EXHIBIT 1

January 5, 2024 Rebuttal Expert Report
of Dr. Oskooii

Rebuttal Expert Report Submitted on Behalf of Plaintiffs

in *Soto Palmer, et al. v. Hobbs, et al.*

Kassra AR Oskooii, Ph.D.

University of Delaware

January 5, 2024

I. Background and Qualifications

1. I, Kassra AR Oskooii, am over 18 years of age and am competent to testify.

2. My background and qualifications are set forth in my expert report dated and submitted on December 1, 2023.

3. I have reviewed the report of Dr. Sean Trende and now offer this rebuttal.

II. Executive Summary

4. There are fundamental problems with Dr. Trende's report and analysis.

5. First, Dr. Trende draws incorrect conclusions about the Remedial Maps, including the remedial district Legislative District 14 ("LD 14"), because he does not consider Washington's redistricting criteria. In fact, at no point throughout his lengthy report does he discuss what principles mapmakers must follow in the State of Washington.

6. Second, Dr. Trende's claims about the nature and magnitude of changes to surrounding districts are misleading and, at times, wholly inaccurate. His characterization of changes to surrounding districts, which were necessary to draw a remedial district while respecting Washington's and traditional redistricting criteria, disregards the realities of redistricting, especially in sparsely populated areas.

7. Third, Dr. Trende's own visuals and data belie his suggestion that LD 14 across the remedial plans was drawn to achieve a particular racial target. In fact, I did not consider any racial demographic or political data in drawing the Remedial Maps. Instead, I drew a district that unites the communities in East Yakima, the Lower Yakima Valley, and Pasco that the court identified as forming a community of interest, while respecting other redistricting criteria.

8. Fourth, Dr. Trende's suggestion that the Remedial Maps make changes to surrounding districts that favor Republicans more than Democrats is simply incorrect. Again, I did not consider any partisan or electoral data in drawing these maps. And, Dr. Trende's own data points show that the incidental changes in partisan composition of the districts surrounding LDs 14 and 15 were very slight and not substantial enough to change the partisan performance of those districts. Prevailing measures of partisan bias (the efficiency gap and declination scores) further confirm that the Remedial Maps do not meaningfully shift the partisan balance as compared to the Enacted Plan. The fact that the boundaries of more Republican performing districts were impacted than Democratic performing districts in the Remedial Maps is simply a function of geography: the region where the VRA violation occurred happens to have many more Republican districts than Democratic districts. Naturally, then, the boundaries of Republican districts will be impacted as a consequence of remedying the violation in that region. However, any alterations to the surrounding districts did not substantively diminish Republican performance in those districts.

9. Fifth, I have provided five new Remedial Maps 1A-5A that address, to the extent possible, the incumbent displacements in Remedial Maps 1-5 identified by Dr. Trende and Mr. Pharris at the Secretary of State's office.

10. Finally, Intervenors claim that LD 14 in Remedial Maps 3 and 4 exclude some Yakama Nation off-Reservation trust land but provide no data or boundary files to support their claim. I have verified that based on tribal land boundaries provided by the U.S. Census

and available on Dave's Redistricting App,[1] LD 14 in Maps 3 and 4 include the Yakama Nation's off-Reservation trust land.

III. Dr. Trende's Analysis Lacks a Serious Consideration of Washington's Redistricting Criteria

11. In evaluating the Remedial Maps, Dr. Trende's report does not address the extent to which districts follow the boundaries of political subdivisions and communities of interest, avoid splitting counties, municipalities, and precincts, and are comprised of traversable territory in light of natural boundaries, waterways, and islands in Washington State.

12. As I emphasized in my report, and which Dr. Trende's report overlooks, my decisions were guided by Washington State's redistricting criteria, including that districts shall have a population as nearly equal as is practicable and should, insofar as practical: follow boundaries of political subdivisions and communities of interest; minimize the number of county, municipality, and precinct splits; and be drawn with convenient, contiguous, and compact territory.

13. In accordance with Washington's requirement that no district be drawn purposely to favor or discriminate against any political party or group, I did **not** consider, view, or otherwise consult any racial/ethnic demographic data, election results, or any partisan metrics while drawing districts. To the extent practicable and based solely on publicly available data, I also considered limiting the pairing of incumbents.

14. In general, I also tried to minimize changes to other districts in the Enacted Plan, but with a recognition that altering other districts is an unavoidable byproduct of remedying

[1] For more details, see here: https://medium.com/dra-2020/tribal-lands-on-daves-redistricting-d3dbbc7ed840.

the violation of federal law. Thus, while some comparison to the Enacted Plan can provide context, overly focusing on it as Dr. Trende does is misplaced.

IV. The Remedial Maps Minimize Changes to Surrounding Districts and Such Changes Are a Natural Consequence of Complying with Redistricting Criteria

15. Dr. Trende makes false claims about the extent of changes to district boundaries across the state. For example, on page 9 of his report he writes: "Finally, the changes take place over much of the state, with blocks being shifted in 28 of the state's 39 counties, including several in western Washington." Similar unsubstantiated claims are made on pages 14, 45, and 49. First, *precincts* are the building blocks of the changes I implemented, with blocks only being selected in rare cases of having to split precincts. Second, various maps in Dr. Trende's report, such as Figures 3, 6, 21, 24, and 31, which aim to highlight affected areas of the state, directly contradict his assertions regarding the number of counties impacted. Third, as Mr. Nicholas Pharris of the Secretary of State's office correctly points out, the Remedial Maps affected anywhere between 3 to 13 (nowhere near 28) counties depending on the map in question (see paragraph 7, page 2 of Nicholas Pharris Declaration), which were the byproduct of abiding by and balancing traditional redistricting criteria.

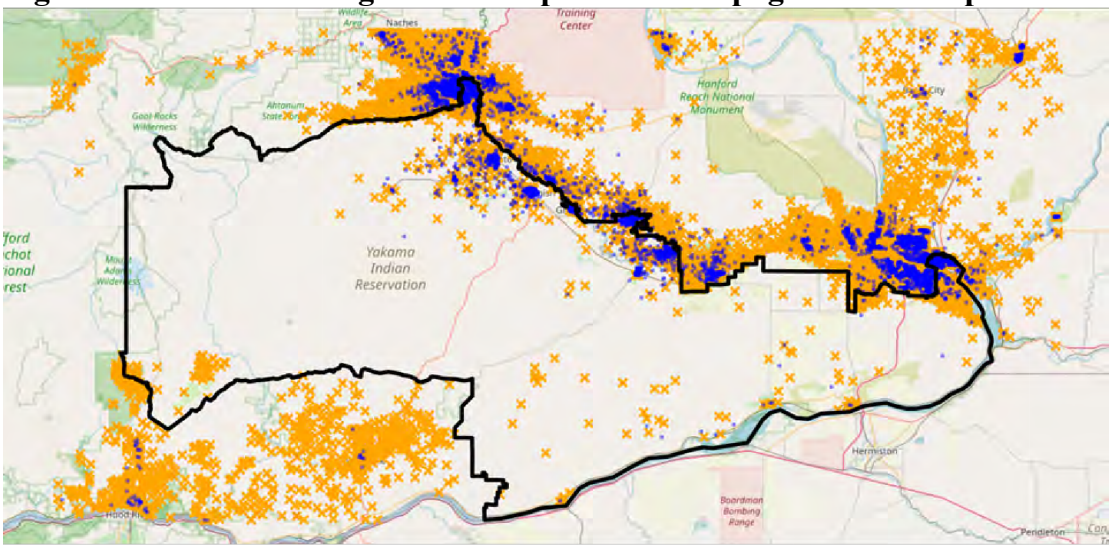
16. Furthermore, Dr. Trende describes the changes made to the districts surrounding the remedial district (LD 14) as if they are somehow unexpected or inconsistent with the realities of redistricting.

17. It is well understood that altering the boundary of one district will inevitably impact surrounding districts due to the necessity of maintaining equal population distribution. This is particularly true in regions, like Central and Eastern Washington, which contain wide swathes of sparsely populated land. Even counties that have a population size that

exceeds the ideal population of a legislative district (157,251), have large unpopulated areas.

18. This principle is perhaps best illustrated by Dr. Trende's own visuals, such as his Figure 12 on page 32, pasted below. As can be seen, many areas within Yakima County, which has an adjusted population of 257,518, are, as Dr. Trende put it, "largely uninhabited."

Figure 1: Dr. Trende's Figure 12 as represented on page 32 of his report



19. Furthermore, many counties in Central and Eastern Washington have an adjusted population (2020 U.S. Census) that is far below the target population of a single legislative district, while others are vastly overpopulated, as illustrated in Table 1.

Table 1: 2020 US Census Adjusted Population of Counties (compared to ideal legislative district population of 157,251)

County	Adjusted Population
Garfield	2,288
Columbia	3,964
Skamania	12,050
Adams	20,638
Asotin	22,357
Klickitat	22,789
Douglas	43,002
Kittitas	44,393
Whitman	47,991
Walla Walla	60,706
Chelan	79,229
Lewis	82,337
Franklin	94,918
Grant	99,342
Cowlitz	111,152
Benton	207,278
Yakima	257,518
Clark	503,829
Spokane	538,615
Pierce	922,415
King	2,272,501

20. As such, redrawing legislative maps to equalize district populations is not a simple process. When one district boundary is altered, that district either gains or loses population, which directly impacts adjacent districts, which will also either gain or lose population. This in turn will cause ripple effects throughout the map, which naturally lowers the overall core retention of the comparison plan.

