

Defining the Gerrymander

by Kent Scheidegger

“I can’t define a gerrymander, but I know one when I see one.” With apologies to Justice Potter Stewart, who famously said that about pornography,¹ many people have felt this way about gerrymanders. This cynical form of political pornography treats people and communities as commodities to be carved up at the pleasure of whoever holds the political power to do so. The result is bizarrely drawn legislative districts that bear no relation to actual communities. Yet despite the nearly universal revulsion for this practice among everyone except the politicians and their operatives, it has proven remarkably resistant to attempts to eradicate it.

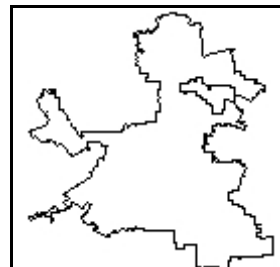


Figure 1.
26th Senate District

A. Background.

The oldest form is the partisan gerrymander. Its purpose is to obtain for the party drawing the lines a larger percentage of the seats in the legislative body than it would have in a districting plan along community lines. This form goes back to the earliest days of American democracy. The gerrymander takes its name from a salamander-shaped district drawn in Massachusetts during the administration of Governor Elbridge Gerry, a signer of the Declaration of Independence. Voters who favor the party out of power are packed into as small a number of districts as possible. Those districts vote solidly for that party’s candidate, but a larger number of other districts lean toward the party drawing the lines, although by narrower margins.

The second form is the racial gerrymander. In a state where a racial majority votes solidly against any member of the racial minority, the minority voters can be spread among districts to insure that they cannot elect a candidate by their own votes. Although this form is the most repugnant, it is also the least common today. Racial gerrymandering violates the Fourteenth Amendment and the Voting Rights Act of 1965, and so there are judicial remedies.² In addition, the premise of solid voting by racial majorities is no longer true in most of the country. Racial minority candidates often win election today.

The third form, the kind in force in California today, is the incumbent protection gerrymander. All or most districts in the plan are deliberately engineered to have a heavy preponderance of one party or the other, making them “safe” for the candidate of that party. Since incumbents are nearly impossible to defeat in a primary and the general election is a foregone conclusion, an incumbent has little to fear from any challenger. This type of gerrymander produces a legislature more partisan and less cooperative than would otherwise be elected. When a seat is

1. *Jacobellis v. Ohio*, 378 U. S. 184, 197 (1964).

2. See *Shaw v. Reno*, 509 U. S. 630, 640 (1993).

open and the general election is expected to be close, each party has a powerful incentive to nominate a candidate who will appeal to independent voters and to moderate voters of the other party. When a district is a “lock” for one party, on the other hand, the activists of that party are free to nominate their most shrill, partisan, and divisive candidate.³

Traditionally, the United States Supreme Court considered partisan gerrymandering “nonjusticiable,” meaning the courts would not interfere with it. In the 1986 case of *Davis v. Bandemer*,⁴ the high court seemingly opened the door to judicial challenges to gerrymandering, but established no standards for deciding such a challenge. The succeeding years have produced no relief for the citizenry. In the most recent case of *Vieth v. Jubelirer*,⁵ the plurality opinion said that no standards for a court to decide such a question existed, and the quest for them was hopeless. A fifth concurring justice said there were no standards yet, but the quest might not be hopeless. The four dissenters said standards could be established, but they had three different opinions as to what they were. Attacks on gerrymandering in the federal courts appear to offer extremely remote chances of relief and high probability of protracted litigation and expense.

Unlike the United States Constitution, the California Constitution specifically addresses the question of gerrymandering, but only in vague terms. Article XXI, § 1 of the California Constitution lays down some basic requirements, such as single-member districts and reasonably equal population, and then imposes this requirement: “(e) The geographical integrity of any city, county, or city and county, or any geographical region shall be respected to the extent possible without violating the requirements of any other subdivision of this section.” To say that the Legislature has ignored this requirement would be an understatement. Yet despite the ruthless carving of cities in the 2001 reapportionment, there has to date been no judicial relief.

