

# Steve Castro's testimony regarding Congressional map proposals

November 5, 2021

Chair Gavarone,

Since the Constitution expects compact districts, I wanted to understand how we could measure compactness objectively. I found an award-winning 2010 paper from 3 mathematicians which describes a method I find more intuitive than the more popular ones. It's called Convexity Coefficient:

<https://www.maa.org/programs/maa-awards/writing-awards/gerrymandering-and-convexity>

In a nutshell: you take 2 random locations in a district, draw a line between them, and check if the line exits the district. Repeat that 10,000 times with a computer and you come up with a percentage of lines that stay in district. (Any lines that exit the State are discarded, so as to not unfairly penalize border districts.)

Using this method, a rectangle is 100% compact. The shape of Ohio itself is 97% compact. Our county map averages 97% too, with the least compact county at 88%. We have a highly compact state and county blocks to work with.

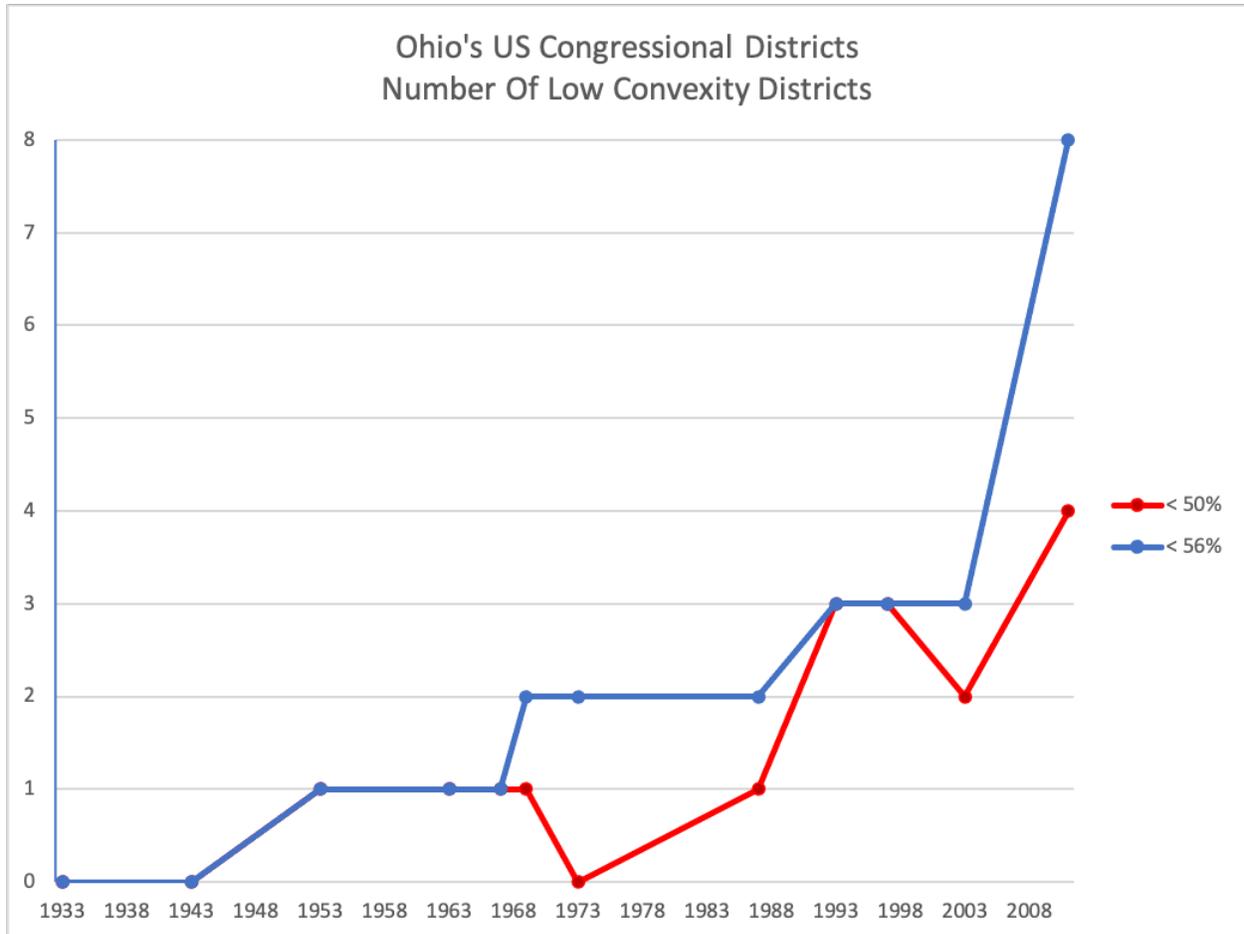
In contrast, I measured the namesake "gerrymander" from 1812 in Massachusetts at about 44% compact. Any district under 50% is objectively more indented than it is compact, and we can reasonably expect every district to exceed at least 50%.

