

June 1, 2001

SECOND REDISTRICTING PLAN¹

TO: SECRETARY OF THE IOWA SENATE
CHIEF CLERK OF THE IOWA HOUSE OF REPRESENTATIVES
MEMBERS OF THE IOWA GENERAL ASSEMBLY

FROM: DIANE BOLENDER, DIRECTOR
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IOWA LEGISLATIVE SERVICE BUREAU

I. INTRODUCTION.

Pursuant to Chapter 42 of the 2001 Code of Iowa, the Legislative Service Bureau delivers to the Iowa General Assembly identical bills embodying a plan of legislative and Congressional districting prepared in accordance with the U.S. Constitution, the Iowa Constitution, and Iowa Code section 42.4. In addition to the identical bills, this memorandum and the accompanying attachments include maps illustrating the plan, a summary of the standards prescribed by law for redistricting, a listing of the population for each district created, a statistical analysis of the plan, and listings of the political subdivisions undivided under the plan. This memorandum, the identical bills, as well as maps illustrating the plan, are also available through the internet on the Iowa Redistricting in 2001 link on the Iowa General Assembly's website (www.legis.state.ia.us).

II. GLOSSARY OF TERMS.

To assist in the understanding of this report and the attached statistical data, the following terms were used to describe various aspects of measuring compactness, convenient contiguous territory, and the population equality between districts:

Absolute deviation: The difference, expressed as a positive number, between the actual population in a district and the ideal population for that district.

Absolute mean deviation: The sum of the absolute deviations of all districts in a plan divided by the number of districts.

Absolute perimeter score: The difference in miles, expressed as a positive number, between the total perimeter score of a Senate or House legislative redistricting plan, and the total perimeter score of the underlying Congressional redistricting plan.

Average length-width compactness: The absolute difference in miles between the east-west width and the north-south height (length) of each district, divided by the number of districts to be created. A lower number indicates better length-width compactness.

Ideal population: The total population of the state as reported in the federal decennial census divided by the number of districts to be created.

Mean deviation percentage variance: The absolute mean deviation of a plan divided by the ideal population for districts in that plan, and expressed as a percentage.

¹ Corrected June 18, 2001.

Overall range: The difference between the most populous and least populous districts in a proposed redistricting plan.

Overall range percentage variance: The absolute overall range for a plan, divided by the ideal population for a district, and expressed as a percentage.

Overall range ratio: The ratio calculated by dividing the population of the most populous district by the least populous district.

Total perimeter score: The distance, in miles, needed to traverse the perimeters of all districts in a redistricting plan.

III. STANDARDS FOR REDISTRICTING – PLAN 2.

A. Statutory Requirements.

Iowa Code section 42.4 prescribes, in subsections 1 through 7, that the following redistricting standards be used in the preparation of redistricting plans:

1. Districts shall be established on the basis of population. The districts shall each have a population as nearly equal as practicable to the ideal population. A Congressional district shall not vary from the ideal population by more than one percent. Districts shall not vary in population from the ideal population for a State Senatorial or State Representative district by an average of more than one percent. A Senate or House district shall not have a population which exceeds that of any other Senate or House district by more than five percent. The burden of proof rests with the General Assembly to justify the selection of any district in a plan which deviates from the ideal population for that district by more than one percent.
2. Within the population variance limitations of the first standard, and to the extent possible, the number of counties and cities divided among more than one district shall be as small as possible. When there is a choice between dividing local political subdivisions, the more populous subdivisions shall be divided before the less populous, except when a county line divides a city.
3. Districts shall be composed of convenient contiguous territory.
4. It is preferable that districts shall be compact in form; however, the first three standards take precedence over the compactness standard. In general, compact districts are those which are square, rectangular, or hexagonal in shape to the extent permitted by natural or political subdivision boundaries. Methods for determining compactness are provided by law and include a length-width compactness standard and a population dispersion standard.
5. A district shall not be drawn for the purpose of favoring a political party, incumbent legislator or member of Congress, or other person or group, or for the purpose of augmenting or diluting the voting strength of a language or racial minority group. In establishing districts, no use shall be made of any of the following data:
 - a. Addresses of incumbent legislators or members of Congress.

- b. Political affiliations of registered voters.
 - c. Previous election results.
 - d. Demographic information, other than population head counts, except as required by the Constitution and the laws of the United States.
6. Each Representative district shall be wholly included within a single Senatorial district and, so far as possible, each Representative and each Senatorial district shall be included within a single Congressional district. However, the standards described above shall take precedence where a conflict arises between those standards and the requirement, so far as possible, of including a Senatorial or Representative district within a single Congressional district.
 7. The new districting plan shall not be used prior to the primary election of 2002. If a vacancy in a district occurs at a time where a special election is required to fill a term prior to January 2003, the present Congressional, Senatorial, and House district plans as described in the 2001 Iowa Code shall be used.

B. Senate Resolution 50.

Iowa law provides that the selection of the second proposed redistricting plan must consider the reasons, if any, provided for the rejection of the first proposed redistricting plan by the General Assembly in so far as they are consistent with Iowa Code section 42.4. Senate Resolution 50 provides several reasons for rejection of the first proposed redistricting plan.

1. Population equality.
 - a. Resolution language.

BE IT RESOLVED BY THE SENATE, That the Senate requests that the next plan drafted by the legislative service bureau improve the population deviations to more nearly represent the ideal of "one person, one vote"; and

BE IT FURTHER RESOLVED, That Iowa Code section 42.4(4) entitled "Redistricting Standards" states, "It is preferable that districts be compact in form, but the standards established by subsections 1, 2 and 3 take precedence over compactness where a conflict arises between compactness and these standards." Iowa Code section 42.4(1), (2), and (3) state the preferred standards are population equalities, contiguous territories, and district boundaries coinciding with political subdivisions. Additionally, courts have consistently held that lower population deviations from the ideal population should take precedence over compactness of the districts as defined in the Iowa Code. Therefore, the next plan should more closely follow those guidelines; and

- b. Legislative Service Bureau response.

Iowa Code chapter 42 provides that the selection of a proposed Congressional redistricting plan be based on all of the criteria specified in Iowa Code section 42.4. As the resolution notes, though, population equality is the most important factor and this was taken into account in selecting the second proposed Congressional redistricting plan. In addition, while Chapter 42 contains no provision mandating a certain population equality standard for the second or third Congressional plan different from that

prescribed for the first, the requirements of the United States Constitution mandate that a second proposed Congressional redistricting plan must have equal or lower population deviations than the first plan submitted. However, consideration of population equality alone is not required based on the United States Constitution and is also not consistent with the requirements of Chapter 42 or Iowa law in general. The second Congressional redistricting plan selected must be the one that best meets all the requirements of Iowa law, including the standards of compactness and convenient contiguous territory, while providing for equal or better population equality amongst districts.

Population equality is also important for proposed legislative redistricting plans and was taken into account in selecting the second proposed legislative redistricting plan. While the resolution accurately states that Iowa law provides that compactness is specifically given less precedence than population equality for legislative redistricting, the resolution fails to mention that the standard that includes respect for the boundaries of political subdivisions and the standard that districts should contain convenient contiguous territory are not made specifically subservient to population equality under Iowa law. Instead, these standards are to be maximized consistent with the population equality standards provided in the Code. In addition, the Code does not provide that compactness be completely ignored in selecting a proposed legislative redistricting plan and compactness was considered in selecting the second proposed legislative redistricting plan.