The answer to gerrymandering is political and not judicial.⁶ The people in California have the power to restrain their Legislature through the initiative. Reformers have several times asked the voters to remove reapportionment from the Legislature and give it to a commission, but these proposals have been uniformly defeated. Proposition 119 in 1990 went down by a landslide 36-64. The argument that this task should not be delegated to an unelected commission not responsible to the people carried the day, notwithstanding the dismal record of the Legislature in carrying out the same task. New proposals along the same lines are circulating today, but it would not be wise to place all the eggs in a basket with such a history.

3. See Walters, *Democrats’ Neat Trick in 1998 May Boomerang Next Time*, *Sacramento Bee* (Dec. 1, 2004).

4. 478 U. S. 109 (1986).

5. 158 L. Ed. 2d 546 (2004).

6. See *Vieth*, 158 L. Ed. 2d, at 557, n. 4.

An alternative and complementary approach is to define gerrymandering in precise, objective terms and then simply prohibit it by constitutional amendment. A straightforward prohibition of bizarre-shaped districts is simple enough for everyone to understand and not subject to any legitimate opposition. If the definition is objective enough, courts will not be involved in subjective political judgments. They will only be called upon to enforce the plain meaning of the law.

B. Defining Eccentricity.

The defining characteristic of a gerrymander is bizarre shape. If one compares a map of California's counties with a map of its present legislative districts, it is immediately apparent that the districts have much more irregular shapes than the counties. Of course, the districts are required to be of equal population while the counties vary widely in population, so some difference is to be expected. However, if we compare the 2001 reapportionment enacted by the Legislature with the 1992 reapportionment decreed by the California Supreme Court, the irregularity of districts in the Legislature's plan remains obvious. The 1992 court plan was promulgated when the Legislature and the Governor deadlocked,⁷ and it is clearly a much superior plan. It provides us with an example of what can be done when partisanship and incumbent protection are not the motives, compared with what is done when they are.

The eccentricity, or irregularity, of shapes can be defined mathematically. One measure is to take the perimeter, square it, and divide by the area. This ratio is dimensionless. That is, it is the same for a given shape regardless of the scale and regardless of the units used to measure it, as long as the units are consistent. That is, if miles are used for perimeter, square miles must be used for area, or kilometers and square kilometers, etc.

A square has a perimeter of four times the length of one side, S . The perimeter squared is $16S^2$. The area is simply S^2 . The eccentricity factor, as defined above, is:

$$E = P^2/A = 16S^2/S^2 = 16$$

E is 16 for any square of any size, measured in any units. The least eccentric figure is a circle. The E for any circle is $(2\pi R)^2/\pi R^2 = 4\pi$, which is about 12.6. To show how the E factor grows with irregular shape, we can compare the square with a long, skinny rectangle, 1 x 5 units. The perimeter is 12, the area is 5, and the E factor is $144/5$, or 28.8.

C. Application to the Real World.

Real-world legislative districts are, of course, more complex than these simple shapes, and their eccentricity factors are higher. How much higher, however, varies dramatically between gerrymandered and nongerrymandered apportionment plans. To demonstrate the difference and to determine a practical limit, we downloaded the 1992 and 2001 apportionment maps from the state reapportionment database, <http://swdb.berkeley.edu/index.html>.

7. See *Wilson v. Eu*, 1 Cal. 4th 707 (1992).

These maps were used to calculate eccentricity factors for the 40 Senate districts in both the 1992 and 2001 reapportionments with the following procedure. The downloaded ArcView shapefiles were converted to AutoCAD 2000 DWG files with the Arcv2CAD program. The resulting files had differing scales. For convenience, both maps were scaled to miles by measuring the distance from the northeast corner of the state to the corner in Lake Tahoe, and scaling the map so that this distance was 207.5 drawing units.⁸

The AutoCAD program was then used to create “regions” from the district boundaries in the file. AutoCAD then computes perimeter and area for the regions. For this purpose, the portion of any district including a Pacific island was disregarded, and only the mainland portion of the district was used. The perimeters and areas were then entered in a spreadsheet, which calculated the eccentricity factor for each district and statistics of eccentricity factors for the plan as a whole. See Table 1.

