom is that much intelligence, energy and technological resources are now directed to realizing political goals in redistricting. Unfortunately, the data is not yet available to assess the full character of these new redistricting politics. One reasonably reliable way, however, to calculate the presence of a possible gerrymander--the disparity between votes cast for party candidates and the percentage of party representation in the legislature--indicates that gerrymandering is present to some significant degree in at least 35 of the 50 states.

### The Effects of Reapportionment and the Prospects.

It is probably too soon to evaluate the long-term effects of the reapportionment revolution. A preliminary conclusion might be that the effects have not been as substantial as predicted. Party competition, although adversely impacted by the wave of partisan gerrymandering, has continued at reasonable levels in many states. It is far from clear that the policies adopted by the new "reapportionment legislatures," have been much different from those embraced by the old "malapportioned legislatures." And it is unproved that minorities or suburbs or other groups have significantly benefited.<sup>46</sup>

### CONCLUSION

In the course of this history, we have traced the principles, institutions and politics that have played a part in the controversy surrounding apportionment, reapportionment and redistricting in the United States. In one sense, events since 1962 have made much of this history irrelevant; in another sense, recent events can only be understood against the backdrop of that history. One lesson above all is suggested by our historical review. It is that, whatever success the Court has had, or may have in the future, in ensuring "equality of representation," the struggle over the structures and processes of representation in this country will continue.

(See Appendix following for examples of recent legislative gerrymanders.)

## APPENDIX: EXAMPLES OF LEGISLATIVE GERRYMANDERS

Illustrations of "the art of the gerrymander" are shown in the attached maps from California Assembly Bill No. 12, a redistricting plan authored by the Democratic Majority in 1972. The plan was bitterly opposed by the Republicans who countered with a "model redistricting plan" of their own. Finally, after a gubernatorial veto, the California Supreme Court appointed Special Masters to draw an entirely new plan.

It is worth noting that the Democratic plan provided for very low population deviations. All these districts meet rather strict criteria of "population equality."

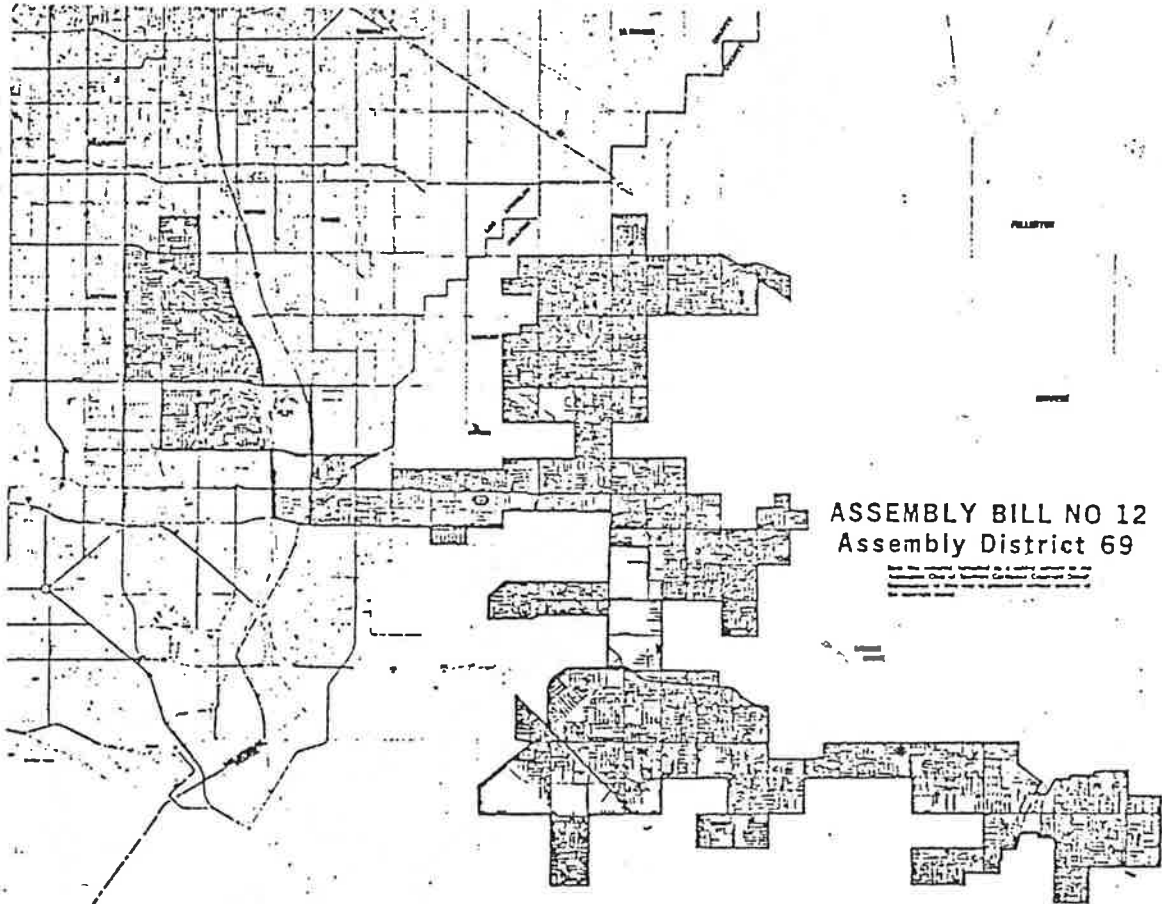
Map 1 This is a good illustration of the sophisticated use of precinct data (vote history and registration data) in district design. The greater part of the proposed District lies within Orange County, an area of traditional Republican strength; but a part of Los Angeles County is also included. Each precinct in the area that had better-than-average Democratic voting proclivity was surveyed: the best were aggregated into District 69 (sometimes referred to as the "Corydor") to secure the re-election of Assemblyman Kenneth Cory. The District stretches octopus-like through Republican territory, sending out tentacles to pick up Democrats in widely separated areas. Parts of 13 cities in two counties are included; but none of the cities falls entirely within the District.

Map 2 This is a dramatic illustration of the use of narrow, very thinly populated corridors to link centers of population many miles apart. There are three areas of heavy population in the District: at the top left and right-hand corners of the District and in the extreme tip of the curving "tail" at the bottom of the map. Each population center is located in a different county (Contra Costa, San Joaquin, Santa Clara). The District meanders almost a hundred miles through the California Coast Range; it bypasses almost a million people in the populated areas of Alameda and Santa Clara counties.

Map 3 This map illustrates the practice of carving districts out of city precincts and balancing political characteristics through the addition of agricultural areas. In this case, a virtual swathe is cut through the center of Fresno. The District was created to assure the election of a Democratic candidate and the defeat of a popular, long-term Republican incumbent (Kenneth Maddy).

APPENDIX: EXAMPLES OF LEGISLATIVE GERRYMANDERS, continued

Maps 4 The bizarre shapes of these districts (District 78 in  
and 5 San Diego and District 19 in the Bay Area) and their  
total lack of compactness illustrate other contortions  
that result from the reach for political advantage.  
District 78 assumed its shape as the result of an effort  
to concentrate Republican voters. District 19 is almost --  
not quite -- divided into three: note the impact in the  
neighboring district, which balloons into the 19th through  
a pencil-thin corridor.



PULLERTON

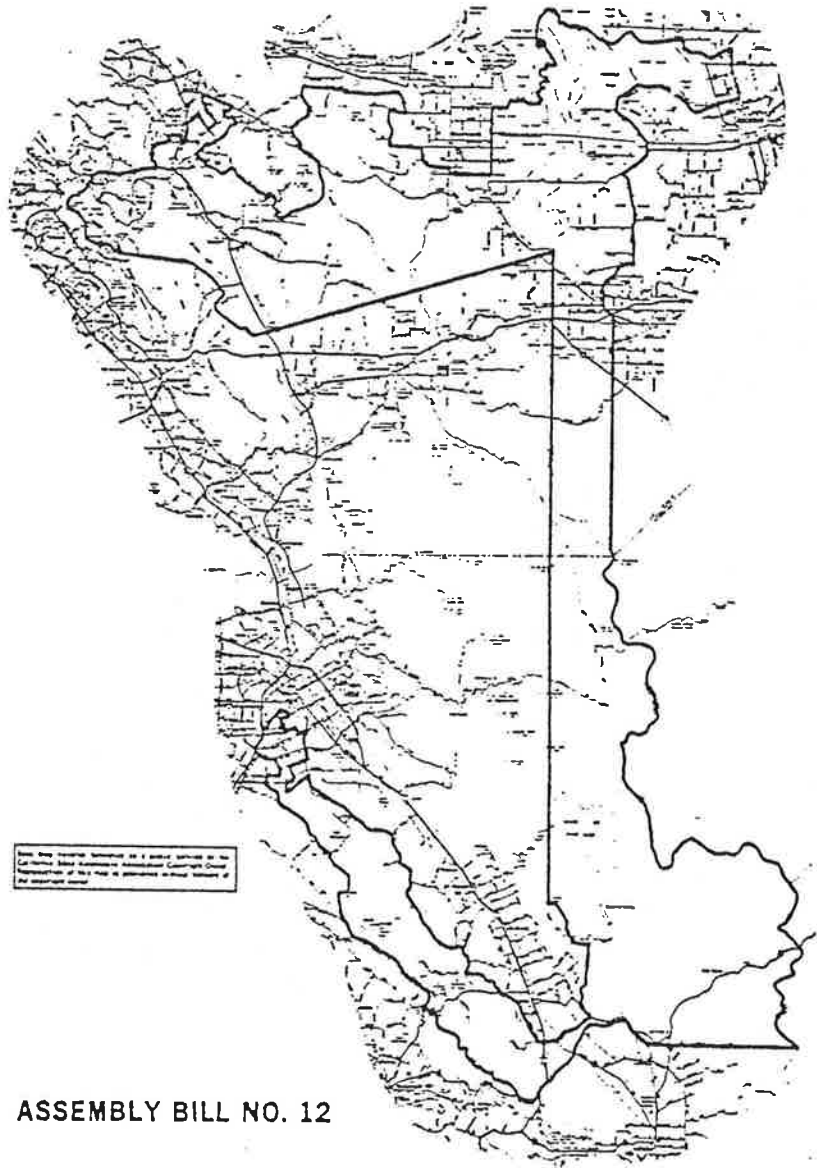
BRIDGE

**ASSEMBLY BILL NO 12**  
**Assembly District 69**

Schematic Map of the City of Santa Ana, California

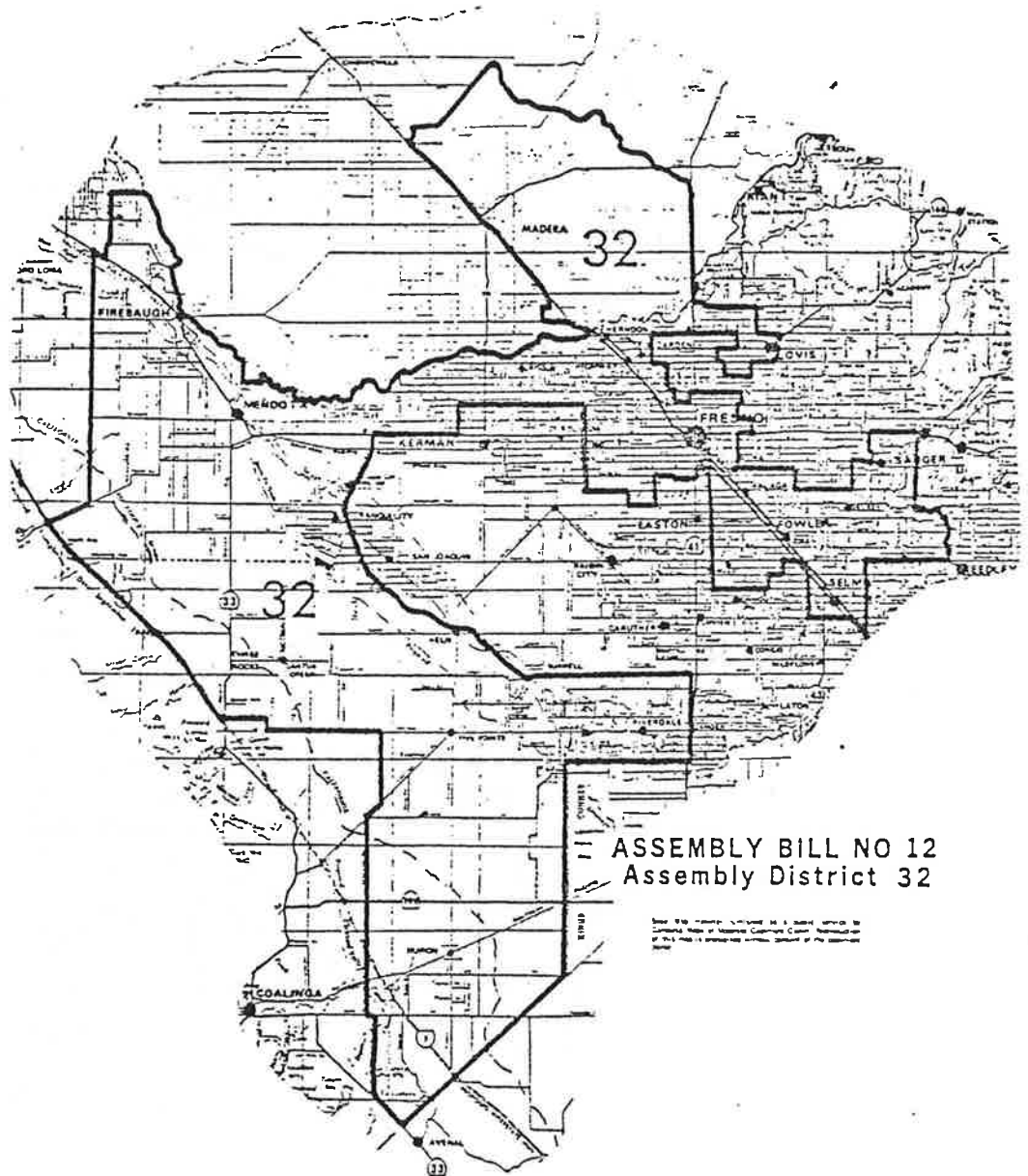
BRIDGE

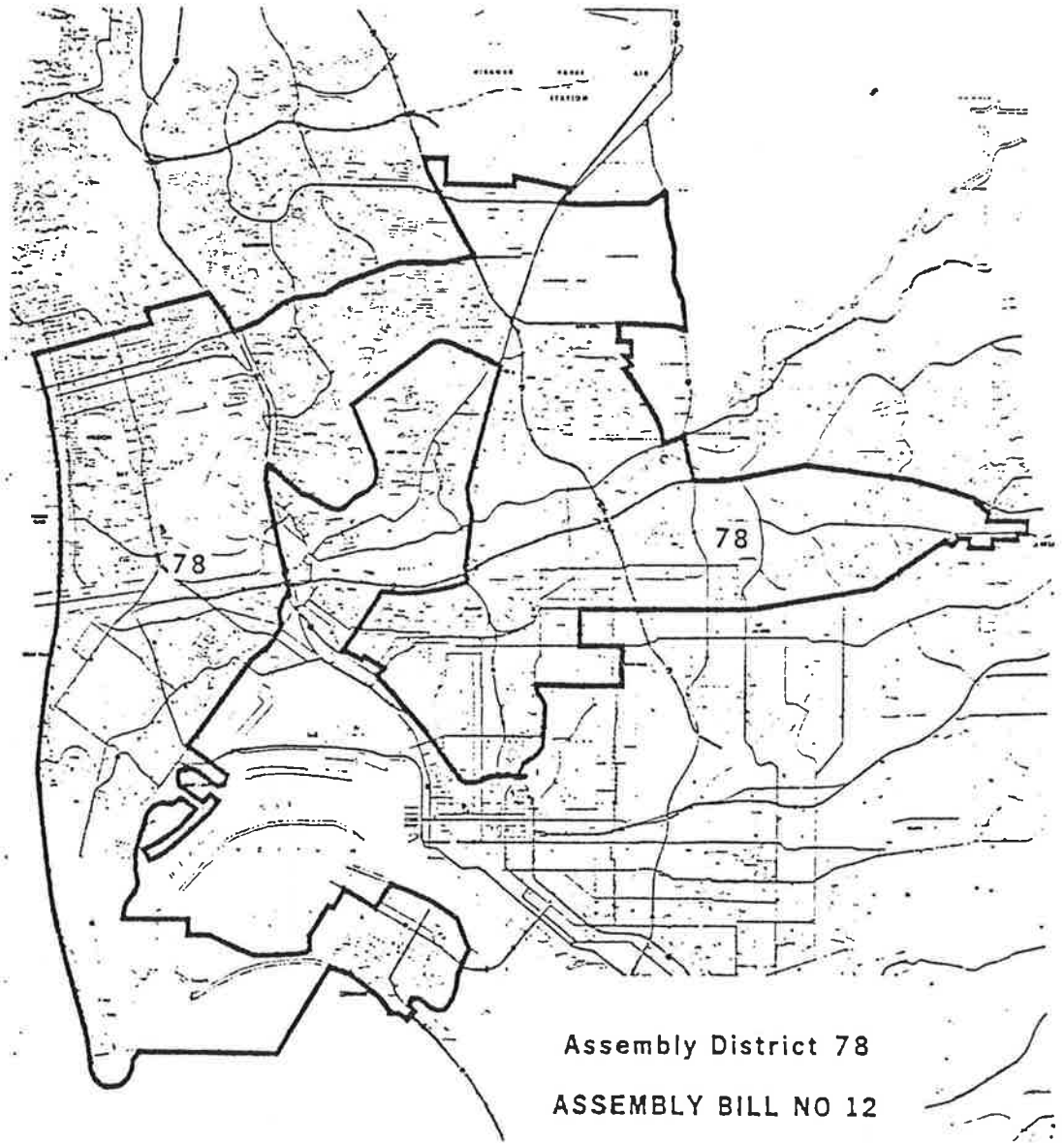
SANTA ANA



ASSEMBLY BILL NO. 12

Assembly District 10



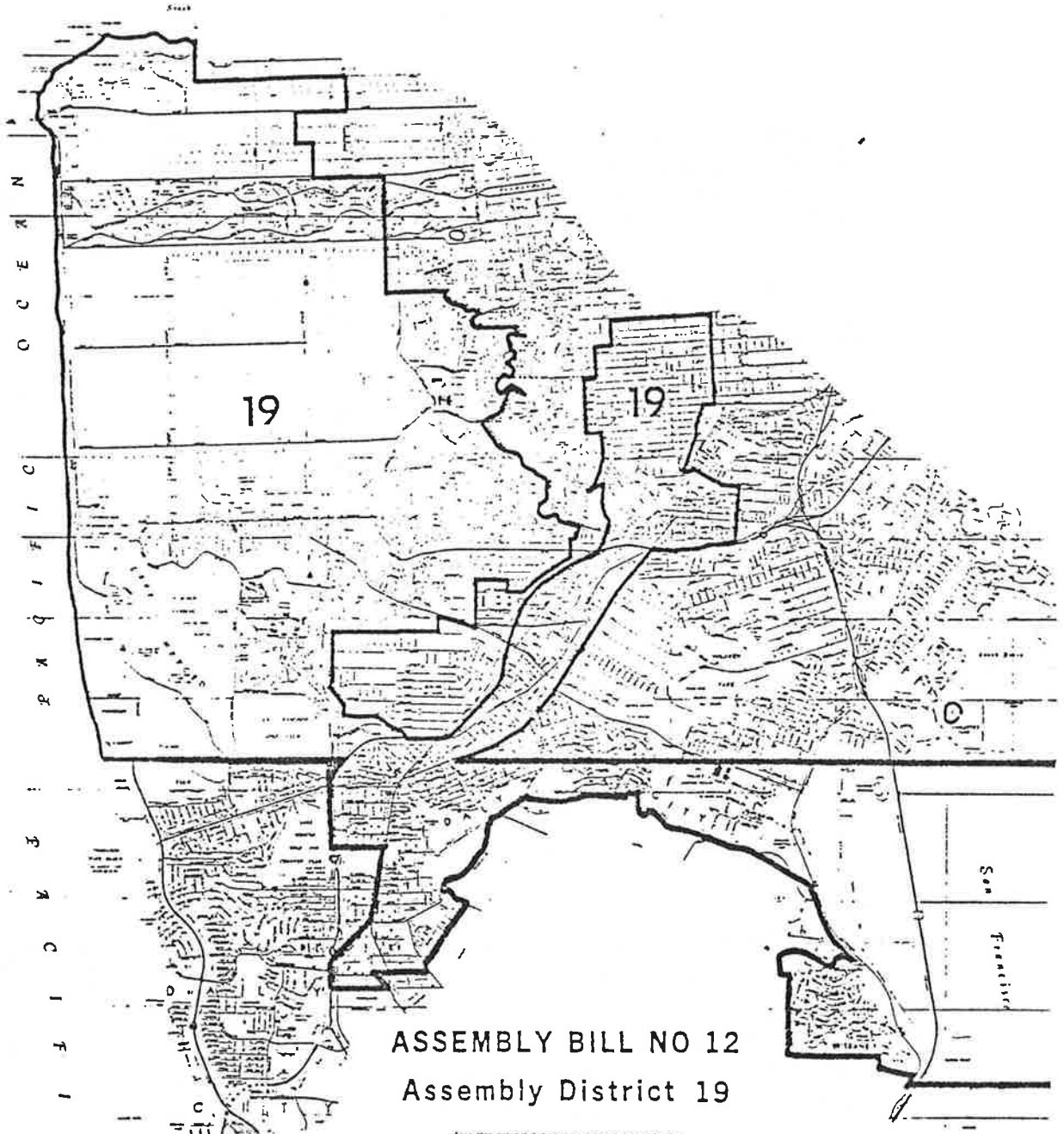


Assembly District 78

ASSEMBLY BILL NO 12

This map is intended to show the general location of the district and is not to be used for legal purposes. For legal purposes, consult the official map of the State of California.





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## Footnotes for Brief History

<sup>1</sup>Norman Wildin, and Philip Laundry, An Encyclopedia of Parliament, pp. 488-493.

<sup>2</sup>Thomas Jefferson, III Writings of Thomas Jefferson, pp. 322-23 (Ford ed. 1894).

<sup>3</sup>For a discussion of these issues see particularly Robert G. Dixon, Jr., Democratic Representation: Reapportionment in Law and Politics, pp. 23-57; Robert B. McKay, Reapportionment: The Law and Politics of Equal Representation, pp. 9-34.

<sup>4</sup>John McMahon, An Historical View of the Government of Maryland, pp. 465-66.

<sup>5</sup>Allan Nevins, The American States During and After the Revolution, p. 180.

<sup>6</sup>Wayland Dunway, A History of Pennsylvania, p. 101.

<sup>7</sup>Nevins, supra, p. 235.

<sup>8</sup>Robert McKay, Reapportionment, p. 25.

<sup>9</sup>Ibid.

<sup>10</sup>Clinton Rossiter, Seedtime of the Republic, p. 90.

<sup>11</sup>United States Advisory Commission on Intergovernmental Relations, "Apportionment of State Legislatures," 7-8 (1962).

<sup>12</sup>Francis N. Thorpe, ed., The Federal and State Constitutions, Colonial Charters and Other Organic Laws, vol. I.

<sup>13</sup>This account of reapportionment politics in Georgia is from James Bonner and Lucien Roberts, eds., Studies in Georgia History and Government, pp. 93-120.

<sup>14</sup>See particularly Gordon Baker, The Reapportionment Revolution, pp. 14-22; McKay, Reapportionment, pp. 9-98; Royce Hanson, The Political Thicket, Reapportionment and Constitutional Democracy, pp. 4-17.

<sup>15</sup>Reynolds v. Sims, 177 U.S. 533 (1964).

<sup>16</sup>Henry Steele Commager, Documents of American History, ninth edition, (Englewood Cliffs: Prentice-Hall, Inc., 1973), vol. I, pp. 122-132.

<sup>17</sup>Ohio Constitution of 1851, Article XI, Section 2; Illinois Constitution of 1780, Article IV, Section 7 in Thorpe, supra.

<sup>18</sup>McKay, supra, p. 275. The Appendix presents a general history of apportionment politics in all of the states through 1965.

<sup>19</sup>Ibid., p. 333.

<sup>20</sup>Ibid., p. 25.

<sup>21</sup>Robert Dixon, Democratic Representation, p. 71.

<sup>22</sup>Francis Thorpe, Constitutional History of the American People 1776-1850 II: 413 (Washington, D.C., U.S. Government Printing Office 1899).

<sup>23</sup>U.S. Bureau of the Census, Historical Statistics of the United States, 1789-1945, Washington, D.C., 1949, pp. 26-27.

<sup>24</sup>Robert Luce, Legislative Problems, p. 348.

<sup>25</sup>McKay, supra, pp. 363-365.

<sup>26</sup>See McKay, supra, pp. 380-390 for discussion of New York history. cf. Thorpe, supra, III 585-90.

<sup>27</sup>Ibid., pp. 410-416, cf. Thorpe, supra, III 599ff.

<sup>28</sup>For the brief history see McKay, supra, pp. 364-351 (regarding Michigan); pp. 205-209 (regarding California).

<sup>29</sup>Robert Luce, supra, note 4; 363-66.

<sup>30</sup>Charles Black, "Inequities in Districting for Congress," 72 Yale Law Journal, 957 (1963).

<sup>31</sup>Robert Dixon, Democratic Representation, p. 110.

<sup>32</sup>328 U.S. 549 (1946).

<sup>33</sup>376 U.S. 1 (1964).

<sup>34</sup>Paul David and Ralph Eisenberg, State Legislative Redistricting, p. 35.

<sup>35</sup>National Municipal League, Court Decisions in Legislative Apportionment, I: 16-20.

<sup>36</sup>Robert Dixon, Democratic Representation, p. 385.

<sup>37</sup>McKay, "Court, Congress and Reapportionment," 63 Michigan Law Review, 255 (1964).

<sup>38</sup>S. J. Res. 103, 89th Congress, 1st Session (1965).

<sup>39</sup>Legislative Sourcebook (Sacramento: California State Assembly, 1965), p. 47.

<sup>40</sup>Ibid.

<sup>41</sup>Reynolds v. Sims, 377 U.S. 533 (1964).

<sup>42</sup>Wells, 394, U.S. 542 (1969).

<sup>43</sup>Kirkpatrick, 394 U.S. 542 (1969).

<sup>44</sup>Abate v. Mundt 403 U.S. 182 (1971).

<sup>45</sup>Noun et al v. Turner, Iowa 193 N.W. 2d. 784 (1973).

<sup>46</sup>Yong Hyo Cho and George Frederickson "The Effects of Reapportionment," National Civic Review, pp. 357-362 (1974); Robert Erickson, "The Partisan Impact of State Legislative Reapportionment," 15 Midwest Journal of Political Science, pp. 47-71 (1971); Roger Hanson and Robert Crew, "The Policy Impact of Reapportionment," 8 Law and Society Review, pp. 69-93 (1973).

A BRIEF HISTORY  
OF  
REAPPORTIONMENT AND REDISTRICTING IN CALIFORNIA

OVERVIEW:

Redistricting plays a key role in the politics of every state. Where district lines are drawn affects incumbent fortunes, the partisan composition of the legislature, control of the legislative process and, eventually, public policy. No wonder, then, that redistricting is always controversial. In California, however, the tradition of weak political parties gives an added significance to the process.

This brief history of reapportionment/redistricting in California is intended as an introduction for the general reader. The enduring, complicated issues raised by reapportionment/redistricting are best seen against the backdrop of historical perspective. The primary focus of the study is on the events of the past fifteen years--the redistrictings of the 1960's and 1970's. Yet there is some advantage, also, in tracing earlier historical events, and in exploring the background to the recent period. The relevant California history, therefore, is divided into four periods:

- I. 1849-1926--The Original Apportionment Formulae
- II. 1926-1964--"The Federal Plan"
- III. 1964-1976--The Modern Setting
- IV. 1971-1973--The Second Round

I. THE ORIGINAL APPORTIONMENT FORMULAE: 1849-1926.

When California was organized as a Territory in 1849 (admitted to the Union in 1850) its constitution's apportionment provisions mandated decennial reapportionments with population "to serve as the basis of representation."<sup>1</sup> The formula was well-suited to the booming frontier state and discontent did not stir for nearly thirty years.

The patterns of immigration and population growth in this era are relatively well documented. From the 1850's through the 1880's, almost 90% of California's population resided in northern California (traditionally, the State is divided north-south at the Tehachapi Mountains). The population was concentrated mostly in and around the gold fields and the expanding San Francisco area. The reapportionment formula consequently allotted the great majority of seats, with subsequent reapportionments occurring without much debate, to the Bay Area.

The first formal indication of dissatisfaction surfaced in the second constitutional convention, convened in 1878. Although not constituted to review this issue specifically, a number of delegates to the convention voiced fears that the interests and opinions of San Francisco were dominating the State Legislature.

Some of the revised provisions in the constitution ratified in 1879 were clearly intended to mollify this discontent. In amending the procedures for drawing congressional districts, the new constitution specifically attempted to restrain efforts to gerrymander (in this case, attempts to dilute the influence of rural counties) by adopting three criteria:

1. A congressional district composed of two or more counties could not be divided by a county belonging to another congressional district.

2. No county could be divided in forming a congressional district, except when it had excess population and thus required more than one representative.

3. A county whose population was greater than required for one congressional district had to be formed into one or more districts according to population. In forming such districts it was further required that (a) no assembly district be divided; (b) each congressional district be composed of compact, contiguous assembly districts; (c) any residual population remaining after forming relatively equal population districts had to be joined (by compact adjoining assembly districts) to a contiguous county or counties to form congressional districts.<sup>2</sup>

These amendments established two important precedents: (1) districts should be both compact and contiguous and (2) the basic building block in legislative representation (and therefore in redistricting) should be assembly districts. Similar language described criteria for drawing senate districts. The most important implication of the provisions, however, was the tacit recognition of the role of counties, especially smaller counties: county lines were not to be arbitrarily disregarded.

The principle of basing representation on population was not substantially contested until the last decade of the 19th Century and the first decade of the 20th. Then, the problem became one of dealings with tidal waves of population increase. Like other large states at the time, California was undergoing two significant demographic revolutions: (1) an accelerated trend toward urbanization, for urban population in the State was increasing very rapidly (7.4% in 1850; 20.7% in 1860; 37.2% in 1870; 52.3% in 1900; 61.8% in 1910); and (2) the rapid population growth in previously underpopulated areas (especially in Southern California; the South's share of total population rose from 16.6% in 1890, to 31.1% in 1910, to 39.3% in 1920, and to nearly 50% by 1930). These trends, of course, were at first the result of the unprecedented surge in U.S. population (fueled by immigration from Europe) and the completion of the northern and southern transcontinental railway systems. Later, they were nurtured by the discovery of oil, the emergence of the tourist boom and the development of the Los Angeles (San Pedro) Harbor.

These demographic trends were soon translated into political power. Los Angeles County's representation in the Assembly leaped from four districts after the decennial census of 1880 to 13 after the census of 1890, to 24 after the census of 1910. The constitutional limit of 80 Assembly seats and 40 Senate seats also meant that this reallocation of legislative districts to the south had to be painfully extracted from the once-powerful northern regions. Moreover, the southern areas began to exercise their new-found political influence by proposing a greatly expanded



water project to accommodate and facilitate growth and an extension of their highway and harbor networks.

This radical transformation of the State over such a short period finally led to crisis. The long-established political and economic interests of the North could maintain their influence only by political maneuver; and the most effective political means was manipulating the formula of apportionment. In 1911, the sectional/urban-rural tension climaxed when the Legislature could not agree on a redistricting plan for the State Legislature.

#### Congressional Redistricting.

The sectional disharmony did not extend to the redistricting of the congressional delegation.<sup>3</sup> When the Sacramento legislators realized the magnitude of the task involved in drawing their own district lines, they turned to the congressional districts, partly in hope of relieving their frustrations, and partly in hope of finding the key to unravelling the problems of Assembly and Senate redistricting. (The plan adopted did, indeed, foreshadow the ensuing compromise in state legislative redistricting.)

The principal difficulty, of course, was the northern representatives' reluctance to distribute the new congressional seats to the faster growing southern counties, particularly Los Angeles. The issue was not partisan, but sectional: the debate revolved around the question whether population alone, or a combination of population and regional factors, would be used in drawing the districts. The controversy, however, was not prolonged, and a compromise was struck to adopt a formula to represent both regional factors and population centers. The

eleven districts created were conformed to the following regions: the 1st CD included the north coast and Sacramento Valley; the 2nd CD, the Mountains; the 3rd CD, the Bay Area; the 4th and 5th CD, San Francisco; the 6th CD, Alameda County; the 7th CD, the San Joaquin Valley; the 8th CD, the South Coast; the 9th and 10th, Los Angeles County; the 11th CD, the rest of Southern California. The recognition of these "communities of interest" can still be seen in the modern configuration of California's 43 congressional districts.

#### State Legislative Redistricting.

The legislative deadlock over the state legislative districts could not be broken in the regular 1911 session. The northern and rural areas were well aware that the 1910 census signaled more than a transient difficulty. (It would be, indeed, the last federal census to register a majority of citizens living in rural areas.) The deadlock was broken only when, in special session, a compromise was reached providing the southern and urban counties increased representation, but still sufficiently below the figures required by the new census to appease the northern and rural interests. The effect was to deprive Los Angeles County of two new Senators and four additional Assemblymen that were justified by the census.

#### Toward the Federal Plan: The Transitional Period.

What was only a promise of impending trouble in 1911, matured into open confrontation after the 1920 census.<sup>4</sup> The new figures indicated that the rural areas would lose the last vestiges of their waning power. This was their signal that, if they failed to secure some permanent solution, further "compromises"

would be no more than stepping stones to their final demise. At the same time, the southern counties were growing at such a rate that they, also, felt they should no longer interest themselves in compromise plans. Their conclusion was given greater force when the 1920 session of the Legislature rejected a bill extending the water project and then passed legislation restricting the southern counties' access to the State highway funds.<sup>5</sup> The alliances that had helped forge the compromise of 1911 collapsed. The fundamental alignment now became the northern counties (urban and rural) versus the southern counties.

Ignoring the constitutional mandate that reapportionment be completed in the first session following the federal decennial census, the northern bloc postponed a decision. The strategy succeeded not only through 1921, but was effective again in the 1923 and 1925 sessions.

The failure of the 1925 Legislature to secure any compromise brought this period of California's reapportionment history to an end. When neither population nor strict regional representation were accepted, increasingly sophisticated formulae were entertained in the legislative debates. The final variation, called the "3/8--5/8 Plan," which would have allotted the metropolitan counties 15 Senators and the remaining 55 counties a total of 25 Senators, was the last alternative seriously debated in the transition to the "Federal Plan."

## II. THE FEDERAL PLAN: REAPPORTIONMENT FROM 1926 TO 1964.

By the close of the 1925 session, the frustrations suffered by both regions in the reapportionment debate had spawned a new

strategy. It became increasingly obvious that a satisfactory conclusion to the deadlock was possible only through the use of the initiative process, and by by-passing the Legislature.

The first steps were taken by a southern county coalition, which sponsored a constitutional revision to retain the principle of equal population representation and to empower a reapportionment commission to enact a redistricting plan, if the Legislature failed to act. The battle lines were drawn when this step was countered by the San Francisco Chamber of Commerce proposal (Proposition 28) which came to be known as the "Federal Plan."

Proposition 28 proposed what eventually would become law: the Assembly would continue to be reapportioned decennially, according to populations; representation in the Senate would be by county, conforming to the following four criteria:

- \* No county could be divided to contain more than one senatorial district.
- \* No more than three counties could be combined into any one district.
- \* No part of any county could be united with any other county to form a district.
- \* Districts must be composed of contiguous territory.

Like the southern initiative, Proposition 28 provided for a reapportionment commission (composed of the Lieutenant Governor, Attorney General, State Controller, the Secretary of State, and the State Superintendent of Public Instruction); the commission was convened if the Legislature failed to enact an Assembly redistricting by the end of the first session of the new decade.

In the ensuing contest, the proposal to retain the population-based formula was rejected by 60% of the voters; the Federal Plan was approved by 55% of those voting.<sup>6</sup>

The adoption of Proposition 28 was an overwhelming political victory for the rural counties. The proponents successfully argued that the potential threat of the larger urban counties had to be balanced by a guarantee that every region of the state could effectively participate in the formulation of state policy. The argument regarding the "right to be heard," which had been gaining currency in a number of the states,<sup>7</sup> now became the popular defense of California's new apportionment formulae. It became sufficiently popular, in fact, that although the Federal Plan was challenged four times by initiatives--in 1927, 1948, 1960 and 1962--even Los Angeles County voters (those with the most to gain) only supported revision in 1927 and 1962. The Federal Plan, which was constituted in 1930, would remain the basis of redistricting in California until it was declared unconstitutional by a Federal District Court in 1964.<sup>8</sup>

#### California's Malapportioned Legislature.

Under the Federal Plan, California progressively became one of the worst examples of malapportionment. The tables below tell the story.

TABLE 1. Malapportionment in the California Senate: 1930-1960

	<u>Smallest District</u>	<u>Largest District</u>	<u>Population Variance Ratio</u>
1930	7,915	2,208,492	279 to 1
1940	9,924	2,785,643	280.7 to 1
1950	13,568	4,125,164	304 to 1
1960	15,000	6,500,000	433.3 to 1

TABLE 2. Malapportionment in the California Assembly: 1940-1960

	<u>Smallest District</u>	<u>Largest District</u>	<u>Population Variance Ratio</u>
1940	56,449	142,320	2.52 to 1
1950	62,580	297,430	4.75 to 1
1960	72,105	306,191	4.25 to 1

TABLE 3. Malapportionment in the California Congressional Districts:  
1930-1960

	<u>Smallest District</u>	<u>Largest District</u>	<u>Population Variance Ratio</u>
1930	165,595	349,686	2.1 to 1
1940	218,002	409,404	1.9 to 1
1950	253,026	708,760	3.0 to 1
1960	300,664	590,590	2.0 to 1

The Reapportionments of 1951 and 1961: The Rise of Partisan  
Redistricting.

Enactment of the Federal Plan did not eliminate California's sectional rivalries, although it did ameliorate some of the tension. What arose, instead, was an equally divisive rivalry between urban and rural legislators. San Francisco and Los Angeles Assemblymen now allied to sponsor social and economic legislation designed to meet the needs of their urban constituencies. The rural-dominated and more conservative Senate allowed few of the bills to become law. An important consequence was the rebirth of partisan politics in California: the Legislature now organized and began to vote along party, rather than strict sectional, lines. (Sectional politics, of course, were still occasionally visible and would sometimes surface, most prominently in battles over the water issue.)

These developments occurred while the Assembly and congressional districts grew increasingly malapportioned. The 1930 redistricting still left the southern counties under-represented in Congress; and although they held the majority in the Assembly, it was not a majority proportioned to their population. There were also large disparities in the size of Assembly and Congressional districts, in both the north and the south. In their overall effect, the redistrictings of 1941, 1951 and 1961 reduced the sectional disparity, but without affecting the population variances in the districts.

By 1951, demographic development had begun to affect redistricting politics. California's population explosion (further fueled by the Depression and its aftermath) had continued to spiral: now, the "established" and more "settled" population began their "flight to the suburbs." The Bay Area typified the new migration: the City and County of San Francisco lost the population of two Assembly seats to adjacent Contra Costa and San Mateo Counties. Such suburban development had a profound affect on reapportionment politics.

The intra-state demographic shifts registered in the 1950 census were, in effect, recording the movement of Republican voters. The great waves of immigrants into California had been mostly Democratic (although including large numbers of Midwestern and Southern conservative Democrats). Partisan interest--and the Republicans' fear of the demographic tides--now resulted in much more detailed attention to the direction of these population shifts. The chief consequence was the introduction by the Republicans of the partisan gerrymander.

The Republicans inaugurated the use of professional consultants (headed by an academician from U.C.L.A.), who were technically qualified to sort out and use the increasingly complicated data of California's demography and politics. Their aim was to set a limit to the emerging Democratic advantage in registration by "wasting" Democratic votes in the cities and building Republican-leaning districts in the rural areas and the suburbs.

Although crude by contemporary standards, the Republican plan accomplished its purpose. A large number of urban Democratic voters were consolidated into a relatively few "over-kill" districts and others were dispersed to the electoral advantage of Republican candidates. The new districts, although prevented by the State Constitution from crossing county lines, took on interesting, even aesthetically pleasing configurations. (The more compact districts, of course, were generally the least competitive.)

The gerrymander was obvious enough to cause a furor. Facing almost certain defeat in a clear majority of the districts, the Democrats succeeded in their demand for a gubernatorial investigation and initiated a number of legal challenges. The Republican Governor, Earl Warren, nevertheless signed the plan into law and the courts, citing Colegrove v. Green (1946), refused to assume jurisdiction.

The election of 1954 confirmed the effectiveness of the gerrymander. Republican congressional candidates in Los Angeles County won 51 percent of the two-party vote, but won 66.6 percent of the County's representation in the congressional delegation.<sup>9</sup>



The importance of technical control of the redistricting process was again demonstrated in 1961--but this time by the Democrats. The off-year election of 1958 had given the Democrats a small majority in the State Legislature and had seen the election of the first Democratic Governor of California in this century. The repeal of cross-filing in 1959 had further improved the Democrat's competitive advantage. By 1961, they were in a position to demonstrate their grasp of the technical mysteries of redistricting.

The Democrats had, indeed, learned their lesson. Their plan, significantly more sophisticated than the Republican effort, bore fruit in 1962. With only 49.9% of the two-party vote in Los Angeles County, the Democrats captured 66.7% of the County's congressional representation. Moreover, the Democrats (unlike the Republicans) had achieved their gains without substantially violating the principle of equal representation: with only three exceptions, the Los Angeles County congressional districts did not exceed 5% population variance. In retrospect, one may see some irony in the result: the new plan, which Governor Warren would certainly have vetoed as a "Democratic gerrymander," came very near to meeting the population equality tests that the Warren Court would soon establish.

The experience of the major parties in these 1951 and 1961 reapportionments prepared them well for the judicial bombshell that struck in 1964. Unlike the other major industrial states, California's State Legislature was filled with legislators skilled in the sophisticated redistricting techniques that would now become critical to the effort to secure partisan advantage.

### III. 1964-1976: THE MODERN SETTING.

The "Reapportionment Revolution" did not reach California until after the Reynolds v. Sims<sup>10</sup> decision in 1964. Six months after the Supreme Court ruling that both houses of the State Legislature had to be apportioned by population, the Federal District Court, sitting in Los Angeles, declared the California Senate reapportionment formula unconstitutional.<sup>11</sup> In one stroke, the Court destroyed a delicate network of legislative alliances and traditions that had survived essentially intact for 38 years and, at the same time, established the modern setting for re-districting politics. The Reynolds decision, of course, was nowhere an "expected" ruling; but it took California particularly by surprise. This element of surprise was extremely important in influencing the political response. Confusion clouded the the political atmosphere in Sacramento until, finally, the 1965 reapportionment "package" was adopted by the Legislature and approved by the Court.

#### The First Stages: Delay!

The flurry of legal actions that followed Baker v. Carr in the majority of the states did not occur in California. Many thought California immune to the ruling, and neither political party thought that a reapportionment suit would be politically advantageous.<sup>12</sup> An initiative challenge to the Federal Plan in 1962 also temporarily delayed interest in a full legal challenge.

The District Court's order for reapportionment of the California Senate included a deadline and a threat: a reapportionment plan had to be submitted to the Court by July 1, 1965, or

the Court would impose a plan of its own. Such a procedure had succeeded in a number of states, yet it did not seem to carry weight with the 1965 session of the California Legislature. The Senate and the Assembly obediently devoted almost the entire 1965 session to the reapportionment issue; but several weeks before the expiration of the deadline the Legislature adjourned without approving a districting plan.

A number of reasons lay behind the failure of the Legislature to act. The Senators found themselves deliberating legislation that would "retire" a major portion of their membership; and the Assembly and Senate were unable or unwilling to settle the boundaries for the new senatorial districts within Los Angeles County.<sup>13</sup> Even more important, however, was the fact that the California Senate had consciously adopted a policy of delay.

California's State Senators were among the first and the most active of the proponents of the "Dirksen Amendment." This amendment to the United States Constitution would have allowed a state the option of choosing an apportionment formula other than population, in one house of its Legislature.<sup>14</sup> When the amendment was finally rejected, however, the policy of delay collapsed.

California was spared a District Court reapportionment plan, but only because the California Supreme Court assumed jurisdiction on July 14, 1965. The Supreme Court's first dramatic intervention was to order the Governor and the Secretary of State to show good cause why the 1966 election should not be

postponed, pending reapportionment of both the Senate and the Assembly. After hearing arguments presented by members of the Legislature, it then ordered the Legislature into special session, included the Assembly in the order for redistricting, and finally extended the deadline for submitting a plan to December 9, 1965. As the District Court had done, it threatened to impose a punitive reapportionment plan, if the Legislature failed to act.<sup>15</sup> The reprieve allowed the Legislature to return to deliberations on a plan that would meet the conditions set forth by the Court, but that would also satisfy the needs of the Legislature.

The California Supreme Court's decision facilitated a speedy settlement of the crisis. The Court had noted that the Assembly district population varied from 306,191 to 72,105 (a ratio of 4.25 to 1), and that twenty-four of the eighty districts varied from the "ideal" district population of 196,167 by more than 15 percent. The 1961 reapportionment was further invalid, the Court noted, because a number of counties had not received adequate representation and San Francisco was significantly over-represented in the plan. The mandate to the Assembly to redistrict, therefore, meant that the special session could not be concerned only with the Senate and, as a result, each house became responsible primarily for its own redistricting.

#### The 1965 Redistricting.

The process, which began on September 20th and finished on October 27th, represents the modern watershed of California's redistricting politics. At least in part, its major themes were reproduced in 1972. Many observers believe that the Legislature's approach in 1981 will continue the basic pattern.

The chief responsibility for redistricting was assumed by the majority leaders in each house. The reapportionment committees provided technical assistance and minor advice, but finally emerged as merely intermediary steps in the process. The minority party leaders and the individual members of both houses were consulted only on matters immediately affecting their interests--and often, not even then.