2. Population comparisons to prior enacted plans.

a. Resolution language.

BE IT FURTHER RESOLVED, That the Senate requests a plan that at a minimum matches, or improves upon, the population deviation in our current Congressional and legislative districts; and,

b. Legislative Service Bureau response.

Iowa Code chapter 42 does not require that each successively enacted Congressional and legislative redistricting plan contain lower population deviations than the prior enacted plan at the time that prior plan was enacted. While a desirable goal, Iowa Code chapter 42 merely requires that, based on the current population reported by the Census Bureau, each proposed Congressional district, and each proposed senatorial and representative district, shall be as nearly equal as practicable to the ideal population of a district consistent with the other standards enumerated in section 42.4. As noted earlier in this report, the second Congressional plan must be equal to or better than the first plan from a population equality perspective based upon the United States Constitution. Based on Iowa law, the best proposed redistricting plan is not the one that merely has the lowest population deviations but is instead the one with the lowest population deviations that also best meets all of the other non-population enumerated requirements of Iowa Code section 42.4.

3. Urban-rural interests – regionalization.

a. Resolution language.

BE IT FURTHER RESOLVED, That in addition, the Senate requests the legislative service bureau in the next plan, strive to develop Congressional and legislative districts that reflect urban and rural interests in our state to the extent consistent with the Iowa Code. Plan #1 regionalized Iowa at the Congressional level. The districts that are included in Plan #2 should better reflect the convenient, contiguous territory of our state.

b. Legislative Service Bureau response.

The Temporary Redistricting Advisory Commission in its April 25, 2001 report to the Iowa General Assembly specifically noted that several persons criticized the first proposed redistricting plan as not providing a mix of urban and rural interests in the state. However, the Temporary Redistricting Advisory Commission unanimously concluded that, "However, no objective geographic map-building units exist from the Census Bureau to consider (this issue) in creating redistricting plans." In addition, Chapter 42 makes no provision for considering "urban-rural interests" and any consideration of these interests would likely require examination of demographic information that Chapter 42 specifically prohibits.

As to the comment that plan #1 regionalized Iowa at the Congressional level, the resolution provided no definition of "regionalized" and provided no guidance as to why the first plan failed in this regard or how this concept is consistent with the requirements of Chapter 42.

The last statement in this excerpt of the resolution indicates that a proposed Congressional redistricting plan must contain districts which are composed of "convenient, contiguous territory." Chapter 42 does specifically require that districts be composed of "convenient contiguous territory." Any plan submitted to the Iowa General Assembly will meet that requirement.

C. Convenient contiguous territory.

Unlike the other standards for redistricting enumerated in Iowa Code section 42.4, the Code does not provide a specific objective measurement for determining whether a proposed redistricting plan contains districts that are composed of **convenient** contiguous territory. (emphasis added) The only objective measurement provided in the Code is that districts that contain areas that meet only at the points of adjoining corners are not contiguous. In considering and selecting proposed plans in 1991 and 2001, the Legislative Service Bureau concluded that a proposed plan was considered to meet this requirement if the redistricting plan avoided, to the greatest extent possible but still consistent with the other enumerated standards in the Code, irregularly shaped districts, districts with narrow connections, and districts that are excessively long from north to south or from east to west. Visual inspection of a map alone, however, is not the best way to judge whether a district is composed of convenient contiguous territory since the geographic projection used to display the state and proposed districts on a flat surface (such as Mercator projection or Equidistant cylindrical projection) distorts the true geography. (For instance, if a rectangle were placed over the entire state to include all parts of the state, the actual east-west distance of that rectangle is 449.0808 miles and the actual north-south distance of that rectangle is 215.9695 miles, making the state considerably longer from east to west than north to south than a visual inspection of a flat map would otherwise indicate.) Therefore, objective, measurable, criteria need to be used, to the greatest extent possible, to evaluate whether a proposed redistricting plan best meets this requirement.

Following submission of the first proposed redistricting plan, the Legislative Service Bureau determined that an objective means for comparing possible plans would be to compare the total number of miles needed to traverse the perimeters of all of the districts in a plan. In essence, the more irregular and oddly shaped the districts in a plan, the greater the number of miles needed to traverse the perimeters of the districts in that plan. The Legislative Service Bureau calculated the perimeters of the Congressional and legislative districts for the second plan and determined a total perimeter score which has been included in this report. In order to more accurately compare the perimeter scores of different legislative redistricting plans based on different Congressional redistricting plans, an absolute perimeter score, representing the absolute difference in miles between the perimeter score for the legislative plan and the perimeter score for the underlying Congressional plan, was also calculated and included in this report. The reason for calculating the absolute perimeter score is that a higher perimeter score for a Congressional plan will lead to a higher score for the legislative plan since the boundary for each Congressional district is also the boundary used for creating 10 Senate and 20 House districts within that

Congressional district; therefore, in order to equalize the impact of different Congressional plans when comparing different legislative plans based on those different Congressional plans, the difference between the total perimeter score for a Senate or House legislative plan and the underlying Congressional plan needs to be considered.

IV. PREPARATION PROCESS BY THE LEGISLATIVE SERVICE BUREAU – PLAN 2.

On April 12, 2001, a bill embodying the first plan of congressional and legislative redistricting was presented to the Iowa General Assembly. On April 25, 2001, and following the conclusion of three public hearings, the Temporary Redistricting Advisory Commission submitted its report concerning the first proposed redistricting plan to the Iowa General Assembly. On May 2, 2001, the Iowa Senate defeated the first proposed redistricting plan (Senate File 540). On May 3, 2001, Senate Resolution 50 was adopted specifying the reasons for the Senate's rejection of the first redistricting plan.

Because Iowa Code section 42.4, subsection 6, provides that so far as possible each Senate and House district be included in a single Congressional district, the Legislative Service Bureau first developed plans for Congressional districts. Congressional plans drawn for consideration had to achieve an equal or better population equality than the first Congressional plan submitted. All Congressional plans created with an absolute mean deviation equal to or less than that of the first proposed Congressional redistricting plan (including the first proposed Congressional redistricting plan) were considered. The second proposed Congressional redistricting plan was not selected until after the reasons for the rejection of the first proposed redistricting plan were transmitted to the Legislative Service Bureau for consideration.

Once the second proposed Congressional district plan was selected, plans were drawn within each of the five Congressional districts for 10 Senate districts and 20 House districts. After a legislative redistricting plan for each Congressional district was tentatively selected, territory adjacent to but outside that Congressional district was examined to determine if the other standards for legislative redistricting could be improved by swapping territory between Congressional districts. The Legislative Service Bureau determined that swapping territory between Congressional districts would not improve the districts so the proposed legislative redistricting plan contains 10 Senate and 20 House district within each Congressional district, with each Senate district containing two House districts.

In the development of Congressional, Senatorial, and Representative districts, at no time did any member of the Legislative Service Bureau redistricting team consider the addresses of incumbents, the political affiliations of registered voters, previous election results, or demographic information other than population headcounts. Plan selection was based solely upon population, the numbers of counties and cities kept whole for legislative districts, the presence of conveniently contiguous territory within each district, and the compactness of each district.