The difference in the two plans is immediately apparent from these numbers. The *average* district in the Legislature’s 2001 plan is more eccentric than *maximum* in the Supreme Court’s 1992 plan. The 1992 plan has a large cluster of districts in the 40s and 50s, and a fairly small spread of eccentricities, as indicated by the standard deviation of 12.0. The 2001 plan has a wide range of eccentricities, as indicated by its large standard deviation of 33.0. The range goes all the way up to 174.8 for the exceptionally bizarre 26th Senate District, shown in Figure 1.

The results are also illustrated with a histogram in Figure 2. The eccentricity factor is plotted on horizontal axis. The height of each bar represents the number of districts in a range of ten eccentricity factors. For example, the seven-unit high bars at 60 for both plans means that both plans have seven districts with eccentricity factors between 60 and 69.9. The dotted bars are the 1992 plan, and the cross-hatched bars are the 2001 plan. The higher eccentricities and broader range for the 2001 plan are apparent.

D. Realistic Limits.

The numbers from the 1992 plan give us a feel for constraints that can be applied without encumbering good faith efforts to meet federal requirements⁹ or the present requirements of the California Constitution. If we take the numbers from the 1992 plan and add some padding to allow for changing conditions, we can define a real constraint that will inhibit illegitimate gerrymandering while allowing all legitimate objectives to be met. For example, we could write into the California Constitution that a valid apportionment plan must have a mean eccentricity factor of districts less than 60, and it must not have any district with an eccentricity factor over 85.

8. The boundary runs along the 120 degree meridian from 42 degrees north to 39 degrees south, a distance of 180 geographic miles = 207.5 statute miles. It does not matter if this scaling is not exact, since the units drop out in calculating the eccentricity factor.

9. A major factor in the Supreme Court’s apportionment was compliance with the Voting Rights Act of 1965, 42 U. S. C. § 1973. See *Wilson v. Eu*, 1 Cal. 4th, at 714-717.

These restrictions would not completely eliminate the black art of gerrymandering. Within the constraints, there will still be some room to maneuver. There will be far less than at present, however, and the extreme distortions of the political process will be curbed.

Courts have long indicated that districts should be drawn with “compactness.”¹⁰ We now have a precise, mathematical definition of what that means. If we write this definition into the California Constitution, we will have more competitive races, more moderate candidates, less partisan division, and more cooperation.

10. *Id.*, at 719.

Table 1. California State Senate Districts

District	1992			2001		
	Area	Perimeter	E factor	Area	Perimeter	E factor
1	31956	1310	53.7	22266	1255	70.7
2	16809	1038	64.1	12058	956.8	75.9
3	1519	237.8	37.2	1307	263.3	53.0
4	28376	1201	50.8	23973	980	40.1
5	2137	295	40.7	2028	533	140.1
6	333.2	139.5	58.4	239.7	131.5	72.1
7	1296	237.6	43.6	777.9	162	33.7
8	357.5	125.2	43.8	459.4	147.4	47.3
9	244.8	93.2	35.5	411.1	169.3	69.7
10	617.9	166.3	44.8	506.2	143.4	40.6
11	963.9	236.9	58.2	836.9	286.9	98.4
12	11813	740.5	46.4	4958	600.7	72.8
13	127.1	88.2	61.2	779.6	252.6	81.8
14	10879	808.4	60.1	10851	1086	108.7
15	8277	570.1	39.3	7695	808.2	84.9
16	10406	794.5	60.7	6381	841.3	110.9
17	37964	1361	48.8	3946	555.6	78.2
18	9591	562.5	33.0	39327	1544.4	60.6
19	1260	225	40.2	3521	487.4	67.5
20	110.6	76	52.2	97.4	79.4	64.7
21	403	175.7	76.6	141	141.1	141.2
22	56.5	51.3	46.6	60.1	102.5	174.8
23	500.5	132.1	34.9	580.4	213.5	78.5
24	125.4	97.4	75.7	119.2	131.1	144.2
25	83	73.6	65.3	174.7	154.7	137.0
26	67.6	52.6	40.9	65.6	95	137.6
27	254.7	117.9	54.6	123.7	89.1	64.2
28	194.8	104.4	56.0	158.6	122.4	94.5
29	640.4	229.3	82.1	755.5	302.6	121.2
30	113.5	85.6	64.6	111.2	107.6	104.1
31	6026	573.6	54.6	1221.5	370.5	112.4
32	341.2	134.5	53.0	229.8	148	95.3
33	560.8	138.6	34.3	430	171.8	68.6
34	95.3	61.6	39.8	76.1	78.6	81.2
35	353	116.7	38.6	329.6	136	56.1
36	3291.9	452.1	62.1	3223	430.5	57.5
37	14437	876.3	53.2	4906	615.9	77.3
38	823.5	197.4	47.3	771.2	173.6	39.1
39	428.2	132	40.7	290.9	154.2	81.7
40	217.4	113	58.7	7142	672.8	63.4
Mean			51.3			85.0
Median			51.5			77.8
Std Dev			12.0			33.0
Min			33.0			33.7
Max			82.1			174.8