The two houses drew their own initial plan,<sup>16</sup> with the Senate working within the limits of the Assembly plan.<sup>17</sup> The majority leaders of both houses worked in concert, independently of their rank-and-file legislative colleagues and the formal apparatus of their state-wide political parties.

The two most immediate concerns of the majority leaders were (1) protection of incumbents (both within the majority party and the most "cooperative" members of the other party); and (2) enhancement of the majority party's electoral advantage. The first factor was independently important as a necessary step to gain legislative approval of the plan and served generally to moderate the reach for partisan advantage. The process allowed--even in the new era of equal population restraints--a tremendous latitude for the discretionary judgment of the majority leaders. Indeed, the more "fine tuning" the plan required, the more opportunity there was for discretion.

The one real casualty of the 1965 process was the sectional competition that had played such a large role in the pre-1964 redistricting politics. The 1965 redistricting turned on personal

and partisan interests, not on regional interests. To the extent to which urban/rural divisions were noticed, it was as a result of purely partisan concerns with voter behavior, personal loyalties and incumbencies.

#### The Partisan Results.

It is generally conceded that the 1965 redistricting was no less politically motivated than the plans drawn in 1951 and 1961. The outward appearance of partisanship was less obvious only because the reach for party interest was more cleverly disguised. What was not expected, of course, was the Reagan landslide of 1966. Nevertheless, the redistricters clearly fulfilled their party responsibilities: in 1966, Republican candidates for the Assembly won 53.7 percent of the two-party vote, but only 47.5 percent of the seats; the Republican candidates for the State Senate won 50.1 percent of the two-party vote, but took only 44.7 percent of the seats.

#### The 1967 Congressional Redistricting.

The congressional delegation was not reapportioned in 1965, despite a request made by the majority of incumbents. The California Supreme Court reopened the issue on October 6, 1967, ruling that "at least nine congressional districts" redistricted in 1961 violated the standards of "one-man, one-vote" (understood at this time to mean a population variance ratio of as much as 15%). The new Governor, Ronald Reagan, who claimed firmly to believe redistricting to be the province of the Legislature, reluctantly called a special session of the

State Legislature to avoid a court-imposed plan. The ensuing negotiations generally followed the traditional processes of California congressional redistricting.

For the most part, the initial working draft of the plan was written by a bi-partisan committee within the delegation, the guiding principle of which was "sweetheart" incumbent protection. Partisan advantage played a role only in increasing the number of "marginal" districts--but even here Democratic incumbents were generally favored. The majority leaders in the State Legislature in turn altered the delegation's plan only when it served to strengthen their position within the Legislature, or when it might contribute to the party's statewide prospects. As a result, under the plan adopted, all the incumbents who wished to run were re-elected and none had to retire to avoid defeat.

The only real moment of controversy came when the Wall Street Journal<sup>18</sup> announced that the delegation had, in effect, drawn its own districts. The accusation of "collusion," however, had no demonstrable effect on the process.

#### IV. 1971-1973: THE SECOND ROUND.

California's "second round" was as spectacular a display of partisan competition in redistricting as any found in the United States. Whether the period is instructive in predicting the events of 1981 is questionable: central to the process in the early 1970's was the battle of wills between a strong Republican Governor and a powerful Democratic majority in the Legislature.

Nevertheless, the over-riding characteristic of the period was that reapportionment was recognized--as it will surely be again in 1981--as the decisive key to California politics.

The Legislative Efforts; the Judicial Solution.

The effort to obtain a redistricting plan for the 1970's took nearly three years. The Legislature debated a dozen detailed proposals and was able to pass two--each extracting its due in caucus negotiations, partisan trade-offs, incumbent demands, leadership demands, retractions and compromises. The plan passed in 1971 was vetoed: Governor Reagan rejected it as a total Democratic gerrymander. The plan passed in 1973 was also vetoed; in a memorable veto message, Governor Reagan condemned it as a Democratic 'gerrymander of the Assembly.<sup>19</sup> The political deadlock finally invited judicial intervention.

When the Legislature was unable to override Governor Reagan's veto in 1971, the issue was postponed to the 1972 session. Then, when the Legislature still could not agree on an alternative plan in 1972, the California Supreme Court tried to goad the political machinery into action, as it had done in 1965: it established a deadline and threatened further intervention. When, even then, the Legislature could not agree on a plan, the Court further extended its deadline, still hoping for some political remedy. The Democratic Assembly majority (50-29), an evenly balanced State Senate (20-20), and the Republican Governor, however, were so deadlocked in political battle, that the Court was forced (1) to order the 1972 State Legislative elections to be held in the still un-redistricted 1961 districts and (2)



to override the Governor's 1971 veto of the congressional redistricting plan to allow the five new congressional representatives to be elected in its districts. The year passed and the State still did not have a reapportionment plan.

In 1973, the process began afresh. The Democratic Assembly and Senate majority leaders again debated and negotiated a redistricting package (now only deliberating on state legislative districting). The process began in January and came to fruition in May. With the Assembly voting 63-12, and the Senate following suit, a plan was submitted to the Governor. On June 28, he vetoed it. The political machinery ground to a final halt.

In the preceding March, the Court had taken precautions against such an eventuality by announcing its intention to appoint a panel of Masters. In May, they appointed the Masters (three retired jurists), who then appointed a staff, held public hearings to establish appropriate redistricting criteria and began the drawing of district lines. In the absence of a political settlement, the Masters drew up an apportionment plan that was publicly announced in August. After reviewing the substance, the possible electoral effects and attending to some clerical inconsistencies, the Court announced the plan on November 28, 1973. The long struggle was finally over and California was at last redistricted. But Republicans noted with apprehension that the Masters' plan was generally similar to the outline of the "Democratic gerrymander" vetoed by Governor Reagan--indeed, that parts of the plan seemed to have been "plagiarized" from the Democratic scheme.

### The Political Process.

Although the political context, matching a large Democratic majority with a strong-willed Republican Governor, lent an unique dimension to the controversy, the legislative process itself followed conventional paths. The factors influential in 1951, 1961 and 1965 were no less influential in 1971-1973.

Both redistricting plans passed by the Legislature were guided through by the majority leaders. In both houses, the majority leaders consulted with the minority leaders and the individual members only when such consultation was politically necessary or politically relevant. The majority leaders were, in short, the arbiters of the process. Few revisions were made that were not consistent with their overall intentions or consistent with their perceived interests.

The majority leaders' principal concern throughout the process was to maximize partisan advantage. The only balancing factor was the need--which became acute in the efforts to override the Governor's veto--to secure Republican votes for passage and to reward "deserving" members of the minority party.

The Governor was also clearly motivated by partisan interest when he rejected the two legislative plans. His partisanship, however, brought him into conflict with his own partisans in the Legislature! His perspective, unlike that of many Republican legislators, was uninformed by the desire to protect individual incumbents, but was centered on the goal of increasing the GOP's overall representation.

This fundamental clash between the gubernatorial and legislative strategies was ultimately responsible for the deadlock of the political process. Each side refused to compromise: finally, the only recourse was a court-mandated plan.

#### The Court's Redistricting Plan.

The Court took every step to allow the political machinery to reach a settlement. It extended its "deadline" twice, issued few ultimata and never prevented a plan from being adopted. When it became clear that it would have to act, the Court was also careful not to appear to support any partisan proposals.

Once the Masters were appointed, there was a period of two months (May and June) when the political and legal processes overlapped. As the Legislature was completing its second plan and the Governor was preparing his veto message, the Masters appointed a General Counsel, a redistricting consultant, a computer technician and scheduled public hearings.

The purpose of the hearings was to gather information on the problems of redistricting and to ask for assistance in delineating a series of criteria to guide the creation of the plan. The effort was to appear as disinterested and un-biased as possible.

The Masters adopted seven criteria<sup>20</sup> that they used in formulating their plan.

(1) The districts in each plan (Assembly, Senate and Congress) should be equal in population, with strict equality in the case of congressional districts and reasonable equality in the case of legislative districts.

(2) The territory included within a district should be contiguous and compact.

(3) In so far as practicable, counties and cities should be maintained intact.

(4) In so far as possible, integrity of the State's basic geographical regions should be preserved.

(5) The community of interest of the population of an area should be considered in determining whether the area should be included within or excluded from a proposed district, so that all its citizens may be represented reasonably, fairly and effectively.

(6) State senatorial districts should be formed by combining adjacent assembly districts, and, to the degree practicable, assembly district boundaries should be used as congressional district boundaries.

(7) The basis for reapportionment should be the 1970 census, and in counties where census tracts existed, such tracts should be used as the basic unit for district formation.

In applying these criteria the commission drew districts with the following variation from the ideal:<sup>21</sup>

	<u>1973</u>	
	<u>Largest</u>	<u>Smallest</u>
Assembly	1.94%	1.90%
Senate	1.92%	1.02%
Congress	0.21%	0.21%

The Result: Was it Fair?

The stated intention of the Masters' plan was to create as many competitive districts as possible. In so doing, it could avoid the charge of a court-imposed partisan gerrymander (either Democratic or Republican). The Commission admitted that all redistricting served some political interest, but it had tried to be as "fair" as possible.

Unfortunately, it soon became impossible to evaluate the "fairness" of the plan. It came into effect for the 1974 elections, and the most decisive influence during the period was, of course, the "Watergate fallout." Whatever elements of gerrymandering might otherwise have been alleged were now submerged by the tide of Democratic victories. Nevertheless, a number of analysts challenged the Masters' claim of political neutrality. The conclusion of the California Journal, for example, was adverse:

"In concluding, the Masters suggest that their plan may result in fewer safe districts, and more competitive seats. An analysis of the plan, however, indicates that only about ten incumbents out of the 163 will lose their seats as a direct result of it, and that only a few more seats than usual will be up for grabs."<sup>22</sup>

According to the California Journal, in the Assembly, the Masters' plan created 32 safe Democratic districts, 13 leaning Democratic "swing" districts, 23 safe Republican districts, 3

leaning Republican "swing" districts, with a total of only 9 "competitive" districts. In the Senate, the Masters' plan was said by the Journal to have created 15 safe Democratic seats, 4 leaning Democratic "swing" seats, 10 safe Republican seats, 6 leaning Republican "swing" seats, with a total of only 5 districts reasonably "competitive." In the congressional redistricting plan, the Masters' plan was said by the Journal to have created 19 safe Democratic districts, 4 leaning Democratic "swing" districts, 15 safe Republican districts, 3 leaning Republican "swing" districts, with only 2 "competitive" districts. Even this tabulation, produced by a journal not noted for its Republican propensities, suggests that the Masters' plan served the interest of protecting the Democratic status quo.

Footnotes for Brief History of  
Reapportionment and Redistricting in California.

<sup>1</sup>California Constitution of 1849, Art. IV, Sec. 28.

<sup>2</sup>California Constitution of 1849, Art. IV, Sec. 27. See also Margaret Greenfield, Legislative Reapportionment.

<sup>3</sup>There are probably three reasons. First, congressional redistricting does not immediately affect the state legislators and only indirectly is related to the complex of issues involved in state legislative redistricting. Congressional districting does not disturb balance of power and influence within the State. Second, the absence of a strong party system in California to connect the various levels of government. Third, and probably most important, federal law requires that states that do not redistrict to accommodate increased congressional representation must elect the whole delegation at-large. The failure to redistrict congressional seats would then have played into the trends of the southern area of the State.

<sup>4</sup>This was not, of course, exclusively a California problem. In this same period, several states began to violate their state constitution by failing to reapportion, several others radically changed their apportionment provisions and even Congress failed to provide for reapportionment.

<sup>5</sup>See John Gallagher and Louis Weschler's essay on "California" in Eleanore Buschnell, ed., The Impact of Reapportionment on the Thirteen Western States, p. 74.

<sup>6</sup>Gallagher and Weschler, Supra, p. 75.

<sup>7</sup>See discussion Supra, Chapter II.

<sup>8</sup>Silver v. Jordan, confirmed without comment by the U.S. Supreme Court, June 10, 1964.

<sup>9</sup>Leroy Hardy, "Congressional Redistricting in California," San Diego Law Review, (10: 757, 1973), p. 759.

<sup>10</sup>Reynolds v. Sims, 377 U.S. 533 (1964).

<sup>11</sup>Silver v. Jordan, 241 F. Supp. 576 (S.D., Calif., 1964).

<sup>12</sup>California was the only large industrial state where the political parties were not actively involved in legislation. See Robert Dixon, Democratic Representation, p. 370.

<sup>13</sup>Leroy Hardy, "Constitutional Challenge and Political Response: California Reapportionment" 1965 Western Political Quarterly, Fall, 1969.

<sup>14</sup>See discussion of California's participation in the efforts on behalf of the Dirksen Amendment" in Chapter II.

<sup>15</sup>Los Angeles Times, June 15, 1965; Silver v. Brown and Adams v. Brown, 33 Cal. Rep.

<sup>16</sup>In 1965, Speaker Unruh did become involved in the Senate plan, but only because of his unique authority in the Assembly and the temptation to influence the unprecedented number of new Senate seats created.



<sup>17</sup>Each California Senate district is composed of two Assembly districts.

<sup>18</sup>Joseph Sullivan, "Gerrymander Mapped in California by 38 Congressmen," Wall Street Journal, November 9, 1967.

<sup>19</sup>Los Angeles Times, June 28, 1973.

<sup>20</sup>Legislature of State of California v. Reinecke, 110 Cal. Rep. 718 at 727.

<sup>21</sup>Ibid. at 751.

<sup>22</sup>Ed Salzman, "Masters Redistricting Outlook," California Journal, October 1973, p. 334.

[Note: An excerpt from Terry B. O'Rourke's Reapportionment: Law, Politics, and Computers is attached as an appendix to this chapter.]

## APPENDIX

### California—A Case Study

Perhaps the most advanced computerized redistricting system in the nation is the geographic data retrieval system developed by Compass Systems, Inc. (CSI) for use by California Republicans in that state's 1971 legislative reapportionment.<sup>16</sup> The Republican party lost control of both houses of the state legislature in the 1970 election. Governor Ronald Reagan was reelected, however, and he immediately announced that he would veto any Democratic gerrymander. Republican legislators, therefore, had to acquire a computerized system capable of performing two tasks: analyzing the political consequences of any Democratic reapportionment plan and creating a Republican alternative proposal.

Already the victims of a 1965 Democratic gerrymander of the state assembly,<sup>17</sup> Republican legislators viewed the retention of their 37 seats as the paramount goal of their proposed districting plan. In addition, Republicans wanted their proposal to achieve three other goals which they believed to be essential to effective government and a viable plan: absolute population equality among districts; increased recognition of community interests by following established city and county boundaries whenever possible; and increased minority group representation by uniting previously divided black and Mexican-American communities, and placing them in districts likely to be won by minority candidates.

The Republican party retained Compass Systems, Inc., which had experience with computer mapping techniques for use in plotting

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<sup>16</sup> Due to the proprietary nature of much of Compass Systems' geographic data retrieval system, the discussion of its use which follows is merely descriptive.

<sup>17</sup> Republican registration was equal to or greater than 50 percent in only 12 of the 80 districts created by the 1965 plan; however, Governor Reagan's landslide victory in the November 1966 election permitted Republicans to win 37 of the new districts.

water temperature patterns in the Pacific Ocean, to construct a geographic data retrieval system for the 1971 reapportionment. Because the CSI system performs almost every task required of a computerized reapportionment system, a consideration of its use in formulating the Republican districting proposal presents an ideal opportunity to study advanced computerized reapportionment techniques and their interaction with party politics.

Over a period of months CSI developed a geographic data retrieval system which met the Republican legislators' request that it be able to retrieve and accurately display all data required for districting decision making. The first step was to assemble all necessary political and demographic data and incorporate them into the data base. Political information contained in the final data base included 1968-70 figures for closing and purged registration totals, votes cast in all statewide races, votes cast in all state senate, state assembly, and congressional races, and votes cast in selected local elections. In addition, voting figures for all 1970 propositions, selected 1968 propositions, and selected local bond elections were also included. Demographic information contained in the final data base included 1960 and 1970 census figures for total population counts, total number of blacks, total number of Spanish surnames, and education and income characteristics. All precinct and census tract maps were digitized by assigning x,y coordinates to key points along the boundary lines, and were incorporated into the data base.<sup>18</sup> The resulting cross referenced data base (linked to its users by a digitizer for geographic input, a teletype for input and output of tabular data, and a computer plotter for geographic output) was capable of giving census data by precincts or precinct data by census tracts.

The system used a number of different programs to manage and operate the data. These included retrieval and aggregation, search, trade-off, and trend analysis programs. In order to retrieve data for any given area, the user simply traced the boundaries of the area with the digitizer. The retrieval and aggregation programs, in turn, identified the centroids of all census tracts and precincts within the area, and summed up by the tabular data associated with them. When the user desired to locate areas with prescribed characteristics, he entered the stipulations (e.g., 1970 Republican registration greater than 50 percent and 1968 Nixon vote greater than 55 percent). The computer then searched through the appropriate data sets, located the stipulated

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<sup>18</sup> CSI used a mechanical plotter; the location of its stylus was automatically encoded by the computer as it moved along the boundaries of the precincts and census tracts.

types of areas, and printed them on a map. Once tentative district lines were established and the user wished to manipulate and exchange areas among districts, the computer expedited the complicated procedure by executing Nagel-type trade-off programs. Finally, when the user wanted to determine the likely characteristics of a district over the next ten years, trend analysis programs compared the 1960 and 1970 census data and 1968 and 1970 political data for the district, and projected the trends displayed in those periods into the future. (See Figure VI.)

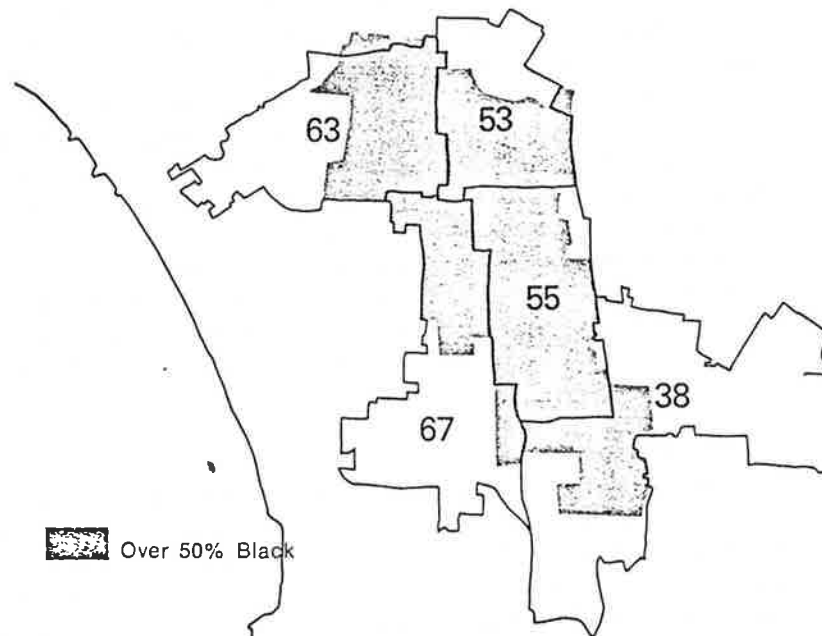
Once the CSI reapportionment system was assembled and operational, its first task was to analyze the current assembly districts and determine what changes had to be made in order to comply with the absolute population equality standard. Only ten of the 80 districts were found to have variances of 3 percent or less from the new average district population of 249,414; the rest ranged in population from 158,724 to 459,547. In addition, the areas of greatest population growth since 1960 were pinpointed. On the basis of this information, the Republican legislators concluded that Santa Clara County was entitled to an additional seat, that one seat had to be shifted from the north to the suburban area south of the Tehachapi Mountains, and one Los Angeles County seat had to be eliminated.

Next the system analyzed the entire state and plotted areas of Republican and Democratic strength and major concentrations of racial and ethnic groups. This step was followed by in-depth interviews with all Republican incumbents to ascertain their individual needs, the location of their campaign workers and financial contributors, and any areas which they might wish to retain in their districts.

Armed with preliminary population and political data, the Republican legislative leadership and CSI staff members sketched out a tentative assembly districting plan. Once all political and demographic tabular data for the new districts were prepared, the tentative plan was shown to Republican incumbents to obtain their reactions and suggestions. These suggestions were incorporated into the plan according to the degree to which they were compatible with Republican goals of increasing racial and ethnic group representation and of recognizing established city and county boundaries.

The next step in the preparation of the Republican plan was to create "ideal" districts for key Democratic incumbents in the hope that their enthusiasm for these districts would lead them to support the Republican proposal. These tentative districts were shown to the respective Democratic assemblymen, and every effort was made to accommodate their suggestions and requests.

**Figure 7. 1971 REPUBLICAN PLAN—LOS ANGELES COUNTY BLACK COMMUNITIES AND PROPOSED DISTRICTS**



The final step in the preparation of the Republican plan was a process called "fine-tuning." This process utilized the whole range of the system's capabilities as the proposed plan's political and demographic data were plotted and boundary lines and areas were manipulated and traded among districts in order to remove any unnecessary irregularities, as well as to achieve near absolute population equality and other districting goals.

The proposed Republican assembly districting plan was released to the public on September 8, 1971. The Republican plan, in large part, achieved the goals set by the leadership: the maximum population variation from average district size was only 0.2 percent, the number of cities and towns presently split among districts was cut in half, new districts were created which were likely to be won by racial and ethnic group candidates, and 37 districts which the Republican incumbents believed they could retain were created. (See Figure X.)

Several major changes were made in northern California districts. Increased population growth in Sonoma County was recognized by moving the 2nd District further north. In the 4th District, Marysville and Yuba City were united. The 6th District lost Roseville and gained Folsom, thereby further solidifying its mountain character. All of Sacramento's suburbs were placed in districts to be represented by Sacramento area residents. The 9th District, a Sacramento and Delta area district, received a higher proportion of black and Mexican-American voters than previously, thereby increasing the likelihood that it could be won by a minority group candidate. The city of Stockton, previously divided between two districts, was placed entirely within one district. The new 24th District was allocated to Santa Clara County, and included almost all of the Mexican-American communities in the area which were previously divided between two districts. The new suburban 19th District encompassed the San Jose area towns of Willow Glen, Los Gatos, and Saratoga. In addition, several changes were made in Central Valley district lines in order to unite previously divided towns and cities.

Population growth within southern California necessitated a number of major changes in district boundaries. The 14th District was transferred from the bay area to San Diego and Riverside counties. Los Angeles County received the major share of 30 districts. Of them, the 41st, 42nd, and 57th districts were assigned to the San Fernando Valley; the 54th District was made much more compact around the city of Arcadia; the 58th District was made more compact in the West Covina area; the 50th District was altered to include most of Whittier; and the 65th District was moved outward from the center of Los Angeles to take in some coastal areas. In addition, several major changes aimed at increasing black and Mexican-American representation were made in central Los Angeles districts: the new 67th District was moved northward so that it could be won by a black candidate, and the new 45th and 51st Districts were moved somewhat westward to include larger Mexican-American areas. Finally, in drawing district lines in Orange and San Diego counties, every effort was made to follow existing city limits: the cities of Fullerton and Anaheim were united to form the new 35th District; the cities of Newport Beach, San Clemente, Laguna Beach, and San Juan Capistrano were joined together to form the new 71st District; and the cities of Imperial Beach, National City, Chula Vista, and El Cajon formed the new 77th District. (See Figure IX.)

Following release of their districting plan, Republican legislators held public meetings in various parts of the state to explain their

proposal and obtain public response to it. Despite Democratic charges that the Republican plan (which created only 13 districts with Republican registration equal to or greater than 50 percent) was a "transparent gerrymander," it gained immediate and widespread support from local government officials and black and Mexican-American groups. (See Figures VII and VIII.)

Meanwhile, Democratic legislators, equipped with their own computerized system, were formulating a second assembly districting plan. While the Democrats labored on their proposal, Republicans bombarded them with charges of blatant gerrymandering. Governor Reagan observed that he could "only conclude that a great deal of secret activity on reapportionment must be going on among the Democrats. This should be done in public."<sup>19</sup> Assemblyman Jerry Lewis, vice-chairman of the Elections and Reapportionment Committee, asserted: "Sooner or later the Majority party leaders must realize that reapportionment is carried out on behalf of the people, not just a few cronies who gather in the back room to negotiate a gerrymander and further their own personal ambitions."<sup>20</sup>

The Democratic assembly districting plan was completed, and released to the public on October 28, 1971. CSI's system analyzed the proposed districts to determine their political character. Taking into account the past success of the different Republican incumbents in garnering votes in Democratic areas, it was determined that only 29 to 32 of the 80 seats could be won by Republicans. (See Figure XI.)

Still determined to retain the status quo of 37 winnable seats, Republican legislators launched a successful attack on the Democratic plan, which was vulnerable on a number of counts. First, in attempting to maximize political gains, the plan simply ignored established city and county boundaries. For example, in Los Angeles County it split 40 cities and towns, while the Republican proposal split half that number; and the Democratic version of the 69th District cut across 11 cities and two counties, while the Republican version cut across only two cities. Second, the Democratic plan had fewer districts likely to be won by minority group candidates. Third, several Democratic incumbents had better districts under the Republican plan than under that of their own party.

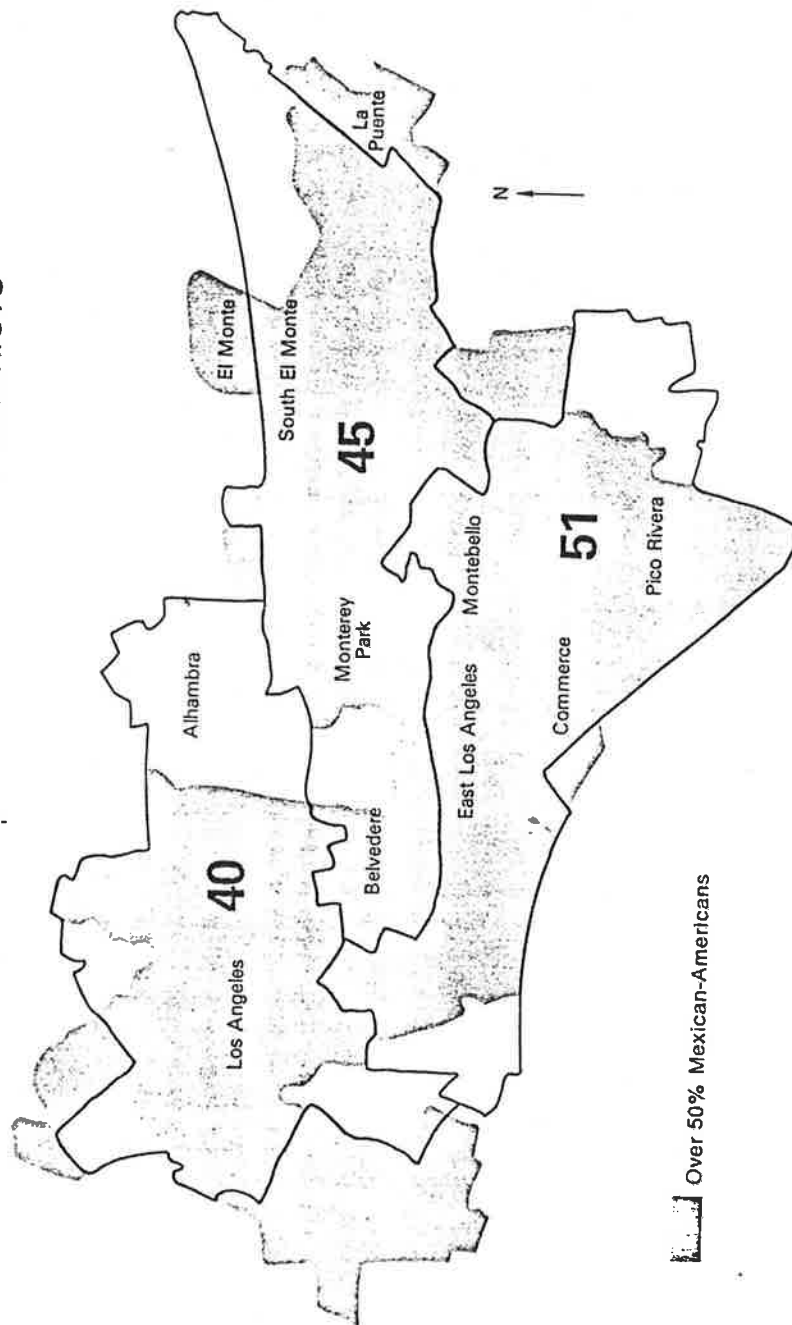
Confronted with Governor Reagan's threatened veto, dissatisfaction in their caucus, public outrage over city and county boundary

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<sup>19</sup> Statement released to the press, September 21, 1971.

<sup>20</sup> Statement released to the press, September 15, 1971.

Figure 8. 1971 REPUBLICAN PLAN—LOS ANGELES COUNTY MEXICAN-AMERICAN COMMUNITIES AND PROPOSED DISTRICTS





**Figure 9.** 1971 REPUBLICAN PLAN—TOUCH MAP OF SAN DIEGO COUNTY SHOWING RELATIONSHIP BETWEEN ASSEMBLY DISTRICT LINES AND CITY AND TOWN BOUNDARIES

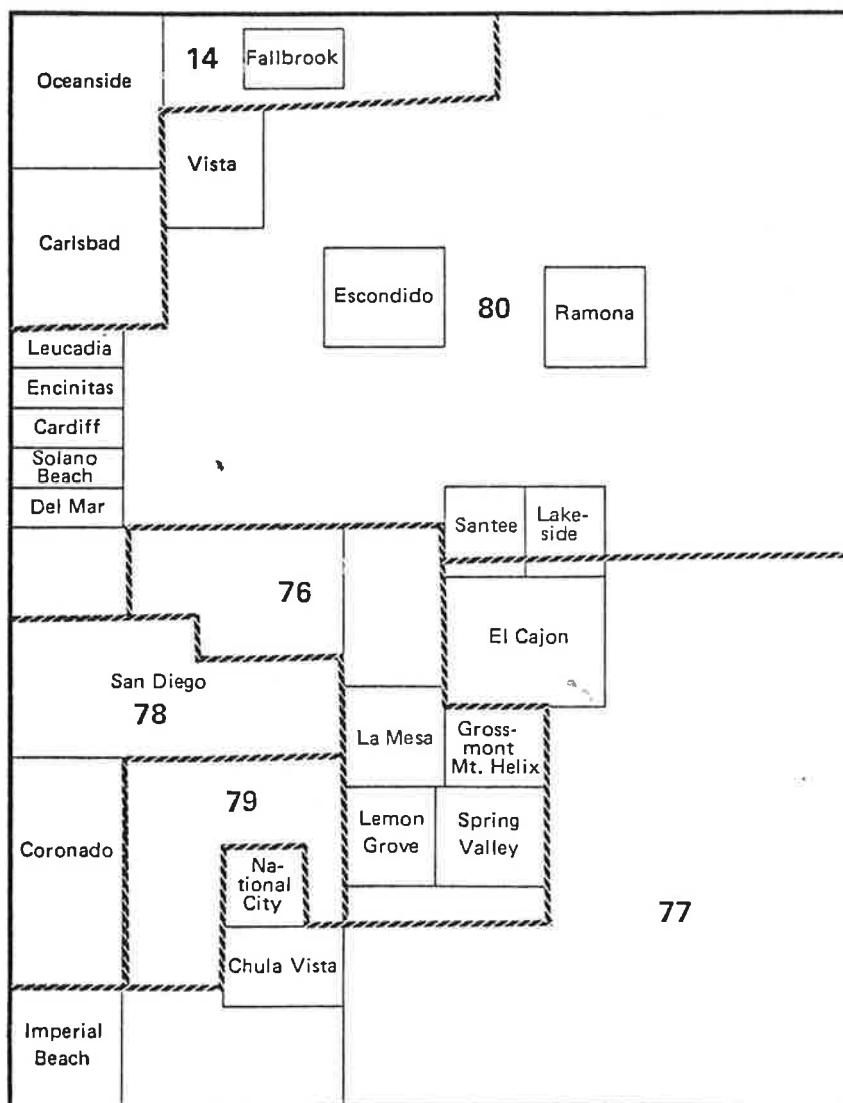
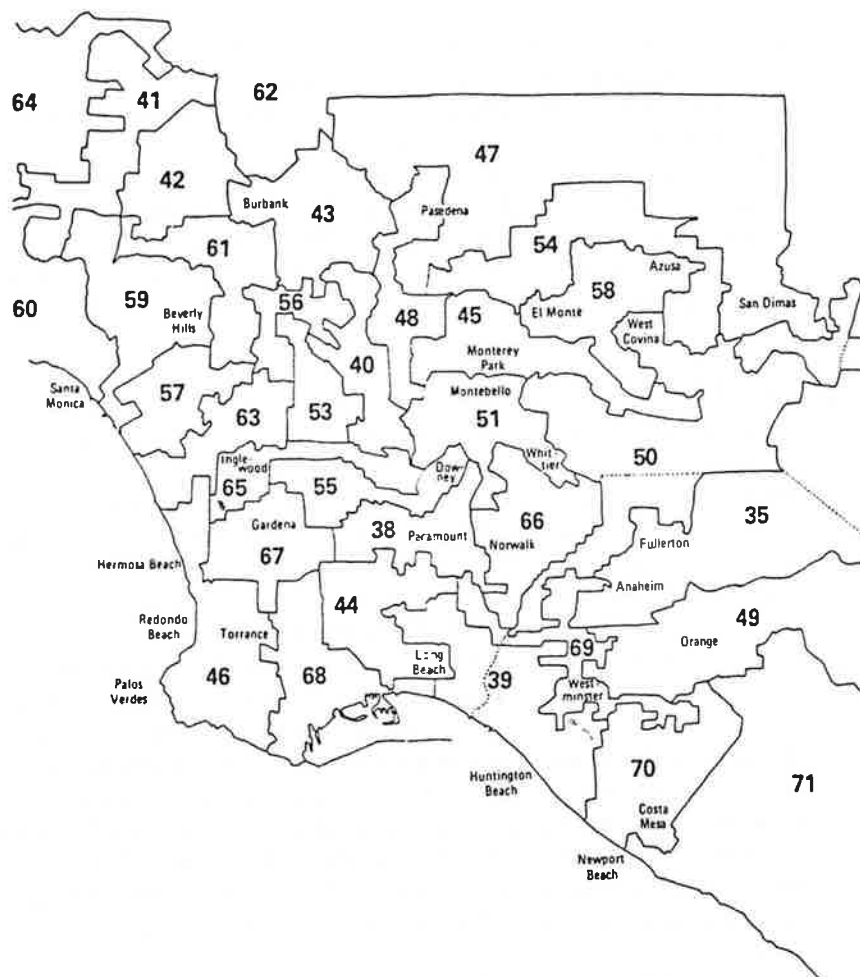


Figure 10. 1971 REPUBLICAN PLAN—LOS ANGELES COUNTY AREA ASSEMBLY DISTRICTS



cutting, and angry black and Mexican-American spokesmen, the Democratic leadership reluctantly agreed to drop its announced plan and draw up another to meet the Republican status quo demand of 37 winnable seats. The Democratic-Republican compromise, however, collapsed on November 20, 1971, when the Republicans won control of the heavily Democratic 48th Assembly District in a special election,

**Figure 11. 1971 DEMOCRATIC PLAN—LOS ANGELES COUNTY AREA ASSEMBLY DISTRICTS**



and insisted that they retain it under the new districting plan. Unwilling to concede the Republicans a 38th seat, the Democrats passed their originally proposed plan, with slight changes, in a special session of the legislature on December 20, 1971.

Confident that the Republican party would receive a larger number of seats under a court-ordered solution to the reapportionment

controversy, Governor Reagan vetoed the Democratic plan on December 30, 1971. Several suits challenging the validity of Reagan's veto and provisions of the state constitution dealing with reapportionment were filed and immediately docketed before the state Supreme Court. On January 18, 1972 the court ruled that because of the limited time remaining before the primary elections, the 1972 assembly elections must be held under the old districting plan.<sup>21</sup>

In assessing the success of the minority Republican party in frustrating further gerrymandering, it is clear that the computerized system it used deserves major credit. Without that system, the Republican legislators would not have been able to formulate their complex, multi-goaled districting plan, which so effectively refuted the Democrats' claim—five weeks before it was made—that bizarrely shaped districts and dismembered cities and counties were inevitable if the Supreme Court's absolute population equality standard was to be met.<sup>22</sup>

#### An Afterword

As computer-assisted gerrymandering increases, it is necessary to consider the possible means of controlling and checking its effects. Since the computer is merely a neutral tool, the solution does not lie in banning its use, but rather in placing additional constraints on its operators. Under present Court decisions, the only constraint on districting in most states is the absolute population equality standard. Nevertheless, the states themselves are free to enact laws requiring that legislative districts meet additional standards of compactness and contiguity. Similarly, Congress can set additional standards for House districts. A step in this direction was recently taken on September 14, 1971, when the House Judiciary Committee reported HR 10645, a bill requiring that each House district be composed on contiguous territory, including adjoining insular territory, in as reasonably compact a form as practicable. To be sure, the value of standards of compactness and contiguity as means of eliminating gerrymandering are largely overrated.<sup>23</sup> Nonetheless, the additional constraints they place

<sup>21</sup> *Washington Post*, January 20, 1972.

<sup>22</sup> This discussion of California reapportionment politics by no means justifies a conclusion that Democrats are differently motivated than Republicans. The question of whether California Republicans would have been as concerned with city and county boundaries and increased minority representation if they had been the ones who were slicing the pie necessarily remains an open one. Nevertheless, it is clear that in the states where Republicans have the votes, they show no hesitation in adopting districting plans that are favorable to their interests.

<sup>23</sup> See Dixon, *op. cit.*, pp. 460-61.

on the districting process would have made several of the gerrymanders enacted in 1971 impossible.<sup>24</sup>

Perhaps the best means of minimizing gerrymandering lies in turning the districting function over to a bipartisan commission, which would eliminate invidious gerrymandering detrimental to either party by checking it at the outset. Bipartisan and impartial districting frequently occurs on an informal basis in states where control of the legislature and the governor's veto power is divided between the two parties, as in the California situation described above. Several states have formal bipartisan and nonpartisan apportionment commissions, which have met with varying degrees of success.<sup>25</sup>

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<sup>24</sup> For example, the 1971 Texas congressional districting plan.

<sup>25</sup> See Dixon, *op. cit.*, pp. 314-84.

# REAPPORTIONMENT AND COMPUTERS

## Redistricting by Computer—An Overview

The Supreme Court's insistence upon absolute population equality among districts as the sole standard of constitutionality—at the expense of all other considerations—will probably result in the most extensive gerrymandering in the nation's history. By eliminating local boundaries, communities of interest, and district compactness as possible justifications for even slight population variances, the Court has unwittingly discarded almost all constraints on gerrymandering. One prominent and now disillusioned reapportionment plaintiff recently told a House Judiciary subcommittee that:

Unfair representation has always come about in *two* ways: through the existence of numerical inequalities among district populations, *and* through what has traditionally been called "gerrymandering"—the placement of district boundary lines in such a way as to give one political party or faction or individual candidates artificial, unwarranted advantages over others. And while the numerical inequalities have now all but disappeared, gerrymandering has, if anything, increased in importance, for with the elimination of the former evil, there has been a tendency to place greater reliance on the latter to accomplish the same political ends. And experience has proven that gerrymandering can be carried on just as effectively when numerical equality of district populations is required as when it is not required. Indeed, in my opinion, the Supreme Court's over-emphasis on precise numerical equality has actually made gerrymandering

easier—by giving those who draw the lines an excuse for ignoring county, town, and city boundary lines.<sup>1</sup>

But perhaps the most significant reason for the increased potential for gerrymandering is the introduction of the computer into the reapportionment process, a step first taken to assist in making the complex calculations necessary to comply with a standard of absolute population equality among districts. Initially, the computer was received as an answer to partisan gerrymandering.<sup>2</sup> In fact, it is no more neutral than those who program it. In addition to population data, there are two other factors vital to the formation of districts and the interests of the party controlling redistricting: registered voters and partisan strength. The computer's enormous capacity to store and process data can just as easily be programmed to consider these factors in formulating a districting plan as it can be to ignore them.

During the 1971-72 redistrictings, computers will be used extensively by legislative committees and state party organizations, both to formulate and analyze proposed districting plans. In one recently redistricted midwestern state, for example, the controlling party's spokesman openly boasted that computers had been used to determine the most politically advantageous districts.<sup>3</sup> Far from having eliminated gerrymandering, the use of the computer in reapportionment allows the party in power to utilize an immense amount of data, previously unavailable or unmanageable, in formulating gerrymanders vastly more sophisticated than the sandbox affair of the past. Without any constraints whatsoever, such as requirements to follow local boundaries or recognize communities of interest, the opportunities for computerized gerrymandering are unlimited.

**Early Uses of Computers in Reapportionment.** During the period in which the Supreme Court was applying its "one man—one vote" standard to legislative districts, computer experts were developing computerized reapportionment systems to assist in formulating districting plans that would satisfy the Court's equal population requirements. The principal approaches developed during the 1960s were the Forrest, Weaver-Hess, and Nagel methods. The first two are

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<sup>1</sup> Statement of David I. Wells, to House Judiciary Subcommittee No. 5, *Hearings, Congressional Districting*, 92nd Congress, 1st Session (1971), p. 76; hereafter referred to as *House Hearings*.

<sup>2</sup> See James B. Weaver and Sidney Hess, "A Procedure for Nonpartisan Districting: Developments of Computer Techniques," *Yale Law Journal*, vol. 72 (1965), p. 288.

<sup>3</sup> *House Hearings*, p. 76.

designed to operate only with demographic data, while the Nagel method utilizes both demographic and political data.

The Edward Forrest system is one of the earliest. The system assigns an x,y coordinate on the map of the state to be reapportioned to the center of each population unit, as determined by the 1960 census. These population center unit coordinates are then placed on a master data tape for the state and processed through a program which examines and breaks the state down into "diminishing halves" of population. When the computer completes its pass, it has broken down the population, with regard to geography, into the requisite number of equal population districts, with deviations of less than 1 percent from average district size. With the creation of these district plotting tapes, containing in digital language the assignments of population units to geography, the final step is to create electronically the map showing the district lines for the entire state. This is done on an electronic graphic recorder, which in a few seconds generates the district lines on a cathode ray tube. The images are microfilmed and enlarged to map scale.<sup>4</sup> The Forrest system was used in 1963 to create possible reapportionment plans for New Jersey and New York.

A second early computerized redistricting system is that developed by James B. Weaver and Sidney Hess. This system is essentially an adaptation of a preexisting program used to determine the optimum location of regional warehouses. By utilizing a special measure of compactness that tends "to locate districts of maximum compactness around centers of population,"<sup>5</sup> Weaver and Hess were able to convert the "warehouse" program to redistricting:

The chosen measure of compactness makes it possible to take advantage of certain mathematical similarities between the redistricting problem and a problem already programmed on computers—that of assigning customer orders to specific warehouse locations so as to minimize freight costs. This program, supplemented for this specific use by various additional steps and subcalculations, assigns EDs (customers) to LD centers (warehouses) in a manner minimizing moments of inertia (freight cost).<sup>6</sup>

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<sup>4</sup> Edward Forrest, "Apportionment by Computer," *American Behavioral Scientist* (December 1964), p. 23.

<sup>5</sup> Weaver and Hess, *op. cit.*, p. 292.

<sup>6</sup> Weaver and Hess, *op. cit.*, pp. 301-02. ED stands for enumeration district, the smallest unit of population count provided by the U.S. Census Bureau; LD stands for legislative district.



The first step in the Weaver-Hess system is to assign an x,y map coordinate to the geographical center of each ED. The coordinates of all EDs within the unit to be districted, along with their respective populations, are fed into the computer. This allows the computer to calculate the distance between any given point and the center of each ED, and in turn to calculate the moment of inertia of the ED around any given point (the moment of inertia is a multiple of the population of the ED times the square of its distance from any given point). Next, the number of legislative districts to be created and their average population are also fed into the computer. At this point, it is necessary to estimate the coordinates of the population centers of the districts to be created, and to feed these estimates into the computer. The computer then processes a program which assigns each ED center to an LD center "in such a way that minimizes the sum of the moments of inertia about the hypothesized centers for the entire unit being districted."<sup>7</sup> Once the new legislative districts are formed, the exact population center of each district is determined. The computer then repeats the "assignment" program over and over again until it arrives at a pass where no changes in ED assignment result from the use of calculated as opposed to estimated LD centers. When this procedure is completed, the computer has produced a number of possible districting plans, along with their population deviations and moments of inertia. Comparison of the plans in terms of these factors allows the rejection of inferior plans. The remaining plans are then outlined on a map to check for contiguity, and the noncontiguous plans are rejected. The entire districting procedure can be repeated again and again until the desired cross section of alternative plans is obtained. (See Figure I.)<sup>8</sup>

A major shortcoming of the Weaver-Hess system is its failure to take into consideration the political characteristics of the districts it creates. Every districting plan favors one political party or the other.<sup>9</sup> Use of the system, which closes its eyes to the political composition of the population, by no means guarantees that the plans it produces will not be gerrymanders. The system, in effect, is non-partisan only in the sense that it does not intentionally favor one party over the other.

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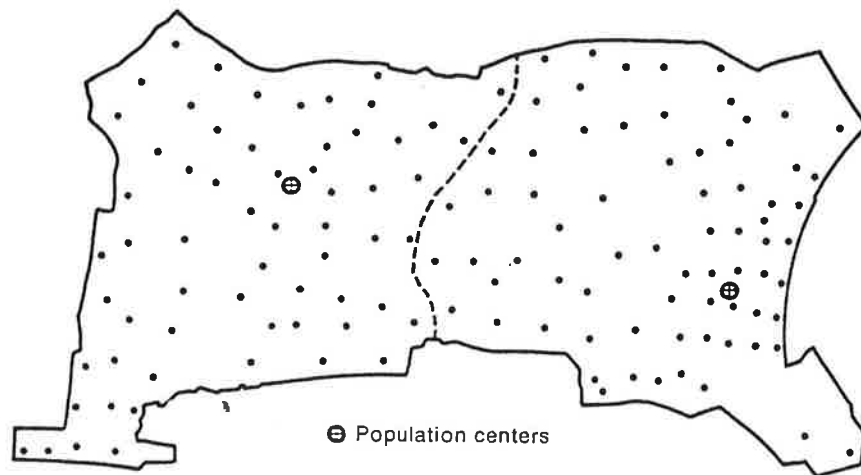
<sup>7</sup> *Ibid.*, p. 302.