V. SELECTION OF CONGRESSIONAL DISTRICTS.

STATISTICAL STANDARDS. Iowa law provides that a Congressional district shall have a population as nearly equal as practicable to the ideal population and it cannot have a population which varies by more than one percent from the ideal district population. Based upon the population data reported by the Census Bureau, the ideal population for each of Iowa's five Congressional districts is 585,265 persons and the maximum allowable absolute deviation for any district is 5,852 persons.

PLAN 2 STATISTICS. The Congressional plan selected was the plan that best met all statutory and constitutional requirements. The plan selected had the lowest absolute mean deviation of any of the plans that also had districts that were composed of conveniently contiguous territory that were compact in form. The absolute mean deviation for the plan selected is 47 persons with a mean deviation percentage variation of .00803 percent. The overall range of the plan, which compares the most populous district to the least populous, is 134 persons with an overall range percentage variance for the plan of 0.023 percent.

Both population statistics are improved from the first proposed Congressional redistricting plan. In addition, the average length-width compactness of the plan is 56.65 miles and the total perimeter score for the plan is 3,132.635 miles.

VI. SELECTION OF SENATE AND HOUSE DISTRICTS.

STATISTICAL STANDARDS. Based on Iowa law, proposed legislative districts shall not vary in population from the ideal population for a State Senatorial or State Representative district by an average of more than one percent. In addition, Iowa law provides that a Senate or House district shall not have a population which exceeds that of any other Senate or House district by more than five percent. Based upon the population of Iowa as reported by the Census Bureau, the ideal population for each of the fifty senatorial districts in Iowa is 58,526, and the ideal population for each of the one hundred representative districts is 29,263. Based on these population totals, the largest absolute mean deviation permitted for a senatorial redistricting plan is 585 persons and 292 persons for a representative redistricting plan. In addition, the largest overall range permitted for a senatorial redistricting plan is 2926 persons and 1463 persons for a representative redistricting plan. However, because Iowa law also provides that the General Assembly has the burden of proof to justify any Senate or House district that deviates from the ideal population by more than one percent, the largest allowable absolute deviation for any proposed Senate district is 585 persons, and the largest allowable absolute deviation for any proposed House district is 292 persons, making the largest allowable overall range of 1170 persons for a proposed Senate redistricting plan and 584 persons for a proposed House redistricting plan.

SENATE PLAN 2 STATISTICS. The legislative Senate redistricting plan selected was the plan that best met the population equality standards while keeping the number of counties and cities split into more than one district at a minimum, consistent with the requirement that districts be composed of conveniently contiguous territory and be compact in form. The absolute mean deviation for the Senate redistricting plan selected is 163.12 persons (of a maximum allowable mean deviation of 585 persons) with a mean deviation percentage variation of .28 percent. The overall range for the plan, which compares the most populous district to the least populous, is 855 persons with an overall range percentage variance of 1.46 percent. Both population statistics are improved from the first proposed Senate redistricting plan. In addition, 72 counties were kept whole in a Senate district in the Senate plan with an additional two counties, Howard and Franklin, split only to keep a city or cities in more than one county whole. In addition, 52 precinct cities located within a single county are kept whole in a single district in the Senate plan, 31 cities located in more than one county are kept whole in a single district in the Senate plan, and no city contained within a single county and with a population less than the ideal population for a Senate district was split into more than one Senate district. In addition, the average length-width compactness of the plan is 15.83 miles, the total perimeter score for the plan is 7,993.042 miles, and the absolute perimeter score for the plan is 4,860.407 miles.

HOUSE PLAN 2 STATISTICS. The legislative House redistricting plan selected was the plan that best met the population equality standards while keeping the number of counties and cities split into more than one district at a minimum, consistent with the requirement that districts be composed of conveniently contiguous territory and be compact in form. The absolute mean deviation for the House redistricting plan selected is 109.6 persons (of a maximum allowable mean deviation of 292 persons) with a mean deviation percentage variation of .37 percent. The overall range for the plan, which compares the most populous district to the least populous, is 552 persons with an overall range percentage variance of 1.886 percent. Both population statistics are improved from the first proposed House redistricting plan. In addition, 54 counties were kept whole in the House plan with an additional two counties, Howard and Franklin, split only to keep a city or cities in more than one county whole. In addition, 48 precinct cities located within a single county are kept whole in the House plan, 31 cities located in more than one county are kept whole in a single district in the House plan, and no city contained within a single county

and with a population less than the ideal population for a House district was split into more than one House district. In addition, the average length-width compactness of the plan is 10.996 miles, the total perimeter score for the plan is 10,835.579 miles, and the absolute perimeter score for the plan is 7,702.944 miles.

VII. NUMBERING OF SENATE DISTRICTS AND INCUMBENT SENATORS.

After the entire Congressional and legislative redistricting plan was selected, the Legislative Service Bureau proceeded to number the districts created. Article III, Section 6, of the Iowa Constitution provides that “as nearly as possible, one-half of the members of the Senate shall be elected every two years.” In addition, based on Iowa law, if an incumbent Senator was elected from an even-numbered district and resides in a newly created even-numbered district with no other incumbent Senator residing in that district, that incumbent Senator can serve until January 2005 without an election in 2002. In order to meet this constitutional directive, the Legislative Service Bureau needed to know in which Senate districts incumbent Senators resided and whether they were elected in 1998 (from an odd-numbered district) or 2000 (from an even-numbered district). If an incumbent Senator elected from an even-numbered district resided in a new district without another incumbent Senator, that Senate district was given an even number and the first general election to be held for that proposed Senatorial district will be November 2004.

VIII. ATTACHMENTS.

Attached to this Report are the following:

Map 1 — Map of proposed Congressional districts.

Map 2 — Map of proposed plan for Senate and House of Representative districts, including detailed maps of metropolitan areas. (Large map: 34 by 22 inches)

Map 3 — Map of proposed Senate districts.

Map 4 — Map of proposed House districts.

Table 1 — Populations and population variance statistics for each Congressional district.

Table 2 — Populations and population variance statistics for each Senate district.

Table 3 — Populations and population variance statistics for each House district.

Table 4 — Counties kept whole in Senate and House districts.

Table 5 — Dividable precincts located within a single county kept whole in Senate and House districts.

Table 6 — Cities located in more than one county kept whole in Senate and House districts.

Table 7 — Numbers of Senate and House districts contained wholly or partially within each county.

Table 8 — Congressional Redistricting Plans – Statistical comparisons.

Table 9 — Legislative Senate and House Redistricting Plans - Statistical comparisons.