21. None of this is acknowledged or considered by Dr. Trende. However, mapmakers and political scientists with expertise in this subject matter know very well that even small changes to existing district boundaries can cause many changes throughout the map. Political scientist and redistricting expert Dr. Kenneth Mayer described it elegantly:

> Redrawing a statewide legislative map to equalize populations is not a straightforward process. When an existing district is underpopulated, map drawers must add populations from surrounding districts. Unless adjacent districts are overpopulated by the same amount, the process requires surrounding districts to expand outward as well. If the surrounding districts are also underpopulated, they become even more so after part of their populations are moved to the first district, and they must be modified to bring in population from other districts, and so on. As a rule, these changes propagate outward (analogous to a ripple spreading out when a rock is tossed into a lake) until an underpopulated region can be balanced with an overpopulated region or the effects dampen as population effects are spread out among more and more districts.
>
> These changes can have large effects that propagate throughout a map, particularly if map drawers are taking other factors into account, such as keeping municipalities together or drawing compact districts.
>
> "Ripple" effects from changes can be severe. Even a small shift in one district can result in the need for dramatic changes in other districts if there are strict population constraints (as there are for congressional districting) or if other constraints are in place such as preserving municipal and county boundaries, or avoiding vote dilution issues (Miller and Grofman 2018, 29).
>
> - *Johnson, et al., v. WEC, et al.*, No. 2021AP1450-OA (Wis. Dec. 15, 2021), Appendix to Merits Brief of Intervenor-Petitioners at 121 (Expert Report of Dr. Kenneth R. Mayer).

22. A mapmaker not only needs to pay critical attention to population disparities across the districts, but, where feasible, also avoid splitting municipalities, communities of interest, and precincts, and address issues of road connectivity to ensure that constituents and representatives can traverse from one side of the district to the other. This process becomes particularly challenging in areas where municipalities are irregularly shaped or when precincts are large and oddly shaped, as is often the case in areas near the Cascades and throughout Central and Eastern Washington. These factors will expectedly require boundary changes that extend beyond the borders of LD 14.

23. Additionally, Dr. Trende's tables showing the number of people "moved" between districts (on pages 9, 14, 45, and 49) are misleading, inaccurate, and use inappropriate metrics to assess core population retention.

24. Dr. Trende's method is flawed in part because he reports absolute numbers, which fail to account for the magnitude of population shifts as a percent of the total population of each district (approx. 157,251). While some of the districts surrounding LD 14 must, of course, be reworked to accommodate drawing a new LD 14 that remedies the VRA violation, the core retention metrics I present below show that the Remedial Maps, as a whole, retained the population of districts in the Enacted Plan at very high rates.

25. In addition, Dr. Trende's account of people "moved" between districts misunderstands the purpose of assessing core retention, which is to see the extent to which populations in a district in the Enacted Plan were kept together in *a* district, regardless of whether that district's label number has changed. Dr. Trende's reported "movements" of people between LD 14 and 15 misses this point and fails to account for the fact that LD 14 and 15 were relabeled in the Remedial Maps. For example, he reports that in Remedial Map 1, 97,346 people from Enacted LD 15 (who comprised 60% of that district) were "moved" to Remedial LD 14 (in which they still comprise 62% of the district). This means that Remedial LD 14 in Map 1 largely *retains* the core of Enacted District 15, and the reported "movement" of population was simply the result of renumbering the district.

26. Table 2 presents core population retention scores for each Remedial Map, which is reported as the percentage of a pre-existing (e.g., enacted) district's population that is kept intact in a new district (e.g. remedial).

Table 2: Core Population Retention Percentages, Remedial Maps 1-5

District	Remedial Map 1	Remedial Map 2	Remedial Map 3	Remedial Map 4	Remedial Map 5
1	100.0%	100.0%	100.0%	100.0%	100.0%
2	86.6%	86.6%	90.1%	90.1%	100.0%
3	100.0%	100.0%	100.0%	100.0%	100.0%
4	100.0%	100.0%	100.0%	100.0%	100.0%
5	86.7%	100.0%	90.1%	100.0%	100.0%
6	100.0%	100.0%	100.0%	100.0%	100.0%
7	86.7%	100.0%	90.1%	100.0%	100.0%
8	61.9%	61.9%	59.3%	59.3%	100.0%
9	95.2%	98.0%	95.2%	98.0%	100.0%
10	100.0%	100.0%	100.0%	100.0%	100.0%
11	100.0%	100.0%	100.0%	100.0%	100.0%
12	86.8%	100.0%	90.1%	100.0%	100.0%
13	80.5%	86.5%	80.4%	85.1%	90.0%
14	62.2%	62.2%	60.5%	60.5%	51.3%
15	56.5%	56.6%	55.8%	55.9%	51.3%
16	46.5%	39.3%	46.8%	43.4%	86.0%
17	86.5%	86.5%	90.0%	90.0%	100.0%
18	100.0%	100.0%	100.0%	100.0%	100.0%
19	100.0%	100.0%	100.0%	100.0%	100.0%
20	86.5%	86.5%	90.0%	90.0%	100.0%
21	100.0%	100.0%	100.0%	100.0%	100.0%
22	100.0%	100.0%	100.0%	100.0%	100.0%
23	100.0%	100.0%	100.0%	100.0%	100.0%
24	100.0%	100.0%	100.0%	100.0%	100.0%
25	100.0%	100.0%	100.0%	100.0%	100.0%
26	100.0%	100.0%	100.0%	100.0%	100.0%
27	100.0%	100.0%	100.0%	100.0%	100.0%
28	100.0%	100.0%	100.0%	100.0%	100.0%
29	100.0%	100.0%	100.0%	100.0%	100.0%
30	100.0%	100.0%	100.0%	100.0%	100.0%
31	86.6%	86.6%	90.1%	90.1%	100.0%
32	100.0%	100.0%	100.0%	100.0%	100.0%
33	100.0%	100.0%	100.0%	100.0%	100.0%
34	100.0%	100.0%	100.0%	100.0%	100.0%
35	100.0%	100.0%	100.0%	100.0%	100.0%
36	100.0%	100.0%	100.0%	100.0%	100.0%
37	100.0%	100.0%	100.0%	100.0%	100.0%
38	100.0%	100.0%	100.0%	100.0%	100.0%
39	100.0%	100.0%	100.0%	100.0%	100.0%
40	100.0%	100.0%	100.0%	100.0%	100.0%
41	100.0%	100.0%	100.0%	100.0%	100.0%
42	100.0%	100.0%	100.0%	100.0%	100.0%
43	100.0%	100.0%	100.0%	100.0%	100.0%
44	100.0%	100.0%	100.0%	100.0%	100.0%
45	100.0%	100.0%	100.0%	100.0%	100.0%
46	100.0%	100.0%	100.0%	100.0%	100.0%
47	100.0%	100.0%	100.0%	100.0%	100.0%
48	100.0%	100.0%	100.0%	100.0%	100.0%
49	100.0%	100.0%	100.0%	100.0%	100.0%
Plan Average	**94.10%**	**94.9%**	**94.5%**	**95.2%**	**97.5%**

27. Looking first at plan-wide averages, Remedial Maps 1-3 retain more than 94% of the population intact within the Enacted Plan's district boundaries. Stated differently, only up to 6% of the population is impacted by changes that the Remedial Maps necessitated. For Remedial Map 4, the plan-wide core retention score is 95.2%, and for Remedial Map 5, it is 97.5%.

28. As previously described, the creation of a remedial district will naturally have a greater impact on the immediately adjacent districts. This is particularly the case in the subject jurisdiction since the surrounding areas include many sparsely populated regions and geographic features. Not surprisingly, then, LDs 14, 15, 8, and 16 generally retain less people than other impacted districts farther away from remedial LD 14, such as LDs 5, 7, 9, 12, 17, 20, and 31. This "ripple" effect is because changes to pre-existing district boundaries generally decrease as one moves farther away and outward from the remedial LD 14, thereby increasing the core retention of the aforementioned districts.

29. Thus, the ultimately necessary boundary changes beyond the remedial district itself are simply a natural consequence of balancing Washington's redistricting criteria and other traditional redistricting criteria.

30. Also, because balancing redistricting criteria presents inherent tradeoffs, I offered the Court multiple configurations of remedial LD 14 and surrounding districts, each reflecting a different and reasonable way of balancing redistricting criteria. As a result, some proposed Remedial Maps required different changes to surrounding districts than others. For example, in Remedial Maps 2 and 4, LD 13 crosses the Cascades, but in Remedial Maps 1, 3, and 5, it does not.

V. Districts in the Remedial Maps are Reasonably Compact

31. Dr. Trende does not dispute that the compactness of every Remedial Map is nearly identical to the compactness of the Enacted Plan. And he does not dispute my conclusion that the Remedial Maps are reasonably compact, especially in light of the often irregular physical and political subdivision boundaries in Washington State.