<sup>8</sup> *Ibid.*, p. 304.

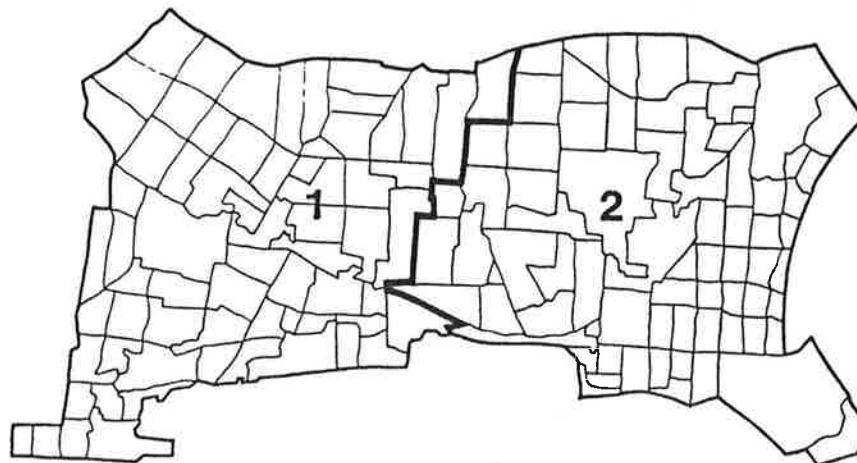
<sup>9</sup> James B. Weaver, *Fair and Equal Districts* (New York: National Municipal League, 1971), p. 3.

**Figure 1. THE WEAVER-HESS REAPPORTIONMENT  
SYSTEM APPLIED TO A HYPOTHETICAL AREA**

Population Centers and Centers of Census Districts



Result Plotted on a Census Tract Map



The third major computerized redistricting system used during the 1960s was developed by Dr. Stuart Nagel. It is the only system designed to start with existing legislative districts and to modify them to meet new standards of compactness, population equality, and political composition by trading units between districts. It therefore has two advantages over the Forrest and Weaver-Hess methods which make it more acceptable to legislators: it minimizes the amount of change; and, because it starts with existing districts, it tends to preserve incumbents.

The first step in the Nagel method is to feed the "parameter" data into the computer. This information includes the number of indivisible population units (census tracts) out of which the districts are to be made, the number of districts to be made, the desired average district population, the maximum allowable percentage deviation from average district size, the desired compactness, the manner by which population units are to be traded among districts, and the desired proportionality (the maximum number of seats each party can expect to win). The next step is to feed the individual unit data into the computer. This information includes an identification number, the population of the unit, the x,y map coordinate of the geographic center of the unit, the district in which the unit is located before redistricting, the number of other units making contact with the unit, a list of these contiguous units, and the number of votes cast for each party in the last election.<sup>10</sup>

Once all the appropriate data have been fed into the computer, they are processed according to a seven-part program. The crucial steps of this program are the moving, revising, and trading parts. The moving part of the program "attempts to move each unit from the district it is in to each other unit, one unit and one district at a time,"<sup>11</sup> subject to certain conditions, the principal one being contiguity. If these conditions are met, the characteristics of the "moved" unit are subtracted from those of its previous district and added to those of its new one. After each such tentative move, the revising part of the program takes over and determines "whether the move further minimized the criterion" (i.e., whether it is an improvement in terms of the characteristics desired for the new districts).<sup>12</sup> If it did, the district lines are redrawn and the number of consummated moves is

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<sup>10</sup> Stuart S. Nagel, "Simplified Bipartisan Computer Districting," *Stanford Law Review*, vol. 17 (1965), pp. 863, 865-68.

<sup>11</sup> *Ibid.*, p. 875.

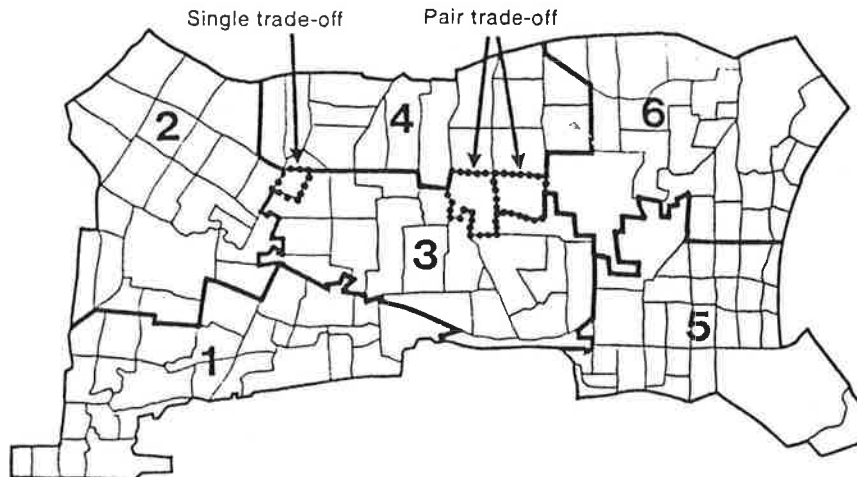
<sup>12</sup> *Ibid.*, p. 876.

counted. If one or more moves has been consummated, the moving step is repeated "because the most recent moves may have improved some potential moves that formerly looked bad."<sup>13</sup> When no more improvement moves can be made, the results can be printed, or the trading section of the program can begin. Due to the nature of the data, or the parameters, moving one unit at a time may not provide an optimum solution, "whereas the simultaneous trading of two or more units may."<sup>14</sup> Like the moving part of the program, the trading part also feeds into the revising part, which recalculates the criterion after each trade. When no more improvement trades can be made, the outcome is printed and the program is completed. (See Figure II.)

The Nagel method was used in the 1960s, to different degrees, in California, Illinois, New York, and Pennsylvania. As originally conceived, the Nagel method is unable to obtain the precise levels of population equality required since the Court's *Kirkpatrick* decision. Revisions of its basic program have been made, however, and modified Nagel systems are now being used in a number of states.

**Figure 2. NAGEL REAPPORTIONMENT SYSTEM  
APPLIED TO A HYPOTHETICAL AREA**

Sample Trade-off Between Districts Three and Four



<sup>13</sup> *Ibid.*, p. 877.

<sup>14</sup> *Ibid.*, p. 883.

**Computerized Reapportionment Systems in the 1970s.** The early applications of computers to reapportionment showed that reapportionment systems could respond rapidly with a number of alternative sets of district boundaries, provide some sort of trade-off method as the basis for optimizing several criteria at once, and manipulate geographic information in one form or another as required to aggregate the statistical data in the computer. Nevertheless, the systems used most frequently in the 1960s had several major shortcomings in addition to their inability to obtain precise levels of population equality: the original accuracy of the political data was lost when it was keyed to census tracts; the data base on which the system operated contained demographic and political data for only one particular year, thereby making trend analysis of the projected workings of the reapportionment system over the next ten years impossible; the need to convert district boundaries into tabular form for input into the computer and conversion back into geographic form before they could be evaluated by legislators slowed the process down; and the utilization of sophisticated quantitative techniques did not permit flexible and timely human intervention.

The limitations of the early computerized redistricting systems have been overcome by the use of geographic data retrieval systems, which take full advantage of a geographic data base and the computer's graphic capabilities. Advanced versions of the system operate with inputs and outputs of both tabular and graphic data, accepting interrogations in the form of geographic areas of interest and producing results in the form of graphic displays. The user not only sees the facts, but he sees the areas they represent. This new approach greatly enhances the effectiveness of the computer in the reapportionment process, and will be used increasingly in the 1970s.

The key advantage of a geographic data retrieval system is its ability to accurately create political profiles for any area of a state. This requires a cross referenced data base, which is a complete, computer-readable description of an area containing four different types of data: 1970 census data, 1970 census data area maps, registration and election data by precincts, and precinct maps.

Various types of demographic data can be included in the data base, but at a minimum it is advisable that it contain population counts, total number of blacks, total number of Spanish surnames, number of persons over the age of 18, number of residences, and education and income characteristics. Such demographic information is readily available from the Census Bureau on all of its official reporting units, which are counties, incorporated areas, minor civil divisions,

census tracts, enumeration districts, block groups, and census blocks. Census maps are also available from the bureau; these include metropolitan maps for the larger cities included in Standard Metropolitan Statistical Areas, county maps, and place maps for smaller cities.

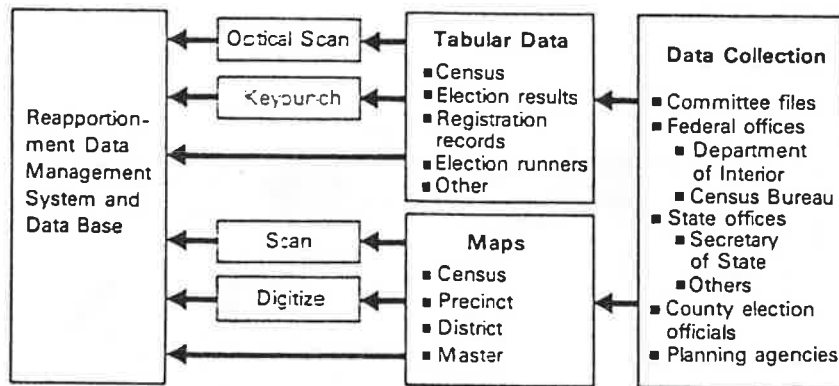
Depending upon the needs of the user, the type of political information contained in the data bases varies. In general, it is sufficient to include registration totals for all political parties, voter turn-out percentages, and major party votes for legislative and statewide races. Since one of the major advantages of a computerized system is its capability to analyze voting trends, it is desirable to include these figures for several election years. Registration figures, election returns, and precinct maps are most commonly obtainable from county elections officials.

Once all the data are acquired, it is necessary to convert them into machine-readable form for entry into the computer. Tabular data can be converted by keypunching or optical character-reading techniques. Geographic data can be converted by encoding each set of unit maps into a series of x,y map coordinates. Encoding can be accomplished in any of three ways: by using a grid overlay to manually read off the coordinates of the line segments; by using digitizing equipment designed to permit an operator to encode the position of a stylus on a tracing table; and by microfilming the maps and using flying-spot scanning techniques to encode the location of boundaries and to edit this file using cathode ray tube interactive terminals. (See Figure III.)

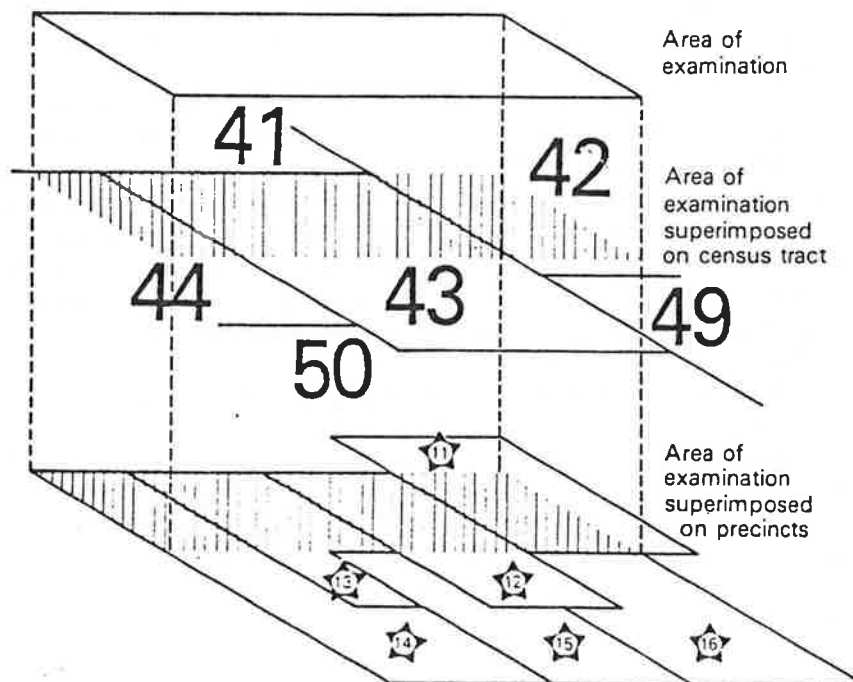
The basic problem of a geographic data retrieval system is to provide the political and demographic characteristics of any given area of a state by locating all of the geographic statistical units falling within the area, ascertaining the geographic relationship between these units, and comparing the tabulations they represent in such a way that the greatest possible accuracy is obtained. Because census tracts and precincts do not correspond with each other, the area of examination will not, in most cases, be the same as any of the geographic statistical units. This basic problem of defining the characteristics of an area is known as the "aggregation problem." The manner in which it is solved in large part determines the capabilities of any geographic data retrieval system. (See Figure IV.)

In some proposed systems, aggregation is performed manually upon the data before they are fed into the computer. In these systems the census tract is selected as the basic unit of analysis, and all precinct tabulations are aggregated with respect to census tracts by assigning a precinct to any census tract in which part of its area falls. Because this approach may assign a precinct to more than one census tract, the

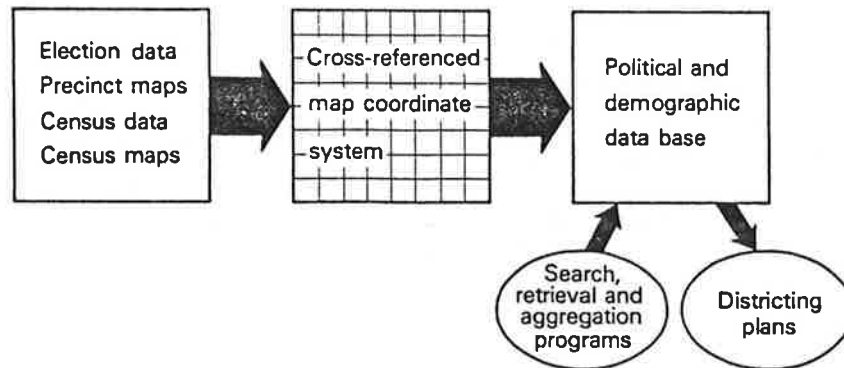
**Figure 3. DATA PREPARATION FOR A COMPUTERIZED REAPPORTIONMENT SYSTEM**



**Figure 4. ILLUSTRATION OF A TYPICAL AGGREGATION PROBLEM IN A GEOGRAPHIC DATA RETRIEVAL SYSTEM**  
(Three dimensional drawing)



**Figure 5. ILLUSTRATION OF A GEOGRAPHIC DATA RETRIEVAL SYSTEM**



resulting profile of an area may be inaccurate. In addition, the use of whole census tracts as the basic area of examination prevents the system from taking full advantage of the flexibility made possible by the data base.

A more accurate and flexible technique is that used by Compass Systems, Inc., of San Diego, in its geographic data retrieval system. The Compass Systems technique is not tied to any geographic unit as its basis for examination or aggregation. Taking advantage of a uniquely constructed data base, the system can more accurately describe any area by assigning every precinct to the census tract in which its center is located. If the area of examination cuts a census tract in half, the user of the system can manually determine how much of the tract falls within the area of examination.

A third method of aggregation, by far the most accurate, is area interpolation. Using this technique, the computer separates those units which fall completely within the area of examination from those which have portions of their areas located in the area of examination, applies an interpolation percentage to the tabulations from units with only portions of their area in the area of examination, and sums the interpolated tabulations with the tabulations which do not require interpolations.



A geographic data retrieval system is a user-oriented tool which utilizes a number of different programs to respond rapidly and accurately to almost any specific inquiry. Among the many tasks it can perform are retrieving specified area information, searching for areas which satisfy the user's stipulations, voting and population trend analysis, and area trade-offs between districts. (See Figure V.)

The system's response to any request can be given in both tabular and graphic form. Several different types of graphic output devices can be used; these include cathode ray tube devices, mechanical plotters, and line printers. Cathode ray tube devices can construct a plot rapidly, but, with one exception, they have small drawing surface areas. Mechanical plotters utilize pens which are moved over stationary paper to draw the map; although they are relatively slow, mechanical plotters are the least expensive mapmakers. Line printers use printed characters to approximate lines; the process is rapid and inexpensive, but less accurate than the other two methods.

Since there is a high probability that any reapportionment plan will be challenged in court, it is essential that every element of a computer-assisted reapportionment be properly documented. The paramount importance of documentation was underscored by the Supreme Court in its *Kirkpatrick* decision:

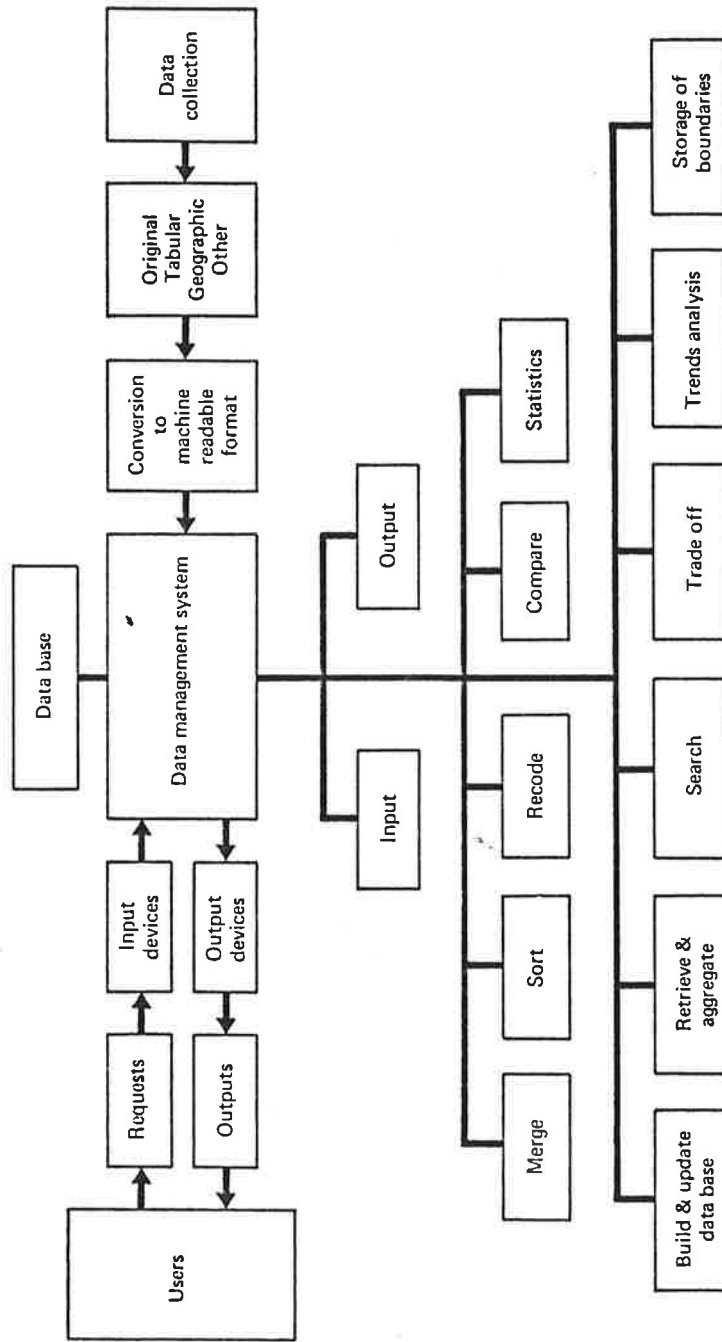
The "nearly as practicable" standard requires that the State make a good faith effort to achieve precise mathematical equality. Unless population variances among Congressional districts are shown to have resulted despite such effort, the State must justify each, no matter how small. . . . a Congressional districting plan will usually be in effect for at least 10 years and five Congressional elections. Situations may arise where substantial population shifts over such a period can be anticipated. Where these shifts can be predicted with a high degree of accuracy, States that are redistricting may properly consider them. . . . [However, these findings of population trends] must be thoroughly documented and applied throughout a State in a systematic, not an ad hoc, manner.<sup>15</sup>

Due to the user-oriented nature of a geographic data retrieval system, marked by frequent and random requests and responses, thorough documentation is particularly important. To insure against the possibility of legal attack, three different document files should be maintained: a management documents file, a data documents file, and a system documents file. The management documents file should con-

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<sup>15</sup> 394 U.S. 526, 531-35.

Figure 6.  
DIAGRAM OF THE COMPASS SYSTEMS INC. REAPPORTIONMENT SYSTEM



tain requests for proposals, proposals, system specifications, task orders, progress and final reports, and presentation and publicity releases. The data documents file should contain data collection reports, a data base dictionary with cross reference listings, census and precinct maps, census and elections figures, and metes-and-bounds descriptions of all pertinent areas. The system documents file is by far the most important. It should contain detailed system specifications, all operating instructions, keypunching instructions, specifications of all programs used, and records of all outputs.

## THE CENSUS AND REDISTRICTING

### OVERVIEW:

Census data, and through it the Bureau of the Census, are gradually becoming a linchpin of our political system. The Census was initially intended to provide a "head-count" to apportion congressional representation and direct taxes among the states. Slowly over the past 100 years, and dramatically in the last twenty, it has been transformed into the mechanism for acquiring politically relevant social, economic and demographic information.

The data, of course, are still used to apportion Congress and are uniquely suited to plan and evaluate government policy. Census information, for example, is one of the most important components in allocating over \$50 billion to the states and localities through more than a hundred Federal programs.<sup>1</sup> It has also become the basic ingredient for congressional and state redistricting; both to ensure arithmetically precise "equal population" districts, and, in some instances, to enhance the electoral predictability of the various districts that are drawn.

The indispensability of the Federal census data in redistricting, however, presents some problems. The enumeration procedures used by the Bureau, although appropriate

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<sup>1</sup>Congressman William Lehman, "The Census Reform Act," Hearings before the Subcommittee on Census and Population, Dept. 1977, p. 1.

to allocate congressional representation among the states, were not designed to reapportion legislative districts within the states. Census procedures have also come under severe attack for significantly undercounting Blacks, Hispanic minorities and the poor.<sup>2</sup> The undercount of the 1970 census is estimated to have been 2.5 percent for the entire population, but more than a 7 percent undercount of Blacks, and perhaps a much larger undercount of the Hispanics. (Census questionnaires were not published in Spanish and questions identifying Spanish surnames were asked of only 5 percent of the population.)<sup>3</sup>

These difficulties became apparent to a number of states reapportioning in the 1970's. Not only was the Bureau of the Census slow in providing the relevant information in a useable form, but the census' geography was frequently inappropriate. In an attempt to find some remedy, Congress and the Bureau are experimenting with a number of reforms to be used for the 1980 census. Unfortunately, the timing of these reforms has already prevented a significant number of states from participating, and so the real effect of the reforms may not be seen until the 1990 census.

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<sup>2</sup>Janet Simons, "Reapportionment: Here It Comes Again," State Legislators, Summer 1978, p. 17.

<sup>3</sup>Robert Garcia, "A Sense of Urban America," American Demographics, May 1979, pp. 44-46.

To understand the full relation between the census and redistricting requires some perspective. The responsibilities and procedures of the Census Bureau are complicated and technical. To classify the subject, this section delineates the organization, responsibilities and procedures of the census, outlines the reforms of the census as they affect redistricting, and highlights some of the anticipated problems in the 1980 census.

The Organization and Responsibilities of the Bureau of the Census:

Although the decennial census is mandated by Article I, section 2 of the Constitution, the Bureau was only organized into a permanent, established subdepartment in 1903.<sup>4</sup> Prior to that date, the census was collected, processed and compiled by an "Office" of the Census" that existed solely on an ad hoc basis. At first, the Office was administered by the Department of State and then by the Department of the Interior (1849); when elevated to a Bureau in 1903, it was transferred to the new Department of Commerce and Labor; and when that Department was split in 1913, the Bureau was placed in the Department of Commerce.

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<sup>4</sup>The discussion of the history of the census is drawn from four sources: U.S. Bureau of the Census, 1970 Census Users' Guide: Part 1, pp. 3-7; National Archives, Preliminary Inventory of the Records of the Bureau of the Census, (Record Group 29) Publication No. 65-3, 1964; U.S. Bureau of the Census, Fact Finder for the Nation (Washington, April 1970), pp. 2-6; U.S. Bureau of the Census, The Story of the Census, (Washington, January 1916).

To prepare for the 1910 census, which would collect statistics in six categories and count a population of nearly 92 million, the new Bureau was staffed with a professional Director, a Chief Clerk (an assistant to the Director), and four Chief statisticians in four divisions (Population, Manufacturers, Cities, and Vital Statistics); there were also eight expert Chiefs of the divisions, a Chief Machinist (to care for the tabulating machines), and 540 clerks-- not counting an additional 750 local special agents who were employed to collect statistics on cotton. By way of contrast, to collect statistics in eight categories and count a population of over 210 million, the 1970 Bureau was staffed with 3,400 full-time employees dispersed among 46 subdivisions and regional offices (see organizational chart).

The first so-called "modern census" was compiled in 1850. In the first six decennial censuses (1790-1840), Congress had fulfilled its constitutional responsibilities perfunctorily. In the first census, Congress had gone beyond the "head-count" required by the Constitution to include names of "heads of households," the number of persons in the family, whether they were slave or free, their sex, and, if free white males, whether they were over or under the age of 16. But Congress did not specify the form in which the data should be taken or establish any

criteria to guarantee uniformity, or, apart from the stipulation that it was to be collected by the U.S. Marshalls, its methodology. It would be 1848 before Congress (perhaps responding to increasing population, to the rise of the "Industrial Revolution" or to the promise of the census in 1840) set the precedent of carefully specifying the form, content and methodology of the census.

These early censuses were relatively crude. The Marshalls delegated the responsibilities of collection to their assistants, who used whatever paper was available, printed their own headings and mailed them first to the President and, after 1800, to the Secretary of State. Once the figures were totaled for each state, and the congressional representation apportioned, there is no evidence they were referred to again.

By 1810, however, Congress was sufficiently interested in tracing industrial development (perhaps attracted by potential tax revenues) to include in the decennial census an estimate of manufacturers' activities and, by 1840, Congress had added to the census an enumeration of agricultural and mining statistics. With the exception of these statistics, the census of population remained more a curiosity than an instrument of policy.

By the late 1840's, the situation was changed: in delineating the actual content of the census, Congress



was now clearly interested in developing characteristics of the population. An examination of the questionnaire from the census indicates the increasing sophistication of the process:

- (1) The number of free inhabitants
- (2) The number of slave inhabitants
- (3) Mortality rates:
  - .cause of death
  - .sex
  - .age
  - .nativity
  - .season of the year
  - .duration of illness
  - .occupation
  - .color
  - .free or slave
- (4) Products of Agriculture
  - .acreage of farms
  - .value of farm
  - .implements
  - .value of animals slaughtered
- (5) Products of Industry
  - .number of manufacturing establishments
  - .capital
  - .value of materials
  - .employees
  - .wages
  - .value of products
  - .percentage of profits
  - .whether the industry was home, corporate or individual
- (6) Social Statistics
  - .value of estates
  - .annual taxes
  - .education (or illiteracy)
  - .libraries (newspapers and periodicals read)
  - .church attendance
  - .pauperism
  - .crime
  - .wages
  - .the number of insane and idiotic
  - .the number of deaf, dumb and blind

It was also in this census that, for the first time, the Census data was compiled in some organized form and published with an explanatory and introductory text. It would

be several more decades before this information was collected, organized and analyzed scientifically (at least by today's standards); but the foundation of our current census was firmly laid.

In 1880, the next stage in the history of the census, accuracy and consistency were greatly enhanced when the U.S. Marshalls were replaced by supervisors and "census takers" who were hired specifically for the task of enumeration. In the urban areas, special agents were employed to collect statistics on manufacturing and, in the rural areas, the untutored interviewer was replaced by a qualified agent to enumerate agricultural statistics. In addition, a more comprehensive and accurate accounting of mortality was secured through correspondence with county officials. The agents and supervisors could still be appointed through the influence of patronage; but these steps represented progress. The immediate benefits of this policy were demonstrated when the 1880 census was completed (by 150 supervisors and 31,382 temporary enumerators) in just one month--compared with the traditional period of anywhere from ten to eighteen months.

It was in this period that the census began to assume some utility. To governments, it was helpful in legislating taxes and guiding the policy of organizing the western territories. In the business community, it was already

being used to plan investment. To meet these needs, the Bureau now became increasingly sophisticated, professional and steadily improved its degree of accuracy. (The single exception was the 1920 census, which was so controverted and incomplete that Congress refused to accept its findings, and congressional apportionment among the states was not altered until the census of 1930.)

With the increased interest in surveying the growth of the country, the Census Bureau was repeatedly assigned additional responsibilities. By 1915, its responsibilities included: a decennial census of wealth, debt and taxation; a decennial census of religious bodies; a decennial census of fisheries; a decennial census of the dependent, defective and delinquent classes; a quinquennial census of manufactures, central electric light and power stations, street and electric railways and telegraphs and telephones; a biennial computation of office holders (the Bluebook); an annual collection of mortality statistics; and an annual collection of statistics on the cities.

In 1941, the Bureau was streamlined by Congress to concentrate on five areas of data collection:

- .Census of Manufactures--taken every five years.
- .Census of Agriculture--taken every five years.
- .Census of Government finance and employment  
--taken every five years for years  
ending in "2" and "7".
- .Census of Housing--taken every 10 years.
- .Census of Foreign Trade--taken every month.

In just a few years, however, the demand for information again began to expand the functions of the Bureau:

- .Census of Business, wholesale, retail and service (since 1954)--taken every five years in years ending in "2" and "7". With quarterly reports on coffee inventories and monthly reports on wholesale inventories and sales.

- .Census of Construction (since 1959)--taken monthly.

- .Census of Transportation (since 1960)--taken every five years.

Although the Census Bureau now reports data in a complex range of areas, its primary task remains the enumeration and survey of the population. Perhaps it is more accurate to say that none of its activities is pursued independently, and each subdivision collects data in mutually compatible schemes, all based on the Census of population. The Bureau's methodology, indeed, is intentionally designed to generate comparisons between and among the different categories.<sup>5</sup> The population characteristics are collected in such a way that they may shed light on the business or agricultural census (or vice versa), which, in turn, may be compared with the census of government finance or with the data on transportation patterns and alternatives, and so forth.

Organized in this way, the Bureau has grown in power as well as size. Since its responsibilities are technical

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<sup>5</sup>U.S. Bureau of the Census, Procedural History of the 1970 Census, Chapter 1, pp. 17-18.

and rarely duplicated in other departments, it is necessarily given, and takes advantage of, the latitude to select its own methodology and procedures. When it is given a new mandate from Congress, the Bureau has consistently integrated these new tasks with the approaches and methods employed in its other censuses. There are few, if any exceptions. For this reason, it is slow to change its ways. If information is to be collected, its content is sometimes affected by the manner in which the Bureau decides it should be collected. At the same time, efforts to change the Bureau's methods are usually frustrated. A good illustration of this phenomenon was the Bureau's hesitancy to support any legislation making census geography more compatible with the states' redistricting needs.<sup>6</sup>

#### Procedures of the Census of Population.

To maintain this interrelation among the data, as well as to increase its utility, the Census Bureau takes great pains to count population in a particular geographic area. Moreover, the full ten years between decennials are used to design, plan and prepare for the census of population and housing. There is now too much at stake and it has become too expensive to tolerate any major errors. In the course of the decade, the Bureau consults with data users in constructing the questionnaire,<sup>7</sup> tests its clarity and experiments with a variety of collection techniques in at least five major "test" censuses. It will

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<sup>6</sup>"Tabulation of Population for Purposes of Apportionment of State Legislative Bodies," Hearings before the Subcommittee on Census and Population. Serial No. 94-24. April 1975.

<sup>7</sup>"1980 Census," Hearings, Serial No. 95-41. June 1977.

also test its questionnaire, techniques and methodology in a number of "special" censuses that are periodically requested by cities and counties that hope to improve priority for Federal grants. Another necessary and on-going project of the Bureau, is to solidify, extend and sophisticate the geographical sub-units in which the census is taken, tabulated and analyzed.

The two elements of procedure that are most relevant for redistricting are: (1) collection of data; and (2) definitions of geographical areas.

#### Collection of Data.

The Bureau collects two kinds of population data on "Census Day," April the First: (1) a "head-count," that, at least in theory, is to account for all residents (citizen or alien) who are living within the territorial limits of the United States; and (2) a survey of certain characteristics, i.e., level of education, employment, mobility, household facilities, fertility, marital history, etc. Using the survey sampling techniques developed in the last thirty years, the second kind of data may be collected by sampling only a small percentage of the population. Data on marital history, for example, may be accurately generalized from a sampling of only 5 percent of the population.

Prior to 1970, the traditional method (initiated in 1790) of collecting this data was to rely on the "census taker." The States were divided into what are called "enumeration districts," of approximately 750 people, designed so that one person can walk from house to house and fill out the appropriate forms.

Under this system, for the census to be completed with dispatch (assuring some compatibility of response from area to area), the Bureau employed a small temporary army of dedicated enumerators.

In 1970, due to increased costs and the growing difficulty of hiring and training a responsible crew, the Bureau adopted what is called the "mail-out/mail-back" census technique. Mailed to 60 percent of the population (see map), the principal advantage of this technique was that, by allowing the Bureau to enumerate the large metropolitan areas quickly and inexpensively, it could concentrate the use of enumerators on "follow-up" interviews (frequently conducted over the phone), and the more difficult task of enumerating the rural areas.

Although the Bureau was experienced in this technique (experiments began in the 1940's), and although the plan was carefully pretested, the use of the "mail-back" generated great controversy. There were five principal complaints:<sup>8</sup>

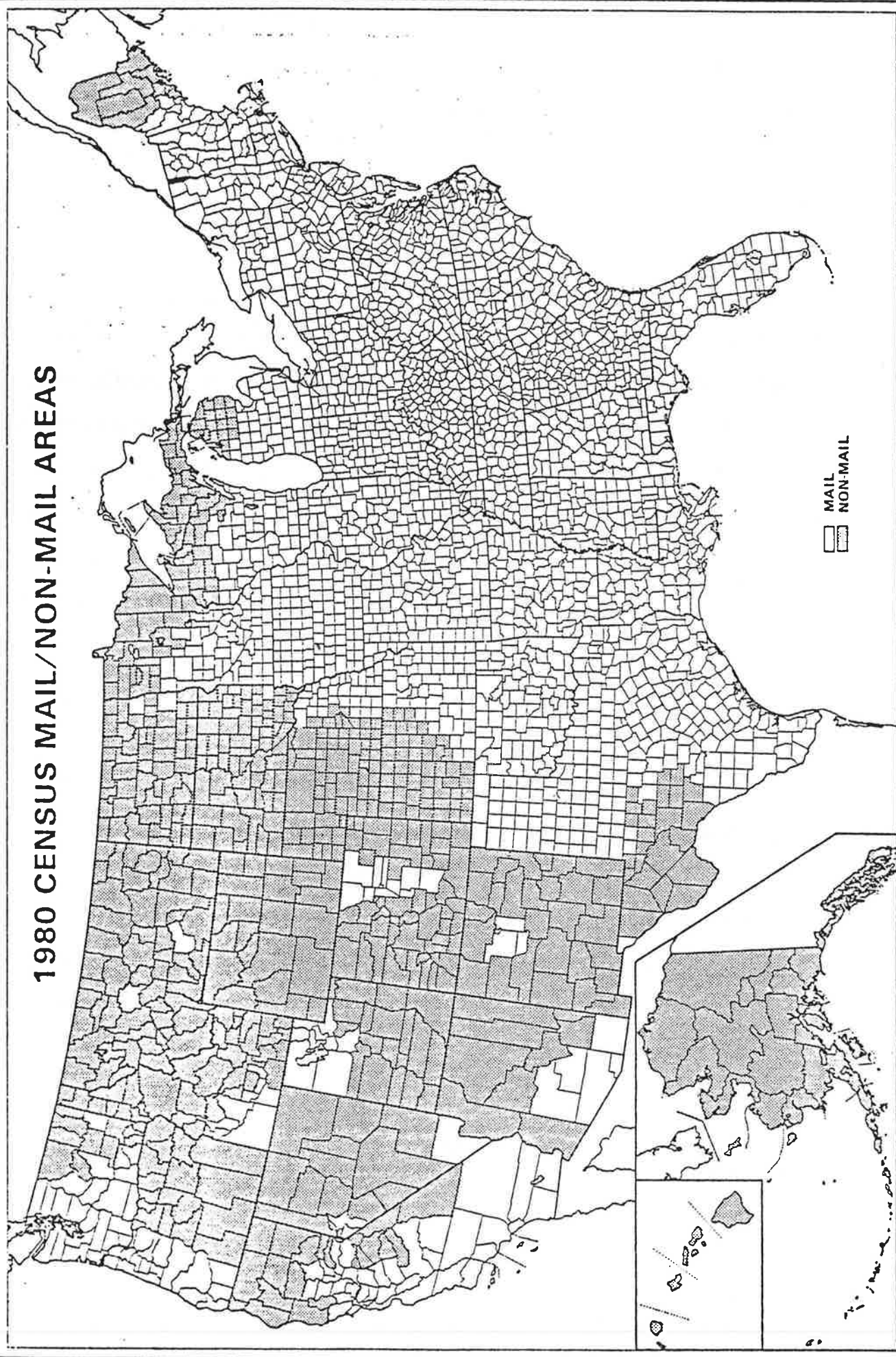
- \* Questionnaires were not sufficiently self-explanatory.
- \* Questionnaires were available only in English.
- \* Many urban areas have unreliable or even non-existent mail service.

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<sup>8</sup>"Evaluation of the 1970 Census," Hearings before the Sub-committee on Census and Population, Sept. 1974.

# 1980 CENSUS MAIL/NON-MAIL AREAS

MAIL  
NON-MAIL





\* The follow-ups" were arbitrary and incomplete.

\* Transient populations were, for the most part, uncounted.

The "mail-back," in short, was held to be inaccurate--and skewed, because it missed substantial numbers of minorities and the urban poor. In addition, by missing this particular element of the population, the population data survey's utility was held to be substantially reduced.

This substantial undercount was first a concern of the affected urban states, counties and cities. Federal relief money is tied to population, and the identification of needy groups and the procedures of the 1960 census were weakest in the sampling of precisely this population. But it was also quickly noticed, particularly by Democrats, that the census would have deleterious effects on the politics of redistricting. A national average undercount of 2.5 percent--or seven percent or even fifteen percent--would not necessarily reflect the potential magnitude of an undercount in Los Angeles, New York, St. Louis, Dallas, or Chicago. A congressional delegation may have been deprived of an additional seat, or if the state was recorded as losing relative population, it may have resulted in the actual loss of a seat. The undercount could also have led to the accidental creation of "over kill" districts--with the result that the party would lose its capacity to disperse its electoral strength through a number of "safe," but not excessively safe districts.

Since the late 1940's, the Census Bureau has steadily consolidated its geographical areas.<sup>10</sup> The intention is to facilitate collection, to avoid missing pockets of population, and to create a consistent procedure to analyze and compare the data.

The census is actually collected in Enumeration Districts (ED's); but it may be tabulated in a number of different areas as functions of the ED's: city block, block group, neighborhood, census tract, incorporated or unincorporated area, Central Business District, Major Retail Center, "urbanized areas," "Standard Metropolitan Statistical Area," City, Ward, County (Minor Civil Divisions in urban areas or Census County Divisions in rural areas), Congressional District, State, or even a major region of the country. For the majority of these areas, the Census Bureau accepts the boundaries as defined (i.e., City or County; and SMSA's, which are drawn by the Office of Statistical Policy). The remaining areas are drawn by the Bureau in consultation with local groups and officials. In some instances (block groups, neighborhoods, Central Business Districts), however, the area is recognized by the Bureau only if the service has been contracted (paid for by the State) and if the Bureau thinks it is practicable or feasible for the area to be created. The articulation of these areas is an on-going project.

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<sup>10</sup>cf Appendix for definition of geographical areas.

Plans for 1980.

Even though it remains controversial, the Bureau plans to increase its reliance on the self-enumeration technique and to mail the 1980 census to over 90 percent of the population. To avoid the deficiencies of the 1970 census, the questionnaire will be available in ten languages (upon request), accompanied by detailed instructions, and the Bureau will orchestrate a massive public relations campaign to "sell the census." In the pre-tests of this new plan, the Census Bureau reports that the mail-back success has risen to almost 87 percent--while simultaneously reducing non-responses and the obvious inaccuracies that require a follow-up. Nevertheless, the Bureau is also expecting to hire a temporary field force of nearly 265,000 to try to reduce the 1980 "undercount."<sup>9</sup>

It is, however,--as the Bureau of the Census is willing to admit--impossible to anticipate the effectiveness of these measures. It should be conceded that there will always be some degree of undercounting: but with the extension of the mail-back technique it is impossible to predict whether the 1980 census will reduce or exceed the inaccuracy levels of the 1970. In an attempt to protect the accuracy of the sample questions, therefore, the Bureau has increased the minimum frequency in metropolitan areas to 15 percent (compared with 5 percent in 1970) and to 50 percent in areas of relatively low

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<sup>9</sup>David L. Kaplan, "America's National Portrait," American Demographics, April 1979, pp. 17-18.

density. It has also changed the question identifying persons of Spanish origin from the 1970 level of five percent to a 100 percent sample in 1980.

Any controversy about the accuracy of the 1980 census will undoubtedly find its way into the process of redistricting. Ensuring the credibility of the census may delay publication which, in turn, will reduce the time available to the state legislatures to redistrict. It is also possible to imagine that the courts may require the Bureau to retake a census of a particular city, or even of a state, if the results are in some major way suspect.

#### Defining the Geographical Areas.

The second important stage in census procedure is the definition of the geographical areas in which it will be taken and analyzed. It is also one of the most relevant links between the census and redistricting.

Unfortunately, the census' geography was not originally designed for compatability with state legislative districts or election districts (precincts): and the process of making it compatible, particularly in rural areas, is difficult and complicated. Since 1910, the census has been tabulated in congressional districts, but even here there is some difficulty. The building blocks of census geography are only relevant to the congressional districts in the year in which the census is taken.

An almost defining characteristic of these areas is that they are not standardized by population or size. Each area artificially created by the Census Bureau has an assigned maximum and minimum range recommended by the Bureau; but these are not absolute. Enumeration districts range from 500 people to several thousands, and census tracts from thousands to tens of thousands.<sup>11</sup> The guiding concern in the creation of all these districts is that they are readily identifiable and reasonably homogeneous. In collecting statistics on manufacturing, business, construction, agricultural productivity, etc., the Bureau is interested in simplifying the tasks of enumeration and providing the means to generalize a sample of population.

The Census Bureau is often accused of being more interested in serving the needs of the Federal agencies and the business community than those of the states. Yet it is principally the Bureau's interest in homogeneity that prevents conforming census geography to states' needs of tabulating population data in election precincts. The "rationality" of each system is fundamentally different and frequently contradictory. Despite the obvious utility of providing for some compatibility, therefore, the process of change has been slow, deliberate and, in many states, far from satisfactory.

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<sup>11</sup>Deith R. Billingsley and Delmer D. Dunn, "The States and the Bureau of the Census," State Government: a journal of state affairs, 1974, p. 182.

### The New Reforms.

Since 1975, there have been four plans instituted to facilitate the use of census data in legislative redistricting. The first was a plan originally supported by the reapportionment committee of the National Conference of State Legislatures and passed by Congress (P.L. 94-171)<sup>12</sup> over the objection of the Census Bureau. The other three were initiated by the Bureau. The details of the plans are complicated, but are necessary to illustrate the problem.

The Bureau refused to accept the proposal that it should simply add election districts or precincts to its list of geographical units for tabulation. The Bureau argued that (1) it would be prohibitively expensive, with no additional benefits accruing in comparability with other census data, and (2) the drawing of the boundaries and maps could not be accomplished with any degree of accuracy in only five years. It did accept, however, that it would contract the service with the states that requested it if (a) the precincts conformed to the criteria established by the Bureau and (b) the states petitioned and their proposals were submitted at least three years before the decennial census (in this case, April 1, 1977).

The principal drawback to this plan was the lack of time available to the states to meet the Bureau's deadline. Initially, 24 states reported their intention to take part in

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<sup>12</sup>Janet Simons, supra.

the voluntary program. By the deadline date, however, only 17 states were able to submit proposals. In the ensuing negotiations between the Bureau and the states, three states (California, Oklahoma and Utah) withdrew from participation. The proposals of the remaining fourteen states (Florida, Idaho, Iowa, Louisiana, Maine, Maryland, Minnesota, New Hampshire, New Jersey, South Carolina, South Dakota, Tennessee, Virginia and Wisconsin) were accepted by the Census Bureau.

Disappointment was registered in Congress over the small number of states able to participate in the program. Eventually, this gave rise to a Bureau proposal for three additional ways to match census population counts with the states' precincts. Nineteen states have now enrolled in one or more of the three programs.

1. The "Alternative Approach for Blocked Areas." This program would facilitate redistricting in the large metropolitan areas of a State (technically the most difficult to redistrict) by providing census data in the smallest, and therefore the most flexible geographical unit. This program extends the policy of providing block data by relaxing the criteria of what would normally constitute the Bureau's definition of a block.<sup>13</sup> Six states have enrolled in this program.

2. "Delineation of Enumeration Districts by Local Authorities for Use in the 1980 Census." This program is not

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<sup>13</sup>See Appendix for definition.

easily assimilated into the redistricting process, but may serve the needs of the more rural states. In preparation for each census, the Bureau re-evaluates the boundaries of its enumeration districts. In changing the boundaries, the Bureau's regional offices normally work in concert with local officials or groups. It could be possible using this format, then, for at least some of the enumeration districts to follow precinct lines. To the extent that these new enumeration districts do not violate the Bureau's rules, there are three possible configurations: (1) an ED and a precinct would coincide, (2) a precinct would consist of two or more ED's, or (3) the ED would consist of two or more precincts. In all these configurations it would be easy to relate the census to precincts.

3. "An Extension of the Bureau's Contract Block Program." Under this program, the Bureau would, at the request and expense of the state or other governmental entity, enumerate and tabulate the census information on a block basis in areas not covered by the Bureau's regular block program.

The net effect of all these programs is that, for the states participating, it will be much easier to incorporate the census population data (and, equally important, the survey data) into their deliberations on reapportionment.