MAPS

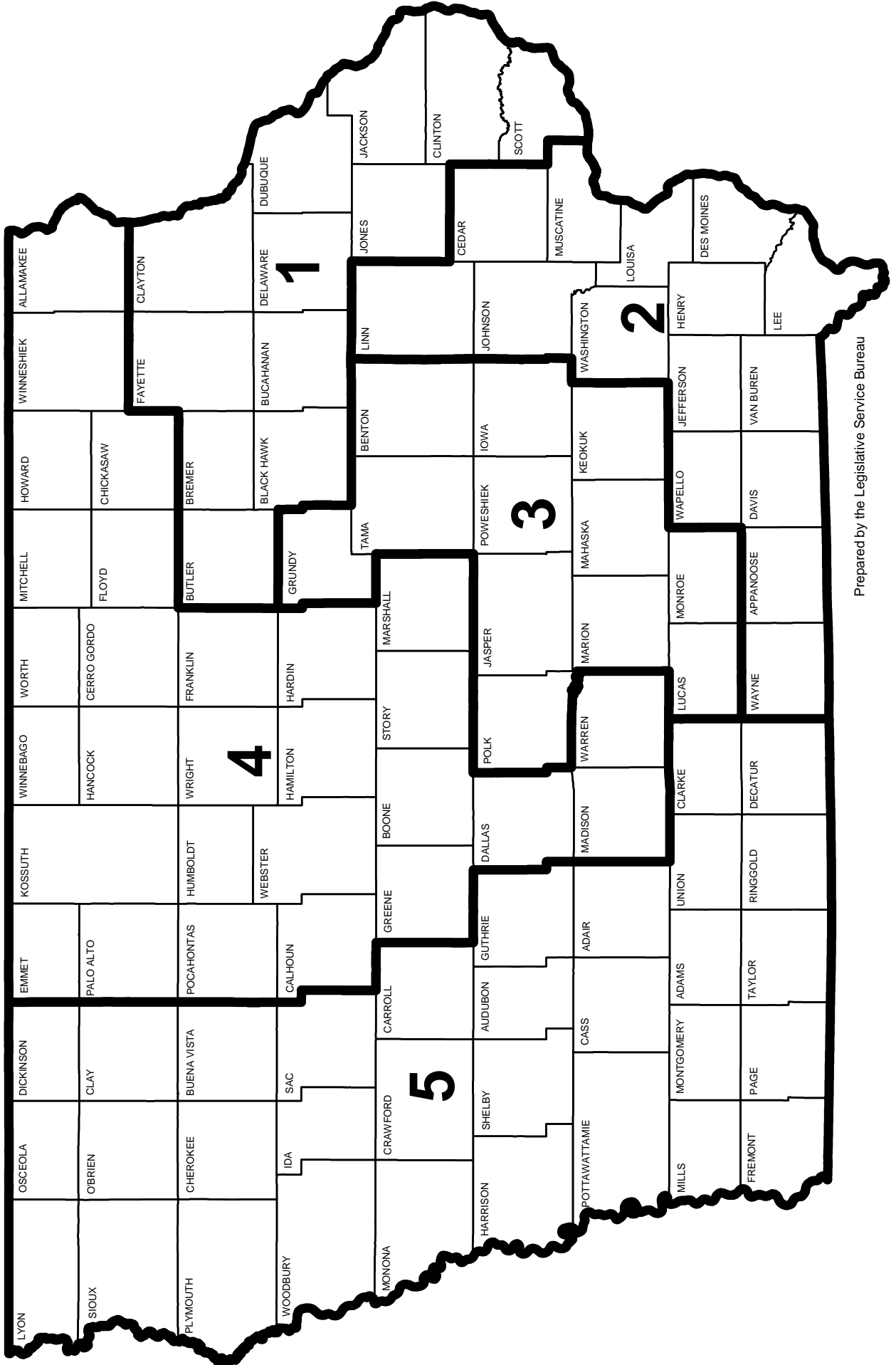
SECOND REDISTRICTING PLAN

Legislative Service Bureau

June 1, 2001

PROPOSED CONGRESSIONAL DISTRICTS

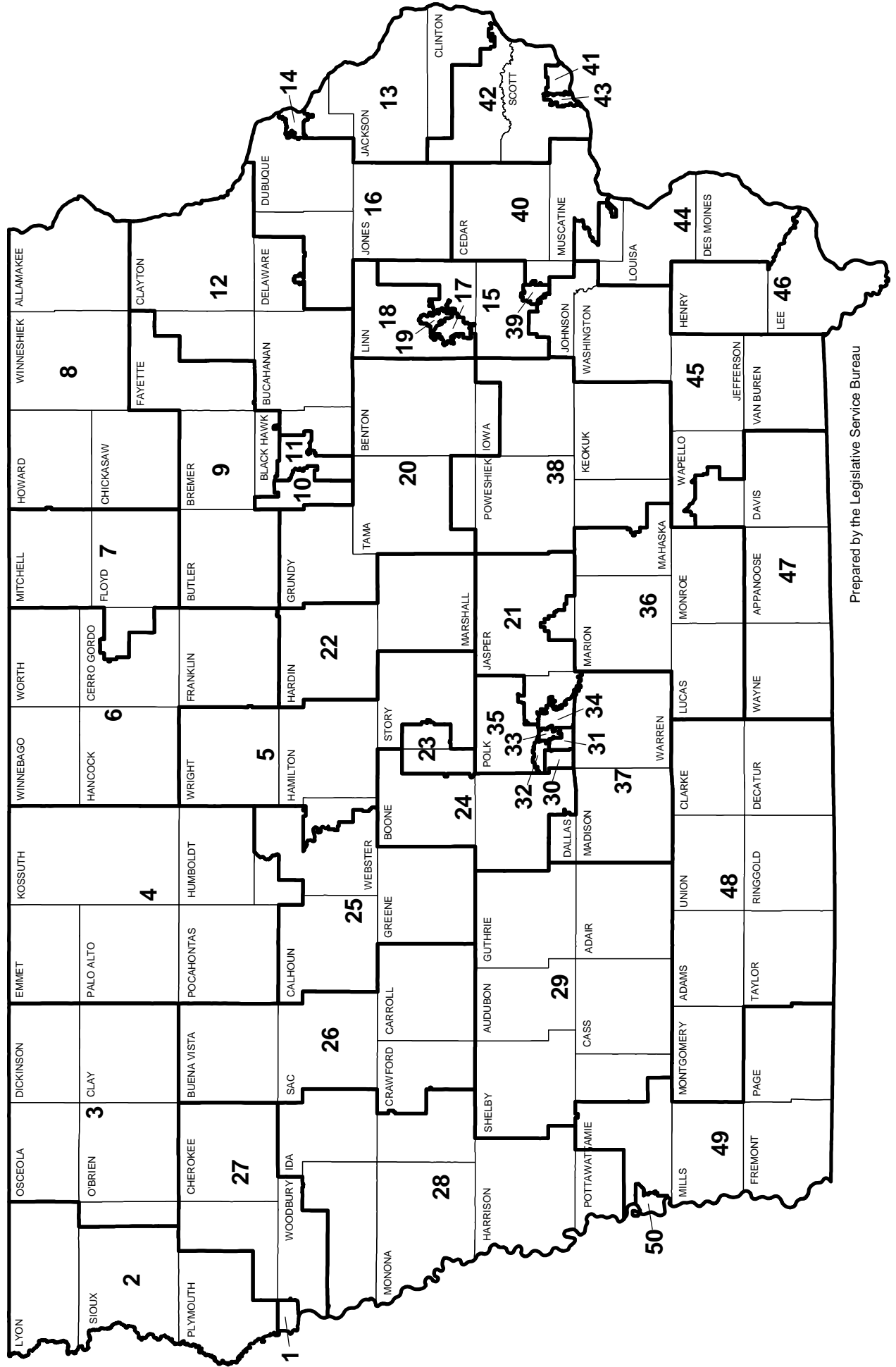
June 2001



Prepared by the Legislative Service Bureau

PROPOSED SENATE DISTRICTS

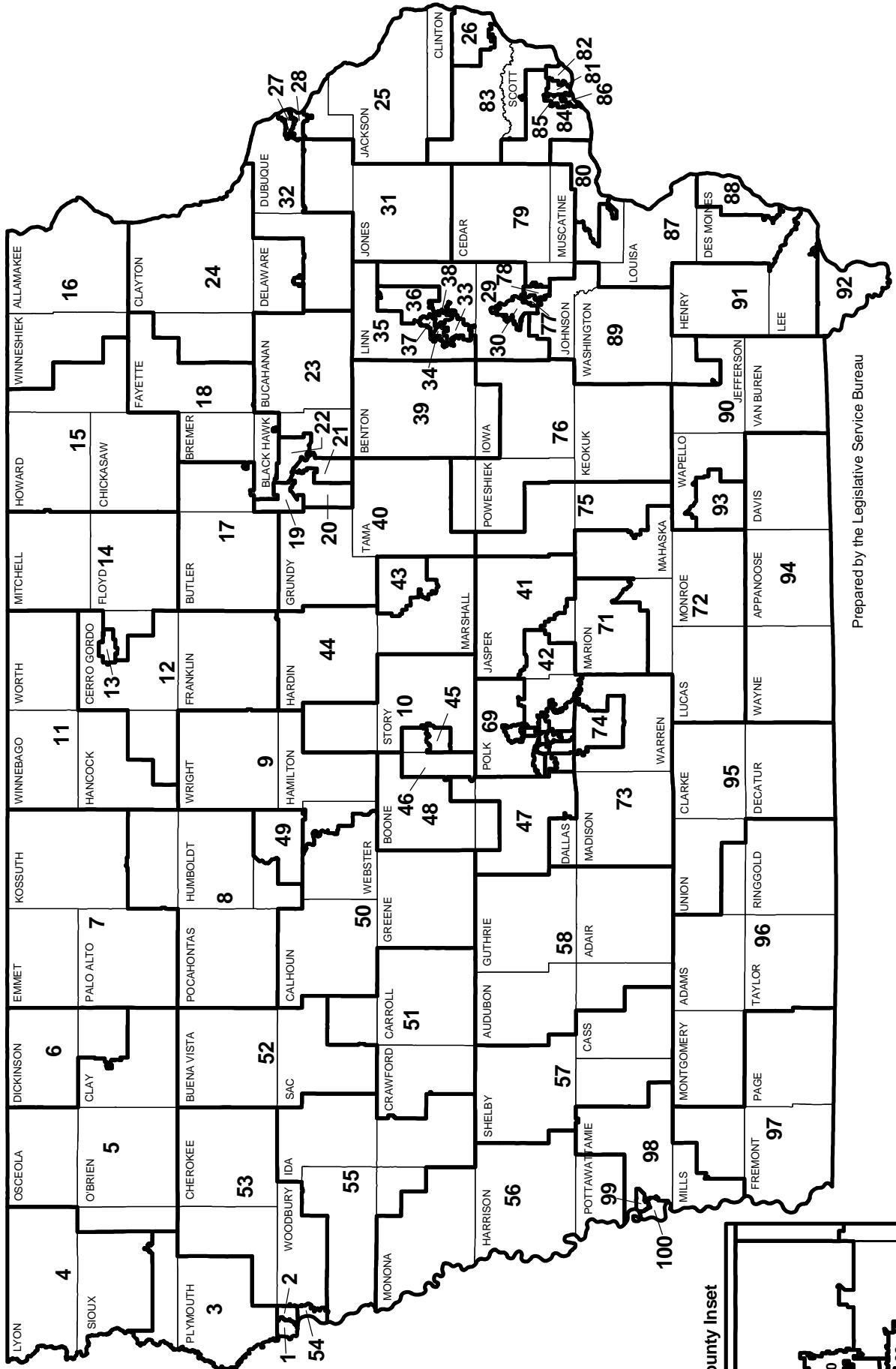
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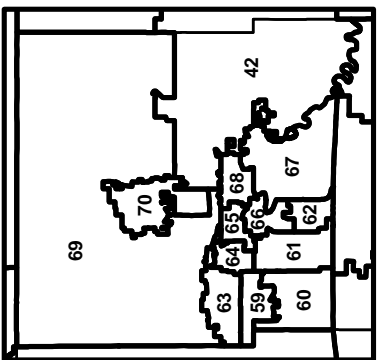
Prepared by the Legislative Service Bureau

PROPOSED HOUSE DISTRICTS

June 2001



Polk County Inset



Prepared by the Legislative Service Bureau

TABLES

SECOND REDISTRICTING PLAN

Legislative Service Bureau

June 1, 2001

TABLE 1
CONGRESSIONAL PLAN SUMMARY

DISTRICT NUMBER	TOTAL POPULATION	% DEVIATION FROM IDEAL DISTRICT POP.	DEVIATION FROM IDEAL DISTRICT POP.	PERIMETER DISTANCE IN MILES	LENGTH-WIDTH COMPACTNESS IN MILES
1	585302	0.006%	37	488.734	86.61206
2	585241	-0.004%	-24	555.766	58.72676
3	585305	0.007%	40	490.366	22.77800
4	585305	0.007%	40	790.618	104.56160
5	585171	-0.016%	-94	807.151	10.57332

Ideal Congressional District Population: 585,265

Lowest Population: District 5 Highest Population: Districts 3, 4

Absolute Mean Deviation: 47 persons

Mean Deviation Percentage Variance: 0.00803%

Total Perimeter Score: 3,132.635 miles

Average Length-Width Compactness: 56.650348 miles

Overall Range

	LOWEST DISTRICT POP.	HIGHEST DISTRICT POP.	OVERALL