32. Dr. Trende instead focuses on individual district compactness scores. He notes that some districts that were altered in the Remedial Maps perform worse on compactness scores while others perform better. He does not dispute that, with the exception of LD 16 in Remedial Map 5,[2] districts in the Remedial Maps are all within the range of individual-district compactness scores in the Enacted Plan

33. Individual district compactness scores can be misleading because a single district's compactness score depends on the shape of whatever underlying features the district's boundaries follow. In Washington, district boundaries must account for irregular geographic features like mountains, roads, and waterways and must follow irregular boundaries of counties, municipalities, and precincts to the extent possible. Precincts are often large and strangely shaped, especially in sparsely populated areas. Following these subdivision boundaries, as I took great care to do, will reduce an individual district's compactness score in some areas.

34. As indicated by his discussion of LD 49 on page 18, Dr. Trende seems to agree that when a district's "shape is largely dictated by" the irregular shape of other political subdivision

[2] Although LD 16 has a new shape in Remedial Map 5, it still retains 86% of the population in Enacted Plan's LD 16, as shown in Table 2 above.

boundaries (a county in the case of LD 49), it is "unsurprising" that the district will have numerically lower compactness scores.

35. Dr. Trende's report does contain one notable inaccuracy with respect to individual compactness scores. He states on pages 18-19 of his report that Remedial Maps 1 and 2 make LD 49 less compact but this is incorrect as LD 49 was not changed in any Remedial Map.

VI. The Proposed Remedial Districts Do Not "Stitch Together Far-Flung Hispanic Populations"

36. Dr. Trende incorrectly claims that the Remedial districts in Remedial Maps 1-4 "stitch[] together district clusters of minority groups to achieve [a] 50% + 1 threshold."

37. As I have stated, I did not view any racial demographic data while drawing the Remedial Maps and did not draw any district to achieve any particular numerical target with respect to race. The various HCVAP figures Dr. Trende reports for each remedial district (LD 14) confirm this.

38. What appears to Dr. Trende as the "stich[ing] together [of] far-flung Hispanic populations" is simply the unification of population centers from East Yakima to Pasco that form a community of interest identified by the Court, including cities in the Lower Yakima Valley that I kept whole in the Remedial Maps.

39. Likewise, what appear to Dr. Trende as "appendages" that apparently "wrap into heavily Hispanic and Democratic areas," are in reality the natural effect of keeping municipalities along the Yakima Valley region whole, while also meeting all the other applicable redistricting criteria such as the equal population requirement and ensuring that districts are contiguous and can be traversed by road.

40. For instance, the boundary lines of LD 14 that connect Yakima and Pasco largely follow highways I-82 and I-182 to connect the two communities and other municipalities in between. These considerations—which Dr. Trende's analysis does not account for—dictate, to a large degree, where lines can be drawn.

41. In addition, Figures 2-4 show that LD 14 lines were drawn to connect communities of interest while following city boundaries (shown in red). The so-called appendages in this area are just oddly shaped city boundaries (e.g., see Sunnyside). These visuals also demonstrate that Wapato, Toppenish, Granger, Sunnyside, Mabton, and Grandview along the Yakima Valley were consistently kept whole across all five Remedial Maps. Only Yakima and Pasco were split, as is also the case in the Enacted Map.[3]

[3] I updated all the interactive, html maps submitted with my initial report and included city limit boundaries downloaded from the Washington State's Geospatial Open Data Portal (https://geo.wa.gov/datasets/WSDOT::wsdot-city-limits/explore). These updated interactive maps are submitted along with my response report.

Figure 2: Remedial Map 1 & 2 LD14 Boundaries Respecting COI City Boundaries Along Yakima Valley

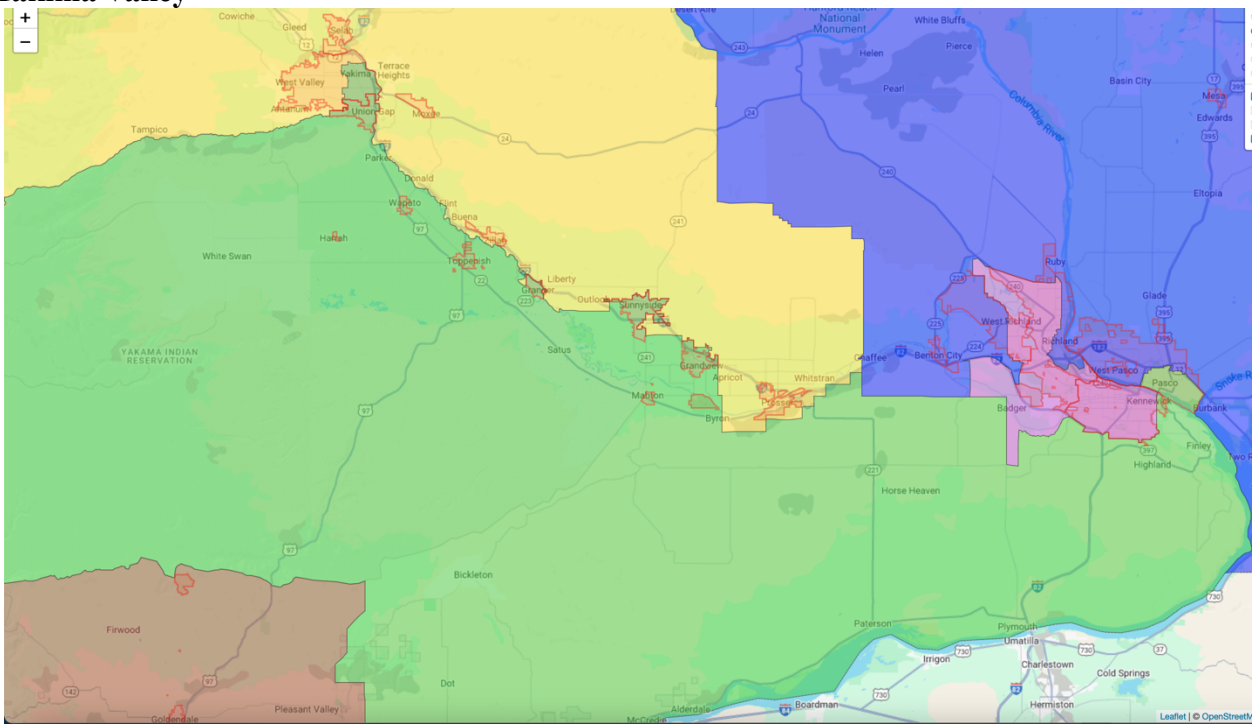


Figure 3: Remedial Map 3 & 4 LD14 Boundaries Respecting COI City Boundaries Along Yakima Valley