#### Prospective Problems in the 1980 Census.

We have already touched on some of the problems which may be expected in the 1980 census. As a former Director of the



Bureau has noted, the greatest threat to the census is its increasing visibility and the residual disenchantment with the 1970 census. There are, however, still other problems that must be anticipated:

\* Cost: Congress has already made several efforts to reduce the estimated costs of the 1980 census. In 1970, the census cost a record \$220 million, or about \$1 a person counted; the estimates for the 1980 census run as high as \$990 million, or about \$4 a person counted. The additional expense is broken down by the Bureau in the following way:

The first dollar is from inflation.

The next 75 cents derives from direct efforts to improve coverage. An additional

50 cents comes from improvements in field administration, many of which are related to the effort to get a better count. New data needs add 25 cents, as do certain enhancements in the geographic and processing operations. The last 25 cents

derives from a demographic phenomenon, namely the decrease in average household size.<sup>14</sup>

\*Non-response to Survey--Survey Length: The 1980 questionnaire is approximately the same length as the 1970;<sup>15</sup> it is feared, and verified in some of the pretests, however,

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<sup>14</sup>Kaplan, supra, p. 14.

<sup>15</sup>See Appendix for Copy of Census Questionnaire.

that the length of the survey may increase total non-response or selective non-response. Several programs are currently being designed to counteract such a tendency.

\* Delay in Meeting Deadlines for Redistricting:

The Bureau has currently contracted to provide the Congress with raw counts per state within nine months of the census (January 1, 1981). By April 1, 1981, the States should receive the data for redistricting. In addition, the Bureau will produce computer summary tapes and computer summaries for blocks and block groups before the materials are published in book form. The delivery dates, however, may already be in some serious jeopardy.

\* Undercounting: Although noted in some detail above, this remains the most significant problem for the census. If the early data is not confirmed by a high response in the "mail-back," or if the groups now organizing informally to follow-up on the Bureau's "follow-ups" are not convinced of the Bureau's dedication to a 100 percent count, then there may be standing for a legal challenge, or even a congressional challenge.

APPENDIX A

THE CENSUS DICTIONARY  
SOURCE: \ 1970 CENSUS USERS' GUIDE  
U.S. BUREAU OF THE CENSUS

## THE CENSUS DICTIONARY

- Regions/Divisions—There are four census regions (West, South, Northeast, and North Central) defined for the United States, each composed of two or more geographic divisions. The nine divisions are groupings of States. (See Chart)
- Governmental Units of the Nation—States, congressional districts, counties, minor civil divisions (MCD's) such as towns and township, incorporated places (e.g., cities or villages), and wards in some cities.
- Congressional Districts—These areas are defined by State legislatures for the purpose of electing congressmen to the U.S. House of Representatives and may change after each decennial census.

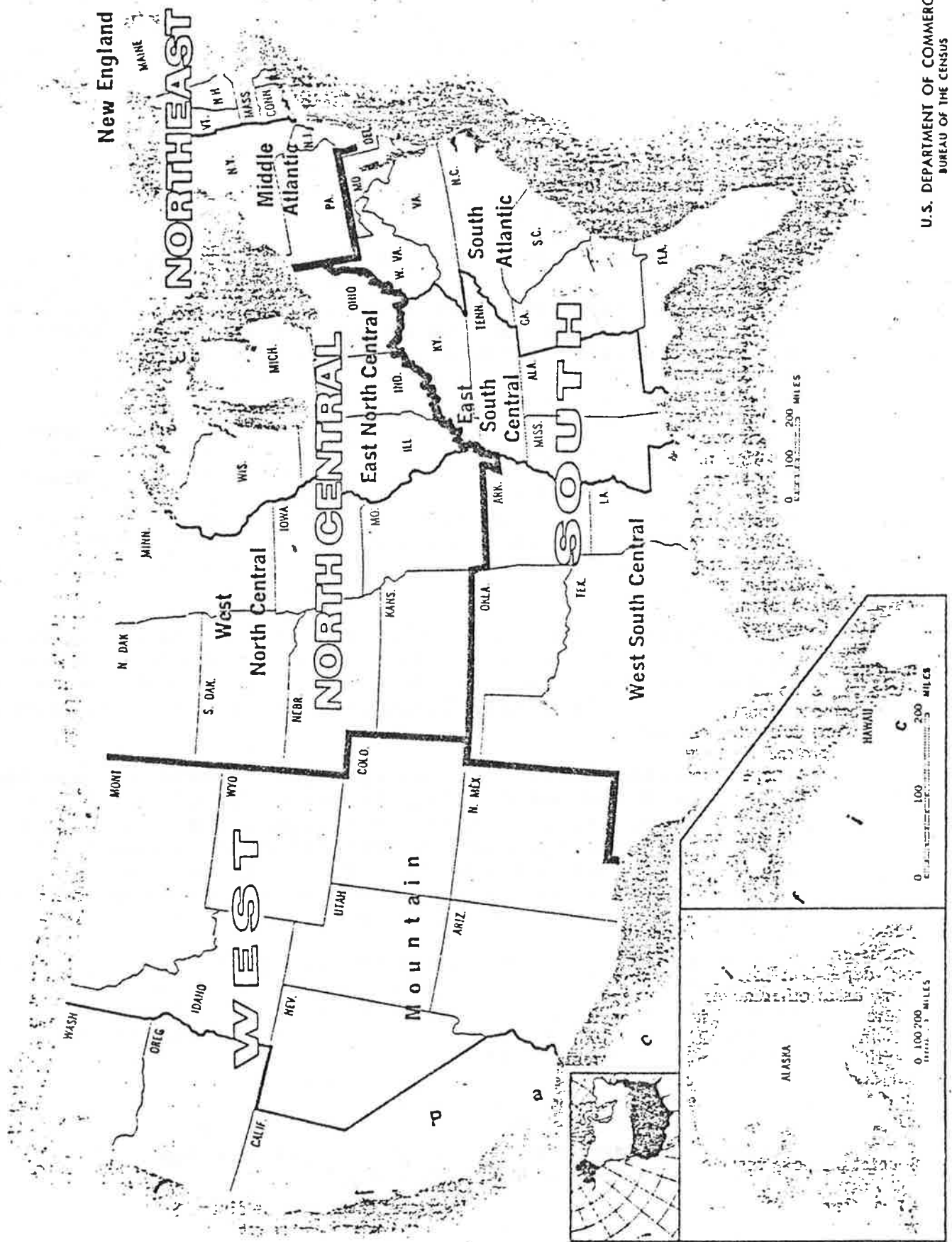
Population and housing are the only censuses which tabulate statistics for the 435 congressional districts. Published census reports include only population totals for each district. These are found, along with much other census data, in the Congressional District Data Book and its supplements. Additional information from other censuses is presented only for districts made up of whole counties or for the smallest combination of split-county congressional districts following county lines.

- Municipalities and Townships—In the census of governments reports, statistics are shown for types of government rather than for types of places, and the statistics for individual cities and towns are shown for either municipality or township governments. The term "municipality" includes all active governmental units officially designated "cities," "boroughs," "villages," or "towns" (except in New England, New York and Wisconsin). This concept generally corresponds to the incorporated places that are recognized in the population and housing censuses.

The term "township" as used in the census of governments refers to over 17,000 organized governments located in 17 States. The designation includes governments known officially as "towns" in New England, New York, and Wisconsin; some "plantations" in Maine; and "locations" in New Hampshire; as well as all governmental units officially called townships in other areas having this type of government.

- Wards—Wards are political subdivisions of cities used for voting and representation purposes. These areas are usually reported in the population and housing census tabulations in cities of 3,000 or more which have provided boundary information. It is planned that 1980 census population totals for wards of cities with 10,000 or more will be published in the census reports.

Figure 1. CENSUS REGIONS AND GEOGRAPHIC DIVISIONS OF THE UNITED STATES



• Minor Civil Divisions (MCD's)—These are the primary political and administrative subdivisions of a county; for example, towns, townships, precincts, magisterial districts, and gores. MCD tabulations are made for the census of population and housing. Each township or equivalent area (including census county divisions) is assigned a three-digit numeric code in alphabetic sequence within a county. In 1970, over 31,000 MCD's were recognized. Almost two-thirds of these were townships.

For those States in which MCD's are not suitable for presenting statistics, census county divisions (CCD's) are established by the Census Bureau.

In 1980, each separate discontinuous territory will be reported in one or more pieces and given a name. If the piece of unorganized territory in the county is large in area or population, it may be divided into named parts in a manner similar to the delineation of census county divisions. This program is limited to South Dakota, Minnesota, and Maine.

• Census County Divisions (CCD)—In the 21 States for which MCD's are not suitable for presenting statistics, either because the areas have lost their original significance, are too small, have frequent boundary changes, or have indefinite boundaries, the Census Bureau has established relatively permanent statistical areas and designated them as CCD's.

The 18 States with CCD's in 1970 were: Alabama, Arizona, California, Colorado, Delaware, Florida, Georgia, Hawaii, Idaho, Kentucky, Montana, New Mexico, North Dakota, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Washington, and Wyoming.

The population, housing, and agriculture censuses are the only ones for which CCD data have been tabulated. The larger incorporated places are recognized as separate CCD's even though their boundaries may change as a result of annexations. Cities with 10,000 or more inhabitants generally are separate CCD's, and some incorporated places with as few as 1,000 population may be separate CCD's.

CCD boundaries were reviewed by county officials and various State agencies and were approved by either the governors or their representatives. Consideration was given to the trade or service areas of the principal settlements and in some instances to major land or physiographic differences.

Unincorporated enclaves within a city are included in the same CCD as the city. In tracted areas, each CCD is normally a single tract or group of tracts, or the combination of two CCD's represents one tract.

• Place (Cities and Other Incorporated and Unincorporated Places)—The term place, as used in the decennial population and housing census, refers to a concentration of population, regardless of the existence of legally prescribed units, powers, or functions. However, most of the places identified in the census are incorporated as cities, towns, villages, or boroughs. In addition, the larger unincorporated places are delineated.

• Standard Metropolitan Statistical Areas (SMSA's)—The concept of an SMSA has been developed in order to present general-purpose statistics. On the basis of the criteria listed below, the geographical boundaries of SMSA's are drawn by the Office of Statistical Policy in the Bureau of the Budget with the advice of representatives of the major Federal statistical agencies.

In 1970, there were 233 SMSA's in the United States and Puerto Rico; as of 1978, there were 311. Generally speaking an SMSA consists of a county or group of counties containing at least one city (or twin cities) having a population of 50,000 or more plus adjacent counties which are metropolitan in character and are economically and socially integrated with the central city. In new England, towns and cities rather than counties are the units used in defining SMSA's. The name of the central city or cities is used as the name of the SMSA. There is no limit to the number of adjacent counties included in the SMSA as long as they are integrated with the central city nor is an SMSA limited to a single State; boundaries may cross State lines, as in the case of the Washington, D.C.-Maryland-Virginia SMSA.

Where the Current Population Reports series presents statistics for the metropolitan and nonmetropolitan populations, "metropolitan" refers to persons residing in SMSA's and "nonmetropolitan" refers to persons not residing in an SMSA even though they may live in a city.

Criteria for SMSA's:

- A. Population size—each SMSA must include at least:
  1. One city with 50,000 inhabitants or more, or
  2. Two cities having contiguous boundaries and constituting, for general economic and social purposes, a single community with a combined population of at least 50,000, the smaller of which must have a population of at least 15,000. If two or more adjacent counties each have a city of 50,000 inhabitants or more and the cities are within 20 miles of each other (city limits to city limits), they will be included in the same area unless there is definite evidence that the two cities are not economically and socially integrated.
- B. Metropolitan character of outlying counties—specifically, the following criteria must be met:
  1. At least 75 percent of the labor force of the county must be in the nonagricultural labor force.

2. The county must meet at least one of the following conditions:

a. It must have 50 percent or more of its population living in contiguous minor civil divisions having a density of at least 150 persons per square mile, in an unbroken chain of minor civil divisions with such density radiating from a central city in the area.

b. The number of nonagricultural workers employed in the county must equal at least 10 percent of the number of nonagricultural workers employed in the county containing the largest city in the area, or the outlying county must be the place of employment of at least 10,000 nonagricultural workers.

c. The nonagricultural labor force living in the county must equal at least 10 percent of the nonagricultural labor force living in the county containing the largest city in the area, or the outlying county must be the place of residence of a nonagricultural labor force of at least 10,000.

C. Integration of central county and outlying counties—sufficient economic and social communication:

1. At least 15% of the workers living in the given outlying county must work in the county or counties containing the central city or cities of the area, or

2. At least 25 percent of those working in the given outlying county must live in the county or counties containing the central city or cities of the area.

D. In New England, where city and town are administratively more important than the county and data are compiled locally for those minor civil divisions, cities and towns are the units used in defining SMSA's. Here, a population density criterion of at least 100 persons per square mile is used as the measure of metropolitan character and the integration criteria for the towns and cities are similar to criterion C.

E. Central city of an SMSA—The largest city in an SMSA is always a central city. One or two additional cities may be secondary central cities in the SMSA on the basis and in the order of the following criteria:

1. The additional city or cities must have a population of one-third or more of that the largest city and a minimum population of 25,000 except that both cities are central cities in those instances where cities qualify under A, (2) of the criteria for SMSA's.



2. The additional city or cities must have at least 250,000 inhabitants.

F. Ring of an SMSA—The ring is all of the SMSA that is not part of the central city itself. This concept is used in the population census to provide information on commuting patterns of workers.

- Urbanized Areas (UA's)—A UA consists of a central city(s) of an SMSA plus the surrounding closely settled urban fringe (the suburbs).
- Urban/Rural—The urban population comprises all persons living in urbanized areas and in places of 2,500 or more inhabitants outside these areas. Everyone else is considered as residing in a rural area.
- Unincorporated Places—Some concentrations of population are not incorporated as cities, villages, etc. The Census Bureau defines them, with local assistance, for statistical purposes.
- Census Tract—Census tracts are small, relatively permanent areas into which large cities and adjacent areas are divided for the purpose of providing comparable small-area statistics. Tract boundaries are determined by a local committee and approved by the Census Bureau; they conform to county lines. Tracts are originally designed to be relatively homogeneous with respect to population characteristics, economic status and living conditions; the average tract has about 4,000 residents. From time to time, changes may be made in tract boundaries; they are not necessarily comparable from census to census.

Census tracts are often used by local agencies in tabulating their own statistics. In 1960, there were over 23,000 tracts identified in 180 areas of the U.S. and Puerto Rico.

All SMSA's were completely tracted for the 1970 census. In addition, over 2,000 census tracts will be recognized in non-SMSA cities and counties. The 1970 total was about 34,000 tracts.

- City Block—A city block is normally a well-defined rectangular piece of land, bounded by streets and roads. However, it may be irregular in shape or bounded by railroad tracks, streams or other features. Blocks may not cross census tract boundaries, but may cross other boundaries such as city limits.

Block data will be tabulated and published for all cities with populations of 50,000 or more prior to 1970. There are about 350 such cities. Block data was tabulated and published for cities which may exceed 50,000 in 1970 and for approximately 900 cities and other areas that have contracted for block statistics.

- Block Face—The side of a city block; a segment of the periphery of a block or of a cul-de-sac into a block. Block faces can be identified using the Address Coding Guide and grouped to any specifications at request for a special tabulation.

•Block Group—This designation was new in 1970. A block group is a combination of contiguous blocks having a combined average population of about 1,000. Block groups are approximately equal in area (discounting parks, cemeteries, railroad yards, industrial plants, rural areas, etc.); they are subdivisions of census tracts which simplify numbering and data control. For purposes of providing small-area population and housing census data, they are the equivalent of enumeration districts within the mail-out/mail-back areas where Address Coding Guides have been prepared.

Block groups (and blocks) are typically defined without regard to the boundaries of political or administrative areas, such as cities, minor civil divisions, and congressional districts. When a block group straddles one or more of these boundaries, data for those parts in different areas will be tabulated separately. Where such a split occurs, the tapes contain two (or more) data records having the same block group number with the census tract but a different place, annexation, minor civil division, or congressional district code depending on the situation.

•Enumeration Districts (ED's)—These small population areas average about 250 housing units and are defined by the Census Bureau. They are used for the collection and tabulation of population and housing census data for the conventional enumeration areas and for portions of the mail-out/mail-back SMSA's not covered by the Address Coding Guide.

APPENDIX B

1980 CENSUS QUESTIONNAIRE

SOURCE: AMERICAN DEMOGRAPHICS, APRIL 1979

2. provides information on type of household (husband/wife, other type of family, or single person households) and the number of persons in the household. Because of changes in society since 1970, the concept of household "head" has been replaced with that of a reference person in whose name the dwelling unit is owned or rented. This person is identified in column one. This key change means data will not be exactly comparable to "male-headed" or "female-headed" household data from the 1970 Census, but it will be easy to identify families and other types of households. In many tabulations characteristics will be shown for both husband and wife where they were shown previously only for the head of family households.

The questionnaire has space for up to seven household members to provide answers. We show only column 1. The other columns are identical except for question 2, which asks relationship. In question 2, columns 2 through 7 have the following language instead of the "Start in this column" language: "If relative of person in column 1: Husband/wife; Son/daughter; Brother/sister; Father/mother; Other relative (specify). If not related to person in column 1: Roomer, boarder; Partner, roommate; Paid employee; Other nonrelative (specify)."

Two of the categories are new: "Partner, roommate" and "Paid employee." The first was added to obtain statistics on the growing number of people who live together without being married.

3. same as in 1970.

4. expands the possible answers about race from nine in 1970 to 15. As a result we can expect a few Samoans to turn up in places like Kansas City, just because that alternative is listed. The expansion is the result of growing ethnic awareness, but note that the word "race" does not appear.

5. same as in 1970.

6. same as in 1970.

7. for the first time asks all Americans a single question about Spanish origin. These data will not be comparable with previous censuses. In 1970, this question was asked of a maximum of 15 percent of the population, and the data were tabulated differently for different regions of the country. This question ends the population questions asked of all Americans. The next three questions appear on the long form questionnaire only.

8. similar to 1970, but what was previously called "parochial" schools is now called "church related."

9. similar to 1970, but the highest college level asked for then was six or more years.

10. same as in 1970.

Note: Because of our format we have reduced the size of the questionnaire by about 15 percent and omitted certain instructions to respondents and Census Bureau use boxes. The census questionnaire also will have blue shading, not gray.

Here are the QUESTIONS ↓	These are the columns for ANSWERS → <i>Please fill one column for each person listed in Question 1.</i>	PERSON in column 1		
		Last name	Last name	
		First name	Middle initial	First name
<p>2. How is this person related to the person in column 1?</p> <p><i>Fill one circle.</i></p> <p><i>If "Other relative" of person in column 1, give exact relationship, such as mother-in-law, niece, grandson, etc.</i></p>	<p><i>START in this column with the household member (or one of the members) in whose name the home is owned or rented. If there is no such person, start in this column with any adult household member.</i></p> <p>If relative of:  <input type="radio"/> Husband  <input type="radio"/> Son  <input type="radio"/> Brother              If not relative:  <input type="radio"/> Roomer, boarder  <input type="radio"/> Partner, roommate  <input type="radio"/> Paid employee  <input type="radio"/> Other nonrelative (specify)         </p>			
<p>3. Sex <i>Fill one circle.</i></p>	<p><input type="radio"/> Male <input checked="" type="radio"/> Female</p>			
<p>4. Is this person —</p> <p><i>Fill one circle.</i></p>	<p> <input type="radio"/> White <input type="radio"/> Asian Indian  <input type="radio"/> Black or Negro <input type="radio"/> Hawaiian  <input type="radio"/> Japanese <input type="radio"/> Guamanian  <input type="radio"/> Chinese <input type="radio"/> Samoan  <input type="radio"/> Filipino <input type="radio"/> Eskimo  <input type="radio"/> Korean <input type="radio"/> Aleut  <input type="radio"/> Vietnamese <input type="radio"/> Other — Specify  <input type="radio"/> Indian (Amer.)  <i>Print tribe →</i> </p>			
<p>5. Age, and month and year of birth</p> <p>a. <i>Print age at last birthday.</i></p> <p>b. <i>Print month and fill one circle.</i></p> <p>c. <i>Print year in the spaces, and fill one circle below each number.</i></p>	<p>a. Age at last birthday</p> <p>b. Month of birth</p> <p>c. Year of birth</p> <p> <input type="radio"/> Jan.—Mar.  <input type="radio"/> Apr.—June  <input type="radio"/> July—Sept.  <input type="radio"/> Oct.—Dec.         </p>			
<p>6. Marital status</p> <p><i>Fill one circle.</i></p>	<p> <input type="radio"/> Now married <input type="radio"/> Separated  <input type="radio"/> Widowed <input type="radio"/> Never married  <input type="radio"/> Divorced         </p>			
<p>7. Is this person of Spanish/Hispanic origin or descent?</p> <p><i>Fill one circle.</i></p>	<p> <input type="radio"/> No (not Spanish/Hispanic)  <input type="radio"/> Yes, Mexican, Mexican-Amer., Chicano  <input type="radio"/> Yes, Puerto Rican  <input type="radio"/> Yes, Cuban  <input type="radio"/> Yes, other Spanish/Hispanic         </p>			
<p>8. Since February 1, 1980, has this person attended regular school or college at any time? <i>Fill one circle. Count nursery school, kindergarten, elementary school and schooling which leads to a high school diploma or college degree.</i></p>	<p> <input type="radio"/> No, has not attended since February 1  <input type="radio"/> Yes, public school, public college  <input type="radio"/> Yes, private, church-related  <input type="radio"/> Yes, private, not church-related         </p>			
<p>9. What is the highest grade (or year) of regular school this person has ever attended?</p> <p><i>Fill one circle.</i></p> <p><i>If now attending school, mark grade person is in. If high school was finished by equivalency test (GED), mark "12."</i></p>	<p>Highest grade attended:</p> <p> <input type="radio"/> Nursery school <input type="radio"/> Kindergarten            Elementary through high school (grade or year)            1 2 3 4 5 6 7 8 9 10 11 12  <input type="radio"/> College (academic year) <input checked="" type="radio"/> 12 or more  <input type="radio"/> Never attended school — Skip question 10         </p>			
<p>10. Did this person finish the highest grade (or year) attended?</p> <p><i>Fill one circle.</i></p>	<p> <input type="radio"/> Now attending this grade (or year)  <input type="radio"/> Finished this grade (or year)  <input type="radio"/> Did not finish this grade (or year)         </p>			

<p><b>H1.</b> Did you leave anyone out of Question 1 because you were not sure if the person should be listed — for example, a new baby still in the hospital, a lodger who also has another home, or a person who stays here once in a while and has no other home?</p> <p><input type="radio"/> Yes — On page 20 give name(s) and reason left out.  <input type="radio"/> No</p>	<p><b>H9.</b> Is this apartment (house) part of a condominium?</p> <p><input type="radio"/> No  <input type="radio"/> Yes, a condominium</p>																																	
<p><b>H2.</b> Did you list anyone in Question 1 who is away from home now — for example, on a vacation or in a hospital?</p> <p><input type="radio"/> Yes — On page 20 give name(s) and reason person is away.  <input type="radio"/> No</p>	<p><b>H10.</b> If this is a one-family house —</p> <p>a. Is the house on a property of 10 or more acres?  <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>b. Is any part of the property used as a commercial establishment or medical office?  <input type="radio"/> Yes <input type="radio"/> No</p>																																	
<p><b>H3.</b> Is anyone visiting here who is not already listed?</p> <p><input type="radio"/> Yes — On page 20 give name of each visitor for whom there is no one at the home address to report the person to a census taker.  <input type="radio"/> No</p>	<p><b>H11.</b> If you live in a one-family house or a condominium unit which you own or are buying —</p> <p>What is the value of this property, that is, how much do you think this property (house and lot or condominium unit) would sell for if it were for sale?</p> <p>Do not answer this question if this is —</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> A mobile home or trailer</li> <li><input type="checkbox"/> A house on 10 or more acres</li> <li><input type="checkbox"/> A house with a commercial establishment or medical office on the property</li> </ul> <table style="width: 100%;"> <tr> <td><input type="radio"/> Less than \$10,000</td> <td><input type="radio"/> \$50,000 to \$54,999</td> </tr> <tr> <td><input type="radio"/> \$10,000 to \$14,999</td> <td><input type="radio"/> \$55,000 to \$59,999</td> </tr> <tr> <td><input type="radio"/> \$15,000 to \$17,499</td> <td><input type="radio"/> \$60,000 to \$64,999</td> </tr> <tr> <td><input type="radio"/> \$17,500 to \$19,999</td> <td><input type="radio"/> \$65,000 to \$69,999</td> </tr> <tr> <td><input type="radio"/> \$20,000 to \$22,499</td> <td><input type="radio"/> \$70,000 to \$74,999</td> </tr> <tr> <td><input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/></td> <td><input type="radio"/> \$75,000 to \$79,999</td> </tr> <tr> <td><input type="radio"/> \$25,000 to \$27,499</td> <td><input type="radio"/> \$80,000 to \$89,999</td> </tr> <tr> <td><input type="radio"/> \$27,500 to \$29,999</td> <td><input type="radio"/> \$90,000 to \$99,999</td> </tr> <tr> <td><input type="radio"/> \$30,000 to \$34,999</td> <td><input type="radio"/> \$100,000 to \$124,999</td> </tr> <tr> <td><input type="radio"/> \$35,000 to \$39,999</td> <td><input type="radio"/> \$125,000 to \$149,999</td> </tr> <tr> <td><input type="radio"/> \$40,000 to \$44,999</td> <td><input type="radio"/> \$150,000 to \$199,999</td> </tr> <tr> <td><input type="radio"/> \$45,000 to \$49,999</td> <td><input type="radio"/> \$200,000 or more</td> </tr> </table>	<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000 to \$54,999	<input type="radio"/> \$10,000 to \$14,999	<input type="radio"/> \$55,000 to \$59,999	<input type="radio"/> \$15,000 to \$17,499	<input type="radio"/> \$60,000 to \$64,999	<input type="radio"/> \$17,500 to \$19,999	<input type="radio"/> \$65,000 to \$69,999	<input type="radio"/> \$20,000 to \$22,499	<input type="radio"/> \$70,000 to \$74,999	<input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/>	<input type="radio"/> \$75,000 to \$79,999	<input type="radio"/> \$25,000 to \$27,499	<input type="radio"/> \$80,000 to \$89,999	<input type="radio"/> \$27,500 to \$29,999	<input type="radio"/> \$90,000 to \$99,999	<input type="radio"/> \$30,000 to \$34,999	<input type="radio"/> \$100,000 to \$124,999	<input type="radio"/> \$35,000 to \$39,999	<input type="radio"/> \$125,000 to \$149,999	<input type="radio"/> \$40,000 to \$44,999	<input type="radio"/> \$150,000 to \$199,999	<input type="radio"/> \$45,000 to \$49,999	<input type="radio"/> \$200,000 or more									
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<p><b>H4.</b> How many living quarters, occupied and vacant, are at this address?</p> <p><input type="radio"/> One  <input type="radio"/> 2 apartments or living quarters  <input type="radio"/> 3 apartments or living quarters  <input type="radio"/> 4 apartments or living quarters  <input type="radio"/> 5 apartments or living quarters  <input type="radio"/> 6 apartments or living quarters  <input type="radio"/> 7 apartments or living quarters  <input type="radio"/> 8 apartments or living quarters  <input type="radio"/> 9 apartments or living quarters  <input type="radio"/> 10 or more apartments or living quarters  <input type="radio"/> This is a mobile home or trailer</p>	<p><b>H12.</b> If you pay rent for your living quarters —</p> <p>What is the monthly rent?</p> <p>If rent is not paid by the month, see the instruction guide on how to figure a monthly rent.</p> <table style="width: 100%;"> <tr> <td><input type="radio"/> Less than \$50</td> <td><input type="radio"/> \$160 to \$169</td> </tr> <tr> <td><input type="radio"/> \$50 to \$59</td> <td><input type="radio"/> \$170 to \$179</td> </tr> <tr> <td><input type="radio"/> \$60 to \$69</td> <td><input type="radio"/> \$180 to \$189</td> </tr> <tr> <td><input type="radio"/> \$70 to \$79</td> <td><input type="radio"/> \$190 to \$199</td> </tr> <tr> <td><input type="radio"/> \$80 to \$89</td> <td><input type="radio"/> \$200 to \$224</td> </tr> <tr> <td><input type="radio"/> \$90 to \$99 <input checked="" type="radio"/></td> <td><input type="radio"/> \$225 to \$249</td> </tr> <tr> <td><input type="radio"/> \$100 to \$109</td> <td><input type="radio"/> \$250 to \$274</td> </tr> <tr> <td><input type="radio"/> \$110 to \$119</td> <td><input type="radio"/> \$275 to \$299</td> </tr> <tr> <td><input type="radio"/> \$120 to \$129</td> <td><input type="radio"/> \$300 to \$349</td> </tr> <tr> <td><input type="radio"/> \$130 to \$139</td> <td><input type="radio"/> \$350 to \$399</td> </tr> <tr> <td><input type="radio"/> \$140 to \$149</td> <td><input type="radio"/> \$400 to \$499</td> </tr> <tr> <td><input type="radio"/> \$150 to \$159</td> <td><input type="radio"/> \$500 or more</td> </tr> </table>	<input type="radio"/> Less than \$50	<input type="radio"/> \$160 to \$169	<input type="radio"/> \$50 to \$59	<input type="radio"/> \$170 to \$179	<input type="radio"/> \$60 to \$69	<input type="radio"/> \$180 to \$189	<input type="radio"/> \$70 to \$79	<input type="radio"/> \$190 to \$199	<input type="radio"/> \$80 to \$89	<input type="radio"/> \$200 to \$224	<input type="radio"/> \$90 to \$99 <input checked="" type="radio"/>	<input type="radio"/> \$225 to \$249	<input type="radio"/> \$100 to \$109	<input type="radio"/> \$250 to \$274	<input type="radio"/> \$110 to \$119	<input type="radio"/> \$275 to \$299	<input type="radio"/> \$120 to \$129	<input type="radio"/> \$300 to \$349	<input type="radio"/> \$130 to \$139	<input type="radio"/> \$350 to \$399	<input type="radio"/> \$140 to \$149	<input type="radio"/> \$400 to \$499	<input type="radio"/> \$150 to \$159	<input type="radio"/> \$500 or more									
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<p><b>H5.</b> Do you enter your living quarters —</p> <p><input type="radio"/> Directly from the outside or through a common or public hall?  <input type="radio"/> Through someone else's living quarters?</p>	<p><b>H13.</b> If you live in a one-family house or a condominium unit which you own or are buying —</p> <p>What is the value of this property, that is, how much do you think this property (house and lot or condominium unit) would sell for if it were for sale?</p> <p>Do not answer this question if this is —</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> A mobile home or trailer</li> <li><input type="checkbox"/> A house on 10 or more acres</li> <li><input type="checkbox"/> A house with a commercial establishment or medical office on the property</li> </ul> <table style="width: 100%;"> <tr> <td><input type="radio"/> Less than \$10,000</td> <td><input type="radio"/> \$50,000 to \$54,999</td> </tr> <tr> <td><input type="radio"/> \$10,000 to \$14,999</td> <td><input type="radio"/> \$55,000 to \$59,999</td> </tr> <tr> <td><input type="radio"/> \$15,000 to \$17,499</td> <td><input type="radio"/> \$60,000 to \$64,999</td> </tr> <tr> <td><input type="radio"/> \$17,500 to \$19,999</td> <td><input type="radio"/> \$65,000 to \$69,999</td> </tr> <tr> <td><input type="radio"/> \$20,000 to \$22,499</td> <td><input type="radio"/> \$70,000 to \$74,999</td> </tr> <tr> <td><input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/></td> <td><input type="radio"/> \$75,000 to \$79,999</td> </tr> <tr> <td><input type="radio"/> \$25,000 to \$27,499</td> <td><input type="radio"/> \$80,000 to \$89,999</td> </tr> <tr> <td><input type="radio"/> \$27,500 to \$29,999</td> <td><input type="radio"/> \$90,000 to \$99,999</td> </tr> <tr> <td><input type="radio"/> \$30,000 to \$34,999</td> <td><input type="radio"/> \$100,000 to \$124,999</td> </tr> <tr> <td><input type="radio"/> \$35,000 to \$39,999</td> <td><input type="radio"/> \$125,000 to \$149,999</td> </tr> <tr> <td><input type="radio"/> \$40,000 to \$44,999</td> <td><input type="radio"/> \$150,000 to \$199,999</td> </tr> <tr> <td><input type="radio"/> \$45,000 to \$49,999</td> <td><input type="radio"/> \$200,000 or more</td> </tr> </table>	<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000 to \$54,999	<input type="radio"/> \$10,000 to \$14,999	<input type="radio"/> \$55,000 to \$59,999	<input type="radio"/> \$15,000 to \$17,499	<input type="radio"/> \$60,000 to \$64,999	<input type="radio"/> \$17,500 to \$19,999	<input type="radio"/> \$65,000 to \$69,999	<input type="radio"/> \$20,000 to \$22,499	<input type="radio"/> \$70,000 to \$74,999	<input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/>	<input type="radio"/> \$75,000 to \$79,999	<input type="radio"/> \$25,000 to \$27,499	<input type="radio"/> \$80,000 to \$89,999	<input type="radio"/> \$27,500 to \$29,999	<input type="radio"/> \$90,000 to \$99,999	<input type="radio"/> \$30,000 to \$34,999	<input type="radio"/> \$100,000 to \$124,999	<input type="radio"/> \$35,000 to \$39,999	<input type="radio"/> \$125,000 to \$149,999	<input type="radio"/> \$40,000 to \$44,999	<input type="radio"/> \$150,000 to \$199,999	<input type="radio"/> \$45,000 to \$49,999	<input type="radio"/> \$200,000 or more									
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<p><b>H6.</b> Do you have complete plumbing facilities in your living quarters, that is, hot and cold piped water, a flush toilet, and a bathtub or shower?</p> <p><input type="radio"/> Yes, for this household only  <input type="radio"/> Yes, but also used by another household  <input type="radio"/> No, have some but not all plumbing facilities  <input type="radio"/> No plumbing facilities in living quarters</p>	<p><b>H14.</b> If you live in a one-family house or a condominium unit which you own or are buying —</p> <p>What is the value of this property, that is, how much do you think this property (house and lot or condominium unit) would sell for if it were for sale?</p> <p>Do not answer this question if this is —</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> A mobile home or trailer</li> <li><input type="checkbox"/> A house on 10 or more acres</li> <li><input type="checkbox"/> A house with a commercial establishment or medical office on the property</li> </ul> <table style="width: 100%;"> <tr> <td><input type="radio"/> Less than \$10,000</td> <td><input type="radio"/> \$50,000 to \$54,999</td> </tr> <tr> <td><input type="radio"/> \$10,000 to \$14,999</td> <td><input type="radio"/> \$55,000 to \$59,999</td> </tr> <tr> <td><input type="radio"/> \$15,000 to \$17,499</td> <td><input type="radio"/> \$60,000 to \$64,999</td> </tr> <tr> <td><input type="radio"/> \$17,500 to \$19,999</td> <td><input type="radio"/> \$65,000 to \$69,999</td> </tr> <tr> <td><input type="radio"/> \$20,000 to \$22,499</td> <td><input type="radio"/> \$70,000 to \$74,999</td> </tr> <tr> <td><input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/></td> <td><input type="radio"/> \$75,000 to \$79,999</td> </tr> <tr> <td><input type="radio"/> \$25,000 to \$27,499</td> <td><input type="radio"/> \$80,000 to \$89,999</td> </tr> <tr> <td><input type="radio"/> \$27,500 to \$29,999</td> <td><input type="radio"/> \$90,000 to \$99,999</td> </tr> <tr> <td><input type="radio"/> \$30,000 to \$34,999</td> <td><input type="radio"/> \$100,000 to \$124,999</td> </tr> <tr> <td><input type="radio"/> \$35,000 to \$39,999</td> <td><input type="radio"/> \$125,000 to \$149,999</td> </tr> <tr> <td><input type="radio"/> \$40,000 to \$44,999</td> <td><input type="radio"/> \$150,000 to \$199,999</td> </tr> <tr> <td><input type="radio"/> \$45,000 to \$49,999</td> <td><input type="radio"/> \$200,000 or more</td> </tr> </table>	<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000 to \$54,999	<input type="radio"/> \$10,000 to \$14,999	<input type="radio"/> \$55,000 to \$59,999	<input type="radio"/> \$15,000 to \$17,499	<input type="radio"/> \$60,000 to \$64,999	<input type="radio"/> \$17,500 to \$19,999	<input type="radio"/> \$65,000 to \$69,999	<input type="radio"/> \$20,000 to \$22,499	<input type="radio"/> \$70,000 to \$74,999	<input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/>	<input type="radio"/> \$75,000 to \$79,999	<input type="radio"/> \$25,000 to \$27,499	<input type="radio"/> \$80,000 to \$89,999	<input type="radio"/> \$27,500 to \$29,999	<input type="radio"/> \$90,000 to \$99,999	<input type="radio"/> \$30,000 to \$34,999	<input type="radio"/> \$100,000 to \$124,999	<input type="radio"/> \$35,000 to \$39,999	<input type="radio"/> \$125,000 to \$149,999	<input type="radio"/> \$40,000 to \$44,999	<input type="radio"/> \$150,000 to \$199,999	<input type="radio"/> \$45,000 to \$49,999	<input type="radio"/> \$200,000 or more									
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<p><b>H7.</b> How many rooms do you have in your living quarters?  Do not count bathrooms, porches, balconies, foyers, halls, or half-rooms.</p> <table style="width: 100%;"> <tr> <td><input type="radio"/> 1 room <input checked="" type="radio"/></td> <td><input type="radio"/> 4 rooms</td> <td><input type="radio"/> 7 rooms</td> </tr> <tr> <td><input type="radio"/> 2 rooms</td> <td><input type="radio"/> 5 rooms</td> <td><input type="radio"/> 8 rooms</td> </tr> <tr> <td><input type="radio"/> 3 rooms</td> <td><input type="radio"/> 6 rooms</td> <td><input type="radio"/> 9 or more rooms</td> </tr> </table>	<input type="radio"/> 1 room <input checked="" type="radio"/>	<input type="radio"/> 4 rooms	<input type="radio"/> 7 rooms	<input type="radio"/> 2 rooms	<input type="radio"/> 5 rooms	<input type="radio"/> 8 rooms	<input type="radio"/> 3 rooms	<input type="radio"/> 6 rooms	<input type="radio"/> 9 or more rooms	<p><b>H15.</b> If you live in a one-family house or a condominium unit which you own or are buying —</p> <p>What is the value of this property, that is, how much do you think this property (house and lot or condominium unit) would sell for if it were for sale?</p> <p>Do not answer this question if this is —</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> A mobile home or trailer</li> <li><input type="checkbox"/> A house on 10 or more acres</li> <li><input type="checkbox"/> A house with a commercial establishment or medical office on the property</li> </ul> <table style="width: 100%;"> <tr> <td><input type="radio"/> Less than \$10,000</td> <td><input type="radio"/> \$50,000 to \$54,999</td> </tr> <tr> <td><input type="radio"/> \$10,000 to \$14,999</td> <td><input type="radio"/> \$55,000 to \$59,999</td> </tr> <tr> <td><input type="radio"/> \$15,000 to \$17,499</td> <td><input type="radio"/> \$60,000 to \$64,999</td> </tr> <tr> <td><input type="radio"/> \$17,500 to \$19,999</td> <td><input type="radio"/> \$65,000 to \$69,999</td> </tr> <tr> <td><input type="radio"/> \$20,000 to \$22,499</td> <td><input type="radio"/> \$70,000 to \$74,999</td> </tr> <tr> <td><input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/></td> <td><input type="radio"/> \$75,000 to \$79,999</td> </tr> <tr> <td><input type="radio"/> \$25,000 to \$27,499</td> <td><input type="radio"/> \$80,000 to \$89,999</td> </tr> <tr> <td><input type="radio"/> \$27,500 to \$29,999</td> <td><input type="radio"/> \$90,000 to \$99,999</td> </tr> <tr> <td><input type="radio"/> \$30,000 to \$34,999</td> <td><input type="radio"/> \$100,000 to \$124,999</td> </tr> <tr> <td><input type="radio"/> \$35,000 to \$39,999</td> <td><input type="radio"/> \$125,000 to \$149,999</td> </tr> <tr> <td><input type="radio"/> \$40,000 to \$44,999</td> <td><input type="radio"/> \$150,000 to \$199,999</td> </tr> <tr> <td><input type="radio"/> \$45,000 to \$49,999</td> <td><input type="radio"/> \$200,000 or more</td> </tr> </table>	<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000 to \$54,999	<input type="radio"/> \$10,000 to \$14,999	<input type="radio"/> \$55,000 to \$59,999	<input type="radio"/> \$15,000 to \$17,499	<input type="radio"/> \$60,000 to \$64,999	<input type="radio"/> \$17,500 to \$19,999	<input type="radio"/> \$65,000 to \$69,999	<input type="radio"/> \$20,000 to \$22,499	<input type="radio"/> \$70,000 to \$74,999	<input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/>	<input type="radio"/> \$75,000 to \$79,999	<input type="radio"/> \$25,000 to \$27,499	<input type="radio"/> \$80,000 to \$89,999	<input type="radio"/> \$27,500 to \$29,999	<input type="radio"/> \$90,000 to \$99,999	<input type="radio"/> \$30,000 to \$34,999	<input type="radio"/> \$100,000 to \$124,999	<input type="radio"/> \$35,000 to \$39,999	<input type="radio"/> \$125,000 to \$149,999	<input type="radio"/> \$40,000 to \$44,999	<input type="radio"/> \$150,000 to \$199,999	<input type="radio"/> \$45,000 to \$49,999	<input type="radio"/> \$200,000 or more
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<input type="radio"/> 3 rooms	<input type="radio"/> 6 rooms	<input type="radio"/> 9 or more rooms																																
<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000 to \$54,999																																	
<input type="radio"/> \$10,000 to \$14,999	<input type="radio"/> \$55,000 to \$59,999																																	
<input type="radio"/> \$15,000 to \$17,499	<input type="radio"/> \$60,000 to \$64,999																																	
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<input type="radio"/> \$45,000 to \$49,999	<input type="radio"/> \$200,000 or more																																	
<p><b>H8.</b> Are your living quarters —</p> <p><input type="radio"/> Owned or being bought by you or by someone else in this household?  <input type="radio"/> Rented for cash rent?  <input type="radio"/> Occupied without payment of cash rent?</p>	<p><b>H16.</b> If you live in a one-family house or a condominium unit which you own or are buying —</p> <p>What is the value of this property, that is, how much do you think this property (house and lot or condominium unit) would sell for if it were for sale?</p> <p>Do not answer this question if this is —</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> A mobile home or trailer</li> <li><input type="checkbox"/> A house on 10 or more acres</li> <li><input type="checkbox"/> A house with a commercial establishment or medical office on the property</li> </ul> <table style="width: 100%;"> <tr> <td><input type="radio"/> Less than \$10,000</td> <td><input type="radio"/> \$50,000 to \$54,999</td> </tr> <tr> <td><input type="radio"/> \$10,000 to \$14,999</td> <td><input type="radio"/> \$55,000 to \$59,999</td> </tr> <tr> <td><input type="radio"/> \$15,000 to \$17,499</td> <td><input type="radio"/> \$60,000 to \$64,999</td> </tr> <tr> <td><input type="radio"/> \$17,500 to \$19,999</td> <td><input type="radio"/> \$65,000 to \$69,999</td> </tr> <tr> <td><input type="radio"/> \$20,000 to \$22,499</td> <td><input type="radio"/> \$70,000 to \$74,999</td> </tr> <tr> <td><input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/></td> <td><input type="radio"/> \$75,000 to \$79,999</td> </tr> <tr> <td><input type="radio"/> \$25,000 to \$27,499</td> <td><input type="radio"/> \$80,000 to \$89,999</td> </tr> <tr> <td><input type="radio"/> \$27,500 to \$29,999</td> <td><input type="radio"/> \$90,000 to \$99,999</td> </tr> <tr> <td><input type="radio"/> \$30,000 to \$34,999</td> <td><input type="radio"/> \$100,000 to \$124,999</td> </tr> <tr> <td><input type="radio"/> \$35,000 to \$39,999</td> <td><input type="radio"/> \$125,000 to \$149,999</td> </tr> <tr> <td><input type="radio"/> \$40,000 to \$44,999</td> <td><input type="radio"/> \$150,000 to \$199,999</td> </tr> <tr> <td><input type="radio"/> \$45,000 to \$49,999</td> <td><input type="radio"/> \$200,000 or more</td> </tr> </table>	<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000 to \$54,999	<input type="radio"/> \$10,000 to \$14,999	<input type="radio"/> \$55,000 to \$59,999	<input type="radio"/> \$15,000 to \$17,499	<input type="radio"/> \$60,000 to \$64,999	<input type="radio"/> \$17,500 to \$19,999	<input type="radio"/> \$65,000 to \$69,999	<input type="radio"/> \$20,000 to \$22,499	<input type="radio"/> \$70,000 to \$74,999	<input type="radio"/> \$22,500 to \$24,999 <input checked="" type="radio"/>	<input type="radio"/> \$75,000 to \$79,999	<input type="radio"/> \$25,000 to \$27,499	<input type="radio"/> \$80,000 to \$89,999	<input type="radio"/> \$27,500 to \$29,999	<input type="radio"/> \$90,000 to \$99,999	<input type="radio"/> \$30,000 to \$34,999	<input type="radio"/> \$100,000 to \$124,999	<input type="radio"/> \$35,000 to \$39,999	<input type="radio"/> \$125,000 to \$149,999	<input type="radio"/> \$40,000 to \$44,999	<input type="radio"/> \$150,000 to \$199,999	<input type="radio"/> \$45,000 to \$49,999	<input type="radio"/> \$200,000 or more									
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<input type="radio"/> \$45,000 to \$49,999	<input type="radio"/> \$200,000 or more																																	

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A4. Block number	A6. Serial number	B. Type of unit or quarters	C. For vacant units	D. Months vacant	F. Total persons
		<p><b>Occupied</b></p> <p><input type="radio"/> First form  <input type="radio"/> Continuation</p> <p><b>Vacant</b></p> <p><input type="radio"/> Regular  <input type="radio"/> Usual home elsewhere</p> <p><b>Group quarters</b></p> <p><input type="radio"/> First form  <input type="radio"/> Continuation</p>	<p><b>C1.</b> Is this unit for —</p> <p><input type="radio"/> Year round use  <input type="radio"/> Seasonal/Mig. — Skip C2, C3, and D.</p> <p><b>C2.</b> Vacancy status</p> <p><input type="radio"/> For rent <input checked="" type="radio"/>  <input type="radio"/> For sale only  <input type="radio"/> Rented or sold, not occupied  <input type="radio"/> Held for occasional use  <input type="radio"/> Other vacant</p> <p><b>C3.</b> Is this unit boarded up?</p> <p><input type="radio"/> Yes <input type="radio"/> No</p>	<p><input type="radio"/> Less than 1 month  <input type="radio"/> 1 up to 2 months  <input type="radio"/> 2 up to 6 months  <input type="radio"/> 6 up to 12 months  <input type="radio"/> 1 year up to 2 years  <input type="radio"/> 2 or more years</p> <p><b>E. Indicators</b> <input checked="" type="checkbox"/></p> <p>1. <input type="radio"/> Mail return  2. <input type="radio"/> Pop./F</p>	
0 0 0	0 0 0 0				0 0 0
1 1 1	1 1 1 1				1 1 1
2 2 2	2 2 2 2				2 2 2
3 3 3	3 3 3 3				3 3 3
4 4 4	4 4 4 4				4 4 4
5 5 5	5 5 5 5				5 5 5
6 6 6	6 6 6 6				6 6 6
7 7 7	7 7 7 7				7 7 7
8 8 8	8 8 8 8				8 8 8
9 9 9	9 9 9 9				9 9 9

**H1-H3.** the housing part of both the 100 percent and sample questionnaires starts with these three questions to make sure that everyone in the household was counted.