ABSOLUTE	-94	40	134
% VARIANCE	-0.016%	0.007%	0.023%
RATIO	1.0002289		

TABLE 2
SENATE PLAN SUMMARY

DISTRICT NUMBER	TOTAL POPULATION	% DEVIATION FROM IDEAL DISTRICT POP.	DEVIATION FROM IDEAL DISTRICT POP.	PERIMETER DISTANCE IN MILES	LENGTH-WIDTH COMPACTNESS IN MILES
1	58965	0.749%	439	29.193	6.702381
2	58287	-0.409%	-239	262.743	11.092560
3	58501	-0.044%	-25	189.085	32.859660
4	58695	0.288%	169	238.132	5.663497
5	58252	-0.469%	-274	265.015	6.234206
6	58437	-0.153%	-89	254.993	0.372412
7	58374	-0.261%	-152	158.585	9.788980
8	58696	0.290%	170	227.418	62.346820
9	58528	0.003%	2	236.125	61.726370
10	58530	0.006%	4	73.567	9.487595
11	58704	0.303%	178	75.588	2.545668
12	58220	-0.524%	-306	266.976	42.581900
13	58643	0.199%	117	175.813	4.812614
14	58216	-0.530%	-310	44.465	1.908560
15	58632	0.180%	106	174.521	9.617145
16	58554	0.047%	28	212.971	14.491800
17	58927	0.684%	401	60.313	2.100432
18	58480	-0.079%	-46	157.711	2.416049
19	58792	0.454%	266	57.996	4.897806
20	58429	-0.167%	-97	242.673	28.561650
21	58653	0.216%	127	192.516	30.649300
22	58180	-0.592%	-346	172.252	2.089653
23	58737	0.360%	211	66.769	1.106527
24	58634	0.184%	108	166.789	8.607487
25	58488	-0.066%	-38	245.985	11.194190
26	58286	-0.411%	-240	236.541	16.320770
27	58416	-0.189%	-110	179.758	34.498480
28	58371	-0.266%	-155	318.196	8.769856
29	58508	-0.032%	-18	235.260	42.129960
30	58110	-0.712%	-416	26.761	0.896484

