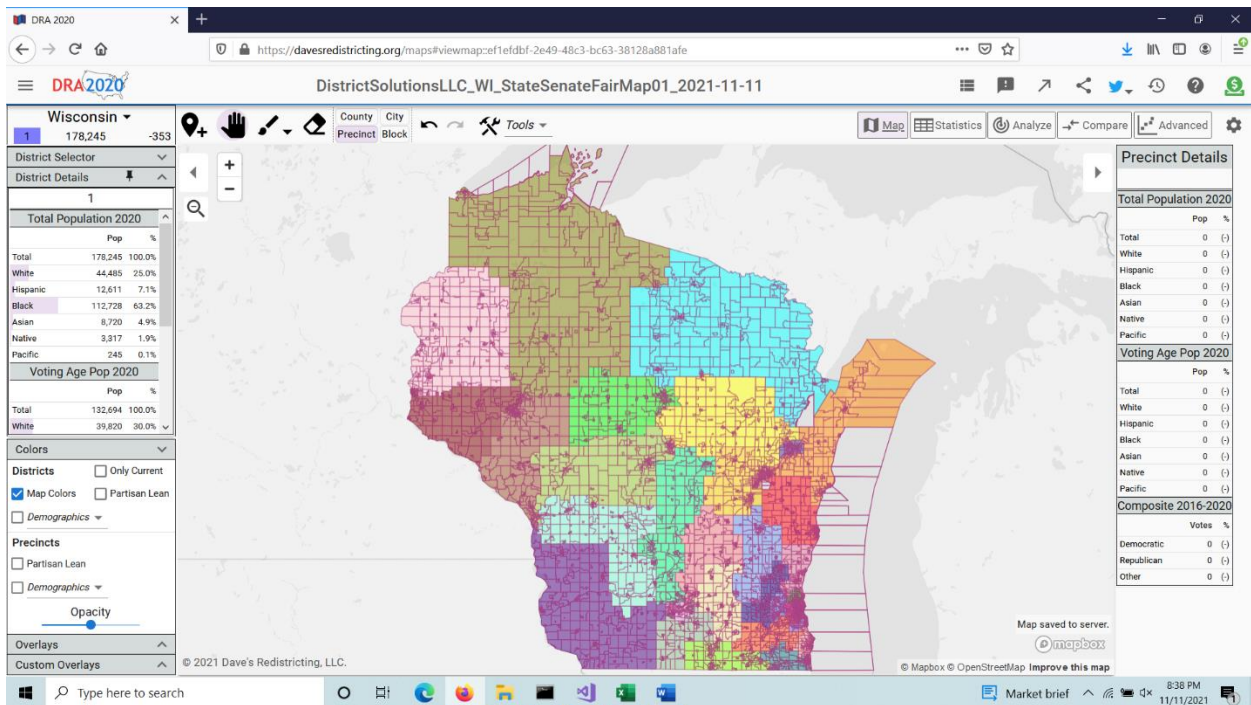


Nov. 11, 2021

District Solutions LLC

Wisconsin State Senate Fair Map #01

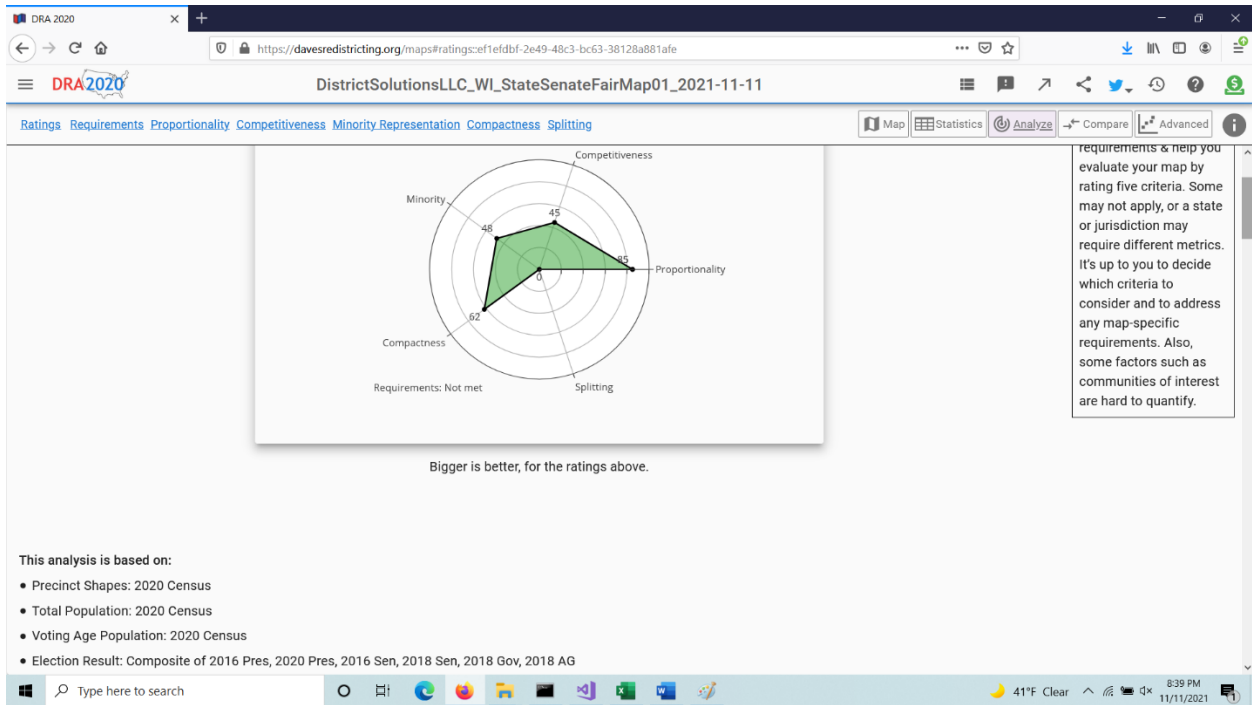
(Dave's Redistricting Evaluation)



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For more information, visit www.districtsolutions.net.

Dr. Matt Petering, owner of District Solutions LLC, can be contacted at matt.petering@districtsolutions.net.



Requirements

Redistricting maps must typically satisfy four constraints.

Check	Description
• Complete	✓ All precincts are assigned to districts
• Contiguous	✗ All precincts in districts are connected
• Free of holes	✓ No districts are embedded in others
• Equal population	✓ Districts have roughly equal populations

Rating

- This map may not meet basic requirements.

Notes

- Districts 2, 7, 11, 13, 14, 15, 17, 19, 21, 22, 29, and 31 may not be contiguous. The shapes for WI are not fully connected, due to split jurisdictions.
- The 1.61% population deviation is within the 10% threshold tolerated by the courts.
- For more information on redistricting in Wisconsin, see Brennan Center for Justice: [Wisconsin Guide to Redistricting](#), Princeton Gerrymandering Project: [Wisconsin Redistricting Reform](#), and Ballotpedia: [Redistricting in Wisconsin](#).

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DRA 2020

https://davesredistricting.org/maps#ratings:ef1efd9f-2e49-48c3-bc63-38128a881afe

DistrictSolutionsLLC_WI_StateSenateFairMap01_2021-11-11

Ratings Requirements Proportionality Competitiveness Minority Representation Compactness Splitting

Map Statistics Analyze Compare Advanced

Proportionality

All else equal, prefer maps that are more proportional.

Metric	Description