**H4.** same as in 1970. This question is asked so that census personnel can be sure that all units at an address are enumerated. Question H13 provides superior data on the number of dwelling units in the structure. Like the first three housing questions, H4 is intended to check coverage.

**H5.** has the objective of making certain the respondent occupies a bona fide dwelling unit, not just a few rooms in someone else's house.

**H6.** one of the few questions left from a series of questions in the 1970 Census which attempted to measure housing quality.

**H7.** same as in 1970.

**H8.** same as in 1970.

**H9.** for the first time poses a separate question on condominiums. The term "cooperative" also appeared on the test questionnaires but was misunderstood by many respondents.

**H10.** separates farmhouses, estates, and partly commercial structures from single family dwelling units. Value is not tabulated for these types of units.

**H11.** asks value. There are 24 categories instead of the 11 in 1970, when the highest value was only \$50,000 or more.

**H12.** also shows the impact of inflation. The highest interval in 1970 was \$300 or more. It is now \$500 or more, and 24 categories appear instead of the former 14.

**H12** ends the housing questions asked of all Americans. The Census Bureau estimates it takes 15 minutes to answer the 19 population and housing questions on the short questionnaire, while the remaining questions add another 30 minutes.



Please answer H30-H32 if you live in a one-family house which you own or are buying, unless this is -

- A mobile home or trailer . . . . .
- A house on 10 or more acres . . . . .
- A condominium unit . . . . .
- A house with a commercial establishment or medical office on the property . . . . .

If any of these, or if you rent your unit or this is a multi-family structure, skip H30 to H32 and turn to page 6.

H30. What were the real estate taxes on this property last year?

\$ .00 OR ☐ None

H31. What is the annual premium for fire and hazard insurance on this property?

\$ .00 OR ☐ None

H32a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on this property?

- ☐ Yes, mortgage, deed of trust, or similar debt
- ☐ Yes, contract to purchase
- ☐ No - Skip to page 6

b. Do you have a second or junior mortgage on this property?

- ☐ Yes
- ☐ No

c. How much is your total regular monthly payment to the lender?

Also include payments on a contract to purchase and to lenders holding second or junior mortgages on this property.

\$ .00 OR ☐ No regular payment required - Skip to page 6

d. Does your regular monthly payment (amount entered in H32c) include payments for real estate taxes on this property?

- ☐ Yes, taxes included in payment
- ☐ No, taxes paid separately or taxes not required

e. Does your regular monthly payment (amount entered in H32c) include payments for fire and hazard insurance on this property?

- ☐ Yes, insurance included in payment
- ☐ No, insurance paid separately or no insurance

Please turn to page 6.

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H13. boats, vans, and tents have been added to the possible answers. Otherwise, it is the same as a question asked in 1970.

H14. same as in 1970.

H15. same as in 1970.

H16. a slight variation from the 1970 question in that the respondent is asked to differentiate a drilled well from a dug well.

H17. same as in 1970.

H18. same as in 1970.

H19. asked in 1970, but of each person in the household, and appeared in the population section.

H20. same as in 1970 except that the choice "electric heat pump" has been added, and an open-ended "other" choice has been eliminated.

H21. same as in 1970.

H22. asked only of renters in 1970. Now all sampled households are expected to answer. Census tests show that respondents almost always overstate their utility costs.

H23. asked in 1970, but on the short form.

H24. same as in 1970.

H25. asked in 1970, except the highest category was "3 or more" bathrooms.

H26. on the 100 percent questionnaire in 1970 and asked differently: Is there a telephone on which people in your living quarters can be called? If the answer was yes, the respondent was asked to write down the phone number. The simpler form for 1980 may produce better results.

H27. same as in 1970.

H28. same as in 1970.

H29. a new question reflecting the substantial increase in the number of vans and trucks.

H30-H32. all new. Their purpose is to obtain a measure of total shelter costs for one-family owner-occupied units. The Census Bureau does not plan to tabulate these questions separately, but to combine them with H22 for a single tabulation of "total shelter costs."

1	2.	4.	2	2.	4.	3	2.	4.
S.S.	1	1	S.S.	1	1	S.S.	1	1
Yes	3	3	Yes	3	3	Yes	3	3
No	5	5	No	5	5	No	5	5
9	9	9	9	9	9	9	9	9
4	2.	4.	5	2.	4.	6	2.	4.
S.S.	1	1	S.S.	1	1	S.S.	1	1
Yes	3	3	Yes	3	3	Yes	3	3
No	5	5	No	5	5	No	5	5
9	9	9	9	9	9	9	9	9
7	2.	4.	GQ.	H30.	H31.	H32c.		
S.S.	1	1	S.S.	1	1	S.S.	1	1
Yes	3	3	Yes	3	3	Yes	3	3
No	5	5	No	5	5	No	5	5
9	9	9	9	9	9	9	9	9

<p><b>Name of Person 1 on page 2:</b></p> <p>_____  <small>Last name First name Middle initial</small></p>	<p><b>16. When was this person born?</b></p> <p><input type="radio"/> Born before April 1965 —  Please go on with questions 17-33</p> <p><input type="radio"/> Born April 1965 or later —  Turn to next page for next person</p>	<p><b>22a. Did this person work at any time last week?</b></p> <p><input type="radio"/> Yes — Fill this circle if this person worked full time or part time. (Count part-time work such as delivering papers, or helping without pay in a family business or farm. Also count active duty in the Armed Forces.)</p> <p><input type="radio"/> No — Fill this circle if this person did not work or did only housework, school work, or volunteer work.</p> <p style="text-align: right;">Skip to 25</p>
<p><b>11. In what State or foreign country was this person born?</b>  Print the State where this person's mother was living when this person was born. Do not give the location of the hospital unless the mother's home and the hospital were in the same State.</p> <p>_____  <small>Name of State or foreign country; or Puerto Rico, Guam, etc.</small></p>	<p><b>17. In April 1975 (five years ago) was this person —</b></p> <p><b>a. On active duty in the Armed Forces?</b></p> <p><input type="radio"/> Yes <input type="radio"/> No</p> <p><b>b. Attending college?</b></p> <p><input type="radio"/> Yes <input type="radio"/> No</p> <p><b>c. Working at a job or business?</b></p> <p><input type="radio"/> Yes, full time <input type="radio"/> No  <input type="radio"/> Yes, part time</p>	<p><b>b. How many hours did this person work last week (at all jobs)?</b>  Subtract any time off; add overtime or extra hours work.</p> <p>Hours _____</p>
<p><b>12. If this person was born in a foreign country —</b></p> <p><b>a. Is this person a naturalized citizen of the United States?</b></p> <p><input type="radio"/> Yes, a naturalized citizen  <input type="radio"/> No, not a citizen  <input checked="" type="radio"/> Born abroad of American parents</p> <p><b>b. When did this person come to the United States to stay?</b></p> <p><input type="radio"/> 1975 to 1980 <input type="radio"/> 1965 to 1969 <input type="radio"/> 1950 to 1959  <input type="radio"/> 1970 to 1974 <input type="radio"/> 1960 to 1964 <input type="radio"/> Before 1950</p>	<p><b>18a. Is this person a veteran of active-duty military service in the Armed Forces of the United States?</b>  If service was in National Guard or Reserves only, see instruction guide.</p> <p><input type="radio"/> Yes <input type="radio"/> No — Skip to 19</p> <p><b>b. Was active-duty military service during —</b>  Fill a circle for each period in which this person served.</p> <p><input type="radio"/> May 1975 or later  <input type="radio"/> Vietnam era (August 1964–April 1975)  <input type="radio"/> February 1955–July 1964  <input type="radio"/> Korean conflict (June 1950–January 1955)  <input type="radio"/> World War II (September 1940–July 1947)  <input type="radio"/> World War I (April 1917–November 1918)  <input type="radio"/> Any other time</p>	<p><b>23. At what location did this person work last week?</b>  If this person worked at more than one location, print where he or she worked most last week.</p> <p>If one location cannot be specified, see instruction guide.</p> <p><b>a. Address (Number and street)</b> _____  If street address is not known, enter the building name, shopping center, or other physical location description.</p> <p><b>b. Name of city, town, village, borough, etc.</b> _____</p>
<p><b>13a. Does this person speak a language other than English at home?</b></p> <p><input type="radio"/> Yes <input type="radio"/> No, only speaks English — Skip to 14</p> <p><b>b. What is this language?</b></p> <p>_____  <small>(For example — Chinese, Italian, Spanish, etc.)</small></p> <p><b>c. How well does this person speak English?</b></p> <p><input type="radio"/> Very well <input checked="" type="radio"/>  <input type="radio"/> Well  <input type="radio"/> Not well  <input type="radio"/> Not at all</p>	<p><b>19. Does this person have a physical, mental, or other health condition which has lasted for 6 or more months and which . . .</b></p> <p><b>a. Limits the kind or amount of work this person can do at a job?</b> . . . <input type="radio"/> Yes <input type="radio"/> No</p> <p><b>b. Prevents this person from working at a job?</b> <input type="radio"/> Yes <input type="radio"/> No</p> <p><b>c. Limits or prevents this person from using public transportation?</b> . . . <input type="radio"/> Yes <input type="radio"/> No</p>	<p><b>c. Is the place of work inside the incorporated (legal limits of that city, town, village, borough, etc.)?</b></p> <p><input type="radio"/> Yes <input type="radio"/> No, in unincorporated area</p> <p><b>d. County</b> _____</p> <p><b>e. State</b> _____ <b>f. ZIP Code</b> _____</p>
<p><b>14. What is this person's ancestry? If uncertain about how to report ancestry, see instruction guide.</b></p> <p>_____  <small>(For example — Afro-Amer., English, French, German, Honduran, Hungarian, Irish, Italian, Jamaican, Korean, Lebanese, Mexican, Nigerian, Polish, Ukrainian, Venezuelan, etc.)</small></p>	<p><b>20. If this person is a female —</b></p> <p>How many babies has she ever had, not counting stillbirths? <input type="radio"/> None <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6</p> <p>Do not count her stepchildren or children she has adopted. <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 or more</p>	<p><b>24a. Last week, how long did it usually take this person to get from home to work (one way)?</b></p> <p>Minutes _____</p>
<p><b>15a. Did this person live in this house five years ago (April 1, 1975)? If in college or Armed Forces in April 1975, report place of residence there.</b></p> <p><input type="radio"/> Born April 1975 or later — Turn to next page for next person</p> <p><input type="radio"/> Yes, this house — Skip to 16</p> <p><input type="radio"/> No different house</p> <p><b>b. Where did this person live five years ago (April 1, 1975)?</b></p> <p>(1) State, foreign country, Puerto Rico, Guam, etc.: _____</p> <p>(2) Country: _____</p> <p>(3) City, town, village, etc.: _____</p> <p>(4) Inside the incorporated (legal) limits of that city, town, village, etc.?</p> <p><input type="radio"/> Yes <input type="radio"/> No, in unincorporated area</p>	<p><b>21. If this person has ever been married —</b></p> <p><b>a. Has this person been married more than once?</b></p> <p><input type="radio"/> Once <input type="radio"/> More than once</p> <p><b>b. Month and year of marriage? Month and year of first marriage?</b></p> <p>(Month) (Year) (Month) (Year)</p> <p><b>c. If married more than once — Did the first marriage end because of the death of the husband (or wife)?</b></p> <p><input type="radio"/> Yes <input type="radio"/> No</p>	<p><b>b. How did this person usually get to work last week?</b>  If this person used more than one method, give the one usually used for most of the distance.</p> <p><input type="radio"/> Car <input type="radio"/> Taxicab  <input type="radio"/> Truck <input checked="" type="radio"/> Motorcycle  <input type="radio"/> Van <input type="radio"/> Bicycle  <input type="radio"/> Bus or streetcar <input type="radio"/> Walked only  <input type="radio"/> Railroad <input type="radio"/> Worked at home  <input type="radio"/> Subway or elevated <input type="radio"/> Other — Specify _____</p> <p>If car, truck, or van in 24b, go to 24c. Otherwise, skip to 28.</p>
<p><b>FOR CENSUS USE ONLY</b></p>		
<p><b>11.</b> similar to a 1970 question, but the wording has been changed from "Where was this person born?"</p> <p><b>12.</b> similar to 1970, but the word "alien" has been changed to "not a citizen."</p> <p><b>13.</b> replaces one that asked about language other than English spoken in the home when the respondent was a child.</p>		

The 1980 question should be more useful for determining how many Americans speak a language other than English and for determining how many persons do not speak English at all.

**14.** replaces two questions in 1970 on where the respondent's parents were born. The new approach is more subjective than the previous approach to ancestry.



c. When going to work last week, did this person usually —

☐ Drive alone — Skip to 28 ☐ Drive others only

☐ Share driving ☐ Ride as passenger only

d. How many people, including this person, usually rode to work in the car, truck, or van last week?

☐ 2 ☐ 4 ☐ 6

☐ 3 ☒ 5 ☐ 7 or more

After answering 24d, skip to 28.

25. Was this person temporarily absent or on layoff from a job or business last week?

☐ Yes, on layoff

☐ Yes, on vacation, temporary illness, labor dispute, etc.

☐ No

26a. Has this person been looking for work during the last 4 weeks?

☐ Yes ☒ No — Skip to 27

b. Could this person have taken a job last week?

☐ No, already has a job

☐ No, temporarily ill

☐ No, other reasons (in school, etc.)

☒ Yes, could have taken a job

27. When did this person last work, even for a few days?

☐ 1980 ☐ 1978 ☐ 1970 to 1974

☐ 1979 ☐ 1975 to 1977 ☐ 1969 or earlier

☐ Never worked

Skip to 31d

28—30. Current or most recent job activity

Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours.

If this person had no job or business last week, give information for last job or business since 1975.

28. Industry

a. For whom did this person work? If now on active duty in the Armed Forces, print "AF" and skip to question 31.

(Name of company, business, organization, or other employer)

b. What kind of business or industry was this? Describe the activity at location where employed.

(For example: Hospital, newspaper publishing, mail order house, auto engine manufacturing, breakfast cereal manufacturing)

c. Is this mainly — (Fill one circle)

☐ Manufacturing ☒ Retail trade

☐ Wholesale trade ☐ Other — (agriculture, construction, service, government, etc.)

29. Occupation

a. What kind of work was this person doing?

(For example: Registered nurse, personnel manager, supervisor of order department, gasoline engine assembler, grinder operator)

b. What were this person's most important activities or duties?

(For example: Patient care, directing hiring policies, supervising order clerks, assembling engines, operating grinding mill)

30. Was this person — (Fill one circle)

Employee of private company, business, or individual, for wages, salary, or commissions . . . . . ☐

Federal government employee . . . . . ☐

State government employee . . . . . ☐

Local government employee (city, county, etc.) . . . . . ☐

Self-employed in own business, professional practice, or farm — ☒

Own business not incorporated . . . . . ☐

Own business incorporated . . . . . ☐

Working without pay in family business or farm . . . . . ☐

31a. Last year (1979), did this person work, even for a few days, at a paid job or in a business or farm?

☐ Yes ☒ No — Skip to 31d

b. How many weeks did this person work in 1979? Count paid vacation, paid sick leave, and military service.

Weeks

c. During the weeks worked in 1979, how many hours did this person usually work each week?

Hours

d. Of the weeks not worked in 1979 (if any), how many weeks was this person looking for work or on layoff from a job?

Weeks

32. Income in 1979 — Fill circles and print dollar amounts. If net income was a loss, write "Loss" above the dollar amount. If exact amount is not known, give best estimate. For income received jointly by household members, see instruction guide.

During 1979 did this person receive any income from the following sources?

If "Yes" to any of the sources below — How much did this person receive for the entire year?

a. Wages, salary, commissions, bonuses, or tips from all jobs . . . Report amount before deductions for taxes, bonds, dues, or other items.

☐ Yes → \$ .00

☐ No (Annual Amount — Dollars)

b. Own nonfarm business, partnership, or professional practice . . . Report net income after business expenses.

☐ Yes → \$ .00

☐ No (Annual Amount — Dollars)

c. Own farm . . . Report net income after operating expenses. Include earnings as a tenant farmer or sharecropper.

☐ Yes → \$ .00

☐ No (Annual Amount — Dollars)

d. Interest, dividends, royalties, or net rental income . . . Report even small amounts credited to an account.

☐ Yes → \$ .00

☐ No (Annual Amount — Dollars)

e. Social Security or Railroad Retirement . . .

☒ Yes → \$ .00

☐ No (Annual Amount — Dollars)

f. Supplemental Security (SSI), Aid to Families with Dependent Children (AFDC), or other public assistance or public welfare payments . . .

☐ Yes → \$ .00

☐ No (Annual Amount — Dollars)

g. Unemployment compensation, veterans' payments, pensions, alimony or child support, or any other sources of income received regularly . . . Exclude lump-sum payments such as money from an inheritance or the sale of a home.

☒ Yes → \$ .00

☐ No (Annual Amount — Dollars)

33. What was this person's total income in 1979? Add entries in questions 32a through g; subtract any losses.

\$ .00

(Annual Amount — Dollars)

If total amount was a loss, write "Loss" above amount. OR ☐ None

15. same as in 1970.
16. same as in 1970.
17. same as in 1970.
18. same as in 1970.
19. resembles a question asked in 1970 but then it was asked only of persons less than 65 years old and was concerned only with a work disability. The 1980 question tested poorly, but so many public agencies need disability data that the question will appear anyway.
20. same as in 1970.
21. same as in 1970.
22. asked in 1970, but in 1980 respondents are also asked to write in the number of hours worked.
23. same as in 1970.
- 24a. a new question which attempts to measure average time spent getting to work.
- 24b. same as in 1970 but with the additional categories of truck, van, motorcycle or bicycle.
- 24c & d. a new series of questions to measure the extent of carpooling.
25. same as in 1970.
26. same as in 1970.
27. same as in 1970.
28. resembles a question asked in 1970 but the words "... this person" have been substituted for the pronoun "he" in the questions on occupation, industry, and income.
29. same as in 1970.
30. same as in 1970.
- 31a & b. same as in 1970.
- 31c & d. new questions to measure part-time workers and the extent of unemployment in the previous year.
32. similar to 1970 except that the question has been recast as "income" instead of "earnings" and "interest, dividends" and "unemployment compensation" have been separated.
33. appeared in 1970 in slightly different form as part of the earnings question. This is the last question. The questions about population characteristics are repeated for up to seven persons in the household. If there are more than seven persons in a household an enumerator can tabulate responses of the additional persons.

APPENDIX C

CENSUS GEOGRAPHY

SOURCE: CENSUS GEOGRAPHY PUBLICATION

U.S. BUREAU OF THE CENSUS

# Census Geography

## INTRODUCTION

The purpose of Data Access Description (DAD), No. 33 is to explain geographic concepts, products, and programs developed by the Census Bureau. Census products and programs which assist users in the analysis of small-area data are emphasized.

Geography plays a crucial role in taking censuses and publishing the results for States, counties, cities, and smaller areas. The geographic work for a census basically consists of determining political and statistical boundaries, preparing the appropriate maps, and providing the technology for assigning the data collected on each census questionnaire to their proper geographic areas. This work has resulted in a number of tools and products that are helpful to the data user as well as to the Census Bureau, such as new types of maps, computerized geographic coding, graphic display systems, and ways of relating local data to census statistics for a variety of planning and administrative purposes.

The Census Bureau tabulates data for over 40 types of geographic areas in its many censuses and sample surveys. Figure 1 presents major geographic areas used in Census Bureau programs. Several principles concerning the general availability of Census Bureau data for geographic areas are worth noting and can be viewed in figure 1. For example, there are more geographic data for censuses than surveys. Within censuses, the decennial census of population and housing has more geographic detail than any of the other censuses.

While most Census Bureau data are tabulated for common geographic areas such as States, counties, and cities, most data programs present some data for special areas. The census of population and housing presents data for small areas such as census tracts and city blocks. In the census of retail trade, data are detailed for central business districts and major retail centers. Special travel regions and production areas are used in the census of transportation. The census of governments provides statistical information for a number of governmental units such as school districts and other special service districts. Foreign trade statistics are presented by country of origin and destination.

The most detailed small-area data are published in the decennial census. The 1970 Census of Population and Housing identified data for more geographic areas than any previous census. Figure 2 presents the geographic areas for which data were tabulated for the 1970 census. As figure 2 shows, the larger the geographic area the greater the detail provided in various tabulations. Also, more data for small areas are available

on computer tape than appear in print. More information on data available from the 1970 Census can be found in *The 1970 Census and You* and *Data Access Description*, No. 39. "Reports Related to the 1970 Census of Population and Housing."

Corresponding information on the geographic coverage of economic census reports appears in the *Mini-Guide to the 1972 Economic Censuses* and the *Mini-Guide to the 1977 Economic Censuses*. While the 1977 Economic Censuses data, collected in 1978, will be available soon, the most current source for small-area economic statistics is the 1972 Economic Censuses data.

## CENSUS GEOGRAPHIC AREAS

The boundaries of the geographic areas for which the Census Bureau collected and tabulated 1970 census data were established in several ways. Boundaries of governmental units—States, U.S. Congressional Districts, counties, minor civil divisions, incorporated places, and city wards—were based on information received from the appropriate government authorities. Boundaries of statistical areas were determined by the Census Bureau in cooperation with various groups of data users who offer advice and assistance to the Census Bureau. For example, the Office of Federal Statistical Policy and Standards of the Department of Commerce (formerly part of the Office of Management and Budget), with the assistance of other Federal agencies, defines standard metropolitan statistical areas (SMSA's). Functional or administrative areas are defined by other government agencies, such as the ZIP Code areas defined by the U.S. Postal Service. Several sets of geographic areas for which 1970 census data were tabulated—urbanized areas, census county divisions, unincorporated places, census tracts, enumeration districts, block groups, and blocks—were defined with varying degrees of local assistance at several levels of government, and by committees representing a broad range of data users.

Governmental units for which census data may be presented include:

- the United States
- States (and outlying areas)
- Counties (and county equivalents)
- Minor civil divisions (MCD's)
- Incorporated places
- Congressional Districts
- Wards (in selected cities)

Figure 1. Major Geographic Areas Tabulated in Selected Census Bureau Programs

Areas	Censuses										Current programs					
	Population and housing censuses		Census of governments	Economic censuses						Census of agriculture						
	Area reports	Subject reports		Retail trade	Wholesale trade	Selected services	Manufactures	Mineral industries	Construction industries		Population estimates	County Business Patterns	Annual Survey of Manufactures	Retail surveys	Current Population Survey	Annual Housing Survey
United States . . . . .	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	
Regions . . . . .	a	s	a	a	a	a	a	a	a	a	a	a	a	a	a	
Divisions . . . . .	a	s	a	a	a	a	a	a	a	a	a	a	a	a	a	
States . . . . .	a	s	a	a	a	a	a	a	a	a	a	a	a	a	a	
SMSA's . . . . .	a	s	a	a	a	a	a	a	a	a	a	a	a	a	a	
Counties . . . . .	a		a	a	a	a	a	a	a	a	a	a	a	a	a	
Places . . . . .	a		a	s	s	s	s			a						
MCD's . . . . .	a			s	s	s	s					s	s			
CCD's . . . . .	a															
Census tracts . . . . .	a															
*ED's and block groups . . .	a															
*ZIP code areas . . . . .	a															
Wards . . . . .	a															
Blocks . . . . .	a															
Central business districts . . . . .	c			a												
Major retail centers . . . . .				a												

KEY

Note: Other areas unique to the population and housing census are urbanized areas, urban/rural, and congressional districts.

a All areas.

c All, by addition of components.

s Selected areas—larger or with more activity.

\* Not in printed reports.

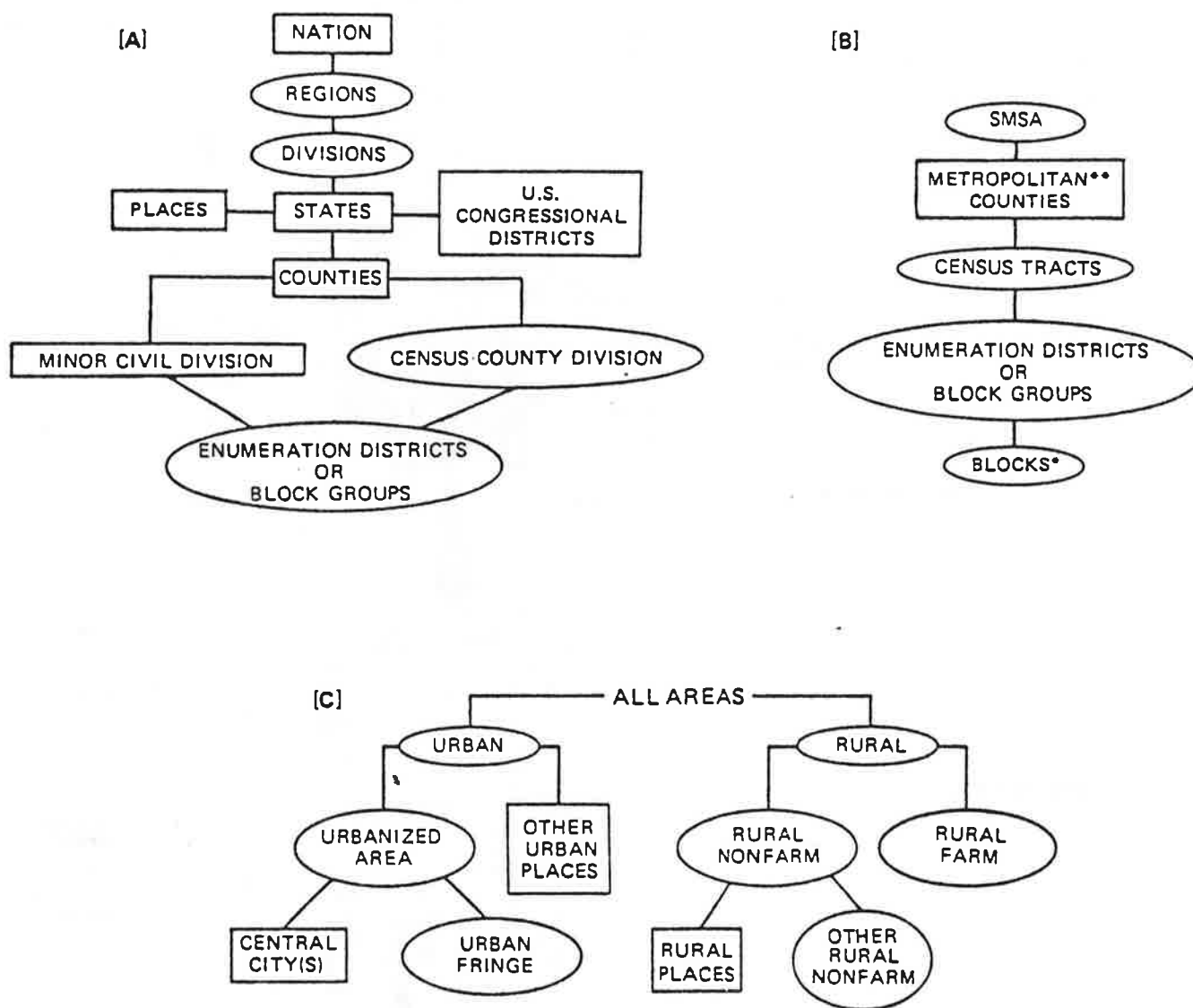
Figure 2. Geographic Areas Summarized in 1970 Census Data Products

Geographic area	Complete Count (100%) Data Only										Complete Count and Sample Data								
	First count				Second count				Third count		Fourth count				Fifth count		Sixth count		
	Summary tape	Microfilm	PC(11)-A <sup>1</sup>	HC(11) <sup>1</sup>	Summary tape	PC(11)-B <sup>1</sup>	HC(11)-A <sup>1</sup>	PHC(11) <sup>1</sup> (part)	Summary tape	HC(11) <sup>1</sup>	Summary tape <sup>2</sup>	PC(11)-C <sup>1</sup>	HC(11)-B <sup>1</sup>	PHC(11) <sup>1</sup> (part)	Summary tape	Microfilm	Summary tape <sup>4</sup>	PC(11)-D <sup>1</sup>	HC(11) <sup>1</sup>
Blocks.....									X	X									
Enumeration districts or blockgroups.....	*A	X																	
Census tracts.....					*A			X	(*)	(*)	*A			X					
Minor civil divisions or census county divisions.....	B	A	X		B	X					B								
All places <sup>3</sup> .....	B	X	X													X			
Places > 1,000 only <sup>3</sup> ....					B	X	X												
Places > 3,500 only <sup>3</sup> ...																			
Places > 10,000 only <sup>3</sup> ..											C	X	X						
Counties.....	B	A	X	X	B	X	X				C	X	X				X		
Urban/rural parts of counties.....					B	X					C	X							
Standard metropolitan statistical areas.....	B	A		X	B	X	X	X			C	X	X						
Urbanized areas of SMSA's	B	X	X		B	X	X				C	X	X				X	X	X
Components of SMSA's.....					B			X			C								
Congressional districts..	B	A															X	X	X
State.....	B	X	X	X	B	X	X				C	X	X				X	X	
ZIP codes.....															A, B				

- <sup>1</sup> Titles of these reports are given on fig. 4.2 and described in Data Access Description No. 39.
- <sup>2</sup> On the fourth and sixth counts, population and housing data appear on separate files.
- <sup>3</sup> MCD/CCD summaries are given only in counties with no census tracts.
- <sup>4</sup> The first, second, fourth, and fifth counts have files designated A and B or A, B, and C.
- <sup>5</sup> Tract totals appear for only that part of the tract which is covered by block summaries.
- <sup>6</sup> Places include all incorporated places and unincorporated places of 5,000 or more in urbanized areas or of 1,000 or more elsewhere.
- <sup>7</sup> Sixth count tapes provide data for metropolitan counties, central cities, and other cities over 50,000 population. Sixth count housing files also present data for nonmetropolitan counties of 50,000+.
- <sup>8</sup> Data for small places can be created by aggregating summaries of component enumeration districts.
- <sup>9</sup> The congressional district profile tape contains fifth count information and a few additional items.

NOTE: This figure appears as figure 6 in the Student Workbook.

Figure 3. Census Geographic Units—Their Hierarchical Relationships



These figures illustrate hierarchical or "nesting" relationships among census geographic areas. Note that the hierarchies overlap, e.g., counties are subdivided into MCD's or CCD's (figure A), into urban and rural components (figure C), and, inside SMSA's, into census tracts (figure B). Note also the relationships among governmental and statistical units as data summary areas.

KEY:

- GOVERNMENTAL UNITS
- STATISTICAL UNITS

\*Blocks cover only the urbanized area of an SMSA

\*\*In New England, metropolitan towns (MCDs) and cities replace counties as the components of SMSAs.

STANDARD METROPOLITAN  
STATISTICAL AREA \_\_\_\_\_

At least 50,000

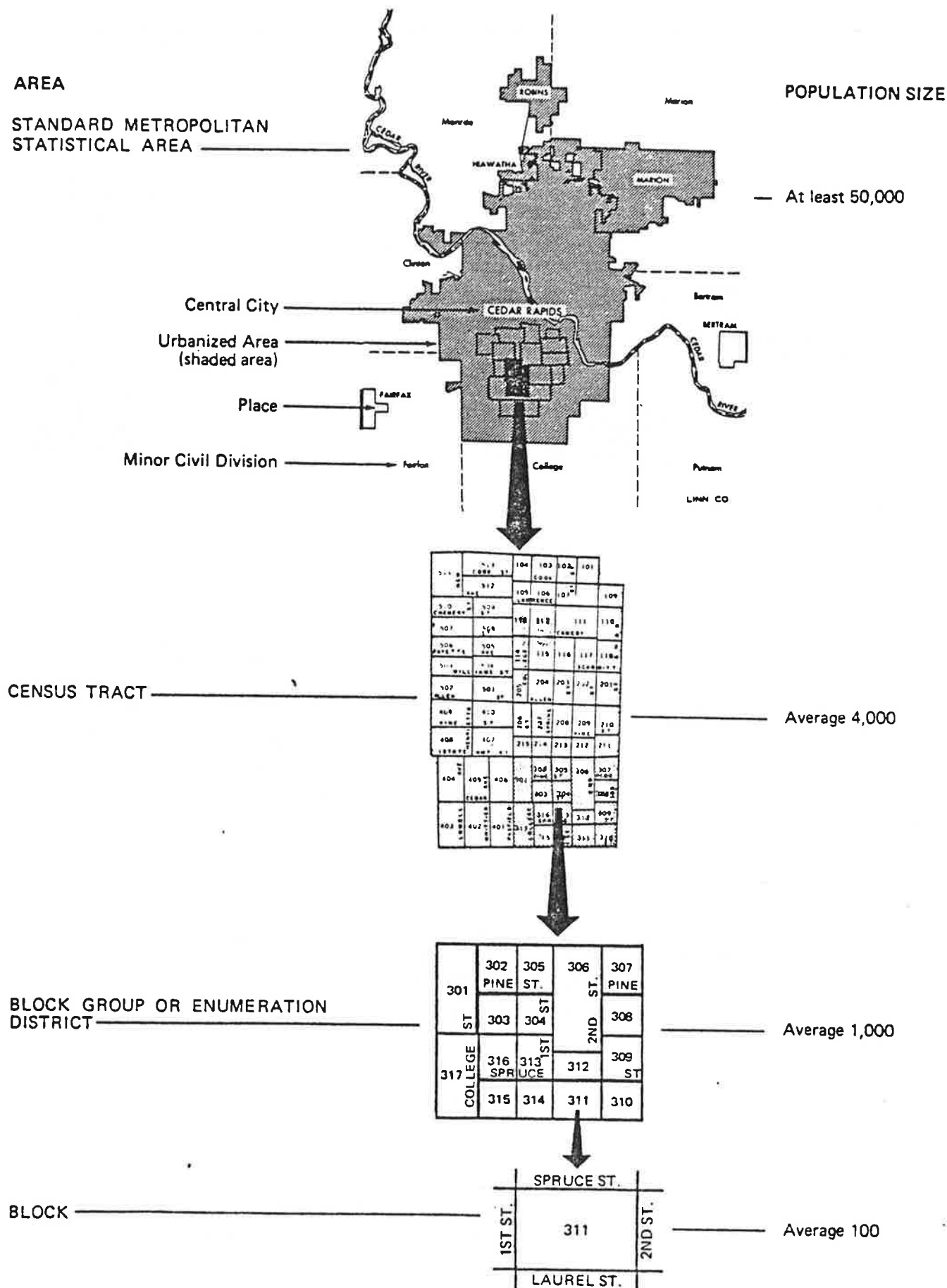
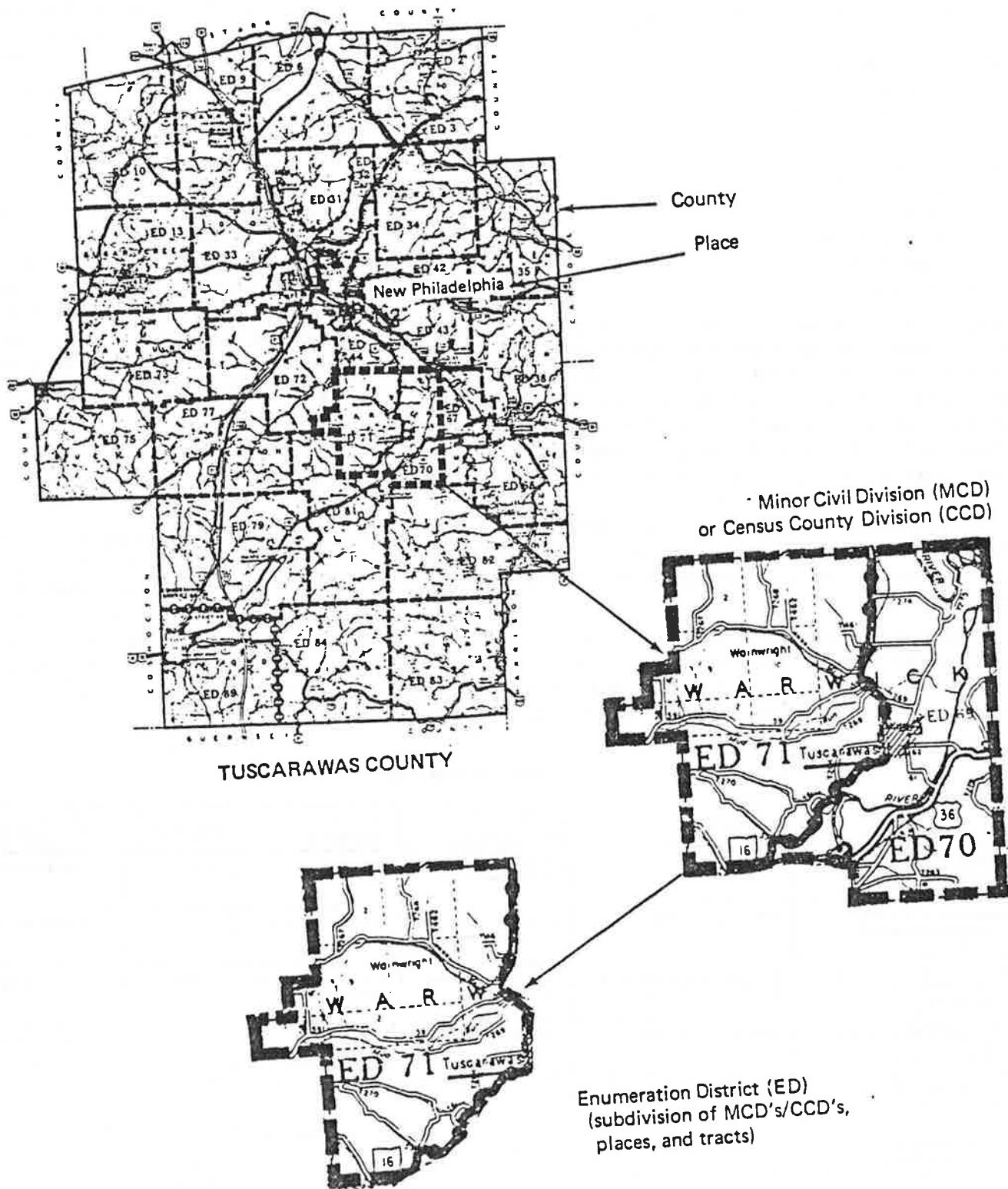


Figure 5. Census Geographic Areas—Nonmetropolitan



Statistical areas for which census data may be presented include:

- Geographic Regions of the United States
- Geographic Divisions of the United States
- Standard Metropolitan Statistical Areas (SMSA's)
- Urbanized Areas (UA's)
- Urban and rural areas
- Unincorporated places
- Census County Divisions (CCD's)
- Census tracts
- Enumeration Districts (ED's)
- Block Groups (BG's)
- Census blocks
- County groups (in the Public-Use Samples)
- State Economic Areas (SEA's)
- ZIP Code areas

The geographic areas observed in the 1970 census are defined in appendix A. More detailed definitions of geographic areas and related descriptive materials are presented in the "Census Users' Dictionary," pages 75-90, in the 1970 Census Users' Guide, Part I; Chapter 3 of the Reference Manual on Population and Housing Statistics from the Census Bureau, and appendixes or introductory material of the various published statistical reports.

Definitions for geographic areas observed in the 1972 Economic Censuses are presented in appendix B, to the extent that they differ from areas recognized for population and housing censuses.

Most census geographic areas have well-defined hierarchical or "nesting" relationships with other types of areas, as illustrated by the three diagrams in figure 3. For example, States are aggregated to form divisions and regions; they also are sub-

divided into counties (parishes in Louisiana and divisions in Alaska), which in turn are further subdivided into minor civil divisions or census county divisions. Governmental units at these levels of statistical areas intermingle in all levels of these hierarchies. Not all of the geographic areas which can be aggregated in the States are included in diagram A of figure 3. States are also composed of urban and rural components as illustrated in diagram C, a hierarchy independent of that shown in diagram A.

Figures 4 and 5 further illustrate the hierarchical relationships that appear for some census geographic areas. Figure 4 shows various geographic areas within metropolitan county areas which also appear in figure 3, diagram B. The figure also details the relationship between blocks, enumeration districts or block groups, and census tracts in SMSA's. Figure 5 shows the geographic components typical of a nonmetropolitan geographic area, which are also listed in figure 3, diagram A. Where census tracts and blocks are not defined, the primary statistical units within a county are minor civil divisions or census county divisions, which in turn are composed of enumeration districts.

## OUTLINE MAPS

There are several series of outline maps which show census geography areas and define the boundaries for small areas. Metropolitan Map Series, county maps, place maps, tract outline maps, urbanized area maps, county subdivision maps, central business district and major retail center maps, and the United States map of counties. Figure 6 presents a summary of the characteristics of these maps and describes how they can be obtained.

Figure 6. Census Outline Maps

MAP SERIES	MAP SCALE	NUMBER OF MAP SHEETS	SIZE OF MAP SHEETS	AVAILABILITY	
				IN REPORTS	SEPARATE
<b>METROPOLITAN MAP SERIES</b> —cover urbanized areas of SMSA's and contain all census boundaries down to the block level	1" = 2,000	Varies according to size of urbanized areas	18" X 24"	HC(3) <sup>1</sup>	From \$1.50 each sheet <sup>1</sup>
<b>COUNTY MAPS</b> —contain boundaries for MCD-CCD's, incorporated places, tracts, and enumeration districts	Generally, 1" = 2 miles	Varies from 1 to as many as 64 per county	Generally, 18" X 24"		From \$1.50 each sheet <sup>1</sup>
<b>PLACE MAPS</b> —for incorporated and unincorporated places; contain tract and enumeration district boundaries	Varies according to size of place; range from 1" = 400' to 1" = 1,500'	Generally, 1 map sheet per place	Varies according to size of place	HC(3) <sup>1,4</sup>	From \$2.25 each sheet <sup>1</sup>
<b>COUNTY SUBDIVISION MAPS</b> —include township and city boundaries	Generally, 1" = 12 miles	Generally, 1 map sheet per state	3' X 4'	PC(1)-A	\$1.00 each sheet <sup>1</sup>
<b>TRACT OUTLINE MAPS</b> —show tract boundaries and incorporated limits for places of 25,000 or more population	Varies according to size of SMSA and complexity of tracted area; range from 1" = ½ mile to 1" = 10 miles	Generally, 2 map sheets per SMSA	Generally, 22" X 24"	PHC(1) <sup>1</sup>	Prices vary see Appendix C
<b>URBANIZED AREA MAPS</b> —show the extent of urbanized areas by grey shading	Generally 1" = 4 miles	Generally, 1 map sheet per UA	17" X 22"	PC(1)-A HC(1)-A	—
<b>UNITED STATES MAP OF COUNTIES</b> —contains boundaries for counties and equivalents	115,000,000	1 map sheet	30" X 40"	—	\$1.00 each sheet <sup>1</sup>
<b>CENTRAL BUSINESS DISTRICT MAPS</b> —show census tracts comprising the CBD	Varies according to the size of the CBD	Single page	8½" X 11"	RC72-C	—
<b>MAJOR RETAIL CENTER MAPS</b> —show general location of MRCs and CBDs	Varies according to the size of the SMSA	Single page	8½" X 11"	RC72-C	—

<sup>1</sup> Available from: Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233 (301) 763-2400.

<sup>2</sup> Available from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or any U.S. Department of Commerce Field Office.

<sup>3</sup> Reports for some areas may be out of stock at GPO.

<sup>4</sup> Only for places participating in the contract block statistics program.





## Metropolitan Map Series

Metropolitan Map Series (MMS) cover at least the urbanized area portion of 233 of the 247 SMSA's reported in the 1970 census. Each MMS sheet shows the names of streets and other significant features within the area covered. Boundaries and names (or numbers) of places, MCD's, CCD's, congressional districts, wards, census tracts, enumeration districts, and blocks are shown on MMS sheets, and block groups can also be ascertained from MMS sheets. A portion of an MMS sheet is shown in figure 7; a list of the areas for which these maps are available appears in appendix C.

## County Maps

County maps show those portions of metropolitan counties not covered by the Metropolitan Map Series and the entirety of those counties outside of SMSA's. Boundaries of MCD's, CCD's, places, congressional districts, census tracts, and ED's are shown on county maps, except that ED's are not defined inside places for which place maps are available. County maps are generally reproductions of maps obtained from individual State highway departments, with census geography superimposed. The upper part of figure 5 shows detail from a county map.

## Place Maps

Place maps are available for every incorporated and unincorporated place which was reported in the 1970 census but which was not included on the Metropolitan Map Series. Place maps, which are usually based on maps supplied to the Census Bureau by local agencies, identify streets and show boundaries for places, MCD's, congressional districts, and enumeration districts. Place maps also show census tracts where applicable and blocks if the place contracted with the Census Bureau for preparation of block statistics. Modified versions of place maps appear in the HC(3) Block Statistics reports for places participating in the contract block statistics program, but they do not show enumeration district boundaries. Figure 8 shows a portion of a place map.