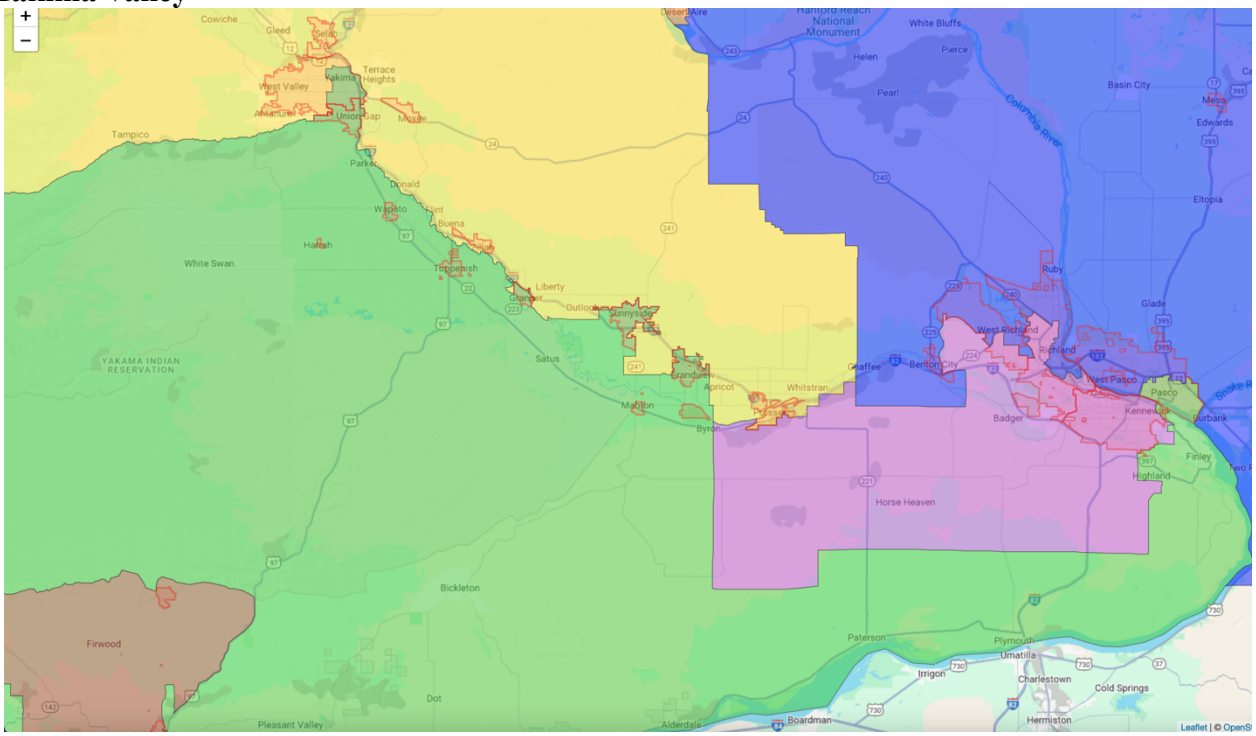
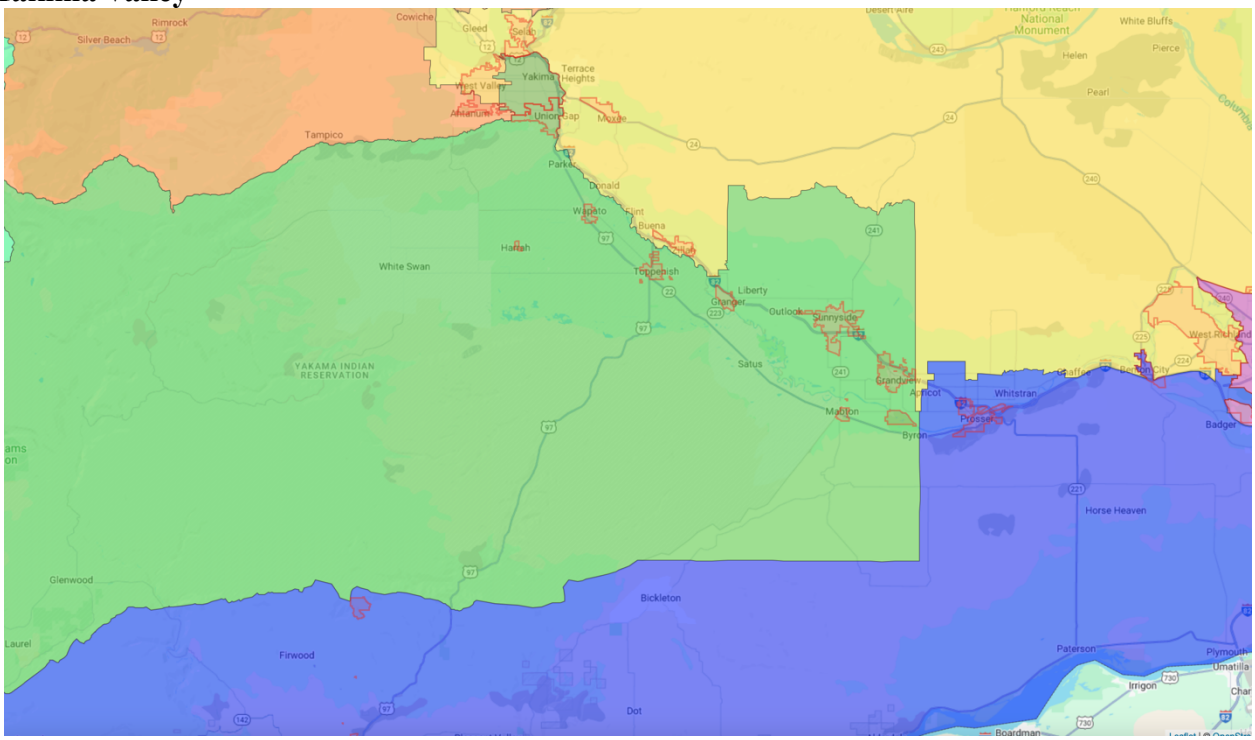


Figure 4: Remedial Map 5 LD14 Boundaries Respecting COI City Boundaries Along Yakima Valley



42. Finally, Dr. Trende's own visuals undermine the claim that Hispanic areas were carved out while white areas were excluded. For illustrative purposes, I have pasted his first two dot plots below and added red arrows in all the areas in which Hispanic areas (blue dots) were *not* included in LD14 and white areas (orange Xs) *were* included in LD 14. There are over a dozen examples of Hispanic areas being excluded, while white areas were included as a byproduct of uniting communities of interest and respecting other applicable redistricting criteria.

Figure 5: Dr. Trende's Figure 12, Page 32

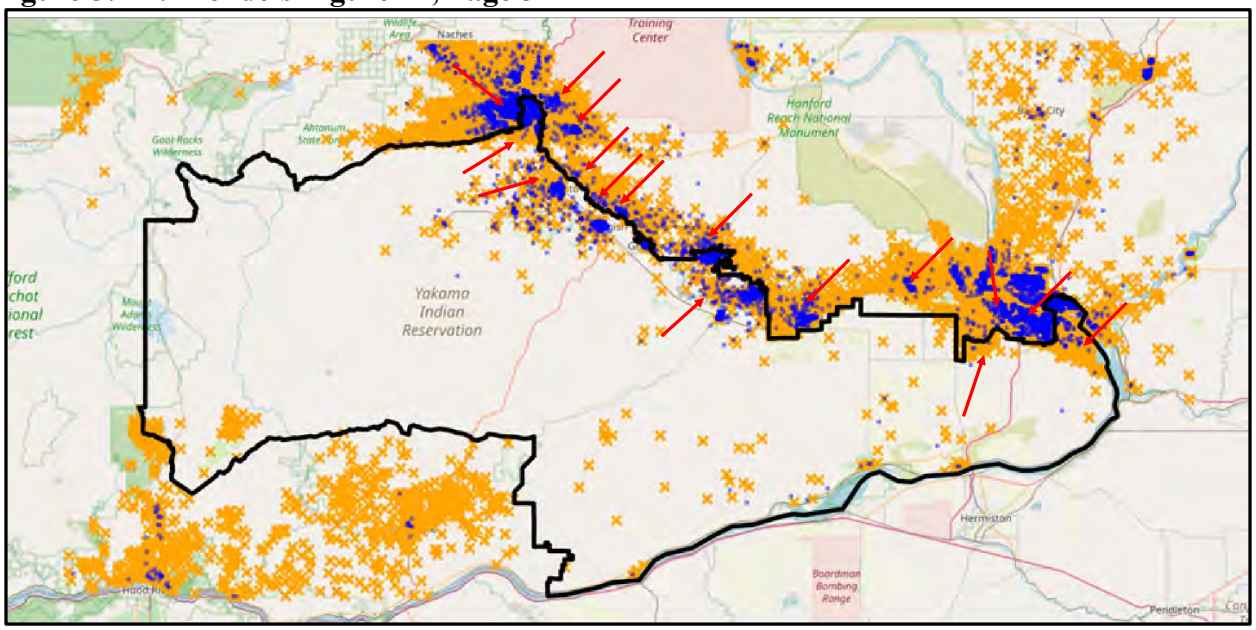
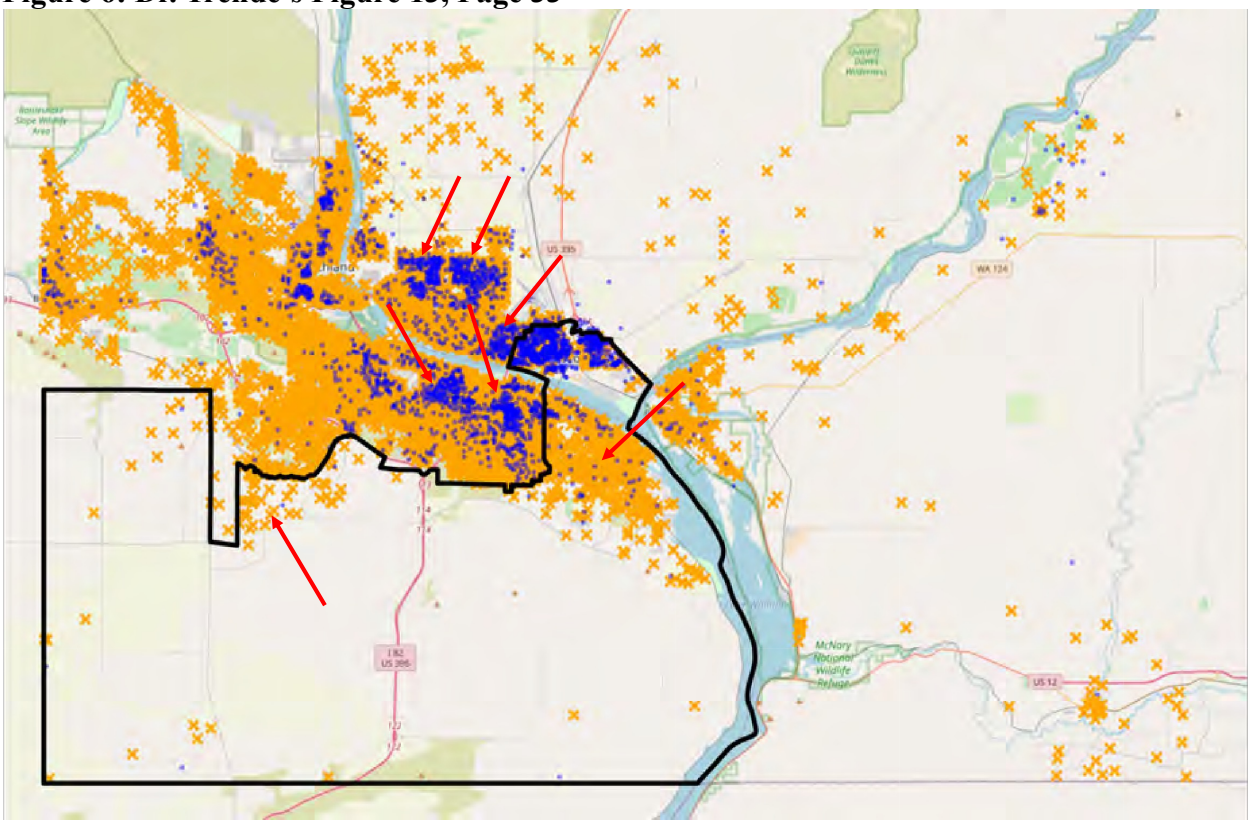


Figure 6: Dr. Trende's Figure 13, Page 33



VII. The Proposed Remedial Plans Were Not Drawn to Favor or Disfavor Any Political Party and Do Not Have That Effect

43. Dr. Trende suggests that changes made to districts beyond LDs 14 and 15 in Remedial Maps 1-4 have "meaningful" political impact. However, the metrics Dr. Trende references show no substantive partisan swing of districts in any district beyond LDs 14 and 15. Common metrics of partisan bias, which Dr. Trende does not consider, also confirm that Remedial Maps do not meaningfully shift the partisan balance as compared to the Enacted Plan.