## HISTORICAL PRECEDENT

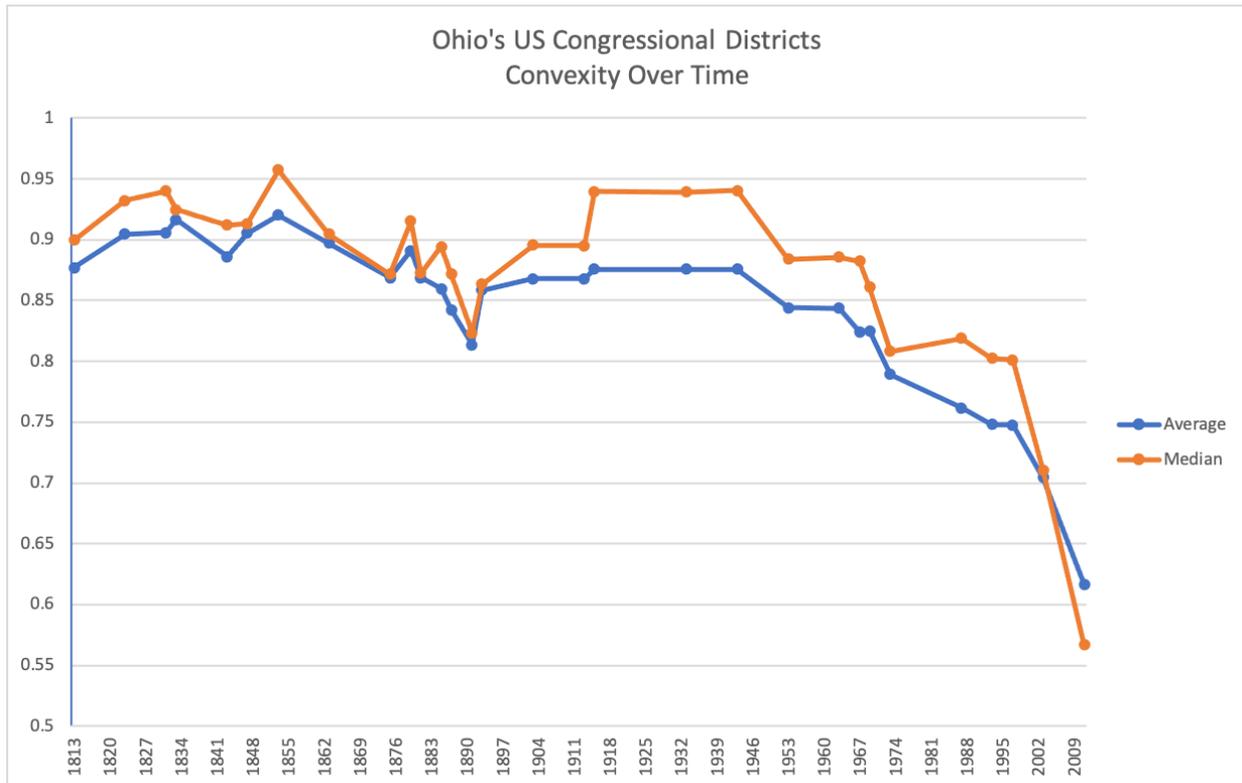
I've analyzed all the map shape files throughout the entire history of Ohio's district maps from 1813 to today, thanks to data made available by UCLA's Jeffrey B. Lewis here:

<https://cdmaps.polisci.ucla.edu/>

Until 1953, our State never had any district under 50%. Until 1993, there was never more than 1 district under 50%. Today there are 4 districts below 50%. Until 1969, we never had more than 1 district under 56%, but today there are 8! In the current map, the Cleveland/Akron district 11 is the worst at only 40%. It is objectively not compact.