Disproportionality	2.92% The deviation from the number of whole seats closest to proportional. Smaller is better. By convention, positive values of bias metrics favor Republicans & negative values favor Democrats.

Rating

Notes

- The average map-wide Democratic two-party vote share is 50.67%, the Republican 49.33%.
- The number of Democratic seats closest to proportional is 17. The likely number of Democratic seats is 16.04. The likely number of unexpected Democratic seats (won) lost is 0.96.
- In contrast, experts would judge partisan bias to be 54 of 100. See [How to Rate Partisan Bias](#) for details.

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DistrictSolutionsLLC_WI_StateSenateFairMap01_2021-11-11

Ratings Requirements Proportionality Competitiveness Minority Representation Compactness Splitting

Map Statistics Analyze Compare Advanced

Competitiveness

All else equal, prefer maps that are more competitive.

Metric	Description
Competitiveness	33.68% The percentage of competitive districts. Bigger is better.

Rating

Notes

- Unlike the partisan lean note in district Statistics that simply counts the number of districts in the 45-55% range, this competitiveness metric uses a probability distribution with the tails approaching zero at 40% and 60%. Hence, an ideally competitive set of districts has a ~75% competitiveness.

Minority Representation

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DistrictSolutionsLLC_WI_StateSenateFairMap01_2021-11-11

Ratings Requirements Proportionality Competitiveness Minority Representation Compactness Splitting

Map Statistics Analyze Compare Advanced

Minority Representation

All else equal, prefer maps that give minorities more opportunities to elect representatives.