44. First, it is important to note that Washington law forbids drawing redistricting plans "purposely to favor or discriminate against any political party." RCW 44.05.090. For this reason, I did not consider any partisan or election data while drawing the proposed Remedial Maps. Any changes to the partisan makeup of districts are incidental to following the redistricting criteria set out in Washington law and traditional redistricting criteria.

45. Second, upon reviewing the metrics used by Dr. Trende, I find that none of the districts in the Remedial Maps, aside from LD 14 and 15, exhibit any meaningful change in partisan performance, and the changes to the district boundaries do not substantively advantage or disadvantage either party.

46. This is apparent, for example, from the composite election results and individual election results Dr. Trende references in his tables on pages 33, 37, 55, and 58.

47. In Table 3, I present the 2016-2020 DRA composite vote share[4] for Republicans and Democrats for the districts other than LDs 14 and 15 in each Remedial Map and the Enacted Plan to evaluate Dr. Trende's claim that the changes to these districts meaningfully changed their partisan performance. I exclude District 49 from the table because it is unclear why Dr. Trende used this district in his analysis when none of the Remedial Maps introduced any changes to its boundaries.

Table 3: Partisan Performance by District and Plan

District	Enacted Map		Remedial Map 1		Remedial Map 2		Remedial Map 3		Remedial Map 4		Remedial Map 5	
	Dem	*Rep*	*Dem*	*Rep*	*Dem*	*Rep*	*Dem*	*Rep*	*Dem*	*Rep*	*Dem*	*Rep*
2	40.62%	57.43%	40.28%	57.76%	40.28%	57.76%	40.79%	57.24%	40.79%	57.24%	40.62%	57.43%
5	56.73%	41.48%	55.71%	42.52%	56.73%	41.48%	55.90%	42.31%	56.73%	41.48%	56.73%	41.48%
7	33.65%	65.30%	34.65%	64.25%	33.65%	65.30%	34.33%	64.57%	33.65%	65.30%	33.65%	65.30%
8	39.79%	58.39%	37.99%	60.16%	37.99%	60.16%	37.31%	60.88%	37.31%	60.88%	39.79%	58.39%
9	40.35%	58.10%	40.94%	57.51%	40.57%	57.88%	40.94%	57.51%	40.57%	57.88%	40.35%	58.10%
12	45.61%	52.82%	47.87%	50.48%	45.61%	52.82%	47.55%	50.83%	45.61%	52.82%	45.61%	52.82%
13	34.96%	63.85%	35.54%	63.32%	35.68%	63.07%	35.67%	63.21%	36.35%	62.42%	34.25%	64.57%
16	38.49%	59.92%	40.10%	58.34%	41.33%	57.15%	40.39%	58.03%	41.22%	57.20%	40.64%	57.95%
17	49.36%	49.08%	50.52%	47.96%	50.52%	47.96%	50.83%	47.63%	50.83%	47.63%	49.36%	49.08%
20	35.17%	63.44%	35.46%	63.22%	35.46%	63.22%	35.12%	63.55%	35.12%	63.55%	35.17%	63.44%
31	44.13%	54.16%	42.57%	55.70%	43.98%	54.24%	42.74%	55.54%	43.43%	54.82%	44.13%	54.16%
# R/D Performing Districts	**1**	**8**	**1**	**8**	**1**	**8**	**1**	**8**	**1**	**8**	**1**	**8**

48. For ease of comparison across the plans, I report all affected districts across the maps even though some districts were not altered in certain Remedial Maps (e.g., Remedial Maps 2, 4, and 5 do not make any changes to the boundaries of the Enacted District 7).

[4] Dr. Trende appears to have made errors in his report in describing which specific elections the 2016-2020 DRA composite score includes. On Page 33 of his report, Dr. Trende claims that the DRA composite includes: "the 2020 and 2016 presidential elections, the 2018 and 2020 senate elections, the 2016 gubernatorial election, and the 2020 attorney general election." That is factually inaccurate because Washington State did not hold a Senatorial election in 2020. The actual 2016-2020 DRA composite score includes the following contests: the 2016 and 2020 Presidential elections, the 2016 and 2018 Senatorial elections, the 2020 Gubernatorial election, and the 2020 election for Attorney General.

49. The colors in the table correspond to how the districts performed using the 2016-2020 DRA composite. A district is considered to perform (also referred to as "lean" or "reliable" in political science) in favor of one party over the other when the difference between the party vote shares of that district is 10% or higher (e.g., 45%-55%). Democratic performing districts are color-coded in blue and Republican performing districts are color-coded in red. Conversely, a district is considered "competitive" or "toss-up" if the difference between the party votes shares of that district is less than 10%, which suggests that the district is more likely than a reliable district to swing back and forth depending on the political currents of the year. This competitive threshold is routinely considered and is also utilized by DRA.

50. Table 3 shows that in the Enacted Plan, one district (LD 5) reliably elects Democratic candidates while eight districts (LDs 2, 7, 8, 9, 13, 16, 20, and 31) reliably elect Republican candidates. The outcome in every one of the Remedial Maps is the same. The slight reduction in Republican vote share across the Remedial Maps has no substantive impact on whether a Republican is likely to carry LDs 2, 7, 8, 9, 13, 16, 20, and 31—Republicans maintain reliable margins in those districts.[5] In fact, the Republican vote shares also marginally increase in some districts, such as LD 8 Remedial Maps 1-4 and LD 31 in Remedial Maps 1 and 3.

[5] On page 33, Dr. Trende writes: "Determining whether a change is electorally meaningful is a tricky endeavor, but in general if a district sees movement in a result within the +/- 10% mark, it is potentially noteworthy." I suspect Dr. Trende made another error in his report because "within" +/-10% suggests that if a district sees a movement of one tenth of a percentage point it would be considered as "potentially noteworthy" per his analysis and interpretation of the results. Political scientists do not consider such minor changes as politically meaningful when determining the partisan makeup of a district.

51. Similarly, the slight reduction in Democratic vote share in LD 5 in Remedial Maps 1 and 3 has no substantive impact on whether a Democrat is likely to prevail by a comfortable margin in that district. On page 36, Dr. Trende appears to suggest, incorrectly, that LD 5 in Remedial Map 1 was "shifted leftward." But as shown in Table 3, the changes made to LD 5 resulted in a slight *decrease* in Democratic performance in both Remedial Maps 1 and 3.

52. LDs 12 and 17 are toss-up districts in the Enacted Plan and both remain so in Remedial Plans 1 and 3, the only plans in which those districts were altered. Dr. Trende's suggestion that these districts should be further altered to restore their precise vote shares in the Enacted Plan has two problems. First, his suggestion to place parts of southeastern Vancouver into LD 49 rather than LD 17 would require altering an additional district that is otherwise untouched in every Remedial Map. More fundamentally, the alterations Dr. Trende suggests amount to partisan gerrymandering, which is expressly prohibited in Washington State, and which I avoided by not utilizing any political data when drawing district lines.

53. Substantively, then, the changes to districts other than LDs 14 and 15 in the Remedial Maps neither advantage nor disadvantage Democrats or Republicans as neither party gains or loses reliable seats in these districts relative to the Enacted Map. And the notion that Republicans are meaningfully affected by changes to these districts compared to the Enacted Plan is plainly incorrect.

54. Third, prevailing measures of partisan bias in redistricting plans confirm that the Remedial Maps do not meaningfully shift the partisan balance as compared to the Enacted Plan.

55. I examine two popular metrics that measure partisan skew to compare the Enacted Plan to the Remedial Maps.

56. The first metric I consider is called the "Efficiency Gap" (EG), which considers inefficient or "wasted" votes to evaluate the extent to which a party's voters are cracked or packed across districts to produce an advantage for one party over another.[6]

57. A positive efficiency gap indicates more Democratic wasted votes (i.e., a pro-Republican bias), while a negative efficiency gap indicates more Republican wasted votes (i.e., a pro-Democratic bias). As a general rule, an EG score closer to zero indicates a fairer map.