In terms of averaging compactness across the map, Ohio has exceeded 81% for 160 years until 1973. It mostly exceeded 85%. The average has only steadily declined each decade since then. The median value was consistently higher than the average for about 200 years, but only in the last 2 decades has the median been lower, due to the large number of low compactness districts.



In 1973, we averaged 79% percent with a median of 81%. The average dropped to 76%, to 75%, to 70%, and today it sits at only 62%. Currently the median is only 57%.

The last time Ohio had this few districts was in 1823 at 14 geographic districts, and that map had an average of 90%.

## PROPOSED STANDARDS

After reviewing maps published in 2018 by FiveThirtyEight.com, I found that maps could be gerrymandered for either party and still achieve a 75% compactness rating. They also demonstrated that a "competitive" map could achieve 86% and a "compact" map could reach 93%. <https://projects.fivethirtyeight.com/redistricting-maps/ohio/>

Therefore, based on historical precedent and the demonstrated feasibility of highly compact maps, I propose we reach an average of 85%. Per district, I consider 50% a bare minimum, and I propose every district exceed 60%.

I created these standards in February, unbiased by any of the proposals currently under consideration.

## APPLYING THIS METHOD TO CURRENT BILLS

Both bills SB237 and SB258 are better than the last 2 decades of Ohio maps in terms of compactness and fewer county splits. However, they both fall short of my proposed standards and what other groups have demonstrated is feasible.

### SB237 (Democrats' proposal)

Average compactness is 77%, median is 79%, minimum is 40%, 1 district is under 60%.

District 4 under Cleveland is only 40% compact. I recommend making this district more compact. Others like Ohio Citizens' Redistricting Commission have done a much better job at compactness in this region.

District 13 around Columbus barely meets the minimum at just 60%, and ideally would be a little more compact as well.

This map only splits 11 counties no more than once each, which I applaud as the best of any proposal I've seen.

The proportion of 8R-7D likely seats does not unduly favor either party.

### SB258 (Republicans' proposal)

Average is 78%, median is 81%, minimum is 54%, 2 districts under 60%.

Districts 6 is too elongated, and others have demonstrated this region can be more compact.

This map splits 14 counties a total of 17 times, which is the highest I've seen, and more than necessary.

Splitting Hamilton and Franklin Counties twice is not inevitable, and appears to intentionally disfavor Democrats, such as connecting German Village in downtown Columbus to the southern tip of Ohio in Lawrence county. I recommend splitting no county more than once since others have demonstrated this is feasible.

The resulting 13R-2D likely seats is not accidental nor unavoidable, but instead appears to intentionally and unduly favor Republicans. I consider this in violation of the Ohio Constitution and therefore I am obligated to oppose this bill.

## OTHER PROPOSALS DEMONSTRATE WE CAN DO BETTER

Ohio Citizen's Redistricting Commission (OCRC) and Fair Districts Ohio winners have all proposed maps that exceed the standards of compactness that I created about 7 months earlier. Their proposals do not unduly favor either party.

OCRC's Unity Map averages 85%, median 86%, minimum 65%, 13 county splits.

Fair District Ohio winners:

John Hagner's map averages 85%, median 87%, minimum 65%, 14 county splits.

Paul Nieves' map averages 90%, median 91%, minimum 76%, 12 county splits.

Riley Jones' map averages 88%, median 87%, minimum 80%, 14 counties split at 15 total splits.

I created my own map on DavesRedistricting.org to find out what would happen if I made no partisan adjustments. The result was 89% compact with 10R-5D likely districts. I've demonstrated that one can accidentally give the majority 10 seats, and I can see how an arbitrary tweak here or there can easily change that balance. I do not believe one can arrive at 11 or more seats for Republicans without intentionally and unduly favoring the majority party.

There's no good reason for a map that likely gives 87% seats to the majority when the last decade of statewide votes show Ohioans voted ~54% for the majority.

I encourage both parties to compromise on a 10R-5D map.

Sincerely and respectfully,

Steven Castro