District VAP %	Potential Opportunity Districts (based on map)				
	Minority Hispanic	Black	Asian	Native	Pacific
35% ≤ VAP < 40%	0	0	0	0	0
40% ≤ VAP < 45%	0	1	0	0	0
45% ≤ VAP < 50%	0	0	0	0	0
50% ≤ VAP < 55%	0	0	1	0	0
55% ≤ VAP < 60%	1	0	1	0	0
60% ≤ VAP < 100%	2	0	0	0	0

	Proportional Seats (based on total VAP %)					
	Minority Hispanic	Black	Asian	Native	Pacific	
Total VAP %	18.17%	6.16%	6.42%	3.18%	2.16%	0.11%
Proportional Seats	6	2	2	1	1	0

Rating

Very Bad Bad OK Good Very Good

DRA 2020

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DistrictSolutionsLLC_WI_StateSenateFairMap01_2021-11-11

Ratings Requirements Proportionality Competitiveness Minority Representation Compactness Splitting

Map Statistics Analyze Compare Advanced

Compactness

All else equal, prefer maps with districts that are more compact.

Metric	Description
• Reock	0.4246 Measures how dispersed district shapes are. Bigger is better.
• Polsby-Popper	0.3117 Measures how indented district shapes are. Bigger is better.

Rating

Very Bad Bad OK Good Very Good

Notes

- In contrast, using a common "know it when you see it" understanding of compactness (KIWYSI), people intuitively judge the compactness of these districts to be 55 of 100. See [How to Measure Legislative District Compactness If You Only Know it When You See It](#) for details.
- Compact districts aren't always fair. To the extent that a state's political geography has a significant urban-rural political divide, maps with more compact districts tend to be less proportional, and maps that are more proportional tend to have less compact districts.

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DistrictSolutionsLLC_WI_StateSenateFairMap01_2021-11-11

Ratings Requirements Proportionality Competitiveness Minority Representation Compactness Splitting

Map Statistics Analyze Compare Advanced

Splitting

All else equal, prefer maps that split counties across districts the least.

Metric	Description
County splitting	1.73 Measures how much single counties are split across multiple districts. Smaller is better.
District splitting	1.84 Measures how much single districts are split across multiple counties. Smaller is better.

Rating

Notes

- Given 33 districts, you might need to split counties 32 times for district populations to be 'roughly' equal.
- In this map, 50 counties are split a total of 93 times: Adams (2), Brown (2), Buffalo (1), Burnett (1), Calumet (1), Chippewa (3), Clark (3), Columbia (2), Dane (6), Dodge (2), Dunn (1), Eau Claire (1), Fond du Lac (2), Green (1), Green Lake (1), Iowa (1), Jackson (1), Jefferson (3), Juneau (2), Kenosha (1), La Crosse (3), Langlade (1), Manitowoc (1), Marathon (2), Marquette (1), Milwaukee (7), Monroe (1), Oconto (1), Oneida (1), Outagamie (4), Ozaukee (1), Portage (2), Racine (2), Richland (1), Rock (2), Sauk (1), Sheboygan (1), St. Croix (1), Taylor (1), Trempealeau (1), Vernon (1), Vilas (1), Walworth (3), Washburn (1), Washington (2), Waukesha (6), Waupaca (2), Waushara (1), Winnebago (2), and Wood (2).
- Six counties -- Racine, Waukesha, Brown, Dane, Milwaukee, and Outagamie -- may have to be split, because they have more people than a district. The resulting splits could yield 13 single-county districts. There are six.
- Altogether, these splits affect 68.66% of people in the state.

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DistrictSolutionsLLC_WI_StateSenateFairMap01_2021-11-11

Rank-Votes Graph Seats-Votes Curve Bias Responsiveness Demographic Voting Compactness Community Splitting

Map Statistics Analyze Compare Advanced

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Bias Measures

These are some prominent measures of partisan bias.