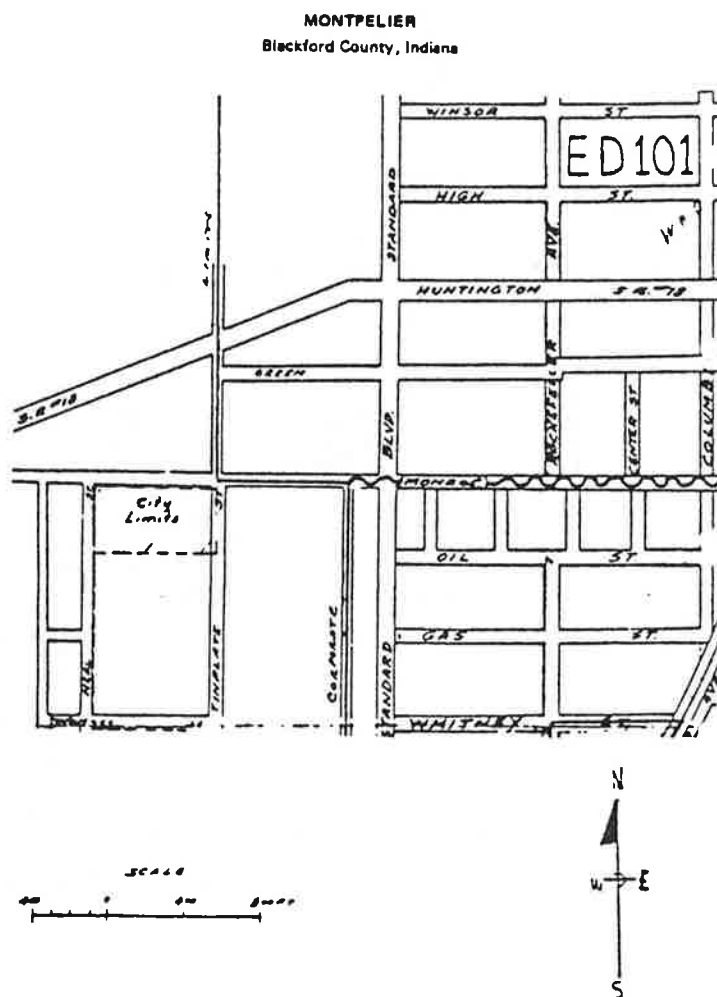
## Tract Outline Maps

Tract outline maps show the boundaries, numbers or names of census tracts, counties, and all places with a population of 25,000 or more for the 241 metropolitan areas tracted in 1970. Only streets and map features which form tract boundaries are shown on the maps. Generally, tract outline maps for an SMSA consist of one or two sheets, but can range up to five sheets for larger SMSA's. The lower part of figure 5 presents a portion of a tract outline map. A list of the metropolitan areas for which these maps are available appears in appendix C.

## Urbanized Area Maps

Urbanized area maps show the extent and components comprising the 279 urbanized areas defined for the 1970 census with various gray shadings. More detailed delineation of urbanized area boundaries can be found in the Metropolitan Map Series. Figure 9 shows an urbanized area map.

Figure 8. Detail From a 1970 Census Place Map



## County Subdivision Maps

County subdivision maps of States show the location and names of counties and the subdivisions of counties (minor civil divisions or census county divisions) as well as the location and names of all places which were recognized in the 1970 census. There is one map sheet for each State, with the exception of a few small States that have been combined on one sheet. The county subdivision maps, on a smaller scale, appear in sectionalized form in PC(1)-A Number of Inhabitants reports. Figure 10 shows a portion of a county subdivision map.

## United States Map of Counties

The United States Map of Counties shows the location and names for all of the 3,141 counties and county equivalents used for the 1970 census.

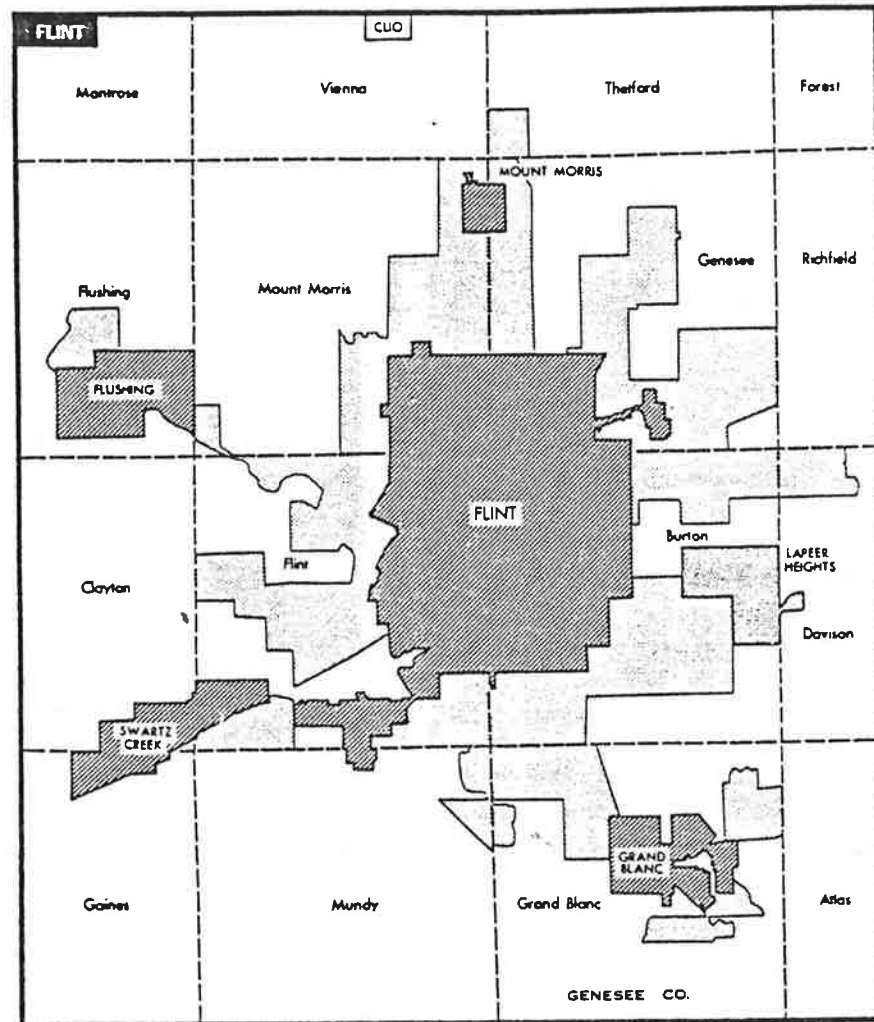
## Central Business District Maps

Central Business District maps show the boundaries and identification of the census tracts that make up the CBD, and show street detail within the CBD as defined for the 1972 Census of Retail Trade.

Figure 9. Example of an Urbanized Area Map (Michigan)

# MICHIGAN

## Urbanized Areas



### COMPONENTS OF URBANIZED AREA

- Incorporated Places
- Unincorporated Places
- Unincorporated Area

### BOUNDARY SYMBOLS

- International
- County
- Minor Civil Division
- Incorporated Place
- Unincorporated Place Outside Urbanized Area

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## Major Retail Center Maps

Major Retail Center maps show the location, but not the boundaries, of Central Business Districts and Major Retail Centers within an SMSA, as defined for the 1972 Census of Retail Trade. Only major streets are shown to assist in locating the MRC. The map scale is small enough to show all MRC's within a metropolitan area on a single page. The boundaries of MRC's are defined in a separate narrative in the 1972 Census of Retail Trade.

The Census Bureau maintains an inventory of the Metropolitan Map Series, county maps, and place maps, listing the cost and required number of map sheets for each State, county and place. Inquiries about particular areas may be directed to the Data User Services Division (phone (301) 763-2400).

## DATA DISPLAY MAPS

The Bureau of the Census issues several series of statistical maps and graphic summaries which portray various kinds of census data. The GE-50 and GE-70 maps series present data for the entire nation by county. The GE-80 Urban Atlases series shows information by census tract for 65 selected SMSA's. Graphic summaries in book form have been issued for the censuses of population, housing, agriculture, and governments.

The GE-50 series consists of statistical maps which show the geographic distribution, by county, of various social and economic censuses, and other sources. Different color schemes are used to depict values of the data; county names and boundaries are easily seen through the color. Each map is a single sheet, 30 by 42 inches in size, at a scale of 1:5,000,000. Titles and prices of available GE-50 series maps are listed in appendix D.

The GE-70 series is at a smaller scale, 1:7,500,000, and measures 20 by 30 inches in size. The first map in this series portrays the 1970 population distribution as white dots on a dark background suggesting a nighttime view of the United States as it might appear from a high altitude. The second map shows the interrelationship of two data variables, people 65 years of age and older cross-classified with the census year in which each county attained its maximum level of population. Types of primary home heating fuels used for 1950, 1960, and 1970 are presented on three maps appearing as GE-70, No. 3. Specific titles and prices are listed in appendix D.

The Urban Atlases portray data by census tract from the 65 largest SMSA's (minimum population, 500,000). The Urban Atlases display, on individual maps, 12 selected data characteristics from the 1970 Census of Population and Housing. The Urban Atlases serve as graphic supplements to individual PHC(1) Census Tracts reports. Atlas sheets measure 19 by 22 inches and are printed in color. Large SMSA's are displayed on more than one sheet to provide legible depiction of data for small census tracts. Prices range from \$2.55 to \$7.05. The SMSA's for which atlases are published are listed in appendix C along with prices. The 12 population and housing character-

istics mapped for each standard metropolitan statistical area are:

1. Population density (population per square mile)
2. Percentage of the total population under 18 years of age
3. Percentage of the total population 65 years of age and older
4. Black population as a percentage of the total population
5. Percentage of all persons 25 years old and over who are high school graduates
6. Median family income
7. Interrelationship of family income and educational attainment
8. Percentage of the total labor force employed in blue collar occupations
9. Median housing value
10. Median contract rent
11. Percentage of all housing units which are owner occupied
12. Percentage of all occupied units constructed from 1960 to March 1970

Order forms for maps in the GE-50, GE-70, and GE-80 series are available upon request from the Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233.

Graphic summaries from the 1970 census were published as parts of the U.S. Summary volumes PC(1)-1 and HC(1)-1 and reprinted as two supplementary reports PC(SI)-55 and HC(SI)-16. Included were several choropleth maps showing data by county across the United States, several maps showing data by State, a dot distribution map, and a number of charts and graphs.

The Graphic Summary from the 1969 Census of Agriculture contains 65 county choropleth maps and 230 dot maps showing the distribution of agricultural resources, products, and practices within the United States. The maps are shown at small scale, one or two to an 8½ by 11 inch page. Subjects include the number, sizes, types, and value of United States farms, the amount of land in farms and how that land is used, production of livestock, poultry and crops, hired farm labor, and machinery and equipment in use on farms. A more extensive Graphic Summary is being published from the 1974 Census of Agriculture.

The Graphic Summary from the 1972 Census of Governments presents charts, graphs, and maps showing data on government organization, public employment, and government finances. The nine maps portray these data by State.

## GEOGRAPHIC CODE SCHEMES AND REFERENCE FILES

### Geographic Code Schemes

Geographic areas are identified on most census computer tapes only by their numeric codes—names are not used. Users, therefore, require some form of a geographic code scheme to relate the codes for geographic areas to geographic area names. Codes

and the corresponding names for census geographic areas are contained in the following Census Bureau products: the Geographic Identification Code Scheme (GICS), the Master Enumeration District List (MEDList), the City Reference File (CRF), and Place Identification, Characteristics and Area, Distance and Direction (PICADAD).

**Geographic Identification Code Scheme.**—The Geographic Identification Code Scheme (GICS) is a four-volume set of tables which presents the names of political and statistical subdivisions (and their corresponding geographic codes) for which the Census Bureau tabulated data from the 1970 census. Geographic codes contained in the GICS correspond to those on all 1970 census computer tape products. Unlike the MEDList described below, the GICS does not present population or housing counts and does not include census tracts, enumeration districts, or block groups.

The GICS is presented in four publications, one for each census region: Northeast, \$1.00; North Central, \$1.75; South, \$1.50; and West, \$0.60. Together they are designated PHC(R)—3. Each volume contains three tables. Table 1, arranged by counties within State, shows the following codes, as appropriate, for counties, county subdivisions, and places: State, county, SMSA, MCD or CCD, place, place description, and place size. Figure 11 illustrates the hierarchical arrangement of geographic identifiers in Table 1 of the GICS. Table 2 presents alphabetically all the places within the State with their corresponding county, county subdivision, and place codes. A third table, shown once for each volume, presents SMSA and urbanized area codes for the entire United States.

Figure 11. Illustration of the 1970 Geographic Identification Code Scheme (GICS) Table

TABLE 1. COUNTIES, COUNTY SUBDIVISIONS AND PLACES

GEOGRAPHIC CODES								NAME	
STATE	COUNTY	SMSA	ESR	SEA	MCD	PLACE	PLACE DESC		
4	001		113	03				BEAVER	
4	001		113	03	005			BEAVER DIV	
4	001		113	03	005	0050	4	03	BEAVER
4	001		113	03	010			MILFORD-MINNERSVILLE DIV	
4	001		113	03	010	0590	4	03	MILFORD
4	001		113	03	010	0600	4	01	MINNERSVILLE
4	003		112	01				BOX ELDER	
4	003		112	01	005			BEAR RIVER DIV	
4	003		112	01	005	0045	4	01	BEAR RIVER
4	003		112	01	005	0160	4	01	CORWIN
4	003		112	01	005	0210	4	01	ELWOOD
4	003		112	01	005	0260	4	01	FELDMAN
4	003		112	01	005	0295	4	03	GARLAND
4	003		112	01	005	1005	4	06	TRENTON
4	003		112	01	010			BENCLAND DIV	
4	003		112	01	010	0175	4	01	DEWEYVILLE
4	003		112	01	010	0375	4	02	HONEYVILLE
4	003		112	01	015			BRIGHAM CITY DIV	
4	003		112	01	015	0080	4	08	BRIGHAM CITY

**MEDList.**—The Master Enumeration District List (MEDList) serves four purposes: (1) to link State, county, place, and minor civil division or census county division names with their corresponding codes; (2) to indicate the hierarchical relationships among those units; (3) to list the enumeration districts and block groups which make up these units; and (4) to present population and housing counts for each of those units from State level to the ED/BG level. (The population and housing counts contained on the MEDList do not reflect any of the corrections stated in correction notes to the PC(1) or HC reports). An illustrative printout of the MEDList (from microfilm) is presented in figure 12.

Figure 12. Master Enumeration District List (MEDList)

Michigan																			Frame No. C									
State		Fed. Std. County	County of lab.	CCC	MCD/CCD	Place			SCA	SMSA	Urbanized area	Tracted area	Univ. area		SEA	ESR	CBD	Area name	Tract		Blk. grp.	ED		Ward	Cong. dist.	1970 counts		
1970	1960					Code	Desc.	Size					Prefix	Code					Basic	Suffix		Code	Suffix			Housing	Pop.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
26	34	121		1														MUSKEGON									49831	149
26	34	121		1	090													Ravenna TWP									650	2
26	34	121		1	090	2275	4	02		5320		5320	1	34062	06	050	1	Ravenna Village	0029			0442		1		09	250	
26	34	121		1	090		7			5320		5320	1	34062	06	050	1	Remainder of MCD (or CCD)	0029			0443		1		09	400	1
26	34	121		1	095													Roosevelt Park City									633	2
26	34	121		1	095	2345	4	06		5320	5320	5320	1	34062	06	050		Roosevelt Park City	0022		1			0		09	633	2
																	1								0	09	200	
																	1								0	09	312	1
																	1								0	09	121	
26	34	121		1	110		7			5320		5320	1	34062	06	050		White Hall TWP									581	1
																	1		0030			0404		1		09	30	
																	1		0036			0405		1		09	40	
																	1		0037			0406		1		09	72	
																	1		0038			0407		1		09	60	
																	1							0		09	165	
																	1		0040					0		09	214	
																	2							0		09		

Note: Explanation of column heading abbreviations: Federal Standard County; County of Tabulation; Central County Code (CCC); Minor Civil Division (MCD)/Census County Division (CCD); Place Description; Standard Consolidated Area (SCA); Standard Metropolitan Statistical Area (SMSA); Universal Area Code; State Economic

Area (SEA); Economic Sub-Region (ESR); Central Business District (CBD); Block Group; Enumeration District (ED); Urban/Rural; Congressional District.

A second version of the MEDList, called the Master Enumeration District List With Coordinates, contains the latitude and longitude coordinates for population centroids (center points) for each of the approximately 250,000 enumeration districts and block groups. The geographic locations of the centroids were estimated visually from census maps based on the density of street patterns. Coordinate values were then assigned by an electronic digitizer.

**City Reference File.**—The City Reference File (CRF) is a computerized listing of census places and post office names and their associated ZIP, State, county, and place codes. It also contains common spelling variations of place and post office names and, where applicable, identifiers for SMSA's. The CRF was used by the Census Bureau for assigning geographic classification codes (State, county, place) to mailing addresses based on ZIP Codes and post office names. The CRF was constructed over a span of several years and was tailored to meet the geographic requirements for tabulating 1972 Economic Censuses data. An example of the file sequence of CRF is shown in figure 13.

While the CRF provides the capability to assign and edit geographic identifiers at the place level, its use without benefit of additional reference file input (such as street names and address ranges within city limits) may result in errors in some place code assignments. Use of the CRF can be limited because there is not always a direct relationship between ZIP Code service areas and census geography, even at the place and county level. Another limitation of the CRF is that while it contains all census places, it does not list all postal service places.

**PICADAD.**—Place Identification, Characteristics and Area, Distance And Direction (PICADAD) is a computerized list of place names and their associated geographic codes and geo-

graphic coordinates. It permits matching of post office names to geographic coordinates, thereby providing the capability to calculate distances between places. It can be used in analyses and tabulations concerning movements or relationships between virtually any geographic locations in the United States.

The PICADAD file contains approximately 24,000 unique geographic locations, each of which is associated with its common alternate names and variant spellings. Each location is assigned a unique "keypoint" number and is listed with its political and postal geography, various economic region identifiers, and its location coordinates.

### Other Geographic Reference Files

The Census Bureau has developed three geographic reference files for use in various types of spatial analysis and computer mapping: DIMECO, the Area Measurement File, and the SMSA Tract Boundary Files.

**DIMECO.**—DIMECO is a boundary file for counties as defined in 1960 for the 48 conterminous States. The DIMECO file is in a format where each record represents a county boundary segment. The principal use of DIMECO is for computer mapping, but since it is in a segment format, many other applications (such as area and distance measurement) are possible. The coordinates are supplied in two forms for convenience—geodetic coordinates (latitude/longitude) for general use, and Alber's equal-area projection for thematic mapping. Areas and distances can also be accurately calculated from DIMECO.

**Area Measurement File.**—This file was prepared by computing the center of population for each county from the 1970 population centroids of enumeration districts and block groups as shown on the MEDList. The county center value is given in decimal degrees of latitude/longitude. Total land and water area for each county is also included. The concept of the

Figure 13. Example of the City Reference File Showing File Sequence

ZIP	PLACE, COUNTY, PO NAME	PNS	PI	NS	COUNTY NAME	ST	CO	PLACE	PD	PS	SMSA	SERIAL NO. WITH CHECK DIGIT
20012	TAKOMA PK			3	PRINCE GEORGES	24	033	0950	4	4	8840	000918102
20012	WASHINGTON			3	PRINCE GEORGES	24	033	0950	4	4	8840	000918201
20022	CAMP SPRINGS			1	PRINCE GEORGES	24	033	0122	9		8840	000918300
20022	CAMP SPRING			3	PRINCE GEORGES	24	033	0122	9		8840	000918409
20022	WASHINGTON			3	PRINCE GEORGES	24	033	0122	9		8840	000818508
20022	OXON HILL			1	PRINCE GEORGES	24	033	0747	9		8840	000918607
20022	WASHINGTON			3	PRINCE GEORGES	24	033	0747	9		8840	000918805
20022	PRINCE GEORGES CO.			1	PRINCE GEORGES	24	033	9990	9		8840	000918904
20022	WASHINGTON			3	PRINCE GEORGES	24	033	9990	9		8840	000919001
20836	CALVERT CO.			1	CALVERT	24	009	9990	9			000919100
20836	LOWER MARLBORO			3	CALVERT	24	009	9990	9			000919209
20836	OWINGS			3	CALVERT	24	009	9990	9			000919308

NOTE: PNS = Place Name Status; PI = Part Indicator; NS = Name Status; ST = State Code; CO = County Code; PD = Place Description Code; PS = Place Size Code.



center of population as traditionally used by the Census Bureau is that of a balance point, that is, the point at which an imaginary, flat, weightless, and rigid plane representation of an area would balance if weights of identical size were placed on it so that each weight represented the location of one person on April 1, 1970.

**SMSA Tract Boundary Files.**—These files contain latitude/longitude coordinates for the boundaries of all census tracts within SMSA's as defined in 1970. The tract boundary files were originally produced for the Census Bureau's Urban Atlases. The tract boundary outlines, a data file of selected population and housing statistics, and the listing of a FORTRAN program used to generate SYMAP-compatible input are available for over 200 SMSA's. The tract boundary files can be used for computer mapping and other types of spatial analysis.

## Acquisition

Copies of the Geographic Identification Code Schemes can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The MEDList with coordinates, City Reference File, PICADAD, DIMECO, and the Area Measurement File are each available on computer tape for \$80 each. The SMSA Tract Boundary Files are available (on 2 tapes) for \$160. The MEDList (without coordinates) is available on microfilm for \$8.00 per reel (3 reels), also from the Customer Services Branch. All can be obtained from the Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233. Phone (301) 763-2400.

Order forms for these publication series are available from Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233.

The 1970 Census Users' Guide is a two-part general reference manual. Part I contains information on census content, data products (now somewhat dated), geographic materials, and uses, as well as a dictionary of census terms including a section on geographic terms. Part II contains technical documentation for the First, Second, Third and Fourth Count summary tapes. The 1970 Census Users' Guide can be purchased from the Census Bureau, Subscriber Services Section at the following prices: Part I, \$2.10; Part II, \$4.40.

Another source for information about geographic concepts is the Reference Manual on Population and Housing Statistics from the Census Bureau. This manual is designed to provide a comprehensive introduction to the 1970 census and related current programs. It includes a chapter on geographic concepts, including user notes, and discussions of hierarchical relationships and changes to area definitions over time. The Reference Manual can be purchased for \$2.00 from the Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233.

The monthly newsletter, Data User News, highlights Census Bureau activities, products, and services. It provides information on new publications, the release of data in both printed reports and summary tapes, upcoming surveys and censuses, developments in census geography including revisions for the 1980 census, and local applications of census data. Data User News

is available by subscription for \$4.00 a year from the Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233.

## GEOGRAPHY REFERENCE REPORTS

Boundary and Annexation Survey, 1970-1975 features statistics on boundary changes since January 1970 for incorporated places with populations of 2,500 or more. The report also contains the names of all places which have incorporated, consolidated, or disincorporated since 1970.

On January 1, 1971, the Bureau of the Census conducted the first of its Boundary and Annexation Surveys. Surveys have been made annually on each subsequent January 1. This publication includes detailed boundary change information for each of 6 calendar years (1970 through 1975) as well as summary tables for the 6-year period.

Centers of Population for States and Counties explains how center of population locations were established by the Census Bureau. A general summary of statistics and their relationship, with one another for the years 1950, 1960, and 1970 is included. Contents of the report include a table of locations and descriptions of centers of State population for 1950, 1960, and 1970; tables showing county centers of population for 1970; and 51 maps showing centers of State population.

Census Tract Memorandum No. 17 lists SMSA's as defined April 15, 1974, the counties that make up each, any other counties containing census tracts, and the number of census tracts recognized in each county for the 1970 and 1960 censuses.

The GE-41 series, Small Area Statistics Papers, are reprints of papers presented at the Conferences on Small-Area Statistics from the American Statistical Association and cover the broad area of the use of all types of small-area data including intercensal estimates, revenue sharing, and social indicators.

Another series of publications, the GE-60 Series, Computerized Geographic Coding, presents the proceedings of regional conferences which were devoted to local applications of GBF/DIME-Files (discussed below). This series provides insight as to what local agencies are doing or plan to do with their GBF/DIME-Files.

## THE GBF/DIME SYSTEM

### Address Coding Guides

In conducting the 1970 census, two different enumeration methods were used: the mail-out/mail-back type of canvass applied primarily in large urban areas, and the conventional house-to-house visits by enumerators in the remainder of the country. The mail-out/mail-back procedure was used in 145 of the then 233 SMSA's and in certain adjoining areas. Approximately 60 percent of the population was canvassed by mail rather than by an enumerator's visit. Householders were asked to complete the census questionnaires in the privacy of their own homes and mail them back to a local Census Bureau office. The remainder of the country was enumerated by the



conventional house-to-house canvassing procedure which closely resembled enumeration methods of the 1960 and earlier censuses. Census takers visited each housing unit and obtained the information required on the questionnaire. Appropriate geographic codes for each household were assigned to the questionnaires by the enumerator.

In the 145 SMSA's in which the mail-out/mail-back technique was used, a method of assigning specific census geographic codes to each mailing list address was needed. A master computer file was created, called an Address Coding Guide (ACG), which contained the information necessary to geographically code the residential addresses for each area. The ACG performed one of the functions of an enumerator by providing the census geography for each residential address.

ACG's are computerized lists of street names and address ranges for all streets within the city postal delivery area (which roughly corresponds to the urbanized area) of an SMSA. Features such as municipal boundaries, rivers, and railroad tracks are not included since there are no housing addresses associated with them. ACG's are no longer maintained by the Census Bureau, having been replaced by GBF/DIME-Files.

## GBF/DIME-Files

After preparation of the ACG's was well underway (and the 1970 census date was too near to permit a change in the system), an improved version of the ACG was developed. The improved ACG, which was known as a geographic base file (GBF), was developed using a technique called Dual Independent Map Encoding (DIME). The geographic base file, now commonly referred to as the GBF/DIME-File, is characterized by: (1) an editing capability which improves the accuracy of the files and, (2) added features which increase the utility to local users.

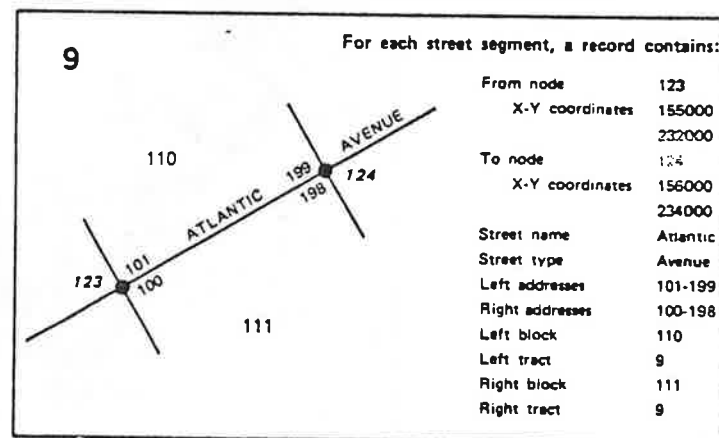
The concept underlying the creation of the GBF/DIME-Files is derived from graph theory. Each street, river, railroad track, municipal boundary, and other feature that bounds a census block can be considered as one or more straight line segments; curved streets or other features can be divided into series of straight line segments. Where streets or other features intersect or change direction, node points are identified. While an ACG was constructed on a block face basis, a GBF/DIME-File is constructed on a street segment basis. Therefore, while each ACG record contains the appropriate census geographic codes for one side of a street between two intersections, each GBF/DIME-File segment record contains the appropriate codes for both sides of a street between two nodes. By uniquely identifying each segment (including segments that are not along streets) and each node point, and their hierarchical geographic relationships, a geographic description which can be checked by computer for accuracy is made possible.

The construction of a GBF/DIME-File involves the transcription of geographic information (i.e., street patterns, address ranges, area identifiers) from metropolitan maps and other sources into a form that can be read and manipulated by computer. Clerks enter the various types of geographic information on worksheets which are then keypunched and entered into the

computer. After the computer editing, appropriate correction, and insertion of coordinates, the GBF/DIME-File is ready for use.

Essentially the same basic information is contained in both the ACG and GBF/DIME-Files: street name, address ranges, census tract and block numbers, place codes, ZIP Codes, and other geographic areas. However, the GBF/DIME-File has three additional codes: (1) the left-right orientation code separating the census geographic codes for areas on each side of the street segment; (2) the identification number of the node point at each end of the segment; and (3) the x-y coordinates of each node point expressed in State plane coordinates (measured in feet relative to State plane grid systems), latitude and longitude (measured in degrees based on distance from the equator), and map set miles (measured in miles from an arbitrary point at the southwest corner of the MMS sheet). Figure 14 illustrates in general terms how a GBF/DIME-File record relates to the features on a map. As with ACG's, most GBF/DIME-Files cover only the urbanized area of an SMSA. Appendix C lists the areas for which GBF/DIME-Files are available.

Figure 14. Contents of a GBF/DIME-File Record



## Census Tract Street Indexes

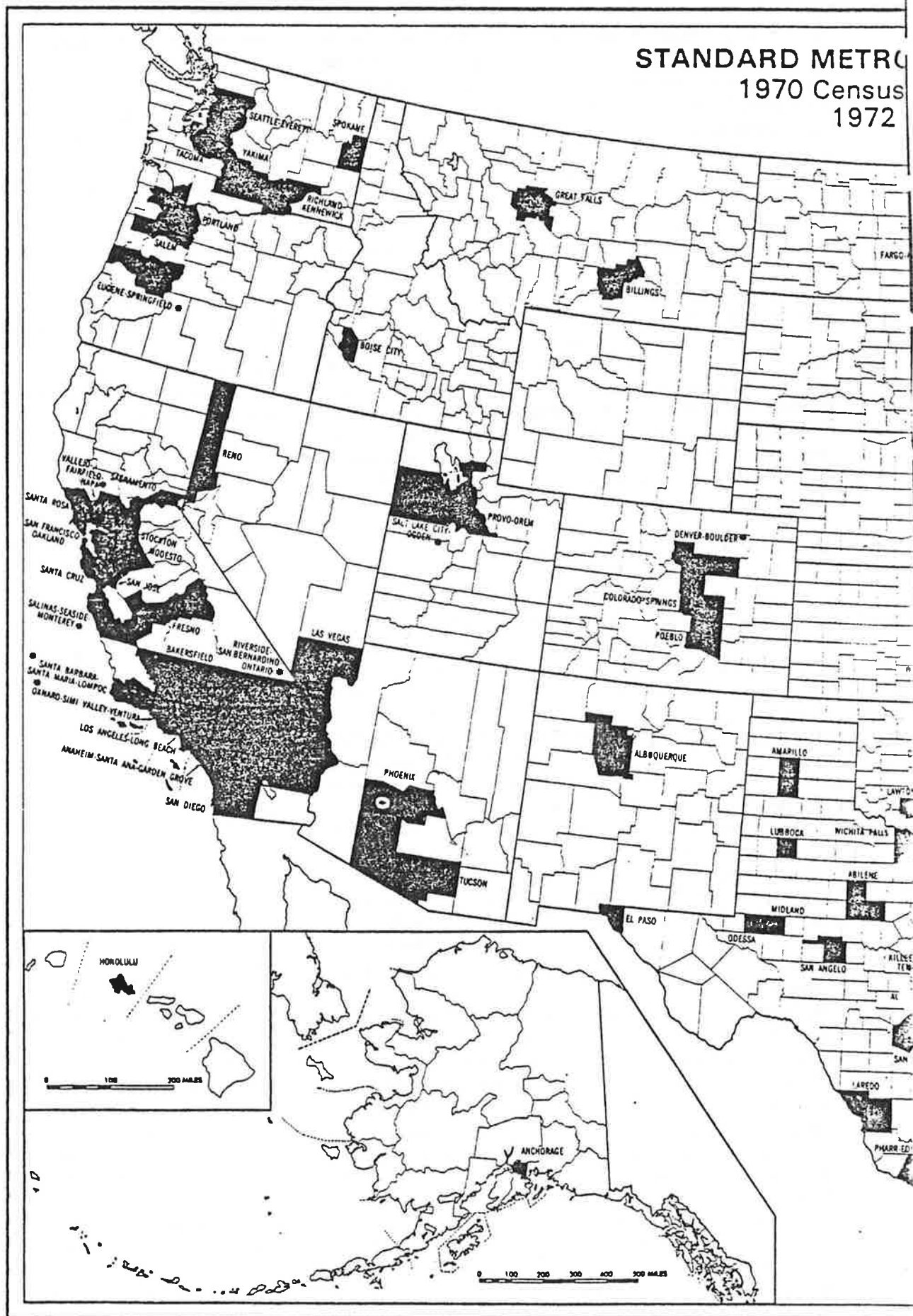
Census tract street indexes are listings of street names and their address ranges for census tracts within urbanized areas of SMSA's. The extent of coverage is limited to the postal city delivery area of the SMSA. Outside of that area the only recourse in identifying addresses to census tracts is to use maps in the PHC(1) Census Tracts reports, which do not contain address ranges.

Each census tract index identifies streets by prefix direction (north, south, etc.), street name, suffix direction (north, south, etc.), and street type (street, avenue, court, etc.). The index shows the high and low ends of the address range of streets passing through a specified census tract. The street identification is repeated each time the street in question passes through a new tract and the address range in that tract is indicated as well.

Street indexes are available for the urbanized areas of most SMSA's in the United States and can be developed for any 1970 SMSA upon request. These indexes are prepared from

# STANDARD METRO

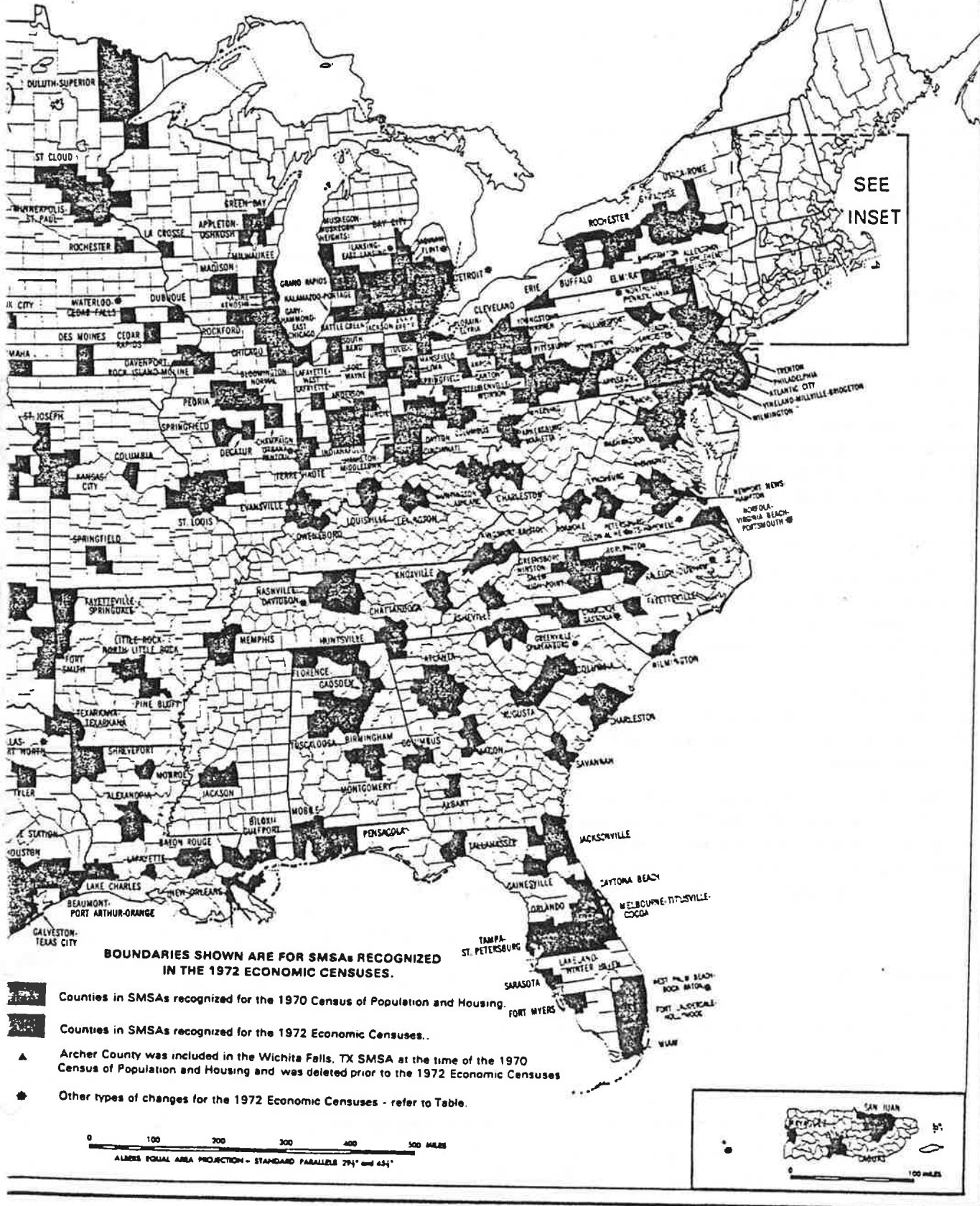
1970 Census  
1972



# AN STATISTICAL AREAS

## ulation and Housing

## ic Censuses



the most current GBF/DIME-Files for the urbanized areas of SMSA's for which a GBF/DIME-File exists. In SMSA's for which GBF/DIME-Files do not exist, ACG files are used to prepare the indexes. While some geographic base files are more current, the ACG's and most GBF/DIME-Files reflect street names and address ranges as they existed between 1968 and 1970 when the original ACG's were developed.

Census tract street indexes are available at a cost of \$80 per urbanized area with the following exceptions: Washington, D.C., Miami, Tampa, St. Petersburg, Baltimore, Boston, Minneapolis-St. Paul, Kansas City, St. Louis, Cleveland, Portland, Pittsburgh, Dallas, Houston, and Seattle at \$160 each, Los Angeles, San Francisco, Chicago, Detroit, and Philadelphia at \$240 each. New York is not available. Inquiries concerning the indexes should be directed to Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233.

### The CUE Program

As with most large-scale computer products, GBF/DIME-Files have some errors and, like the associated source MMS sheets from which they were constructed, the files become out of date as time passes. The files and appropriate maps must be updated as well as corrected to be of most use to local agencies and the Census Bureau. To accomplish this, the Census Bureau has established the CUE Program, referring to the correction, update, and extension of GBF/DIME-Files.

Purposes of the CUE Program are:

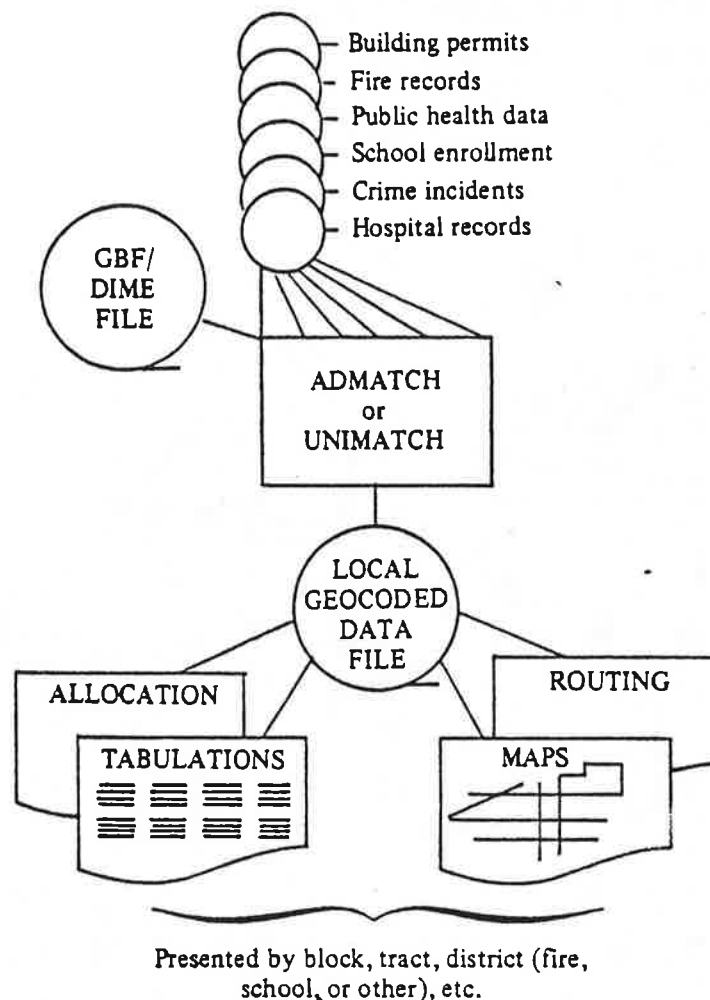
1. To make corrections as necessary to produce a complete and accurate GBF/DIME-File and MMS sheets for SMSA's having an existing file.
2. To prepare GBF/DIME-Files and MMS sheets for those SMSA's where GBF/DIME-Files and MMS sheets do not currently exist.
3. To develop procedures by which SMSA's can systematically maintain current and accurate GBF/DIME-Files and MMS sheets.

Through the CUE Program, many local agencies are correcting, updating, and extending their GBF/DIME-Files using computer programs and clerical procedures developed by the Census Bureau. Further information on the CUE Program can be obtained from the Geography Division, Bureau of the Census, Washington, D.C. 20233.

### GBF/DIME Applications

GBF/DIME-Files, along with related computer programs such as those mentioned below, can be used to assign geographic codes carried on those files to any records containing local street addresses. After local records (such as school enrollment or charge accounts) have been geocoded, they can be tallied for analysis, along with census statistics or other local data for the area. The generalized flowchart in figure 15 shows how a GBF/DIME-File can be used to assign geographic codes to individual records allowing them to be summarized by geography and then displayed or analyzed in some way.

Figure 15. GBF/DIME System



Since a GBF/DIME-File associates coordinates with computerized geographic records, it provides an essential input for computer mapping. A GBF/DIME-File can be used in street network analysis and routing design problems. Street networks of varying degrees of detail are required for computerized study and design of routes for garbage trucks, ambulances and other service vehicles. Computer programs that are designed to allocate resources to facilities can also take advantage of a GBF/DIME-File. For example, the file can be used in allocating people to community fallout shelters, determining logical service areas for community health facilities, or children to schools, and evaluating alternate sites for new retail outlets.

Many organizations now use GBF/DIME-Files as analytical tools. For example, a city's parks and recreation department wishes to know how many children in the local school system live in each planning district and their distribution within the district to determine where new playgrounds should be built; the executives of a department store want to know which census tracts their charge account customers live in, as part of the planning for new branch stores. GBF/DIME-Files, along with related computer programs such as those mentioned below, can be used to assign geographic codes carried on those files to any records containing local street addresses. After the organization's records (such as school enrollment or charge

accounts) have been so coded, they can be tallied for analysis, along with census statistics or other local data for the area.

## GBF/DIME Computer Software

A large number of computer programs that can be used with a GBF/DIME-File have been written at the Census Bureau. They can be used for a number of different applications such as geocoding, computer mapping, and file manipulation. These programs are categorized in figure 16 and explained in detail in appendix E.

Figure 16. GBF/DIME Software

CORRECTION, UPDATE & EXTENSION <sup>1</sup>	FILE PREPARATION <sup>2</sup>
<ul style="list-style-type: none"> <li>• CREATE</li> <li>• ADDEDIT-L</li> <li>• TOPOEDIT</li> <li>• FIXDIME II</li> <li>• FIXCORD</li> <li>• NODEDIT</li> <li>• FIXDIME 3</li> </ul>	<ul style="list-style-type: none"> <li>• DACS</li> <li>• POLYGON</li> <li>• GBF/POLYGUIDE</li> <li>• INTERSECT</li> <li>• SECS</li> <li>• STREETS</li> </ul>
GEOCODING <sup>2</sup>	COMPUTER MAPPING <sup>2</sup>
<ul style="list-style-type: none"> <li>• ADMATCH</li> <li>• UNIMATCH/ZIPSTAN</li> </ul>	<ul style="list-style-type: none"> <li>• GRIDS</li> <li>• EASYMAP</li> <li>• CENPLOT</li> </ul>
RESOURCE ALLOCATION <sup>2</sup>	
<ul style="list-style-type: none"> <li>• CARPOL</li> </ul>	

<sup>1</sup> CUE tape (one reel of tape containing 7 programs and documentation - \$80).

<sup>2</sup> GBF/DIME application tape (one reel of tape containing 10 programs and documentation - \$80).

All are available from:

Customer Services Branch  
Data User Services Division  
U.S. Bureau of the Census  
Washington, D.C. 20233

Telephone: (301) 763-2400

**Correction, Update and Extension.**—The CREATE program and related clerical procedures provide a local agency with a standardized system for creating a new GBF/DIME-File or for extending the coverage of an already existing file. Several COBOL edit and correction programs are also available. These include an address range, node chain and ZIP Code edit program, ADDEDIT-L; a block edit program, TOPOEDIT; file correction programs, FIXDIME II and FIXDIME 3; a program for editing the nodes in a file, NODEDIT; and a program for inserting coordinate values, FIXCORD.

**File Preparation.**—These programs are used to edit, reformat, or manipulate GBF/DIME-Files. This software includes a program for calculating areas and computing centroids of various areas, DACS; a program for determining segment intersections, SECS;

a program for producing street and address listings from the file, STREETS; a program for determining the address range of a segment within specified boundaries, GBF/POLYGUIDE; a series of programs for restructuring a GBF/DIME-File into a file of geographically coded intersections, INTERSECT; and a program for defining additional local geography (i.e., school districts, precincts) on the file, POLYGON.

**Geocoding.**—ADMATCH is an address matching system which provides the capability of geocoding computer-readable records containing street addresses. It is designed to attach geographic codes (such as census tract, block, school district, geographic coordinates, etc.) to records containing street addresses. UNIMATCH is a generalized record linkage system designed to assign geographic codes or to match data files. ZIPSTAN is a computer program which can be used as an address standardizer for UNIMATCH processing. ZIPSTAN converts addresses into a standard form (i.e., corrects misspelled street components, converts nonstandard abbreviations into a standard form) suitable for input to UNIMATCH.