DISTRICT NUMBER	TOTAL POPULATION	% DEVIATION FROM IDEAL DISTRICT POP.	DEVIATION FROM IDEAL DISTRICT POP.	PERIMETER DISTANCE IN MILES	LENGTH-WIDTH COMPACTNESS IN MILES
31	58421	-0.180%	-105	28.540	2.981577
32	58708	0.310%	182	28.603	7.983299
33	58327	-0.341%	-199	26.257	0.178813
34	58677	0.257%	151	66.349	3.467578
35	58445	-0.139%	-81	91.972	16.400570
36	58799	0.466%	273	213.720	20.660920
37	58812	0.488%	286	165.347	32.425070
38	58736	0.358%	210	222.869	10.465600
39	58402	-0.213%	-124	35.763	0.606707
40	58546	0.033%	20	177.214	7.720814
41	58554	0.047%	28	31.487	4.104686
42	58527	0.001%	1	169.253	5.793875
43	58826	0.512%	300	35.130	4.747943
44	58345	-0.310%	-181	189.174	18.655080
45	58463	-0.108%	-63	298.377	13.723280
46	58388	-0.237%	-138	169.497	12.553050
47	58266	-0.445%	-260	223.606	58.242210
48	58811	0.486%	285	271.738	85.500210
49	58554	0.047%	28	265.476	6.869518
50	58472	-0.093%	-54	37.960	1.928044

Ideal Senate District Population: 58,526

Lowest Population: District 30 Highest Population: District 1

Absolute Mean Deviation: 163.12 persons

Mean Deviation Percentage Variance: 0.27871%

Total Perimeter Score: 7,993.042 miles

Absolute Perimeter Score: 4,860.407 miles

Average Length-Width Compactness: 15.829593 miles

Overall Range

	LOWEST DISTRICT POP.	HIGHEST DISTRICT POP.	OVERALL
ABSOLUTE	-416	439	855
% VARIANCE	-0.71%	0.75%	1.46%
RATIO	1.01471		

TABLE 3
HOUSE PLAN SUMMARY

DISTRICT NUMBER	TOTAL POPULATION	% DEVIATION FROM IDEAL DISTRICT POP.	DEVIATION FROM IDEAL DISTRICT POP.	PERIMETER DISTANCE IN MILES	LENGTH-WIDTH COMPACTNESS IN MILES
1	29444	0.618%	181	22.767	2.763726
2	29521	0.881%	258	24.689	2.691247
3	29006	-0.879%	-257	168.324	9.612516
4	29281	0.061%	18	169.000	16.478020
5	29342	0.269%	79	198.158	32.893240
6	29159	-0.356%	-104	114.282	3.909774
7	29289	0.088%	26	179.496	24.321610
8	29406	0.488%	143	183.623	22.658470
9	29169	-0.322%	-94	174.656	0.372343
10	29083	-0.616%	-180	146.933	9.750218
11	29075	-0.643%	-188	177.089	24.583270
12	29362	0.337%	99	209.524	8.997103
13	29198	-0.223%	-65	26.525	7.105194
14	29176	-0.298%	-87	158.430	8.436619
15	29330	0.228%	67	166.583	16.356000
16	29366	0.351%	103	143.588	33.997700
17	29227	-0.124%	-36	127.611	24.685250
18	29301	0.129%	38	177.120	24.977100
19	29135	-0.438%	-128	44.864	1.644901
20	29395	0.450%	132	55.482	2.234611
21	29494	0.789%	231	48.891	4.875213
22	29210	-0.182%	-53	41.723	7.409688
23	29082	-0.619%	-181	130.216	24.274700
24	29138	-0.428%	-125	186.293	22.957230
25	29363	0.341%	100	148.241	15.357610
26	29280	0.057%	17	57.236	8.101518
27	29051	-0.725%	-212	27.610	5.170862
28	29165	-0.336%	-98	39.432	4.262978
29	29279	0.054%	16	202.393	9.617145
30	29353	0.307%	90	51.815	0.928128

DISTRICT NUMBER	TOTAL POPULATION	% DEVIATION FROM IDEAL DISTRICT POP.	DEVIATION FROM IDEAL DISTRICT POP.	PERIMETER DISTANCE IN MILES	LENGTH-WIDTH COMPACTNESS IN MILES
31	29478	0.734%	215	135.983	4.083751
32	29076	-0.640%	-187	168.096	38.646280
33	29383	0.409%	120	53.392	2.939223
34	29544	0.959%	281	23.506	3.402423
35	29188	-0.257%	-75	144.542	2.416049
36	29292	0.098%	29	62.501	2.851889
37	29295	0.109%	32	31.195	4.460170
38	29497	0.799%	234	35.821	4.179652
39	29144	-0.407%	-119	120.294	3.907563
40	29285	0.074%	22	170.380	2.440163
41	29238	-0.086%	-25	110.892	16.382740
42	29415	0.519%	152	118.339	16.206000
43	29076	-0.640%	-187	66.096	4.598840
44	29104	-0.544%	-159	190.170	2.089653
45	29411	0.505%	148	33.299	2.397049
46	29326	0.214%	63	67.589	0.344498
47	29222	-0.141%	-41	129.507	2.954492
48	29412	0.508%	149	109.088	2.308955
49	29191	-0.247%	-72	63.983	11.926860
50	29297	0.115%	34	196.075	16.644470
51	29132	-0.448%	-131	158.348	19.909530
52	29154	-0.373%	-109	151.431	11.639910
53	29047	-0.739%	-216	179.278	30.879940
54	29369	0.361%	106	29.737	1.176311
55	29159	-0.356%	-104	224.167	27.943820
56	29212	-0.175%	-51	224.324	1.470579
57	29275	0.040%	12	175.809	2.583877
58	29233	-0.103%	-30	185.564	10.066800
59	29110	-0.524%	-153	19.579	4.663442
60	29000	-0.900%	-263	26.575	0.264489
61	29108	-0.530%	-155	21.891	0.301523

DISTRICT NUMBER	TOTAL POPULATION	% DEVIATION FROM IDEAL DISTRICT POP.	DEVIATION FROM IDEAL DISTRICT POP.	PERIMETER DISTANCE IN MILES	LENGTH-WIDTH COMPACTNESS IN MILES
62	29313	0.170%	50	14.580	0.795815
63	29485	0.758%	222	28.365	8.964353
64	29223	-0.138%	-40	14.091	0.201130
65	29071	-0.657%	-192	15.351	2.230811
66	29256	-0.025%	-7	18.131	0.628955
67	29331	0.232%	68	54.097	5.401081
68	29346	0.283%	83	21.362	3.863758
69	29143	-0.411%	-120	122.049	16.400570
70	29302	0.132%	39	41.378	1.794902
71	29498	0.802%	235	110.172	5.216948
72	29301	0.129%	38	206.937	29.044550
73	29301	0.129%	38	200.541	32.425070
74	29511	0.847%	248	62.617	7.129239
75	29454	0.652%	191	138.516	23.796990
76	29282	0.064%	19	205.596	2.414184
77	29349	0.293%	86	20.423	2.147415
78	29053	-0.718%	-210	30.969	1.266477
79	29273	0.033%	10	126.319	10.048280
80	29273	0.033%	10	90.451	18.694320
81	29196	-0.230%	-67	25.309	0.018586
82	29358	0.324%	95	24.368	0.988447
83	29274	0.037%	11	144.390	12.867350
84	29253	-0.035%	-10	104.101	8.722458
85	29400	0.467%	137	25.996	2.077562
86	29426	0.556%	163	22.410	0.498783
87	29052	-0.722%	-211	210.059	18.931860
88	29293	0.102%	30	68.965	5.085256
89	29103	-0.548%	-160	163.275	7.153974
90	29360	0.331%	97	203.268	24.778940
91	29067	-0.671%	-196	148.117	5.370403
92	29321	0.197%	58	93.414	11.674180