58. The second metric I rely on is called "Declination," which considers threshold-related asymmetry in the distribution of votes across districts to evaluate possible partisan gerrymandering. A declination value near 0 is indicative of a fair map, and the greater the declination value, the greater likelihood that the map is a partisan gerrymander. Once again, positive values indicate a pro-Republican tilt, while negative values indicate a pro-Democratic tilt.[7]

59. Table 4 shows the results of EG and Declination scores using the most up-to-date methodology outlined by the publicly available tool PlanScore.[8]

[6] PlanScore, "Efficiency Gap," https://planscore.org/metrics/efficiencygap/.
[7] PlanScore, "Declination," https://planscore.org/metrics/declination/.
[8] PlanScore, "Unified District Model," https://planscore.org/models/data/2022F/.

Table 4: Comparison of Partisan Bias Metrics Across Plans

Plans	*Efficiency Gap*	*Declination*
Enacted Map	3.2% R	0.07 R
Remedial Map 1	2.0% R	0.01 R
Remedial Map 2	2.2% R	0.02 R
Remedial Map 3	2.0% R	0.01 R
Remedial Map 4	2.2% R	0.02 R
Remedial Map 5	2.2% R	0.02 R

60. The EG and Declination scores in Table 4 for the Remedial Maps are slightly closer to 0 but do not meaningfully diverge from the scores for the Enacted Plan. They show that the Remedial Maps are, like the Enacted Plan, close to fair and maintain the very slight Republican bias found in the Enacted Plan. The same is true for the adjusted Remedial Maps 1A-5A (see Part VIII and Appendix Table 4).

VIII. Incumbent Displacement and Adjusted Remedial Maps

61. It is important to note that Washington's redistricting criteria do not include protecting incumbents. For this reason, I attempted to address incumbent-pairing, where possible, only after ensuring the Remedial Maps abided by Washington's redistricting criteria and minimally impacted surrounding districts.

62. As I stated in my initial report, I did this based on the publicly accessible data available to me at that time. It has since become clear, based on the filings from the Secretary of State and the declaration of Mr. Pharris, that some of the addresses I had for incumbents were out of date or inaccurate. Based upon updated address data provided by the Secretary of State, I have made small adjustments that resolve many of the incumbent pairings identified by Mr. Pharris and Dr. Trende while still adhering to Washington's redistricting criteria.

63. Using the updated data provided by the Secretary of State's office, I have drawn five new Remedial Maps (Remedial Maps 1A-5A), each a slight variation on Remedial Maps 1-5, to address, to the extent possible, the incumbent displacements in those maps.

64. Because LDs 14 and 15 must be redrawn substantially to comply with the Court's order, federal law, and Washington redistricting criteria, displacement of incumbents from these districts is to be expected.

65. The displaced incumbents outside LDs 14 and 15 were largely a product of incorrect or out-of-date address data, and I have adjusted the maps to correct for these changes. Any additional incumbent displacements outside of LDs 14 and 15 are the result of very specific mapping considerations, which I explain below.

66. In Map 5A, I was able to make a very minor adjustment to the boundary between LD 13 and LD 15 to resolve Intervenor LD 13 Representative Alex Ybarra's particular concern about being paired with another House incumbent in LD 13.

67. As also indicated in further detail below, I conclude that all five additional Remedial Maps abide by Washington's redistricting criteria and other traditional redistricting criteria. Furthermore, I did not rely on any political, partisan, or racial demographic data while making changes to any district boundaries.

A. Plaintiffs' Remedial Map 1A

68. Figure 7 provides a visual depiction of Remedial Map 1A.

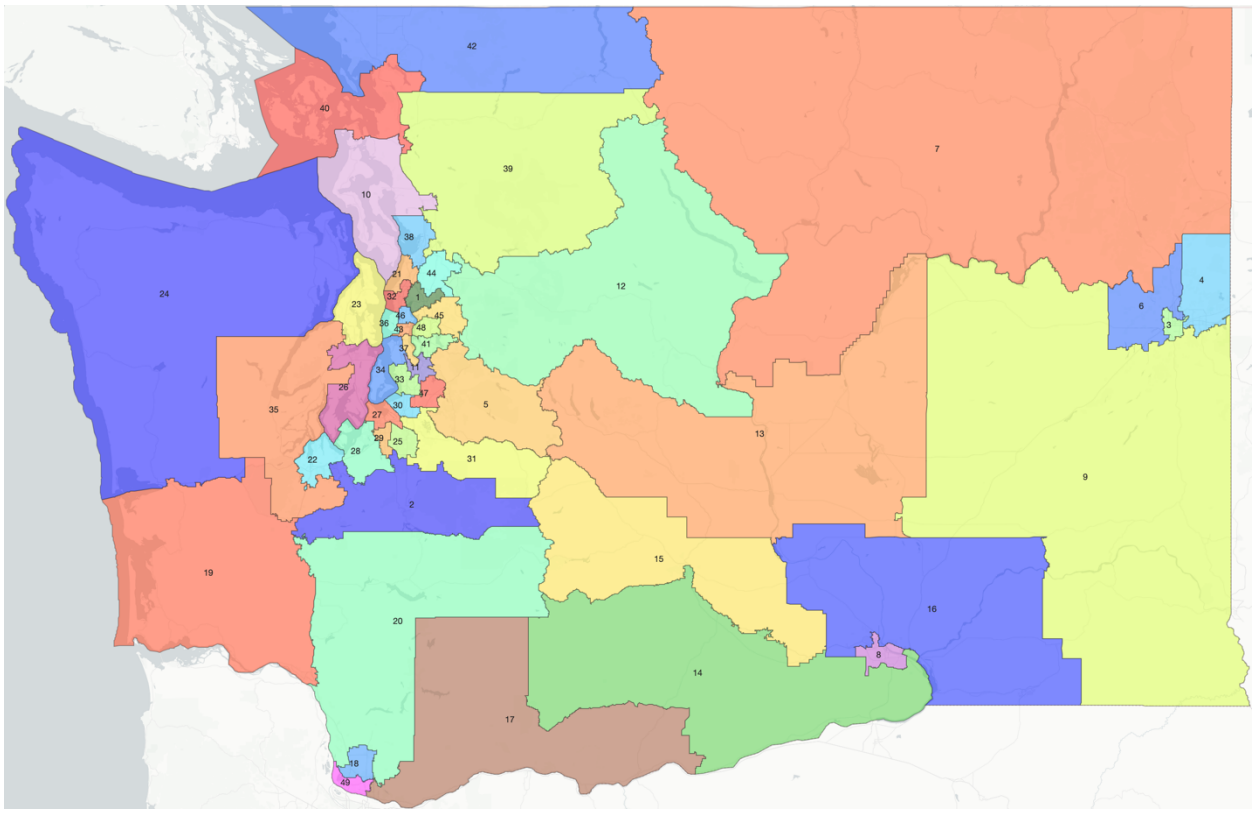


Figure 7: Remedial Map 1A

69. Remedial Map 1A is a variation on Remedial Map 1 that displaces fewer incumbents.

70. Aside from the legislators in enacted LDs 14 and 15, Mr. Pharris and Dr. Trende identified four incumbents displaced in Remedial Map 1: the LD 8 Representative, Position 1, the LD 31 Senator, the LD 31 Representative, Position 1, and the LD 12 Senator.

71. I have adjusted the boundary lines so that the LD 8 Representative, Position 1 now resides in LD 8, and the LD 31 Senator and the LD 31 Representative, Position 1 now reside in LD 31.

72. To accomplish this change, boundary changes were made to LDs 8, 16, 5, and 31. Remedial Map 1A is otherwise identical to Map 1.

73. Remedial Map 1A still keeps the LD 12 Senator in LD 7. The changes necessary for the LD 12 Senator to be in LD 12 are reflected in Remedial Maps 2A and 4A, and in Remedial Map 5A.[9]

74. As noted above, the displacement of any LD 14 and 15 Senators and Representatives were a byproduct of relying on the applicable redistricting criteria to draw Remedial LD 14 that unites the population centers forming a community of interest between East Yakima and Pasco, while keeping the Yakama Nation Reservation whole, along with some off-reservation trust lands and fishing villages.

75. **Appendix Table 1**, located at the end of this document provides total population based on Washington's adjusted 2020 U.S. Census data and the population deviation from the target population (157,251). According to Table 1, Remedial Map 1A has a negligible total population deviation[10] of 0.23%, which is less than the Enacted Plan and well below the 10% population deviation threshold for state legislative plans accepted by courts.

76. **Appendix Table 2** provides the Reock and Polsby-Popper compactness scores for Remedial Map 1A, which are largely on par with the compactness scores for the Enacted Plan.

77. Remedial Map 1A's districts are comprised of convenient, contiguous territory and are traversable.

[9] Upon inspection, it appears that the Redistricting Commission drew part of the boundary between LD 12 and LD 7 in the Enacted Plan solely to protect LD 12's incumbent senator. Indeed, a small part of LD 12 crosses the Columbia River from Chelan County into Douglas County and a small part of East Wenatchee, for no apparent purpose other than keeping the LD 12 senator in that district.

[10] Total population deviation for a redistricting plan is calculated by taking the difference between the population deviation in the least and most populous districts.