**Computer Mapping.**—GRIDS is a generalized computer graphics system which produces several types of line printer maps using a large variety of files. EASYMAP is a computer program designed as an inexpensive and simple means of producing line printer choropleth (shaded area) maps from a basic boundary file. These maps can optionally have boundaries around each data area, map borders, margins and headings. CENPLOT is a program designed to plot segment records in the GBF/DIME-File. A CALCOMP or similar plotter is required.

**Resource Allocation.**—CARPOL is a computer program which develops lists of potential carpoolers who live near each other and who work similar hours.

## ACQUIRING GEOGRAPHIC PRODUCTS

All geographic products contained on computer tape sell for \$80 per reel. This price includes the cost of reproducing copies, plus the cost of the tape reels, technical documentation, and shipping and handling. Computer tapes can be purchased from:

Customer Services Branch  
Data User Services Division  
Bureau of the Census  
Washington, D.C. 20233

Phone: (301) 763-2400

## FURTHER INFORMATION

If further information is desired concerning the matters presented in this DAD, address inquiries to:

Data Access and Use Staff  
Data User Services Division  
Bureau of the Census  
Washington, D.C. 20233

Phone: (301) 763-2400

## Appendix A

### 1970 CENSUS GEOGRAPHY

#### Geographic Areas Associated with the 1970 Census of Population and Housing

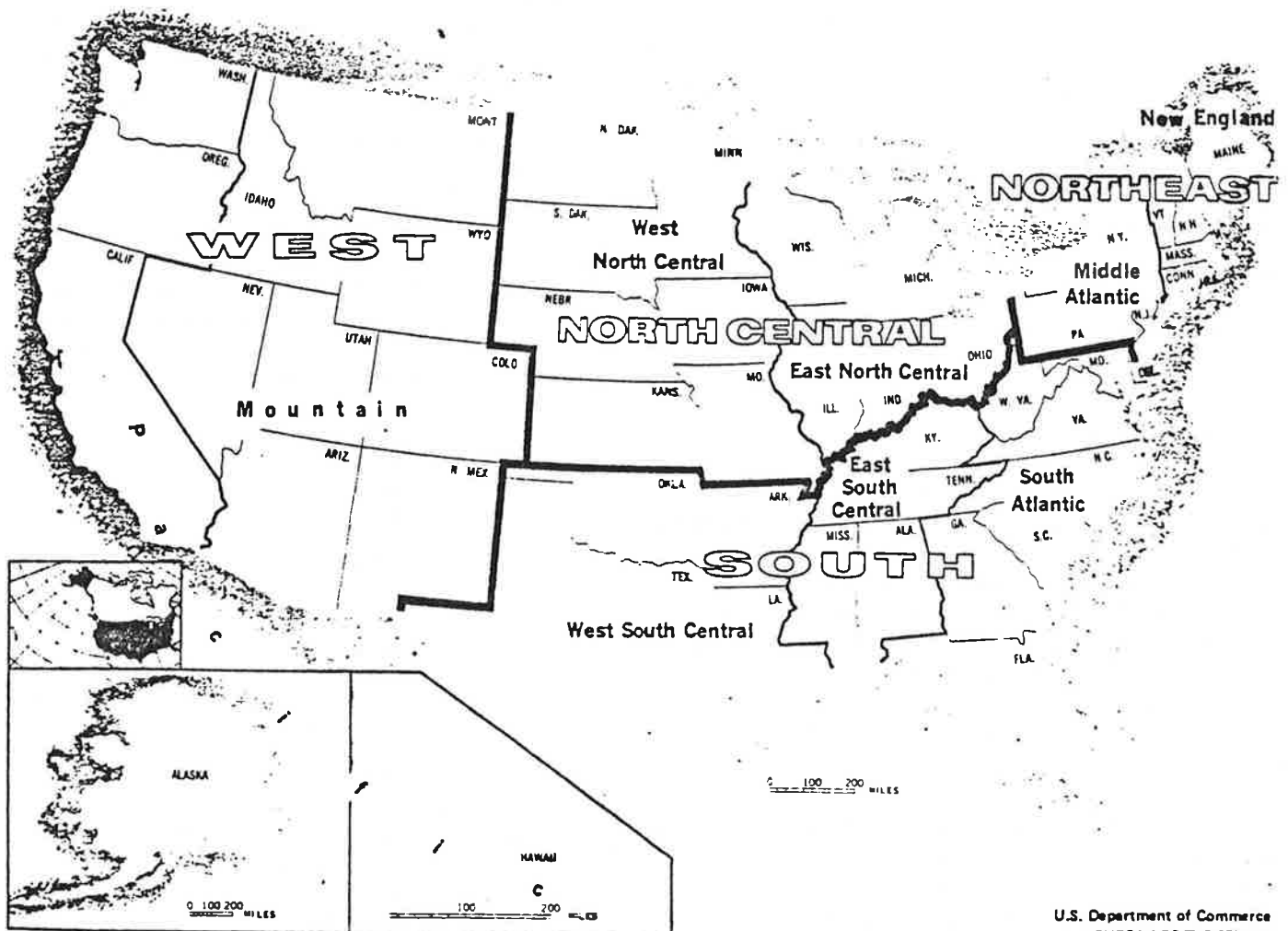
**Regions.**—Regions are large, geographically contiguous groups of States (with the exception of the region which includes Alaska and Hawaii) which are the first-order census subdivisions of the United States. There are four regions: Northeast, North Central, South, and West. See figure A-1.

**Divisions.**—Divisions are groups of States which are subdivisions of regions. There are nine geographic divisions. They have remained largely unchanged and have been used for the presentation of summary statistics since the 1910 census. See figure A-1.

**States.**—The 50 States are the major political units of the United States. The District of Columbia is treated as a State-equivalent in all tabulation series. See figure A-1.

**Counties.**—Counties are the primary political and administrative divisions of the States. In Louisiana such divisions are called parishes, and in Alaska 29 census divisions were established as county equivalents for statistical purposes. A number of cities (Baltimore, MD; St. Louis, MO; Carson City, NV; and a number of Virginia cities) are independent of any county organization and thereby constitute primary divisions of their States and are treated the same as counties in census tabulations. There were 3,141 counties and county equivalents in the United States tabulated for the 1970 census.

Figure A-1. Geographic Regions and Divisions of the United States



U.S. Department of Commerce  
BUREAU OF THE CENSUS



**Minor Civil Divisions (MCD's).**—These are the primary political and administrative subdivisions of counties; most frequently known as townships, but in some States include towns, precincts, and magisterial districts. MCD tabulations were made for the 1970 census in 29 States. In 1970, over 24,000 MCD's were recognized by the Census Bureau.

**Census County Divisions (CCD's).**—In 21 States, MCD's were found to be unsuitable for presenting statistics, either because the areas have lost their original significance, are very small in population, have frequent boundary changes, or have indefinite boundaries. The Census Bureau, in cooperation with State and local governments, established relatively permanent statistical areas designated as Census County Divisions.

CCD's are defined with boundaries that seldom change and can be easily located (e.g., roads, highways, streams, railroads, power lines, and bridges). Large incorporated places are usually recognized as separate CCD's even though their boundaries may change as a result of annexations. Cities with 10,000 or more inhabitants generally are separate CCD's and some incorporated places with as few as 1,000 population may be separate CCD's in very rural areas. There were approximately 7,000 CCD's in the 1970 census. The 21 States with CCD's in 1970 were Alabama, Arizona, California, Colorado, Delaware, Florida, Georgia, Hawaii, Idaho, Kentucky, Montana, New Mexico, North Dakota, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Washington, and Wyoming.

**Places.**—The term "place," as used by the Census Bureau, refers to a concentration of population, regardless of the existence of legally prescribed limits, powers, or functions. Most of the places identified in the 1970 census are incorporated as cities, towns, villages, or boroughs. In addition, a number of unincorporated places were delineated for the 1970 census tabulations. There were almost 21,000 places recorded in the 1970 census.

1. **Incorporated places.**—These are political units incorporated as cities, boroughs (excluding Alaska and New York), villages and towns (excluding the New England States, New York, and Wisconsin). Most incorporated places are subdivisions of the MCD or CCD in which they are located; for example, a village located within and legally part of a township. However, almost 4,000 incorporated places cross MCD and/or county lines, but no incorporated places cross State lines since they are chartered under the laws of a State. There were over 18,500 incorporated places in 1970.
2. **Unincorporated places.**—These are densely settled population centers without legally defined corporate limits or any other corporate powers or function. Each has a definite residential nucleus. Boundaries are drawn by the Census Bureau, in cooperation with State and local agencies, to include, insofar as possible, all the closely settled areas. In the 1970 census, statistics were tabulated for each unincorporated place with

5,000 inhabitants or more if located inside an urbanized area, or with 1,000 inhabitants or more if located outside any urbanized area. In all, 2,100 unincorporated places were recognized in the 1970 census.

For the 1980 census, the term unincorporated place is being changed to census designated place (CDP). The new terminology is designed to make it more explicit that unincorporated places are defined by the Census Bureau, and to avoid confusion in New England where many unincorporated places are parts of incorporated towns. For the 1980 census, CDP's will be used to describe densely settled population centers without legally defined limits or corporate powers. CDP's, as did unincorporated places, contain a dense, city-type street pattern and ideally should have an overall population density of at least 1,000 persons per square mile. In addition, a CDP should be a community that can be identified locally by place name, having developed over the years from a small commercial area or market center, rather than encompassing a residential land subdivision, apartment development, or general urban expansion area.

**Standard Metropolitan Statistical Areas (SMSA's).**—An SMSA is an integrated economic and social unit with a recognized large population nucleus. Generally, each SMSA consists of one or more entire counties, or county equivalents, that meet standards pertaining to population and metropolitan character. In New England, towns and cities, rather than counties, are used as the basic geographic units for defining SMSA's. In Alaska, census divisions are used for defining SMSA's.

SMSA's are designated by the Office of Federal Statistical Policy and Standards of the Department of Commerce with the advice of the Federal Committee on Standard Metropolitan Statistical Areas, which is composed of representatives of concerned Federal agencies. From time to time, the criteria for defining SMSA's are reviewed and revised; as a result, new SMSA's are established, and new areas are added to existing SMSA's.

Criteria used to establish the 247 SMSA's for which data were tabulated for the 1970 census specified that an SMSA include at least:

1. One city with 50,000 inhabitants, or more, or
2. Two cities having contiguous boundaries and constituting, for general economic and social purposes, a single community with a combined population of at least 50,000, the larger of which had a population of at least 35,000.

Criteria used to delineate the 267 SMSA's for which data were tabulated for the 1972 Economic Censuses specified that an SMSA include at least:

1. One city with 50,000 inhabitants, or more, or
2. A city having a population of at least 25,000 which, with the addition of the population of contiguous

places, incorporated or unincorporated, having a population density of at least 1,000 persons per square mile, which together must constitute, for general economic and social purposes, a single community with a combined population of at least 50,000, provided that the county or counties in which the city and contiguous places are located has a total population of at least 75,000.

Users of data for SMSA's need to pay attention to boundary changes that occur from time to time, particularly in comparing data from different sources. Of particular interest are the boundary changes that occurred between the reference dates for the 1970 Census of Population and Housing and the 1972 Economic Censuses: 23 new SMSA's were defined in the interim and 101 of the existing SMSA's changed boundaries. These boundary changes are highlighted in the centerfold map and figure A-2.

All of the changes could not adequately be represented on the maps, such as name changes and consolidations. SMSA changes between the 1970 and 1972 census, not obvious from the maps, are as follows:

**Boston, Mass. SMSA.** Billingham, Franklin, Stoughton, and Wrentham towns in Norfolk County, and Abington and Hanson towns in Plymouth County were transferred to Boston from other SMSA's. In addition, Boxford town in Essex County, Acton, Boxborough, Carlisle, and Holliston towns in Middlesex County, Foxborough and Medway town in Norfolk County, and Kingston town in Plymouth County were added.

**Brockton, Mass. SMSA.** Stoughton town in Norfolk County, Abington and Hanson towns in Plymouth County, deleted from area definition (transferred to Boston SMSA).

**Champaign-Urbana-Rantoul, Ill. SMSA.** Name changed from Champaign-Urbana, Ill. SMSA.

**Charlotte-Gastonia, N.C. SMSA.** Charlotte, N.C. SMSA (Mecklenburg County, Union County) combined with Gastonia, N.C. SMSA (Gaston County) to form Charlotte-Gastonia, N.C. SMSA.

**Dallas-Fort Worth, Tex. SMSA.** Dallas, Tex. SMSA (Collin County, Dallas County, Denton County, Ellis County, Kaufman County, Rockwall County), and Fort Worth, Tex. SMSA (Johnson County and Tarrant County) combined to form Dallas-Fort Worth, Tex. SMSA.

**Denver-Boulder, Colo. SMSA.** Denver, Colo. SMSA (Adams County, Arapahoe County, Denver County, Jefferson County) combined with Boulder, Colo. SMSA (Boulder County) to form Denver-Boulder, Colo. SMSA.

**Detroit, Mich. SMSA.** Lapeer County transferred to Detroit, Mich. SMSA from Flint, Mich. SMSA.

**Eugene-Springfield, Ore. SMSA.** Name changed from Eugene, Ore. SMSA.

**Flint, Mich. SMSA.** Lapeer County transferred from Flint, Mich. SMSA to Detroit, Mich. SMSA.

**Greenville-Spartanburg, S.C. SMSA.** Greenville, S.C. SMSA (Greenville County, Pickens County) combined with Spartanburg, S.C. SMSA (Spartanburg County) to form Greenville-Spartanburg, S.C. SMSA.

**Kalamazoo-Portage, Mich. SMSA.** Name changed from Kalamazoo, Mich. SMSA.

**Lansing-East Lansing, Mich. SMSA.** Name changed from Lansing, Mich. SMSA.

**Nashville-Davidson, Tenn. SMSA.** Nashville, Tenn. SMSA consolidated with Davidson County to form Nashville-Davidson, Tenn. SMSA.

**Nassau-Suffolk, N.Y. SMSA.** Nassau County and Suffolk County transferred from New York, N.Y. SMSA to form Nassau-Suffolk, N.Y. SMSA.

**New Haven-West Haven, Conn. SMSA.** Name changed from New Haven, Conn. SMSA.

**New York, N.Y.-N.J. SMSA.** Bergen County, N.J. transferred from Paterson-Clifton-Passaic, N.J. SMSA to New York SMSA. Nassau and Suffolk Counties taken from New York SMSA to form Nassau-Suffolk SMSA.

**Norfolk-Virginia Beach-Portsmouth, Va. SMSA.** Name changed from Norfolk-Portsmouth, Va. SMSA.

**Northeast Pennsylvania SMSA.** Scranton, Pa. SMSA (Lackawanna County), Wilkes-Barre-Hazleton, Pa. SMSA (Luzerne County) and Monroe County, Pa. combined to make Northeast Pennsylvania SMSA.

**Oxnard-Simi Valley-Ventura, Calif. SMSA.** Name changed from Oxnard-Ventura, Calif. SMSA.

**Paterson-Clifton-Passaic, N.J. SMSA.** Bergen County transferred from Paterson-Clifton-Passaic, N.J. SMSA and added to New York, N.Y. SMSA.

**Petersburg-Colonial Heights-Hopewell, Va. SMSA.** Name changed from Petersburg-Colonial Heights, Va. SMSA.

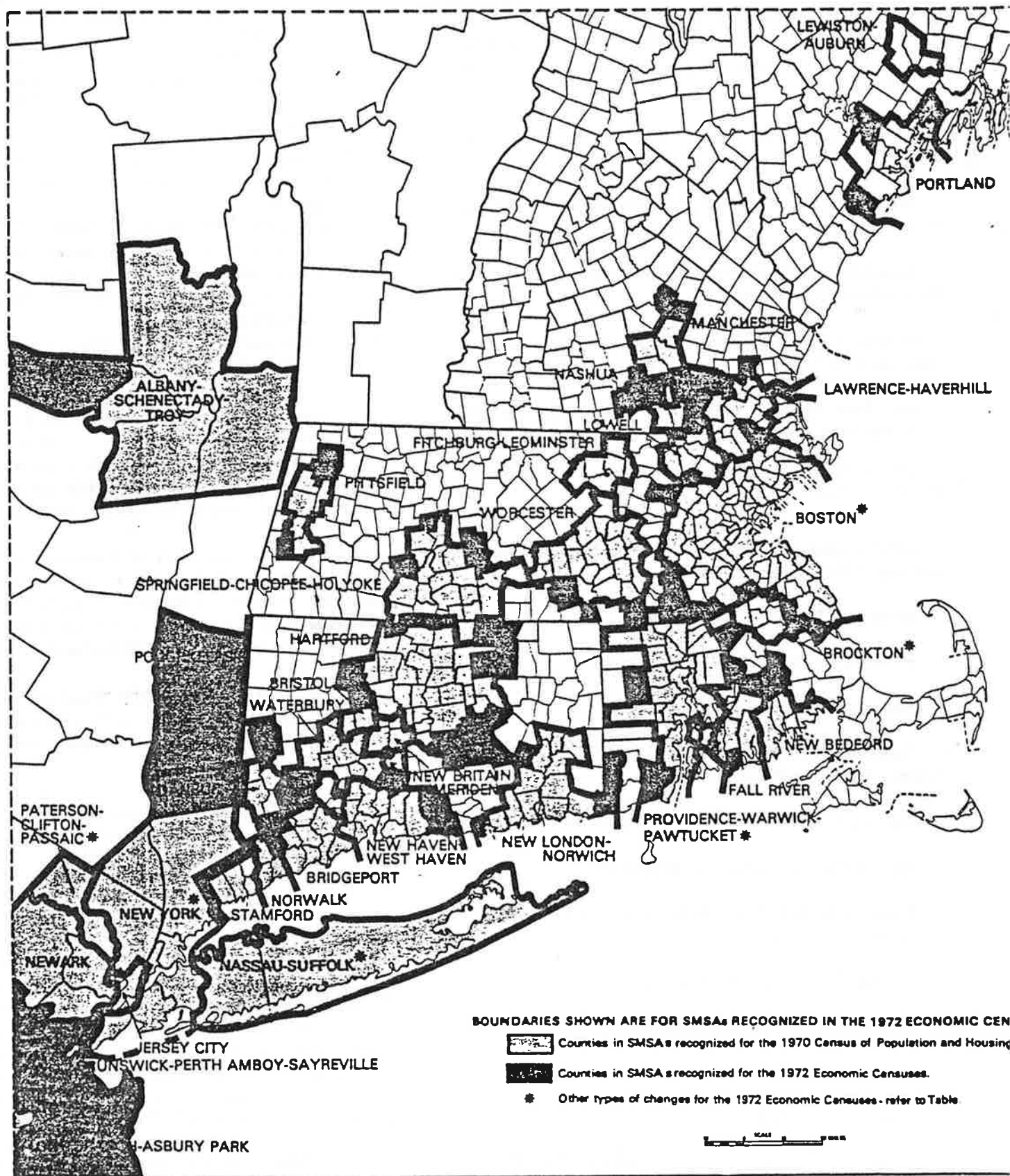
**Providence-Warwick-Pawtucket, R.I.-Mass. SMSA.** Bellingham, Franklin, and Wrentham towns in Norfolk County, Mass. deleted from area definition (transferred to Boston SMSA).

**Raleigh-Durham, N.C. SMSA.** Raleigh, N.C. SMSA (Wake County) combined with Durham, N.C. SMSA (Durham County, Orange County) to form Raleigh-Durham, N.C. SMSA.

**Riverside-San Bernardino-Ontario, Calif. SMSA.** Name changed from San Bernardino-Riverside-Ontario, Calif. SMSA.



Figure A-2. Inset from Centerfold Map



Salinas-Seaside-Monterey, Calif. SMSA. Name changed from Salinas-Monterey, Calif. SMSA.

Salt Lake City-Ogden, Utah SMSA. Salt Lake City, Utah SMSA (Davis County, Salt Lake County) combined with Ogden, Utah SMSA (Weber County) to form Salt Lake City-Ogden, Utah SMSA.

Santa Barbara-Santa Maria-Lompoc, Calif. SMSA. Name changed from Santa Barbara, Calif. SMSA.

Texarkana, Texas-Texarkana, Arkansas SMSA. Name changed from Texarkana, Texas-Ark. SMSA.

Vallejo-Fairfield-Napa, Calif. SMSA. Name changed from Vallejo-Napa, Calif. SMSA.

Waterloo-Cedar Falls, Iowa SMSA. Name changed from Waterloo, Iowa SMSA.

West Palm Beach-Boca Raton, Fla. SMSA. Name changed from West Palm Beach, Fla. SMSA.

Wichita Falls, Tex. SMSA. Archer County was dropped from the Wichita Falls, Tex. SMSA.

SMSA's designated between the 1972 Economic Censuses and July 1, 1978 are as follows:

- Anniston, Ala. SMSA. Calhoun County
- Bloomington, Ind. SMSA. Monroe County
- Bradenton, Fla. SMSA. Manatee County
- Clarksville-Hopkinsville, Tenn.-Ky. SMSA. Montgomery County, Tenn. and Christian County, Ky.
- Eau Claire, Wis. SMSA. Eau Claire and Chippewa Counties
- Fort Collins, Colo. SMSA. Larimer County
- Grand Forks, N.D.-Minn. SMSA. Grand Forks County, N.D. and Polk County, Minn.
- Greeley, Colo. SMSA. Weld County
- Kankakee, Ill. SMSA. Kankakee County
- Kokomo, Ind. SMSA. Howard and Tipton Counties
- Lawrence, Kans. SMSA. Douglas County
- Longview, Tex. SMSA. Gregg and Harrison Counties
- Panama City, Fla. SMSA. Bay County
- Pascagoula-Moss Point, Miss. SMSA. Jackson County

SMSA changes since 1970 have occurred for three separate reasons:

1. Commuting data from the 1970 census showed that certain counties were sufficiently integrated with the existing SMSA that those counties qualified for inclusion in the SMSA. In a few cases that also involved the combination of existing entire SMSA's (e.g., Dallas-Forth Worth).
2. Definitional criteria were relaxed somewhat to allow SMSA designation for places as small as 25,000 population if—
  - a. the city, and contiguous places with a population density of at least 1,000 persons per square mile constitute (for general economic and social purposes) a single community with a total population of at least 50,000, and
  - b. the county or counties (towns in New England) in which the places are located have at least 75,000 inhabitants.
3. Some additional places have increased in size to meet the basic population criteria of 50,000 inhabitants or more, or the modified criteria given above either through annexations or population gains evidenced by special censuses or revenue sharing population estimates.

There are two basic types of changes—those that involve changes to existing SMSA's (type 1 above), and those that involve the creation of new SMSA's (types 2 and 3 above). There have been, as shown above, 14 new SMSA's designated since the reference date for the 1972 censuses.

**Central Cities (of an SMSA).**—The largest city in an SMSA is always a central city. One or two additional cities may be added to the SMSA title and identified as central cities on the basis of the following criteria:

1. The additional city or cities must have a population of one-third or more of that of the largest city and a minimum population of 25,000, or
2. The additional city or cities must have at least 250,000 inhabitants.

**Urbanized Areas (UA's).**—An urbanized area contains a central city (or twin cities) meeting the same criteria used in defining an SMSA, plus the surrounding closely settled incorporated and unincorporated areas which meet certain criteria of population size or density. Beginning with the 1950 census, statistics have been presented for urbanized areas, which were established primarily to distinguish the urban from the rural population in the vicinity of large cities. They differ from SMSA's chiefly by excluding the rural portions of counties that make up the SMSA's as well as those places which are separated by rural territory from the densely populated fringe around the central city. Because UA's are defined on the basis of population distribution at the time of a decennial census, their boundaries tend to change in each census.

There were 252 urbanized areas recognized in the 1970 census, more than the number of SMSA's because several SMSA's include two noncontiguous urbanized areas, though counterbalanced somewhat by the fact that the New York, Chicago, and Los Angeles urbanized areas encompass the urbanized territory in two or more adjacent SMSA's. The urban fringe is that part of an urbanized area outside of a central city and includes the following:

1. Incorporated and unincorporated places with 2,500 or more inhabitants;
2. Incorporated places with less than 2,500 inhabitants, provided each has a closely-settled area of 100 dwelling units or more;
3. Adjacent unincorporated areas with a population density of 1,000 or more inhabitants per square mile;
4. Other adjacent areas with lower population density that serve to smooth the boundary or link densely populated contiguous areas.

In 1974, the Census Bureau modified the criteria for central cities of UA's and designated 27 new UA's for a total of 279 UA's. The change in criteria for UA central cities parallels the change in standard metropolitan statistical area criteria issued by the Office of Management and Budget in November 1971. This modification extends UA recognition to certain cities of between 25,000 and 50,000 which have a total of 50,000 or more when densely settled communities adjacent to the city limits are included. Population, land area data, and maps for the 27 new UA's are presented in PC(S1)-106 Population of Urbanized Areas Established Since the 1970 Census, for the United States: 1970.

**Standard Consolidated Areas (SCA's).**—In view of the special importance of the metropolitan complexes around two of the Nation's largest cities, New York and Chicago, several contiguous SMSA's, together with additional counties that did not meet the formal integration criteria but do have other strong interrelationships, were combined into SCA's known as the New York-Northeastern New Jersey SCA and the Chicago-Northwestern Indiana SCA. The New York-Northeastern New Jersey SCA was made up of the New York, N.Y. SMSA, Newark, N.J. SMSA, Jersey City, N.J. SMSA, Paterson-Clifton-Passaic, N.J. SMSA, and Middlesex and Somerset Counties in New Jersey. The Chicago-Northwestern Indiana SCA was made up of the Chicago, IL. SMSA and Gary-Hammond-East Chicago, IN. SMSA.

In 1976, the SCA concept was broadened and retitled; 13 areas have now been defined under the title Standard Consolidated Statistical Areas (SCSA's). These new statistical areas are composed of two or more contiguous SMSA's which meet certain criteria of population size, urban character, social and economic integration, and contiguity of urbanized areas.

The SCSA's as now defined are:

1. Boston-Lawrence-Lowell, MA-NH
2. Chicago-Gary, IL-IN
3. Cincinnati-Hamilton, OH-KY-IN
4. Cleveland-Akron-Lorain, OH
5. Detroit-Ann Arbor, MI
6. Houston-Galveston, TX
7. Los Angeles-Long Beach-Anaheim, CA
8. Miami-Fort Lauderdale, FL
9. Milwaukee-Racine, WI
10. New York-Newark-Jersey City, NY-NJ-CT
11. Philadelphia-Wilmington-Trenton, PA-DE-NJ-MD
12. San Francisco-Oakland-San Jose, CA
13. Seattle-Tacoma, WA

**Census tracts.**—Census tracts are generally small, relatively permanent areas into which metropolitan and certain other areas are divided for the purpose of providing statistics for small areas that will be comparable over time. Tracts are designed to be relatively homogeneous areas at the time of establishment with respect to population characteristics, economic status, and living conditions; the average tract contains about 4,000 residents. All SMSA's recognized at the time of the 1970 census were completely tracted. In addition, over 2,300 census tracts were recognized in non-SMSA cities and counties. The 1970 census total was about 34,700 tracts. It is estimated that there will be over 40,000 census tracts in the 1980 census.

Tract boundaries are established cooperatively by a local census committee and the Census Bureau in accordance with guidelines that impose limitations on population size and specify the need for visible boundaries. Geographic shape and areal size of tracts are of relatively minor importance. Tract boundaries are established with the intention of being maintained over a long time so that statistical comparisons can be made from census to census. However, occasional changes may be made in tract boundaries due to physical changes in street patterns caused by highway construction, park development, urban renewal programs, etc.

**Enumeration Districts (ED's).**—These areas averaged about 800 people or 250 housing units and were defined by the Census Bureau. They were used to control the collection and tabulation of the 1970 census data for the conventional enumeration areas (i.e., for areas not covered by computerized address coding guides). Two administrative factors play a part in determining the geographic definition of enumeration districts. First, the estimated population size of the ED should constitute an adequate enumerator workload. Second, the enumeration district must not cross the boundaries of any area for which data are to be tabulated (i.e., census tracts, MCD's, places, congressional districts, wards, or other areas except blocks). About 142,000 ED's were created for the 1970 census.

**Block groups.**—This area is a combination of contiguous blocks having an average population of about 1,000. Block groups are subdivisions of census tracts in areas covered by Address Coding

**Guides.** (i.e., in the urbanized area of 145 SMSA's) where ED data are not available. They are the equivalent of enumeration districts for purposes of providing small-area population and housing data. Block groups are typically defined without regard to the boundaries of political or administrative areas such as cities, minor civil divisions, or U.S. congressional districts. Each block group is identified by a one-digit numeric code which is unique within a census tract and is determined by the first digit of the three-digit block number. For example: Block group "1" would contain all blocks in the range 101-199 within a given tract.

**Blocks.**—A census block is a well-defined piece of land, bounded by streets, roads, railroad tracks, streams or other features on the ground. Blocks do not cross census tract boundaries, but may cross other boundaries such as city limits. Blocks are the smallest areas for which census data are tabulated. Data were tabulated and published for all blocks located in the urbanized areas of 233 of the SMSA's existing at the time of the 1970 census. Block data were also tabulated and published for approximately 1,000 cities and other areas that contracted with the Census Bureau for preparation of block statistics. (For a list of these contract block areas, see *Data Access Description*, No. 15, "Contract Block Statistics Program".) There were over 1,700,000 blocks in the 1970 census. The number of blocks recognized in the 1980 census will increase not only as urbanized areas have grown, but also because blocks will be tabulated for all cities of 10,000 inhabitants or more outside urbanized areas.

**Urban and Rural Areas.**—As defined by the Census Bureau, the urban population comprises all persons living in urbanized areas and in places of 2,500 inhabitants or more outside urbanized areas. The urban population consists of all persons living in:

1. places of 2,500 inhabitants or more incorporated as cities, villages, boroughs (except Alaska), and towns (except in the six New England States, New York, and Wisconsin);
2. census-defined unincorporated places of 2,500 inhabitants or more; and
3. other territory, incorporated or unincorporated, included within urbanized areas.

The population not classified as urban constitutes the rural population. The rural population is subdivided into the rural-farm population, which comprises all rural households living on farms, and the rural-nonfarm population, which comprises the remaining rural population.

### Other Geographic Areas Associated with the 1970 Census of Population and Housing

**U.S. Congressional Districts.**—These 435 areas are defined by State legislatures for the purpose of electing persons to the U.S. House of Representatives. The census of population and housing is the only source from which statistics for the congressional districts are tabulated. Published 1970 census reports

include population totals and selected characteristics for each congressional district. These are found, along with much other census data, in the *Congressional District Data Book*. Outline maps showing boundaries of districts are found in the *Congressional District Atlas* and GE-50 map No. 72 for the 95th Congress.

**Wards.**—Wards are political subdivisions of incorporated places used for voting and representation purposes. Wards were reported in one 1970 supplementary report for places of 10,000 or more which provided ward boundary information: PC(S1)-9, *Population of Places of 10,000 or More by Wards: 1970*.

**County Groups.**—County groups are geographic areas used in conjunction with the 1970 public-use microdata samples. The 409 county group areas identify economically related groups of counties, each of which contains at least 250,000 persons, in order to meet confidentiality criteria for public-use samples. Each SMSA of 250,000 or more population is a county group or can be defined in terms of two or more county groups. County groups frequently cross State boundaries. The public-use samples are a collection of 1970 census records (microdata) for individual persons and households with names and addresses removed. Information concerning County Group Public-Use Samples can be found in *Data Access Description*, No. 24, "Public-Use Samples of Basic Records from the 1960 and 1970 Censuses" and in a supplement (BC-81) entitled "Areas Defined on County Group Public Use Samples".

**State Economic Areas (SEA's).**—SEA's are single counties or groups of counties within a State, designed in the 1950's to be relatively homogeneous with respect to economic and social characteristics. Boundaries were drawn in such a manner that each economic area had certain significant characteristics which distinguished it from adjoining areas. SEA's were revised slightly in 1960 and were virtually unchanged for 1970. There were 510 SEA's in the 1970 census. SEA's are found only in two subject reports in the 1970 census: Subject Reports PC(2)-2E, *Migration Between State Economic Areas*, and PC(2)-10B, *State Economic Areas*.

**ZIP Code areas.**—ZIP Code areas were a new type of area for which 1970 census data were summarized. Fifth count summary tapes are the only source for population and housing data by ZIP Code areas. *Data Access Description*, No. 36, "1970 Census Fifth Count for ZIP Codes, Counties, and Smaller Areas," discusses the availability of ZIP Code data. ZIP Code data are used frequently by market researchers, hospital administrators, and others whose mailing lists or client records are ordered by ZIP Code. There are several disadvantages in using ZIP Code areas for statistical purposes: the areas were not designed with statistical use in mind—they are heterogeneous, the boundaries change over time, and maps are not generally available. Nationwide, ZIP Code data from the 1970 census are available only for three-digit ZIP Codes, except that data for five-digit ZIP Code areas are provided within SMSA's. ZIP Code areas seldom cross State lines, but frequently cross county, SMSA, and city boundaries.

## Appendix B

### GEOGRAPHIC AREAS ASSOCIATED WITH THE 1972 ECONOMIC CENSUSES

This appendix provides a summary of the geographic areas for which the Census Bureau tabulates statistics for the economic censuses program and includes definitions for those areas not covered in appendix A. The 1972 Economic Censuses included the censuses of construction industries, manufactures, mineral industries, retail trade, wholesale trade, transportation, and selected service industries. Further information about the 1972 Economic Censuses can be found in the Mini-Guide to the 1972 Economic Censuses, available for \$1.00 from the Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233. A Mini-Guide to the 1977 Economic Censuses is also available.

Comparability of data from the 1970 and 1972 censuses is affected by boundary changes for two types of areas: SMSA's and incorporated places. Many SMSA's changed their boundaries between February 1971 and August 1973 (the reference dates for the delineation of SMSA's for the 1970 and 1972 censuses). Further, there were only 247 SMSA's for the 1970 census while there were 267 SMSA's for the 1972 census. These changes and additions are highlighted on the comparative SMSA map found in the centerfold and in the accompanying text, map, and figures in appendix A. The only SMSA changes between the 1972 and 1977 censuses are the new SMSA's listed on page 25.

Incorporated places in many States carried out boundary changes due to annexations and/or deannexations between the two census years. About 50 percent of incorporated places changed their boundaries between the reference dates for the 1970 and 1972 censuses. Also, some new places were incorporated and a few went out of existence by merger or disincorporation.

As with the census of population and housing, data collected in the economic censuses are provided for the following geographic areas:

- the United States
- Geographic regions of the U.S.<sup>1</sup>
- Geographic divisions of the U.S.<sup>1</sup>
- States
- Counties
- Standard consolidated areas<sup>2</sup>
- Standard metropolitan statistical areas

Data are also provided for the following areas, subject to certain criteria:

- Incorporated places of 2,500 inhabitants or more in 1970.
- Unincorporated places of 25,000 inhabitants or more in 1970.
- Minor Civil Divisions (towns) in New England with 2,500 or more urban population, or with a total population of 10,000 or more in 1970; and township in New Jersey and Pennsylvania with a population of 10,000 or more in 1970.

Economic censuses data are not tabulated for census tracts, census county divisions, enumeration districts, block groups, blocks, U.S. congressional districts, wards, or ZIP Code areas. The relatively small number of business establishments and the sensitivity of the data to the confidentiality restrictions imposed by Title 13 of the U.S. Code severely limit the amount of economic census data that can be provided for small places, counties, or even SMSA's. However, for areas with high concentrations of retail establishments, small areas are defined which are not recognized in the population and housing censuses: Central Business Districts and Major Retail Centers (including Downtown Business Areas). See figure B-1 for an example of a Central Business District/Major Retail Center map.

Special areas for which economic censuses data are tabulated include:

- Central Business Districts
- Major Retail Centers
- Downtown Business Areas
- Travel Regions
- Production Areas
- Oil and Gas Districts

**Central Business Districts (CBD's).**—For the 1972 Census of Retail Trade the CBD is defined as an area in a city of 100,000 or more which has high land value; a high concentration of retail businesses, offices, theaters, hotels, and service businesses; and high traffic flow. The CBD is defined in terms of existing census tract boundaries and may comprise one or more whole tracts. CBD data are shown for the census of retail trade only.

For the 1977 Economic Censuses, CBD's will still be defined as "areas of high land valuation" delineated by census tract boundaries. However, there will no longer be a distinction drawn between CBD's and Downtown Business Areas (DBA's) defined below. DBA's established in previous census years will now be called CBD's. The kind-of-business detail provided for

<sup>1</sup> Regions and divisions were summarized in a number of 1972 Economic Censuses census reports, but are not often summarized in 1977 Economic Censuses census reports.

<sup>2</sup> Standard consolidated statistical areas replace SCA's for 1977.

CBD's will be varied according to the number of retail establishments in the CBD rather than the population size of the central city. Some 1972 CBD's have been modified for the 1977 censuses, and new CBD's have been established in many of the remaining central cities and other cities with at least 50,000 inhabitants based on the 1970 census.

**Major Retail Centers (MRC's).**—The MRC is a concentration of retail stores, located in standard metropolitan statistical areas, but outside the Central Business District, which has at least \$5 million in retail sales and at least 10 retail establishments during the census year, one of which is classified as a department store. MRC data are shown only for the census of retail trade. MRC's include planned suburban shopping centers as well as unplanned centers, such as older "string street" developments (continuous businesses along a street or highway, with few intersecting cross streets containing any businesses) and neighborhood developments which meet the above criteria.

Where the MRC is a planned center, the boundaries encompass all of the stores in the center, and may include adjacent stores outside of the planned center. Where the MRC is an unplanned center, the boundaries include the block in which the department store is located and all adjacent blocks having at least one general merchandise, apparel, or furniture and appliance store. See figure B-1 for an illustrative map showing a CBD and MRC's.

For the 1977 Economic Censuses, the minimum number of stores required to qualify as an MRC has been increased from 10 to 25. The criterion that an MRC contain a department store has been changed as follows: (1) one of the 25 stores must be a general merchandise store, and (2) the general merchandise store must have at least 100,000 square feet of total floor space. The introduction of these criteria is expected to reduce the number of MRC's reported in the 1977 Economic Censuses.

**Downtown Business Areas (DBA's).**—The DBA is a specialized type of MRC which is located in an SMSA central city with less than 100,000 population. It is defined in the same manner as a CBD—in terms of whole tracts—rather than in the manner of MRC's which are defined on the basis of field inspection. The level of detail published for DBA's is the same as for MRC's. In the Major Retail Center reports for cities of less than 100,000 population the DBA can be recognized by the inclusion of tract numbers in the descriptions of MRC's. DBA's will not be used in the 1977 Economic Censuses and existing DBA's will become CBD's.

**Other Special-Purpose Districts.**—Some publications from the economic censuses show statistics for areas defined for special purposes. Detailed descriptions of these areas can be found in the publications showing the statistics for these areas. Examples of such areas follow.

Nine "travel regions" have been defined for the National Travel Survey, part of the census of transportation. These areas differ from the four census regions and nine census divisions used to present census of population and housing data. The "travel regions" represent the most natural travel-serving geographic grouping of States within the constraints of the national sample design.

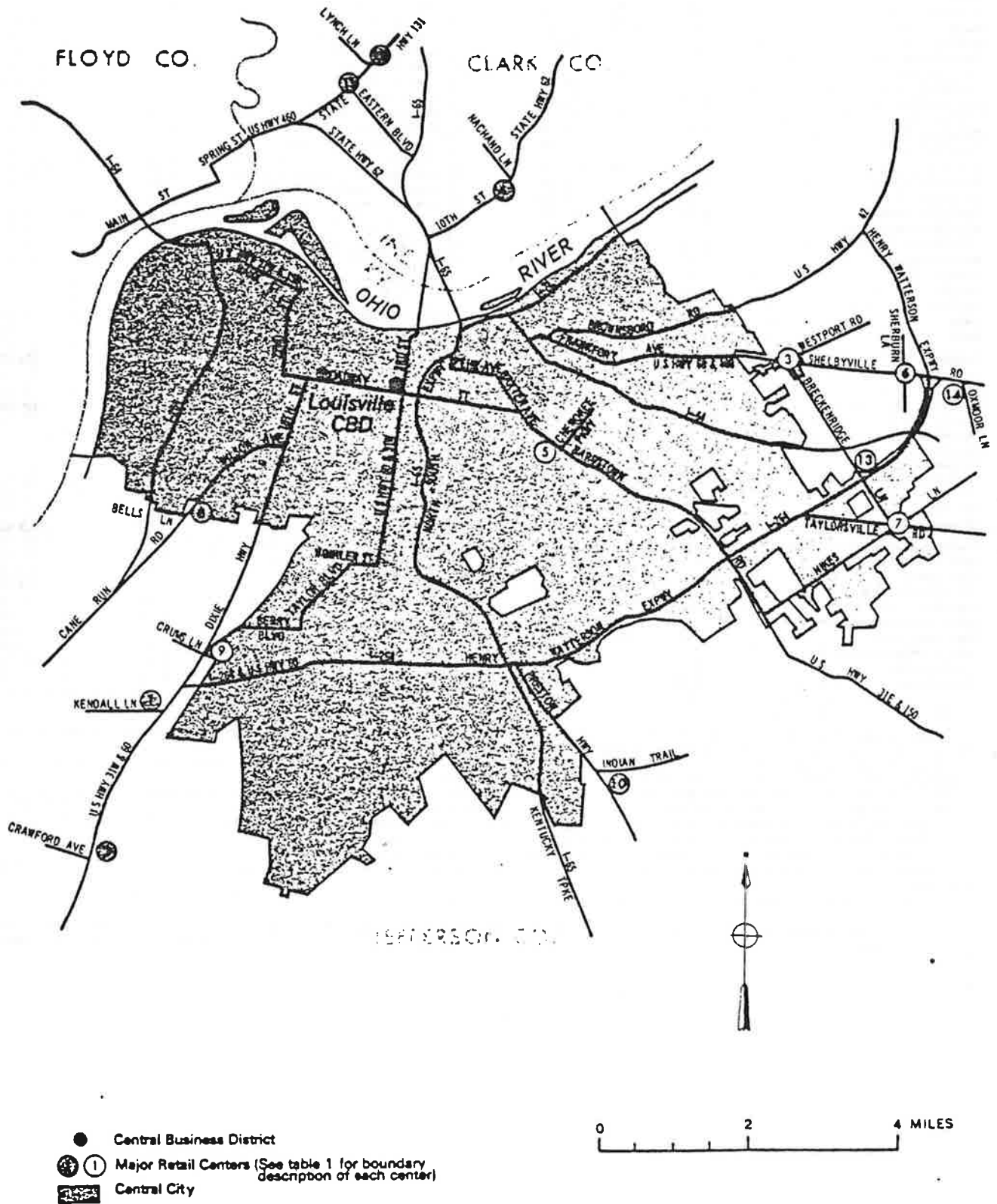
Twenty-seven "production areas" are used in the Commodity Transportation Survey, another part of the census of transportation. They are single SMSA's or clusters of SMSA's selected to represent relatively large but geographically compact concentrations of industrial activity.

Seventeen "oil and gas districts" in California, Louisiana, Texas, and New Mexico, comprising groups of counties, are used to present specialized statistics on petroleum and natural gas industries in the census of mineral industries.