DISTRICT NUMBER	TOTAL POPULATION	% DEVIATION FROM IDEAL DISTRICT POP.	DEVIATION FROM IDEAL DISTRICT POP.	PERIMETER DISTANCE IN MILES	LENGTH-WIDTH COMPACTNESS IN MILES
93	29274	0.037%	11	60.517	4.864365
94	28992	-0.927%	-271	187.159	73.180770
95	29406	0.488%	143	175.833	22.589930
96	29405	0.484%	142	223.859	53.962920
97	29286	0.078%	23	180.242	27.039950
98	29268	0.016%	5	168.845	4.907272
99	29164	-0.339%	-99	18.850	4.455956
100	29308	0.153%	45	34.612	0.491114

Ideal House District Population: 29,263

Lowest Population: District 94 Highest Population: District 34

Absolute Mean Deviation: 109.6 persons

Mean Deviation Percentage Variance: 0.37453%

Total Perimeter Score: 10,835.579 miles

Absolute Perimeter Score: 7,702.944 miles

Average Length-Width Compactness: 10.996298 miles

Overall Range

	LOWEST DISTRICT POP.	HIGHEST DISTRICT POP.	OVERALL
ABSOLUTE	-271	281	552
% VARIANCE	-0.926%	0.960%	1.886%
RATIO	1.0190397		

TABLE 4
COUNTIES KEPT WHOLE IN A SENATE DISTRICT

(Total: 72)

Adair	Clayton	Jackson	Osceola
Adams	Davis	Jefferson	Page
Allamakee	Decatur	Jones	Palo Alto
Appanoose	Des Moines	Keokuk	Pocahontas
Audubon	Dickinson	Kossuth	Poweshiek
Benton	Emmet	Lee	Ringgold
Bremer	Floyd	Louisa	Sac
Buchanan	Fremont	Lucas	Shelby
Buena Vista	Greene	Lyon	Taylor
Butler	Grundy	Madison	Union
Calhoun	Guthrie	Marion	Van Buren
Carroll	Hamilton	Marshall	Warren
Cass	Hancock	Mills	Washington
Cedar	Hardin	Mitchell	Wayne
Cherokee	Harrison	Monona	Winnebago
Chickasaw	Henry	Monroe	Winneshiek
Clarke	Humboldt	Montgomery	Worth
Clay	Ida	O'Brien	Wright

COUNTIES KEPT WHOLE IN A HOUSE DISTRICT

(Total: 54)

Adair	Clarke	Humboldt	Page
Adams	Clayton	Ida	Palo Alto
Allamakee	Davis	Jackson	Pocahontas
Appanoose	Decatur	Jones	Ringgold
Audubon	Dickinson	Keokuk	Shelby
Benton	Emmet	Louisa	Taylor
Buchanan	Floyd	Lucas	Van Buren
Buena Vista	Fremont	Lyon	Washington
Butler	Greene	Madison	Wayne
Calhoun	Grundy	Mitchell	Winnebago
Carroll	Guthrie	Monroe	Worth
Cedar	Hardin	Montgomery	Wright
Cherokee	Harrison	O'Brien	
Chickasaw	Henry	Osceola	

TABLE 5

DIVIDABLE PRECINCTED CITIES LOCATED WITHIN A SINGLE COUNTY AND KEPT WHOLE IN SENATE AND HOUSE DISTRICTS

CITIES KEPT WHOLE IN SENATE DISTRICTS

Algona	Cherokee	Harlan	Newton
Altoona	Clarinda	Hiawatha	Norwalk
Ames	Clear Lake	Independence	Oelwein
Anamosa	Clinton	Indianola	Orange City
Ankeny	Coralville	Johnston	Oskaloosa
Atlantic	Creston	Manchester	Ottumwa
Bettendorf	Denison	Maquoketa	Pleasant Hill
Boone	Dubuque	Marion	Sioux Center
Burlington	Evansdale	Marshalltown	Spencer
Camanche	Fairfield	Mason City	Storm Lake
Carroll	Fort Dodge	Mount Pleasant	Waverly
Cedar Falls	Fort Madison	Muscatine	Webster City
Charles City	Glenwood	Nevada	Windsor Heights

CITIES KEPT WHOLE IN HOUSE DISTRICTS

Algona	Clear Lake	Independence	Norwalk
Altoona	Clinton	Indianola	Oelwein
Anamosa	Coralville	Johnston	Orange City
Ankeny	Creston	Manchester	Oskaloosa
Atlantic	Denison	Maquoketa	Ottumwa
Boone	Evansdale	Marion	Pleasant Hill
Burlington	Fairfield	Marshalltown	Sioux Center
Camanche	Fort Dodge	Mason City	Spencer
Carroll	Fort Madison	Mount Pleasant	Storm Lake
Charles City	Glenwood	Muscatine	Waverly
Cherokee	Harlan	Nevada	Webster City
Clarinda	Hiawatha	Newton	Windsor Heights

TABLE 6

**CITIES LOCATED IN MORE THAN ONE COUNTY AND KEPT ENTIRELY WITHIN
A SINGLE SENATE AND HOUSE DISTRICT**

Ackely
Adair
Barnes City
Bevington
Cascade
Casey
Dows
Dyersville
Edgewood
Fairbank
Farnhamville
Forest City
Gilmore City
Janesville
Lenox
Lu Verne
Mitchellville
Nora Springs
North English
Protivin
Riceville
Shannon City
Shelby
Shenandoah
Stuart
Sumner
Tabor
Victor
West Bend
West Branch
Zwingle