78. **Appendix Table 3** provides statistics regarding county splits for Remedial Map 1A, including county-district splits and district-county splits.[11] Remedial Map 1A performs about the same on county split metrics as compared to the Enacted Plan.

79. **Appendix Table 4** provides the district and plan partisan performance composite scores (2016-2020), which were compiled and calculated only after the drawing of Remedial Map 1A was finalized. The results show that neither Democrats nor Republicans were substantively advantaged or disadvantaged by any boundary changes.

80. **Appendix Table 5** provides EG and Declination scores, which show that Remedial Map 1A, like the Enacted Plan, is close to fair and maintains the very slight Republican bias found in the Enacted Plan.

81. **Appendix Table 6** provides the core retention metrics for Remedial Map 1A.

82. In summary, Remedial Map 1A is compliant with all relevant redistricting criteria and does not introduce any other boundary changes outside of the boundaries of LD 8, 16, 5, and 31.

B. Plaintiffs' Remedial Map 2A

83. Figure 8 provides a visual depiction of Remedial Map 2A.

[11] The county-district split metric measures the extent to which the plan splits counties across districts. The district-county split metric measures the extent to which districts are split across counties.

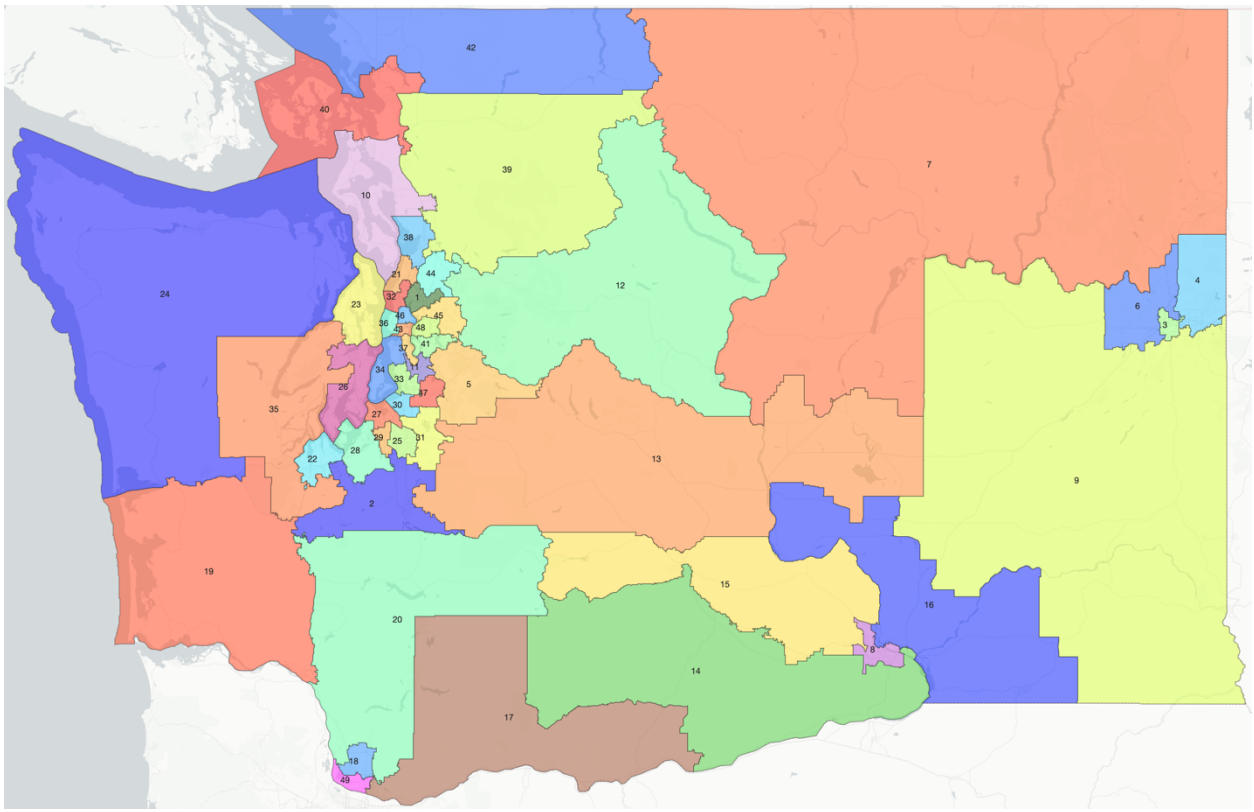


Figure 8: Remedial Map 2A

84. Remedial Map 2A is a variation on Remedial Map 2 that displaces fewer incumbents.

85. Aside from the legislators in enacted LDs 14 and 15, Mr. Pharris and Dr. Trende identified only one incumbent displaced in Remedial Map 2: the LD 8 Representative, Position 1.

86. Boundary changes were made to LDs 8 and 16 so that the current LD 8 Representative, Position 1 now resides in LD 8. Remedial Map 2A is otherwise identical to Map 2.

87. As noted above, the displacement of any LD 14 and 15 Senators and Representatives were a byproduct of relying on the applicable redistricting criteria to draw Remedial LD 14 that unites the population centers forming a community of interest between East Yakima and Pasco, while keeping the Yakama Nation Reservation whole, along with some off-reservation trust lands and fishing villages.

88. **Appendix Table 1**, located at the end of this document provides total population based on Washington's adjusted 2020 U.S. Census data and the population deviation from the target population (157,251). According to Table 1, Remedial Map 2A has a negligible total population deviation of 0.22%, which is less than the Enacted Plan and well below the 10% population deviation threshold for state legislative plans accepted by courts.

89. **Appendix Table 2** provides the Reock and Polsby-Popper compactness scores for Remedial Map 2A, which are largely on par with the compactness scores for the Enacted Plan.

90. Remedial Map 2A's districts are comprised of convenient, contiguous territory and are traversable.

91. **Appendix Table 3** provides statistics regarding county splits for Remedial Map 2A, including county-district splits and district-county splits. Remedial Map 2A performs about the same on county split metrics as compared to the Enacted Plan.

92. **Appendix Table 4** provides the district and plan partisan performance composite scores (2016-2020), which were compiled and calculated only after the drawing of Remedial Map 2A was finalized. The results show that neither Democrats nor Republicans were substantively advantaged or disadvantaged by any boundary changes.

93. **Appendix Table 5** provides EG and Declination scores, which show that Remedial Map 2A, like the Enacted Plan, is close to fair and maintains the very slight Republican bias found in the Enacted Plan.

94. **Appendix Table 6** provides the core retention metrics for Remedial Map 2A.

95. In summary, Remedial Map 2A is compliant with all relevant redistricting criteria and does not introduce any other boundary changes outside of the boundaries of LD 8 and 16.

C. Plaintiffs' Remedial Map 3A

96. Figure 9 provides a visual depiction of Remedial Map 3A.

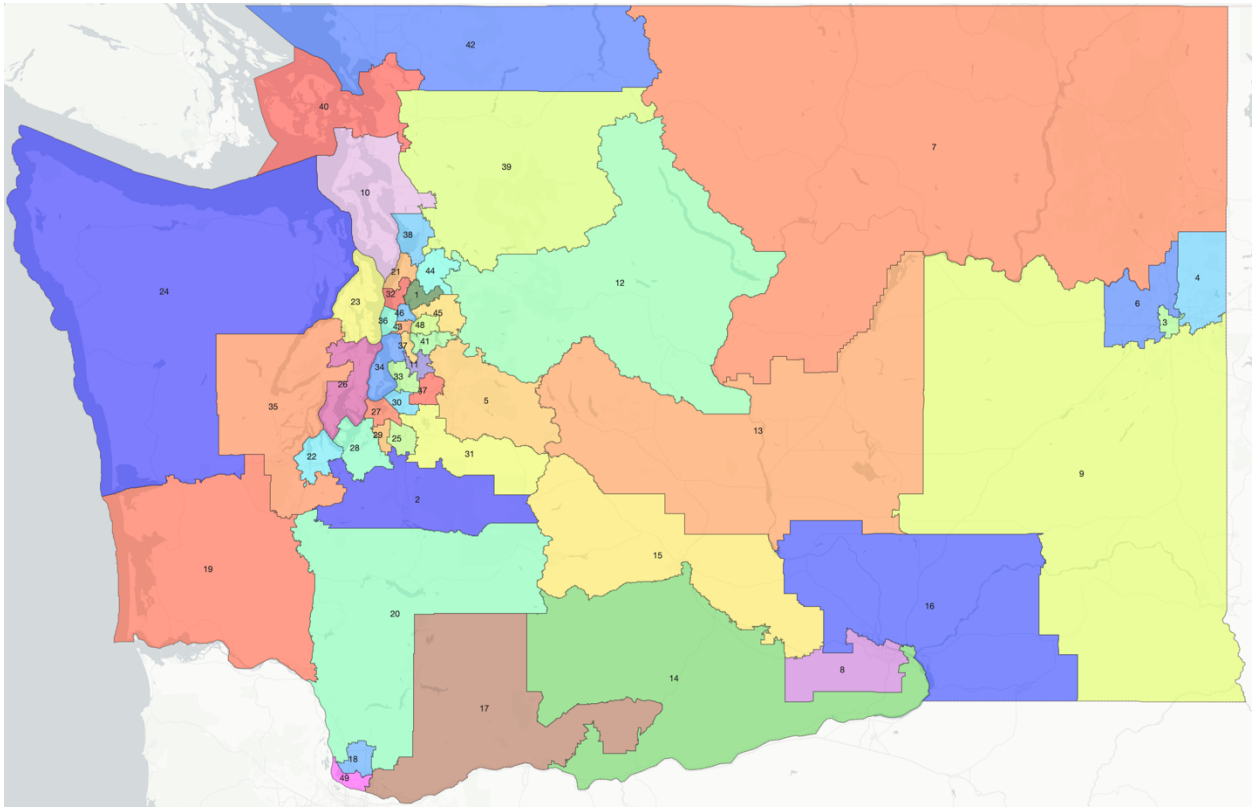


Figure 9: Remedial Map 3A

97. Remedial Map 3A is a variation on Remedial Map 3 that displaces fewer incumbents.

98. Aside from the legislators in enacted LDs 14 and 15, Mr. Pharris and Dr. Trende identified three incumbents displaced in Remedial Map 3: the LD 8 Representative, Position 1, the LD 31 Senator, and the LD 12 Senator.