E factor = Perimeter squared / Area

Calculated numbers are shown to one decimal place

Eccentricity of Cal. Senate Districts 1992 and 2001 Apportionments

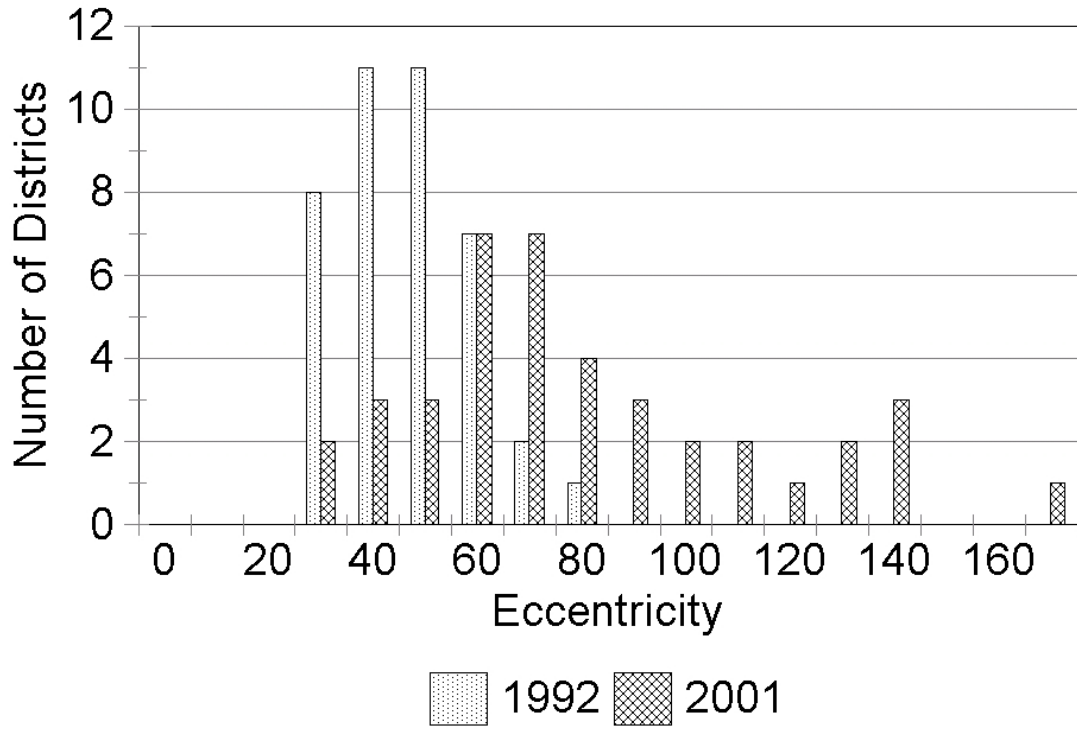


Figure 2