TABLE 7

LEGISLATIVE DISTRICTS PER COUNTY

	4/1/2000	Senate	Senate	House	House
	Census	Districts	Districts in	Districts	Districts in
County	Population	Required	Plan 2	Required	Plan 2
Adair	8,243	1	1	1	1
Adams	4,482	1	1	1	1
Allamakee	14,675	1	1	1	1
Appanoose	13,721	1	1	1	1
Audubon	6,830	1	1	1	1
Benton	25,308	1	1	1	1
Black Hawk	128,012	3	4	5	6
Boone	26,224	1	2	1	3
Bremer	23,325	1	1	1	2
Buchanan	21,093	1	1	1	1
Buena Vista	20,411	1	1	1	1
Butler	15,305	1	1	1	1
Calhoun	11,115	1	1	1	1
Carroll	21,421	1	1	1	1
Cass	14,684	1	1	1	2
Cedar	18,187	1	1	1	1
Cerro Gordo	46,447	1	2	2	3
Cherokee	13,035	1	1	1	1
Chickasaw	13,095	1	1	1	1
Clarke	9,133	1	1	1	1
Clay	17,372	1	1	1	2
Clayton	18,678	1	1	1	1
Clinton	50,149	1	2	2	3
Crawford	16,942	1	2	1	2
Dallas	40,750	1	2	2	3
Davis	8,541	1	1	1	1
Decatur	8,689	1	1	1	1
Delaware	18,404	1	2	1	2
Des Moines	42,351	1	1	2	2
Dickinson	16,424	1	1	1	1
Dubuque	89,143	2	3	4	5
Emmet	11,027	1	1	1	1
Fayette	22,008	1	2	1	3 ⁱ
Floyd	16,900	1	1	1	1
Franklin	10,704	1	3 ⁱⁱ	1	3 ⁱⁱⁱ
Fremont	8,010	1	1	1	1
Greene	10,366	1	1	1	1
Grundy	12,369	1	1	1	1

	4/1/2000	Senate	Senate	House	House
	Census	Districts	Districts in	Districts	Districts in
County	Population	Required	Plan 2	Required	Plan 2
Guthrie	11,353	1	1	1	1
Hamilton	16,438	1	1	1	2
Hancock	12,100	1	1	1	2
Hardin	18,812	1	1	1	1
Harrison	15,666	1	1	1	1
Henry	20,336	1	1	1	1
Howard	9,932	1	2 ^{IV}	1	2 ^V
Humboldt	10,381	1	1	1	1
Ida	7,837	1	1	1	1
Iowa	15,671	1	2	1	2
Jackson	20,296	1	1	1	1
Jasper	37,213	1	2	2	3
Jefferson	16,181	1	1	1	2
Johnson	111,006	2	4	4	6
Jones	20,221	1	1	1	1
Keokuk	11,400	1	1	1	1
Kossuth	17,163	1	1	1	2
Lee	38,052	1	1	2	2
Linn	191,701	4	4	7	7
Louisa	12,183	1	1	1	1
Lucas	9,422	1	1	1	1
Lyon	11,763	1	1	1	1
Madison	14,019	1	1	1	1
Mahaska	22,335	1	2	1	2
Marion	32,052	1	1	2	2
Marshall	39,311	1	1	2	2
Mills	14,547	1	1	1	2
Mitchell	10,874	1	1	1	1
Monona	10,020	1	1	1	2
Monroe	8,016	1	1	1	1
Montgomery	11,771	1	1	1	1
Muscatine	41,722	1	2	2	3
O'Brien	15,102	1	1	1	1
Osceola	7,003	1	1	1	1
Page	16,976	1	1	1	1
Palo Alto	10,147	1	1	1	1
Plymouth	24,849	1	2	1	2
Pocahontas	8,662	1	1	1	1
Polk	374,601	7	7	13	13
Pottawattamie	87,704	2	4	3	5
Poweshiek	18,815	1	1	1	2
Ringgold	5,469	1	1	1	1

	4/1/2000	Senate	Senate	House	House
	Census	Districts	Districts in	Districts	Districts in
County	Population	Required	Plan 2	Required	Plan 2
Sac	11,529	1	1	1	2
Scott	158,668	3	3	6	6
Shelby	13,173	1	1	1	1
Sioux	31,589	1	2	2	3
Story	79,981	2	2	3	3
Tama	18,103	1	2	1	2
Taylor	6,958	1	1	1	1
Union	12,309	1	1	1	2
Van Buren	7,809	1	1	1	1
Wapello	36,051	1	2	2	2
Warren	40,671	1	1	2	2
Washington	20,670	1	1	1	1
Wayne	6,730	1	1	1	1
Webster	40,235	1	3	2	4
Winnebago	11,723	1	1	1	1
Winneshiek	21,310	1	1	1	2
Woodbury	103,877	2	3	4	5
Worth	7,909	1	1	1	1
Wright	14,334	1	1	1	1

ⁱ One district due to keeping the city of Fairbank whole in district 23.

ⁱⁱ One district due to keeping the city of Dows whole in district 5 and one district due to keeping the city of Ackley whole in district 22.

ⁱⁱⁱ One district due to keeping the city of Dows whole in district 9 and one district due to keeping the city of Ackley whole in district 44.

^{iv} One district due to keeping the city of Riceville whole in district 7.

^v One district due to keeping the city of Riceville whole in district 14.

TABLE 8
Congressional Redistricting Plans – Statistical Comparisons.

	Absolute Mean Deviation	Mean Deviation Percentage Variance	Overall Range	Overall Range Percentage Variance	Average length-width compactness in miles	Total Perimeter Score	Longest E-W distance in miles for a district in plan (Dist #)	Longest N-S distance in miles for a district in plan (Dist #)
Current Congressional Districts	104.94 persons	0.018%	279.23 persons	.048%	109.93	2896.825 miles	307 (Dist #3)	137.59 (Dist #2)
First Proposed Congressional Redistricting Plan	130.2 persons	0.022%	483 persons	.08%	72.47	2832.104 miles	266.49 (Dist #3)	202.48 (Dist #5)
Second Proposed Congressional Redistricting Plan	47 persons	0.008%	134 persons	.023%	56.65	3132.635 miles	266.56 (Dist #4)	202.48 (Dist #5)

Note: The figures listed as the absolute mean deviation and the overall range for current Congressional districts are adjusted from the actual 1991 figures based on Iowa's total 2000 population.

TABLE 9
Legislative Redistricting Plans – Statistical Comparisons.

	Absolute Mean Deviation	Mean Deviation Percentage Variance	Overall Range	Overall Range Percentage Variance	Average length-width compactness in miles	Counties kept whole	Precincted cities kept whole	Cities in > one county kept whole	Total Perimeter Score	Absolute Perimeter Score	Longest E-W and N-S distance in miles for a district in plan (Dist #)
Current Senate Districts	137.14 persons	0.23%	847.3 persons	1.45%	23.42	68	47	24	7716.717 miles	4819.892 miles	E-W: 134.85 (46) N-S: 67.66 (49)
First Proposed Senate Redistricting Plan	212.96 persons	0.36%	1097 persons	1.87%	16.51	75	52	24	8166.023 miles	5333.919 miles	E-W: 99.44 (27) N-S: 89.32 (10)
Second Proposed Senate Redistricting Plan	163.12 persons	0.28%	855 persons	1.46%	15.83	72	52	31	7993.042 miles	4860.407 miles	E-W: 126.36 (48) N-S: 84.99 (28)
Current House Districts	123.39 persons	0.42%	577.5 persons	1.97%	14.35	49	42	24	10644 miles	7747.175 miles	E-W: 88.36 (11) N-S: 59.16 (15)
First Proposed House Redistricting Plan	149.32 persons	0.51%	577 persons	1.97%	13.14	55	48	24	11041.068 miles	8208.964 miles	E-W: 97.94 (50) N-S: 66.36 (49)
Second Proposed House Redistricting Plan	109.6 persons	0.37%	552 persons	1.89%	11	54	48	31	10835.579 miles	7702.944 miles	E-W: 95.28 (94) N-S: 61.02 (56)

Note: The figures listed as the absolute mean deviation and the overall range for current House and Senate Legislative districts are adjusted from the actual 1990 figures based on Iowa's total 2000 population.