Figure B-1. Map Showing Central Business District and Major Retail Centers

# LOUISVILLE KY.-IND.



## MAP PRICES AND AVAILABILITY OF GBF/DIME-FILES—Continued

SMSA	Tract Outline Maps <sup>1</sup>	Urban Atlases <sup>2</sup>	Metro- politan Maps <sup>3</sup>	GBF/DIME- Files or ACG <sup>4</sup>  (Number of reels)	SMSA	Tract Outline Maps <sup>1</sup>	Urban Atlases <sup>2</sup>	Metro- politan Maps <sup>3</sup>	GBF/DIME- Files or ACG <sup>4</sup>  (Number of reels)
Norwalk, CT.....	\$1.20	-	\$12.00	*1	Savannah, GA.....	\$1.20	-	\$10.50	1
Odessa, TX.....	1.20	-	10.50	1	Scranton, PA.....	1.20	-	13.50	1
Ogden, UT.....	1.20	-	36.00	1	Seattle-Everett, WA.....	2.25	3.90	31.50	2
Oklahoma City, OK.....	1.75	3.90	70.50	1	Sherman-Denison, TX.....	1.20	-	12.00	1
Omaha, NE-IA.....	2.05	2.55	15.00	1	Shreveport, LA.....	2.05	-	13.00	1
Orlando, FL.....	1.75	-	25.50	*1	Sioux City, IA-NE.....	1.20	-	9.00	1
Oxnard-Simi Valley-Ventura, CA.	1.75	-	27.00	1	Sioux Falls, SD.....	1.20	-	6.00	1
Paterson-Clifton-Passaic, NJ...	1.50	2.55	37.50	2	South Bend, IA.....	1.20	-	15.00	1
Pensacola, FL.....	1.75	-	10.50	*1	Spokane, WA.....	1.75	-	12.00	1
Peoria, IL.....	1.50	-	21.00	1	Springfield, IL.....	1.50	-	12.00	*1
Philadelphia, PA-NJ.....	3.90	5.05	64.50	3	Springfield, MO.....	1.20	-	9.00	1
Phoenix, AZ.....	1.50	2.55	49.50	1	Springfield, OH.....	1.20	-	6.00	1
Pine Bluff, AR.....	1.20	-	6.00	1	Springfield-Chicopee- Holyoke, MA-CT.....	1.75	2.55	30.00	1
Pittsburgh, PA.....	3.90	3.90	110.00	2	Stamford, CT.....	1.20	-	13.50	*1
Pittsfield, MA.....	1.20	-	6.00	1	Steubenville-Weirton, OH-WV...	1.20	-	9.00	1
Portland, ME.....	1.20	-	13.50	1	Stockton, CA.....	1.75	-	9.00	1
Portland, OR-WA.....	2.25	2.55	31.50	2	Syracuse, NY.....	1.20	2.55	13.50	*1
Providence-Warwick- Pawtucket, RI-WA.....	2.25	2.55	3.90	1	Tacoma, WA.....	1.50	-	19.50	1
Provo-Orem, UT.....	1.75	-	9.00	1	Tallahassee, FL.....	1.20	-	7.50	1
Pueblo, CO.....	1.20	-	6.00	1	Tampa-St. Petersburg, FL.....	2.25	3.90	43.50	2
Racine, WI.....	1.20	-	81.00	1	Terre Haute, IN.....	1.75	-	9.00	1
Raleigh, NC.....	1.20	-	15.50	1	Texarkana, TX-Texarkana, AR...	1.20	-	6.00	1
Reading, PA.....	1.75	-	9.00	1	Toledo, OH-MI.....	1.75	2.55	16.50	1
Reno, NV.....	1.20	-	10.50	1	Topeka, KS.....	1.20	-	7.50	1
Richmond, VA.....	1.50	2.55	25.50	*1	Trenton, NJ.....	1.20	-	15.00	1
Riverside-San Bernardino- Ontario, CA.....	2.25	3.90	48.00	*1	Tucson, AZ.....	1.50	-	16.50	1
Roanoke, VA.....	1.50	-	10.50	1	Tulsa, OK.....	1.50	-	25.50	1
Rochester, MN.....	1.20	-	6.00	-	Tuscaloosa, AL.....	1.20	-	6.00	1
Rochester, NY.....	1.75	2.55	19.50	1	Tyler, TX.....	1.20	-	10.50	1
Rockford, IL.....	1.75	-	10.50	1	Utica-Rome, NY.....	1.75	-	19.50	1
Sacramento, CA.....	2.25	2.55	24.00	1	Vallejo-Fairfield-Napa, CA...	1.50	-	(See San Francisco)	1
Saginaw-Bay City, MI.....	1.20	-	12.00	1	Vineland-Millville-Bridgeton, NJ.....	1.50	-	13.50	*1
St. Joseph, MO.....	1.20	-	7.50	1	Waco, TX.....	1.75	-	18.00	1
St. Louis, MO-IL.....	2.00	3.90	30.00	2	Washington, DC-MD-VA.....	6.00	3.90	46.50	2
Salem, OR.....	1.20	-	9.00	1	Waterbury, CT.....	1.20	-	13.50	*1
Salinas-Seaside-Monterey, CA...	1.75	-	13.50	1	Waterloo-Cedar Falls, IA.....	1.20	-	9.00	1
Salt Lake City-Ogden, UT.....	1.50	2.55	36.00	1	West Palm Beach-Boca Raton, FL	2.25	-	27.00	1
San Angelo, TX.....	1.20	-	6.00	1	Wheeling, WV-OH.....	1.75	-	10.50	1
San Antonio, TX.....	1.50	2.55	33.00	1	Wichita, KS.....	1.50	-	15.00	1
San Diego, CA.....	2.80	3.90	61.50	1	Wichita Falls, TX.....	1.75	-	9.00	1
San Francisco-Oakland, CA.....	5.40	6.00	109.50	4	Wilkes-Barre-Hazleton, PA.....	1.20	-	18.00	1
San Jose, CA.....	2.25	2.55	43.50	1	Wilmington, DE-NJ-MD.....	1.75	-	18.00	1
Santa Barbara-Santa Maria- Lompoc, CA.....	1.75	-	4.50	1	Wilmington, NC.....	-	-	9.00	-
Santa Rosa, CA.....	1.20	-	6.00	1	Worcester, MA.....	1.50	-	33.00	1
					York, PA.....	1.50	-	10.50	1
					Youngstown-Warren, OH.....	1.75	2.55	18.00	1

\*ACG only. - Represents zero.

<sup>1</sup>Tract outline maps may be purchased from the Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233. They were also previously published as parts of Census Tracts reports.<sup>2</sup>Urban Atlases, prepared for the 65 largest SMSA's, are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 or any U.S. Department of Commerce Field Office.<sup>3</sup>MMS sheets may be purchased from the Customer Service Branch. They were also previously published as part of Block Statistics reports.<sup>4</sup>ACG--Address Coding Guides, forerunner to the GBF/DIME-Files, were developed in 1968-1969 for parts of 147 SMSA's. They contain address range and geographic identifiers necessary for geocoding. They have been replaced by GBF/DIME-Files in most SMSA's excepting those denoted by an asterisk. GBF/DIME-Files and ACG's are available from the Customer Services Branch.<sup>5</sup>Northeastern Ohio map series - 76 sheets (\$114)-includes urbanized portions of Akron, Canton, Cleveland, and Lorain-Elyria SMSA's.<sup>6</sup>Southwestern Connecticut map series - 47 sheets (\$70.50)-includes urbanized portions of Bridgeport, Meriden, New Haven, Norwalk, Stamford, and Waterbury SMSA's.<sup>7</sup>Eastern Massachusetts map series - 73 sheets (\$109.50)-includes urbanized portions of Boston, Brockton, Lawrence-Haverhill, and Lowell SMSA's.<sup>8</sup>New York-Northeastern New Jersey map series - 144 sheets (\$216)-includes urbanized portions of New York and Nassau-Suffolk (New York) SMSA's and Jersey City, Newark, and Paterson-Clifton-Passaic, New Jersey SMSA's, plus portions of Middlesex, Monmouth, and Somerset counties.



## Appendix D

### GE-50 AND GE-70 SERIES MAPS AVAILABLE FOR SALE<sup>1</sup>

#### GE-50 Series (1:5,000,000)

- No. 44 – Net Migration by Counties of the United States: 1960-1970 (\$1.05)
- No. 45 – Population Distribution, Urban and Rural, in the United States: 1970 (95 cents)
- No. 46 – Congressional Districts for the 93rd Congress (95 cents)
- No. 47 – Number of Negro Persons, by Counties of the United States: 1970 (95 cents)
- No. 48 – Negro Population as a Percent of Total Population, by Counties of the United States: 1970 (95 cents)
- No. 49 – Number of American Indians, by Counties of the United States: 1970 (95 cents)
- No. 50 – Number of Chinese, by Counties of the United States: 1970 (95 cents)
- No. 51 – Number of Japanese, by Counties of the United States: 1970 (95 cents)
- No. 52 – Number of Persons of Spanish Origin, by Counties of the United States: 1970 (95 cents)
- No. 54 – Percent Change in the Negro Population, by Counties of the United States: 1960-1970 (95 cents)
- No. 55 – Standard Metropolitan Statistical Areas, Area Defined by Office of Management and Budget: January 1, 1974 (95 cents)
- No. 57 – Per Capita Money Income for 1969, by Counties of the United States (95 cents)
- No. 58 – Families Below the Low-Income Level in 1969, by Counties of the United States (95 cents)
- No. 59 – Number of Owner-Occupied Housing Units, by Counties of the United States: 1970 (70 cents)
- No. 60 – Number of Renter-Occupied Housing Units, by Counties of the United States: 1970 (70 cents)
- No. 61 – Spanish Population as a Percent of Total Population, by Counties of the United States: 1970 (70 cents)

- No. 63 – Ratio of Workers Working in County to Workers Residing in County in the United States: 1970 (65 cents)
- No. 64 – Median Cross Rent, by Counties of the United States: 1970 (70 cents)
- No. 65 – Median Value of Owner-Occupied Housing Units, by Counties of the United States: 1970 (70 cents)
- No. 66 – Owner-Occupied Housing Units as a Percent of All Occupied Housing Units, by Counties of the United States: 1970 (95 cents)
- No. 67 – Number of Workers Commuting In and Percent of Workers Commuting Out, by County: 1970 (90 cents)
- No. 69 – Percent of Children 5 to 17 Years Old Below the Poverty Level in 1969, by Counties of the United States (\$1.35)
- No. 70 – Number of Children 5 to 17 Years Old Below the Poverty Level in 1969, by Counties of the United States (\$1.35)
- No. 71 – Per Capita Retail Sales in the United States by Counties (\$1.35)
- No. 72 – Congressional Districts for the 95th Congress (\$1.20)
- No. 73 – Percent Change in Manufacturing Employment by Counties of the United States: 1967 to 1972 (\$1.25)

#### GE-70 Series (1:7,500,000)

- No. 1 – Population Distribution, Urban and Rural, in the United States: 1970 (\$1.60)
- No. 2 – Distribution of Older Americans in 1970 Related to Year of Maximum County Population (70 cents)
- No. 3 – Primary Home Heating Fuel, by Counties of the United States: 1950, 1960, 1970 (\$1.90)

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<sup>1</sup> U.S. Government Printing Office, Washington, D.C. 20402.

## Appendix E

### GBF/DIME COMPUTER SOFTWARE

#### Correction, Update & Extension

##### CREATE<sup>1</sup>

CREATE is designed to perform two independent operations. In areas where a GBF/DIME-File does not currently exist, it will create a new file using locally coded information transcribed from geographic coding worksheets. In areas where a file already exists, the program will allow a large number of new records to extend the file. The program requires approximately 60 K bytes of usable core.

##### ADDEDIT-L<sup>1</sup>

ADDEDIT-L edits address ranges along a street feature, checks for ZIP Code consistency and the orientation within and between segments on both street and nonstreet features. Street and nonstreet features are checked to determine whether all segments of the feature will chain together; whether the addresses at the "From" node end of the segments are equal to or lower than the addresses at the "To" node end of the segments; and whether all odd address numbers are on one side of the street and even numbers are on the other. ADDEDIT-L needs 95 K bytes of core.

##### TOPOEDIT<sup>1</sup>

TOPOEDIT edits the network features of the GBF/DIME-File to determine their validity (i.e., it checks to see that each block is bounded on all sides by nodes). It includes several options, including an option to edit only records in certain tracts, thus eliminating the necessity of editing the network within tracts in which no changes have occurred. TOPOEDIT requires 44 K bytes of core.

##### FIXDIME II (2 AND C VERSIONS)<sup>1</sup>

FIXDIME II edits corrections for completeness and consistency and inserts the accepted corrections into a GBF/DIME-File. FIXDIME II is supplied in two versions: FIXDIME 2 for agencies which do not intend to correct or insert X-Y coordinates in the GBF/DIME-File during a correction pass of the file and FIXDIME C for agencies which can obtain X-Y coordinates from local sources and want to include them along with other corrections to the file. FIXDIME 2 requires 47 K bytes of usable core; and FIXDIME C requires 60 K bytes of usable core.

##### FIXCORD<sup>1</sup>

FIXCORD provides the means for correcting erroneous or missing X-Y coordinates into the GBF/DIME-File. FIXCORD calculates the coordinates in the three coordinate systems used in the GBF/DIME System. The minimum core requirement for the program is 40 K bytes of usable core.

##### NODEDIT<sup>1</sup>

NODEDIT edits the nodes in the GBF/DIME-File, checking to see that each node point can be properly bounded by blocks (i.e., that blocks can be chained around a node). NODEDIT consists of two programs separated by a system sort. NODEDIT requires a computer with 55 K bytes of usable core.

##### FIXDIME 3<sup>1</sup>

FIXDIME 3 is designed to accomplish all of the functions of FIXDIME II/2 with the additional capabilities to handle changes to existing records on a mass correction basis. FIXDIME 3 requires a computer with 70 K bytes of usable core.

#### Geocoding

##### ADMATCH

ADMATCH is designed to prepare a file of address data records and a GBF/DIME-File for transferring geographic codes from the reference file to the appropriate matched address record. The matching is accomplished by building the necessary linkages between the two files. ADMATCH is available in IBM 360/OS and IBM 360/DOS assembler language versions. The OS version requires 34 K bytes of core. The DOS version requires 32 K bytes of core.

##### UNIMATCH

UNIMATCH is a generalized record-matching system. UNIMATCH can be used for almost any conceivable application by defining, with the UNIMATCH language, the nature of a record-linking operation. UNIMATCH is available in IBM 360/OS assembler language and requires 64 K bytes of core.

##### ZIPSTAN

ZIPSTAN can be used as an address standardizer for UNIMATCH processing. ZIPSTAN converts addresses into a standardized format by correcting misspelled street components and converting nonstandard abbreviations into a standard form suitable for input to UNIMATCH. ZIPSTAN is written in IBM 360/OS assembler language and requires 75 K bytes of core.

<sup>1</sup>Written in ANSI COBOL

## File Preparation

### DACS<sup>1</sup>

DACS can be used for locating polygon centroids and calculating areas for polygons from GBF/DIME-Files. Centroid location is required as input to GRIDS and other computer mapping packages. DACS requires 68 K bytes of core.

### POLYGON<sup>1</sup>

POLYGON provides for the definition of polygons for (1) the assignment of local geographic areas (e.g., school districts or transportation zones), and (2) to correct existing polygons (e.g., ZIP Code areas or census tracts). A polygon can be defined either by a string of node points or X-Y coordinate values. The program is written for a computer with 95 K bytes of usable core.

### GBF/POLYGUIDE<sup>1</sup>

GBF/POLYGUIDE is designed to collapse a GBF/DIME-File to any geographic unit (e.g., transportation zone or school district) for the purpose of creating a geocoding reference file. GBF/POLYGUIDE accepts the GBF/DIME-File as input and creates a record for each side of the street, and then collapses the address ranges of the block side records along the length of the street within the geographic unit chosen by the user. GBF/POLYGUIDE requires 15 K bytes of usable core.

### INTERSECT<sup>1</sup>

INTERSECT restructures a GBF/DIME-File into a file of intersections along street features. Each segment associated with the intersection is identified with its respective geographic codes. To convert the segment file, chain the intersections, and to print the file in intersect chain form requires a computer with 57 K bytes of usable core.

### SECS<sup>1</sup>

SECS is designed to detect common errors in the digitizing of GBF/DIME Files. SECS examines all possible pairs of line segments to determine if intersections occur. Intersections constitute errors since GBF/DIME-File segments are, by definition, connected only at their end points. SECS requires 95 K bytes of storage.

## STREETS<sup>1</sup>

STREETS is a street and nonstreet feature information display program. It can be used to give insight into the quality of addresses (abbreviations, spellings, etc.) in a GBF/DIME-File. STREETS runs with about 60 K bytes of usable core.

## Computer Mapping

### EASYMAP<sup>2</sup>

EASYMAP is an inexpensive and simple system for producing choropleth (shaded area) maps from a geographic reference file. EASYMAP requires 72 K bytes of core.

### GRIDS<sup>2</sup>

GRIDS is a computer mapping system developed for producing character printed maps. GRIDS has a flexible user-oriented language and has several mapping options available. GRIDS requires 88 k bytes of core.

### CENPLOT<sup>2</sup>

CENPLOT is designed to plot the segment records in a GBF/DIME-File, one map sheet at a time at any scale. CENPLOT requires a computer with 128 K of usable core. CENPLOT is capable of producing four-color plots, arrows, legends, and other map features.

## Resource Allocation

### CARPOL<sup>2</sup>

CARPOL is designed as a large-scale carpool candidate generator. The program generates lists of potential fellow-riders from which a candidate can create his carpool group. The program has a primary search radius based on geographic areas and a secondary search based on nongeographic criteria such as common workdays, hours, and driver/rider specifications. CARPOL requires 88 K bytes of core.

<sup>2</sup> Written in FORTRAN IV

CENSUS CHAPTER  
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## COMPUTERIZED REDISTRICTING

Not so long ago, in the era before the application of computer technology to politics, it was common for politicians and their staffs to spread out maps on their office floors and, using adding machines to work their arithmetic, slowly build new districts from census tracts and precincts. Such a procedure was not only infinitely laborious, but also prevented the full reach for political advantage. The redistricting team might start out at one end of the state, for example, build satisfactory districts until they reached the other end, and then find that they were short of majority party registrants or had miscalculated the population needed for the final districts. The task of "rippling" additional voters from one end of the state to the other presented huge difficulties in this kind of non-automated redistricting. Often, too, the plans would be built using only the most primitive political and demographic information: politicians backed their hunches after "eyeballing" a few statistics, or simply guessed what the political impact might be of adding or subtracting territory from the districts.

In redistricting, most decisions must be made sequentially: one boundary change requires another, which requires yet another, and so forth. The computer is able to speed each decision, so that the whole process is accelerated. Many more alternatives, based on very much fuller information, can thus be considered.

Early Uses of Computers in Redistricting: Computer Modelling.

During the 1960's a number of computerized redistricting systems were created (see Technical Volume for further information). They were aimed to optimize goals such as equality of population, district compactness, and various demographic standards. Most of these systems were designed to operate with population and demographic data, but not with vote history or registration data. Only one system -- the Kaiser-Nagel system -- saw extensive practical use:

\*The Forrest Method. This system was used to create districts for possible reapportionment plans in New York and New Jersey in 1963. The system used geographic information in the form of an x, y coordinate representing the center of each census unit. These center coordinates were placed on a master data tape for the state and processed through a program that examined and broke down the state into diminishing fractions. When the computer completed a pass, it had broken down the population with regard to geography and continued to break down each fraction until the desired number of districts was created. Each succeeding pass started from a perpendicular direction with respect to the previous pass. The state was thus broken down into rectangular districts with deviations of one-half to one percent variation from the mean. The x, y coordinates were then converted back into geographic units and plotted on an electronic plotting device.

\*The Weaver-Hess Method. This system was used to create a preliminary redistricting plan for the State of Delaware in 1963. It is best characterized as a "compactness" system where the location of a citizen from the center of his district is minimized. The system started with the same basic procedure as the Forrest system. Each enumeration district was assigned geographic x, y coordinates which were placed in the computer. In the Weaver-Hess method, however, a center of population was selected (by estimate) for each district to be created. The computer then multiplied the population of each enumeration district times the square of the distance from the population centers. This product is called the moment of inertia, and each enumeration district was assigned by the computer to a population center so that each center had the lowest sum of moments of inertia, while also having the correct population assigned to it. After the new legislative districts were formed, the exact center of population of each district was determined. The computer then repeated the entire procedure over and over again until a new trial failed to produce districts with better equality of population. The districts formed were not necessarily geographically compact, but they were compact in terms of population distribution.

\*The Ohio State University Method. This program produced districts substantially equal in population that were basically wedge-shaped, but formed around a circular central district. The districts were designed to be heterogeneous in nature, combining the center city, the suburbs and the rural areas. Like the Forrest method, the geographic input was in the form of the x, y coordinate representing the centers of the census units. The starting point in this method was specified at or near the center of the urban area. Using this starting point, the program scanned the census unit positions in a circular manner. The radius of the scan circle was increased until the population total was equal to that required for a district. This central district assured center city representation. Upon completing the center district, the scan process was changed. Starting with some specified bearing, the census units were collected as the scanning ray was rotated over the sector. When the total population equalled that of the desired district, a district was formed and the process continued until the ray had been rotated through the full circle.

\*Kaiser-Nagel Method. This system was designed to start with existing legislative districts and to modify them to conform to new criteria. The system took the original districts -- or, perhaps, a set of



preliminary districts -- and transferred geographical units from one district to another.

These different modelling systems were not more widely employed in actual redistrictings because they failed to meet the political needs of legislative users. They also suffered from various technical deficiencies. Even the most practical and sophisticated of the modelling approaches, the Kasier-Nagel method, suffered from certain weaknesses;

- \*The accuracy obtainable by trading whole census tracts might not be acceptable for use under the strictest court standards.

- \*The original accuracy of the political data was lost when it was keyed to census tracts.

- \*The system was slow because proposed district boundaries had to be converted into tabular form for input into the computer programs and then converted back into graphic form before they could be evaluated by legislators.

Moreover, all these systems failed to capitalize fully on the major advantage of the computer in the redistricting process: namely, the ability to sample and present information from a very extensive demographic and political data base. The data bases on which these systems operated represented only one single time-period, i.e., the party

counts, election results, and demographic figures for a particular year. As a result, the political decision-maker could develop only a weak understanding of how an area would vote; he had no information, for example, on how the voting characteristics of an area were shifting over time.

Contemporary Computer Districting Systems. Today, computers are used to aid redistricting decisions from the beginning of the district formation process to the stage of final analysis and evaluation. They operate with inputs and outputs not only of tabular data, but also of graphic data. They accept interrogations in the form of geographic areas of interest and produce results in the form of geographic display. Thus, the user not only sees the facts, but he sees what areas they represent.

The systems are user-oriented -- tailored to the specific needs and interest of legislative users. They work with very extensive data bases, often those that have been developed for use in statewide election campaigns and that include great quantities of politically relevant information. They incorporate advanced software systems, generalized data management systems, and make use of a variety of advanced equipments (digitizers, plotters, etc.).

The greatest advance has been in the area of geographic retrieval, or the ability of the systems to determine accurate values (population or political and demographic characteristics) for any geographic area, no matter how large,

or as small as an individual precinct or a fraction of a census tract. Generally geographic retrieval is accomplished by entering a map area on a digitizer -- a table with x and y axis scales that are read by an electro-optical encoder that can transmit to the computer the x and y positions of a tracing stylus. This function is particularly useful in the decisional stage on district boundaries, when large areas are being traded between proposed districts, and at the fine tuning stage when very small areas are being moved in order to achieve equality of population (without losing the desired political characteristics of the districts involved).

Modelling and simulation functions are possible on the new systems. For example, projections can be made for an entire district based on specific criteria, and assessments can be made of its future voting behavior in different political circumstances. Search functions are also incorporated in the new systems, providing the user with the ability to determine the areas in the state that possess certain specified characteristics: the results of the search can not only be listed, but plotted so the user can grasp the geographic pattern.

## REDISTRICTING POLITICS: PROCESS AND STRATEGIES

As we have seen, the Court's decision in Baker v. Carr in 1962 was followed by a flurry of citizen suits challenging malapportionment in state legislatures. By March 1964, 26 states had approved new apportionment plans. Alabama, Oklahoma, and Tennessee were redistricted under court-drafted plans; several states redistricted under court threats of postponement of elections or at-large elections. In Delaware, a court order gave the legislature 12 days to reapportion; Wisconsin was given 19 days, and Michigan 33 days. Faced with these examples of judicial severity, most states now voluntarily undertook reapportionments.

At the time of the Reynolds decisions in June 1964, court action on reapportionment was underway in 39 states. The 1964 decisions further accelerated the process. Two years later, legislatures in 46 of the 50 states had brought their apportionments into some degree of compliance with judicial standards of population equality. Indeed, by this point, several states were experiencing their second reapportionment of the decade: legislatures that had been reapportioned after Baker now adopted their own new plans. In a few states, reapportionment had been handed over to specially created commissions, established by statute or by constitutional amendment. In some states, too, constitutional provisions requiring geographic or other modifications to population-based apportionments were abandoned or amended. Elsewhere, states created multi-member and floterial districts

in order to preserve the boundaries of traditional political subdivisions in their districting systems. A number of states actually changed the size of their state legislatures in order to accommodate to population-based apportionments.

In the great majority of the states, the task of drawing new district lines was undertaken by the state legislatures themselves. As of 1977, the state legislature had initial responsibility for preparing apportionment plans in 37 states. In nine of these states, some other agency (the state supreme court or a special board) had authority to prepare a plan if the legislature did not develop one.

As always, political considerations played a major role in these redistrictings. Incumbents sought to protect their incumbencies by drawing "safe" districts; legislative leaders sought to secure their positions by rewarding supporters with improved district boundaries or by unseating opponents; majority parties developed plans to perpetuate their majority status and shelter them from adverse electoral tides. Gerrymandering -- or re-districting for partisan and other political advantage -- was widely, almost universally, practiced. Indeed, it was one of the ironic results of the Supreme Court's insistence on "one man, one vote," that many of the traditional restraints on gerrymandering were now ineffective. County boundaries and other historic jurisdictional or community-of-interest lines, state constitutional requirements for the compactness and contiguity of districts -- all were now subordinated to the quest for population equality.

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It soon became obvious that the criterion of population equality was a poor check on the reach for partisan and political advantage.

Techniques of Gerrymandering. The basis of all gerrymanders is the effort of power holders to perpetuate or add to their power in the legislature. There are two main types of gerrymander: (a) the bipartisan or "incumbent survival" plan; (b) the partisan or "majority party" plan. In bipartisan gerrymanders, the aim is simply to preserve incumbent legislators, generally by adding to the number of their party registrants within the district. The tell-tale signs of such a gerrymander are increased majorities for all or most incumbents, reduction in two-party competition, or even the elimination of electoral challenges in many districts. The partisan gerrymander has the aim of maintaining or adding to the number of seats held by the majority party. The basic technique is to waste votes for the opposition party. This may be achieved by concentration of the voters of the minority party in as few districts as possible: these districts will then produce huge majorities for minority party representatives, but at the price of preventing or limiting effective minority party competition in other districts. Alternatively, the wasting effect may be achieved by dispersal of the voters of the opposition party: by dividing up concentrations of minority party strength among a number of districts, but assuring that the minority voters will always fall short

boundaries. Sometimes, a legislative leader will engineer a district to assure the defeat of an opponent and secure the election of a supporter. (The most dramatic form of this tactic is when two opponents are thrown together in one district and forced to compete against each other). In this way, the gerrymander may become a weapon of intra-party warfare. Partisan gerrymanders put majority party leaders to their greatest test, for they typically require some incumbents of the majority party to accept a reduction in their margin of safety (i.e., very safe incumbents must share some of their loyalist voters in order to shore up or build majorities in neighboring districts). Inducements must be found to hold such incumbents in line: promises may be made of funds or other assistance in the next election; or perhaps the key is found in commitments on future legislation or in promises of patronage or appointments. If the leader fails to make appropriate concessions, rivals for the leadership may find their opportunity, and factions within the majority party caucus will form and re-form. The task of the minority party leader is no less demanding, for he must find ways to counter the very attractive offers made to the members of his caucus who have been identified as candidates for top-heavy minority party districts.

own group. (Occasionally, however, the contrary argument is made: in Miami in the mid-1960's, for example, some black leaders reportedly preferred at-large elections in multi-member districts, because they believed that single-member districts would produce one or two black winners at the price of several very conservative white representatives). In some cases, heavy ethnic minority districts can only be constructed at the expense of white incumbents. Especially in states where Democratic legislative majorities have been based on the loyal voting behavior of ethnic minorities, the creation of ethnic seats may endanger Democratic control of neighboring districts: the creation of a district that will assure the election of a black representative, for example, typically involves the concentration of Party loyalists and the "wasting" of their votes in a top-heavy Democratic district.

\*Intra-Party Politics. Questions of legislative and party leadership are always raised by redistricting. A leader's control over the legislative party may be enhanced, diminished, or broken in the process. Typically, promises of future support of a leader are involved in the adjustment of district



\*Inter-Party Politics. the task of the majority party leadership is made much more difficult if the minority party is capable of countering every deal with proposals of its own (e.g., by committing to preserve or add to a majority party incumbent's margin of safety in its own plan). Sometimes a governor of the minority party is able to garner support for a veto of a majority plan by exposing or countering different accommodations. In such situations, redistricting quickly leads to inter-party warfare. Frequently, in legislatures where the margin of majority control is slight, redistricting will center around a complex process of trades and counter-trades, as each party leadership seeks to hold its own caucus in line behind its own plan. In such circumstances, of course, the shrewed incumbent who is willing to risk charges of party disloyalty may competitively raise his bid to improve his own district and in other ways squeeze advantage from the process. In some cases, the majority party finds itself unable to carry its plan through the legislature, or is blocked by a gubernatorial veto. Then redistricting often becomes publicly controversial, involving the regular party organizations, the press and the media, and is typically resolved only by court intervention.

the development of future challenges). Sometimes, a legislator will seek to head off a problem in his party primary: perhaps this may be done by stretching the district across county lines so that a primary challenger will have more difficulty in gaining a following or have to deal with two county organizations: perhaps the key is to exclude potential challengers from the district, by-passing their residences; or perhaps it can be done by adjusting registration percentages. Sometimes, the aim is to use the redistricting to enhance a future bid for state-wide office: perhaps this can be done by including areas of strong fundraising potential in the new district; perhaps it necessitates dropping an area that poses difficult or controversial issue problems; or perhaps the key is simply to improve party registration in the district in order to add to the incumbent's reputation as a vote-getter or to make it safer to assume a position as a party leader in the legislature.

\*Ethnic Minorities. Redistricting has peculiar importance for ethnic minorities, many of which are concentrated in urban centers. Typically, minority spokesmen claim that "fair representation" requires districts that will elect members of their

of a majority in these districts, the majority party wins additional seats. Another technique that is sometimes used in partisan gerrymanders is to establish multi-member districts that have the effect of submerging or limiting the voting strength of minority parties. The tell-tale sign of a partisan gerrymander is that the percentage of the seats held by the majority party in the legislature is significantly higher than its percentage of the two-party vote in the preceding election.

Redistricting Politics. The process of drawing new district lines can involve many other political considerations besides incumbent security or partisan advantage. The power struggle may spill over into many areas of the political process. The future careers of leading politicians may be affected, intra-party disputes and rivalries may be involved, even the resolution of major policy issues may be at stake.

A few typical situations are sketched below:

\*Future Careers. Legislators see redistricting as both a threat and an opportunity, the outcome of which may decisively affect their future political careers. Often, district lines are drawn with an eye to a bid for higher office: assemblymen, for example, interest themselves in the shape of neighboring senate or congressional districts in which they may someday run; (equally, of course, senators and congressmen watch and guard against

## FUTURE TRENDS IN REDISTRICTING

The decennial census conducted by the U.S. Bureau of the Census will occur in 1980. In 1981 or 1982, the great majority of the states will redistrict. Well before that, however, redistricting will almost certainly emerge as a major public issue. A national movement of "reapportionment reform" is under way that seeks to take redistricting out of the hands of state legislatures. Before the end of the current decade it is likely that "anti-gerrymandering" constitutional amendments will be pressed in many states. In most cases, intense legislative resistance to such initiatives is highly probable.

At the same time, a number of state legislatures and state party organizations are developing more and more powerful political/demographic data bases. The new technology -- which was used in only a few states in the late 1960's and early 1970's -- is almost certain to be much more widely applied. The prospect is that future legislatively-conducted redistrictings will have the advantage of much greater sophistication than in the past.

Many different interest groups have begun to realize their stake in redistricting. Groups that find themselves confronted by hostile majorities in state legislatures see that the publicly-appealing concept of a non-partisan, commission-directed redistricting might result in major, beneficial change in legislative membership. Unexpected alliances -- for example, between business groups and minorities -- might well form to "re-shuffle the legislative

deck." In many states, the press and media might throw their weight behind "model districting plans" or "community-of-interest redistrictings."

Some of these developments are already obvious. But what exactly will happen is, of course, a matter of very uncertain prediction. The paragraphs below outline some of the factors that are likely to play a role in the redistrictings of the future.

The Challenge to Legislatively-Conducted Redistrictings. In 37 states, redistricting is the initial responsibility of the legislature. It was a responsibility, however, that many legislatures found difficult, or even impossible, to perform in the early 1970's; in more than a dozen states, federal or state courts stepped in to the process to impose their own plans (see Table I). Great political turmoil surrounded the redistricting process in a number of other states, and the final legislative plans were often intensely controversial.

In a sense, the legitimacy of legislatively-conducted redistrictings is now under challenge. It is widely charged that there is an inherent "conflict-of-interest" in allowing state legislators to draw district lines -- for "incumbent protection" is the aim and the result, of many legislative plans. The claim is also made that legislatively-conducted redistricting undermines two-party competition, not only in individual safe districts, but in state-wide politics. Parties are weakened, the argument insists, by the security of their office-holders, for there is no need to field high-quality candidates. Districts that are top-heavy with registrants of

TABLE 1

## STATE LEGISLATIVE AND CONGRESSIONAL REDISTRICTINGS

	LOWER HOUSE			UPPER HOUSE			CONGRESS
	Initially Responsible Agency	Present Redistricting Conducted By	Year of Last Redistricting	Initially Responsible Agency	Present Redistricting Conducted By	Year of Last Redistricting	
ALABAMA	L	FC	1972	L	FC	1972	L
ALASKA	G, B	SC	1974	G, B	SC	1974	One Member
ARIZONA	L	L	1972	L	L	1972	L
ARKANSAS	B	B	1971	B	B	1971	L
CALIFORNIA	L	SC	1973	L	SC	1973	SC
COLORADO	L	L	1972	L	L	1972	L
CONNECTICUT	L	B	1971	L	B	1971	L
DELAWARE	L	L	1971	L	L	1971	FC
FLORIDA	L	L	1972	L	L	1972	One Member
GEORGIA	L	L	1974	L	L	1974	L
HAWAII	B	B	1973	B	B	1973	L
IDAHO	L	L	1971	L	L	1971	L
ILLINOIS	L	L	1973	L	L	1973	L
INDIANA	L	L	1972	L	L	1972	FC
IOWA	L	SC	1972	L	SC	1972	L
KANSAS	L	L	1973	L	FC	1972	L
KENTUCKY	L	L	1972	L	L	1972	L
LOUISIANA	L	FC, L	1972	L	FC, L	1972	L
MAINE	L	SC	1974	L	SC	1974	L
MARYLAND	G	SC	1977	G	SC	1977	L
MASSACHUSETTS	L	SC	1972	L	SC	1972	L
MICHIGAN	B	SC	1972	B	SC	1972	FC
MINNESOTA	L	FC	1975	L	FC	1975	L
MISSISSIPPI	L	FC	1971	L	FC	1971	L
MISSOURI	B	SC	1974	B	B	1974	FC
MONTANA	B	B	1974	B	B	1974	L
NEBRASKA	Unicameral	L	1973	L	L	1971	L
NEVADA	L	L	1971	L	L	1973	L
NEW HAMPSHIRE	L	L	1973	L	L	1972	One Member
NEW JERSEY	B	B, SC	1973	B	B, SC	1972	L
NEW MEXICO	L	L, SC	1972	L	L, SC	1973	FC
NEW YORK	L	L	1971	L	L	1971	L
NORTH CAROLINA	L	L	1971	L	L	1971	L
NORTH DAKOTA	L	FC	1975	L	FC	1971	L
OHIO	B	B	1971	B	B	1975	One Member
OKLAHOMA	L	L	1971	L	L	1971	L
OREGON	L	L	1971	L	L	1971	L
PENNSYLVANIA	B	B	1971	B	B	1971	L
RHODE ISLAND	L	L	1974	L	L	1971	L
SOUTH CAROLINA	L	L	1974	L	L	1974	L
SOUTH DAKOTA	L	L	1971	L	L	1972	L
TENNESSEE	L	L	1973	L	L	1971	L
TEXAS	L	L	1975	L	L	1973	L
UTAH	L	L	1972	L	L	1971	L
VERMONT	L	L	1974	L	L	1972	L
VIRGINIA	L	L	1972	L	L	1973	One Member
WASHINGTON	L	FC	1972	L	FC	1971	L
WEST VIRGINIA	L	L	1973	L	L	1972	FC
WISCONSIN	L	L	1972	L	L	1976	L
WYOMING	L	L	1971	L	L	1972	L

KEY:

B = Board

L = Legislature

FC = Federal Court

SC = State Court

S = Secretary of State

G = Governor

Sources:

American State Legislatures: Their Structures and Procedures (Council of State Governments, 1977) and Congressional Districts in the 107th Congress (1981)

one party tend to elect candidates who represent the extreme, ultra-loyalist wings of the party. Moreover, the responsiveness to public opinion of individual office-holders and of legislative parties is lessened, for they can ride out all but the most massive electoral tides in the security of safe districts. The policy process itself, it is claimed, is distorted, for there is less need to seek support from different interests or to build diverse issue coalitions. Indeed, many groups (particularly ethnic minorities), it is said, are permanently shut out of the policy process by party-controlled districting. Thus the indictment embraces many facets of the representative system -- its competitiveness, its responsiveness, the quality of representation, its capacity to produce effective policy, and the adequacy of group participation in politics.

Legislative control of the redistricting process is supported by a number of counter-arguments:

\*Stability and Continuity. There is a public interest, it is claimed, in the stability and continuity of representation. Effective legislative service requires experience in the traditions and procedures of the legislature. Substantial numbers of long-tenured members (who necessarily represent safe districts) are required to assure the professionalism of the legislative body and to prevent sudden, disruptive change in the conduct of the public business. From this perspective, therefore, any effective districting plan will provide for a

degree of "incumbent protection." Proposals for non-legislative redistrictings ignore this criterion, with the risk that large numbers of novice legislators would be elected.

\*Inherently Political Character of Redistricting. It is argued that the creation of districts is an inherently political process. Proposals for non-partisan redistricting would merely cloak the politics of the process. So-called "non-political" or "non-partisan" commissions would be drawn willy-nilly into politics, the drawing of district boundaries cannot but involve political judgments and political results. But such commissions, to the extent they are artificially isolated from the political system, would be unable to accommodate and respond appropriately to political pressures. The argument concludes that this is the task of the legislature, a body that is supremely qualified to balance interests and to compromise among different groups.

\*Community. The legislature, it is claimed, is better able than any other body to produce districting plans that promote "community of interest." No one is more expert than the individual legislator on the political character of his district -- its mix of opinions on issues, its centers of group power. In redistricting, the incumbent's political interest is generally to reduce the cross-pressures of opinions.



He will seek a district that does not suffer from intense strains and divisions, in which group conflict is tempered, and that will support consistent policy positions. Such districts, it is argued, are much more likely to contain true communities of interest than any created by "non-partisan" boards or commissions. The heterogeneous constituencies, in which many conflicting groups are jumbled together, that might result from non-legislative districting could render effective representation impossible.

\*An Historic Responsibility, Well Performed. The whole history of representative government, it is argued, suggests that redistricting is a legislative responsibility. Legislatures have traditionally carried the responsibility for their own apportionment and, even in the best ordered of modern democracies, generally continue to do so. The argument continues that the historical record is one of effective and responsible performance. It is said that judgments should not be based on the redistrictings of the late 1960's and early 1970's; it was the difficulty of adapting to the wholly new ground rules of "one-man-one-vote" that caused many legislative plans to fail in that period. Moreover, it is claimed that the problem of the partisan gerrymander has been much exaggerated: in state after state, so-

called gerrymanders have not led to any reduction in two-party competition. Indeed, it is pointed out that many of the most notorious gerrymanders were quickly followed by the rise to power of the minority party.

The Redistricting Commission. The national movement of "reapportionment reform" is currently headed by Common Cause. The Common Cause approach has three main elements: establishment of an independent, non-partisan reapportionment commission in every state; strict anti-gerrymandering standards; and prompt judicial review. The argument for the approach is summarized in the Common Cause publication, "Reapportionment: A Better Way":

The purpose of political gerrymandering is to shut people out of the political process.

Reapportionment reform is designed to benefit the public by broadening political participation and increasing electoral competition.

Reapportionment reform is designed to strengthen the political process by providing an incentive for political parties to bring new ideas and new people into the process. By reforming the reapportionment process and improving state legislatures, states may increase public respect for state government and strengthen the role of state government in our federal system . . . Common Cause proposes a reapportionment process designed

to produce districts of substantial population equality. Unlike district lines produced by political gerrymandering, fair district lines are not drawn to pre-determine election results.

Implementation of this approach is sought via voter approach of a constitutional amendment -- either proposed by the legislature or petitioned to the ballot by citizen initiative -- by 1980. The proposed Common Cause amendment provides for the following:

\*Decennial Reapportionment in Single Member Districts.

The amendment provides for reapportionment of state legislative and congressional districts in 1981 and every tenth year after that. Single member districts are required.

\*Establishment of Commission. The amendment provides for the establishment of a five member reapportionment commission in 1980 and every tenth year after and at any other time of court ordered reapportionment. Four members of the commission are appointed by the legislative leaders -- one each by the President of the Senate, the Speaker of the House, the Minority Leader of the Senate, and the Minority Leader of the House. The four members select a fifth member who serves as chair. None of the five members may be a public official. The amendment requires the legislature to provide by law for the

qualifications, duties, and powers of commissioners, procedures for the selection of commissioners and filling of vacancies, and adequate funding for the commission.

\*Population Parameters. The amendment provides that districts in each house shall have "population as nearly equal as is practicable" based on the federal census. Specific population parameters are established to give definition to the requirement of substantial population equality. For state legislative districts, the amendment provides that the average percentage deviation of all the districts of a house from the average population of all districts in that house shall not exceed one percent. No district shall have a population which varies from the average population of all districts unless necessary to comply with one of the other reapportionment standards. In no case shall a district have a deviation from the average of more than five percent. Thus, the maximum allowable deviation from the highest to the lowest populated district is ten percent. In the event of a court challenge, the commission has the burden of justifying any deviation.

For congressional districts, the amendment provides that the same standards shall be used as for state legislative districts except that no district shall have a population deviation of more than one percent

from the average population of all districts.

\*Use of Traditional Jurisdictional Boundaries. The amendment provided that district lines be drawn to coincide with the boundaries of political subdivisions (for example, towns and counties) to the extent consistent with the requirement of substantial population equality.

\*Compactness and Convenient Contiguity. The amendment requires districts to be "compact in form and composed of convenient contiguous territory." The amendment provides that the aggregate length of all district boundaries shall be as short as practicable, consistent with the constitutional requirements of substantial population equality and maintenance of political subdivision boundaries. The amendment establishes a judicially enforceable compactness requirement by providing that in no case shall the aggregate length of all the districts exceed by more than five percent the shortest possible aggregate length of all the districts under any other plan consistent with the population and political subdivision standards. The same compactness standard applies to district lines within local political subdivisions that have two or more complete districts.

\*Ban on Use of Political Information. The proposed amendment provides that: "No district shall be drawn

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for the purpose of favoring any political party, incumbent legislator, or other person or group." The amendment prohibits the commission from taking into account the addresses of incumbent legislators. The commission may not use the political affiliations of registered voters, previous election results, or demographic information other than population headcounts for the purpose of favoring any political party, incumbent legislator, or other person or group. The amendment further provides that no district shall be drawn for the purpose of diluting the voting strength of any racial or language minority group.

\*Judicial Review. The amendment provides that the state supreme court has original jurisdiction over apportionment matters. The model authorizes any registered voter to file a petition to challenge a reapportionment plan or to compel the commission or any person to perform duties required by the model. Challenges to an apportionment plan must be filed within forty-five days of adoption of a plan. The court must give apportionment matters precedence over all other matters and must render a decision within sixty days after a petition is filed. The court may declare a plan invalid in whole or in part and must order the commission to prepare a new plan.

\*Duration. The amendment provides that reapportionment plans remain in effect for ten years unless invalidated or modified pursuant to court order. A plan shall not be subject to amendment, approval, or repeal by initiative, referendum, or act of the legislature.

The Role of Interest Groups and Media. Many different groups are beginning to be alerted to their stake in redistricting -- whether in the shape of individual districts, or in the outcomes of an entire plan, or in the choice between legislative and non-legislative processes. The groups principally concerned include:

\*Minorities. In the period 1971-1973, in a number of states, blacks lobbied aggressively for districts that would increase the numbers of black congressmen and state legislators. A widespread conviction arose among many blacks that they were blocked in this aspiration by the "white liberal establishment," which gave precedence, it was claimed, to the preservation of white incumbents. In the Southwestern states, Mexican-Americans suffered similar frustrations. They also faced additional difficulties, since the Census count provided little information on the Spanish-speaking population, and the dispersal of Mexican-Americans over the agricultural areas of the states (in contrast to the urban concentration of black population) blocked the creation of more than a handful of "ethnically-representative districts."

These minorities have already made clear their determination to press for new districts in 1981; they may be joined by several other ethnic groups.

\*Business and Industry. The elections of 1972 and 1974 -- which occurred when anti-business sentiment was running at high levels -- produced legislative majorities in many states that have remained critical of business and industry. Undoubtedly, many business groups -- particularly, perhaps, those that have suffered under increased regulation -- will not wish to see these majorities perpetuated via the redistricting process. The outlook, then, is that such groups may seek to influence redistricting, perhaps by alliance with public interest groups in pressing for commission-type amendments, or by proposing model plans for more competitive districts.

\*Professional Groups. Doctors, lawyers, and many other professional groups that perceive their steadily increasing stake in the legislative process in Congress and the states may also be drawn into redistricting politics. Professional associations are generally organized on a county-by-county basis in the states, and some groups may now press for giving greater weight to the use of county boundaries in redistricting. The tactics of professional groups will undoubtedly vary, depending on the



legislative configurations they confront and their political needs. A likely approach in some states, however, is the creation of model districting plans. Such plans -- perhaps co-authored with a variety of group allies -- may become an important means of imposing constraints on legislatively-conducted redistricting.

Although coverage was given by the press and media to the Court reapportionment decisions of the 1960's, the actual redistricting processes of 1971-73 attracted relatively little attention. In part, this may be explained by the technical character of the process and the difficulty of interpreting it to the general public. In part, however, it was also due to the success of many legislatures in restricting public involvement in and understanding of the process. It is likely that the redistrictings of 1981-1983 will receive much more critical scrutiny from the press and media. Controversy and public interest will certainly be generated by Common Cause or other commission-type amendments; group involvement in redistricting is likely to be much more intense than previously, and this will also lead to great coverage.

Analysis of Districting Plans. It is likely that the period 1981-82 will see the development by different groups of a sophisticated ability to evaluate and critique redistricting plans. The new computer technology permits very rapid read-out of political and demographic characteristics; indeed,

an entire plan, even for a large state, can be analyzed in as little as 24 or 48 hours. Possible developments here include:

\*Business, Professional and Minority Groups.

Legislatures may find that their plans are subjected to almost instant analysis by groups that have developed their own data bases and geographic retrieval systems. Information on the political and socioeconomic composition of proposed districts may enable such groups to exert pressure for changes in redistricting plans.

\*Press and Media. It is not unlikely that some newspaper and media organizations will also develop a computerized capability for analyzing districting plans. There is thus a prospect that those in the public debate on redistricting will be informed by much more accurate and comprehensive data than in the past.

\*Counties, Cities, and Local Communities. Analytic capability may strengthen the position of local governments and other official bodies to play a role in redistricting.

#### CONCLUSION

The 1960's did, indeed, produce a "reapportionment revolution," but one that is far from complete. One may safely predict that the rest of this decade will see a mounting controversy over the law, politics, and technology

of redistricting; by 1981, it will be one of the major issues of the day. The districting plans that are finally written -- whether by state legislatures or by commissions, or as a result of a complex bargaining process involving many official and unofficial participants -- will be a key to the politics of the 1980's.

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that should be reviewed, including: U.S. Department of Commerce, Bureau of the Census (see, e.g., County and City Data Book, Congressional District Data Book, Statistical Abstract of the United States); Advisory Commission on Intergovernmental Relations (see, e.g., Apportionment of State Legislatures); Library of Congress, Legislative Reference Service (see, e.g., Legislative Apportionment: The Background and Current Status of Developments in Each of the 50 States). A number of state governments have also published materials on redistricting.

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