Metric	Description
Seats bias	3.85% Half the difference in seats at 50% vote share
Votes bias	1.06% The excess votes required for half the seats
Declination	6.91° A geometric measure of packing & cracking
Global symmetry	2.23% The overall symmetry of the seats-votes curve
Gamma	3.84% The fair difference in seats at the map-wide vote share
Efficiency gap	2.75% The relative two-party difference in wasted votes
Partisan bias	3.88% The difference in seats between the map-wide vote share and the symmetrical counterfactual share
Proportional	2.08% The simple deviation from proportionality using fractional seat shares
Mean--median	0.99% The average vote share across all districts minus the median vote share
Turnout bias	-0.52% The difference between the map-wide vote share and the average district share
Lopsided outcomes	2.93% The relative two-party difference in excess vote shares

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DistrictSolutionsLLC_WI_StateSenateFairMap01_2021-11-11

Rank-Votes Graph Seats-Votes Curve Bias Responsiveness Demographic Voting Compactness Community Splitting

Map Statistics Analyze Compare Advanced

- Efficiency gap 2.75% The relative two-party difference in wasted votes
- Partisan bias 3.88% The difference in seats between the map-wide vote share and the symmetrical counterfactual share
- Proportional 2.08% The simple deviation from proportionality using fractional seat shares
- Mean-median 0.99% The average vote share across all districts minus the median vote share
- Turnout bias -0.52% The difference between the map-wide vote share and the average district share
- Lopsided outcomes 2.93% The relative two-party difference in excess vote shares
- Proportional seats 16.72 The fractional Democratic seats for the map-wide vote share
- Geographic seats 14.25 The fractional Democratic seats implied by county political geography
- Geographic bias 7.48% The bias due to county political geography
- Map seats 16.04 The fractional Democratic seats for the map
- Boundary bias -5.40% The bias due to district lines

Notes

- By convention, positive values of bias metrics favor Republicans & negative values favor Democrats.
- Use [PlanScore](#) to further assess the degree to which a map is gerrymandered. [PLANSORE](#)

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DRA 2020

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DistrictSolutionsLLC_WI_StateSenateFairMap01_2021-11-11

Map Statistics Analyze Compare Advanced

ID	Total	+/-			Dem	Rep	Oth	Total	White	Minority	Hispanic	Black	Asian	Native	Pacific
23	179,582	0.55%	✓	✓	49.63%	47.53%	2.84%	139,963	91.87%	8.13%	3.15%	1.47%	1.25%	1.62%	0.10%
24	178,978	0.21%	✓	✓	54.78%	42.43%	2.78%	139,905	91.67%	8.33%	2.76%	1.90%	1.88%	1.23%	0.08%
25	179,515	0.51%	✓	✓	45.55%	52.11%	2.34%	141,620	87.21%	12.79%	3.14%	4.30%	3.55%	1.09%	0.11%
26	179,257	0.37%	✓	✓	28.75%	69.17%	2.08%	140,222	93.08%	6.92%	2.73%	0.95%	1.39%	1.22%	0.08%
27	178,357	-0.13%	✓	✓	53.47%	44.23%	2.30%	141,257	88.71%	11.29%	4.11%	2.90%	1.85%	1.81%	0.10%
28	178,601	0.00%	✓	✓	79.21%	18.50%	2.29%	145,963	71.68%	28.32%	8.13%	6.97%	11.65%	1.56%	0.11%
29	177,373	-0.69%	⊗	✓	67.25%	30.35%	2.40%	137,742	86.74%	13.26%	4.75%	3.88%	2.66%	1.46%	0.13%
30	179,108	0.29%	✓	✓	63.94%	33.53%	2.53%	146,807	82.70%	17.30%	5.01%	5.24%	5.15%	1.59%	0.13%
31	178,928	0.18%	⊗	✓	54.17%	43.15%	2.68%	140,414	86.07%	13.93%	6.42%	3.09%	2.34%	1.54%	0.11%
32	179,962	0.76%	✓	✓	32.52%	65.31%	2.18%	142,336	91.10%	8.90%	3.67%	1.07%	2.17%	1.35%	0.07%
33	178,434	-0.09%	✓	✓	37.40%	60.23%	2.37%	139,766	84.14%	15.86%	6.25%	2.62%	5.25%	1.25%	0.10%
178,598	1.61%	⊗	✓	49.34%	48.03%	2.62%	139,767	81.83%	18.17%	6.16%	6.42%	3.18%	2.16%	0.11%	

Notes

- Districts 2, 7, 11, 13, 14, 15, 17, 19, 21, 22, 29, and 31 may not be contiguous. The shapes for WI are not fully connected, due to split jurisdictions.
- The 1.61% population deviation is within the 10% threshold tolerated by the courts.
- Eleven districts lean Republican, nine lean Democratic, and 13 fall in the 45-55% competitive range.
- There are three majority-minority districts.

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