99. I have adjusted the boundary lines so that the LD 8 Representative, Position 1 now resides in LD 8, and the LD 31 Senator now resides in LD 31.

100. To accomplish this change, boundary changes were made to LDs 8, 16, 5, and 31. Remedial Map 3A is otherwise identical to Map 3.

101. Remedial Map 3A still keeps the LD 12 Senator in LD 7. The changes necessary for the LD 12 Senator to be in LD 12 are reflected in Remedial Maps 2A and 4A, and in Remedial Map 5A.

102. As noted above, the displacement of any LD 14 and 15 Senators and Representatives were a byproduct of relying on the applicable redistricting criteria to draw Remedial LD 14 that unites the population centers forming a community of interest between East Yakima and Pasco, while keeping the Yakama Nation Reservation and all off-reservation trust lands and fishing villages within LD 14.

103. **Appendix Table 1**, located at the end of this document provides total population based on Washington's adjusted 2020 U.S. Census data and the population deviation from the target population (157,251). According to Table 1, Remedial Map 3A has a negligible total population deviation of 0.24%, which is less than the Enacted Plan and well below the 10% population deviation threshold for state legislative plans accepted by courts.

104. **Appendix Table 2** provides the Reock and Polsby-Popper compactness scores for Remedial Map 3A, which are largely on par with the compactness scores for the Enacted Plan.

105. Remedial Map 3A's districts are comprised of convenient, contiguous territory and are traversable.

106. **Appendix Table 3** provides statistics regarding county splits for Remedial Map 3A, including county-district splits and district-county splits. Remedial Map 3A performs about the same on county split metrics as compared to the Enacted Plan.

107. **Appendix Table 4** provides the district and plan partisan lean composite scores (2016-2020), which were compiled and calculated only after the drawing of Remedial Map 3A was finalized. The results show that neither Democrats nor Republicans were substantively advantaged or disadvantaged by any boundary changes.

108. **Appendix Table 5** provides EG and Declination scores, which show that Remedial Map 3A, like the Enacted Plan, is close to fair and maintains the very slight Republican bias found in the Enacted Plan.

109. **Appendix Table 6** provides the core retention metrics for Remedial Map 3A.

110. In summary, Remedial Map 3A is compliant with all relevant redistricting criteria and does not introduce any other boundary changes outside of the boundaries of LD 8, 16, 5, and 31.

D. Plaintiffs' Remedial Map 4A

111. Figure 10 provides a visual depiction of Remedial Map 4A.

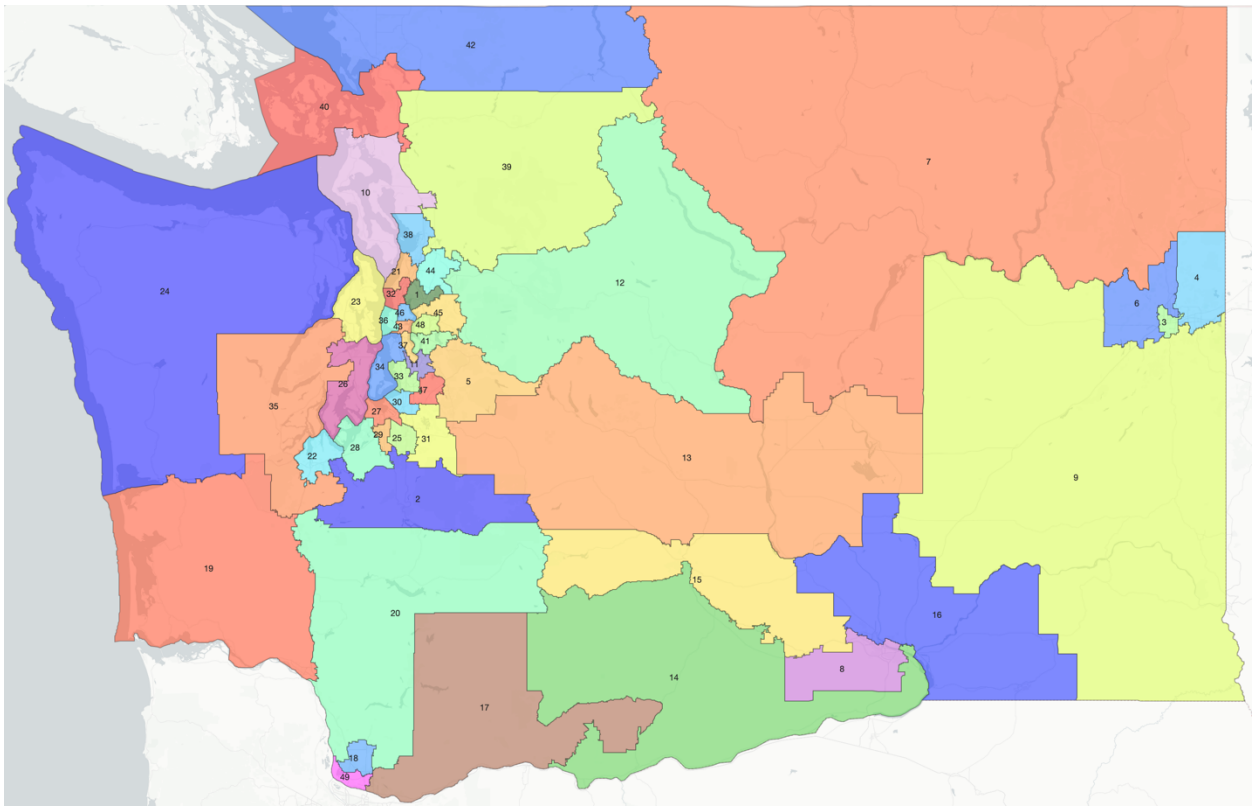


Figure 10: Remedial Map 4A

112. Remedial Map 4A is a variation on Remedial Map 4 that displaces fewer incumbents.

113. Aside from the legislators in enacted LDs 14 and 15, Mr. Pharris and Dr. Trende identified only one incumbent displaced in Remedial Map 4: the LD 8 Representative, Position 1.

114. Boundary changes were made to LDs 8 and 16 so that the current LD 8 Representative, Position 1 now resides in LD 8. Remedial Map 4A is otherwise identical to Map 4.

115. As noted above, the displacement of any LD 14 and 15 Senators and Representatives were a byproduct of relying on the applicable redistricting criteria to draw Remedial LD 14 that unites the population centers forming a community of interest between East Yakima and Pasco, while keeping the Yakama Nation Reservation whole, along with some off-reservation trust lands and fishing villages.

116. **Appendix Table 1**, located at the end of this document provides total population based on Washington's adjusted 2020 U.S. Census data and the population deviation from the target population (157,251). According to Table 1, Remedial Map 4A has a negligible total population deviation of 0.24%, which is less than the Enacted Plan and well below the 10% population deviation threshold for state legislative plans accepted by courts.

117. **Appendix Table 2** provides the Reock and Polsby-Popper compactness scores for Remedial Map 4A, which are largely on par with the compactness scores for the Enacted Plan.

118. Remedial Map 4A's districts are comprised of convenient, contiguous territory and are traversable.

119. **Appendix Table 3** provides statistics regarding county splits for Remedial Map 4A, including county-district splits and district-county splits. Remedial Map 4A performs about the same on county split metrics as compared to the Enacted Plan.

120. **Appendix Table 4** provides the district and plan partisan lean composite scores (2016-2020), which were compiled and calculated only after the drawing of Remedial Map 4A was finalized. The results show that neither Democrats nor Republicans were substantively advantaged or disadvantaged by any boundary changes.

121. **Appendix Table 5** provides EG and Declination scores, which show that Remedial Map 4A, like the Enacted Plan, is close to fair and maintains the very slight Republican bias found in the Enacted Plan.

122. **Appendix Table 6** provides the core retention metrics for Remedial Map 4A.

123. In summary, Remedial Map 4A is compliant with all relevant redistricting criteria and does not introduce any other boundary changes outside of the boundaries of LD 8 and 16.

E. Plaintiffs' Remedial Map 5A

124. Figure 11 provides a visual depiction of Remedial Map 5A.

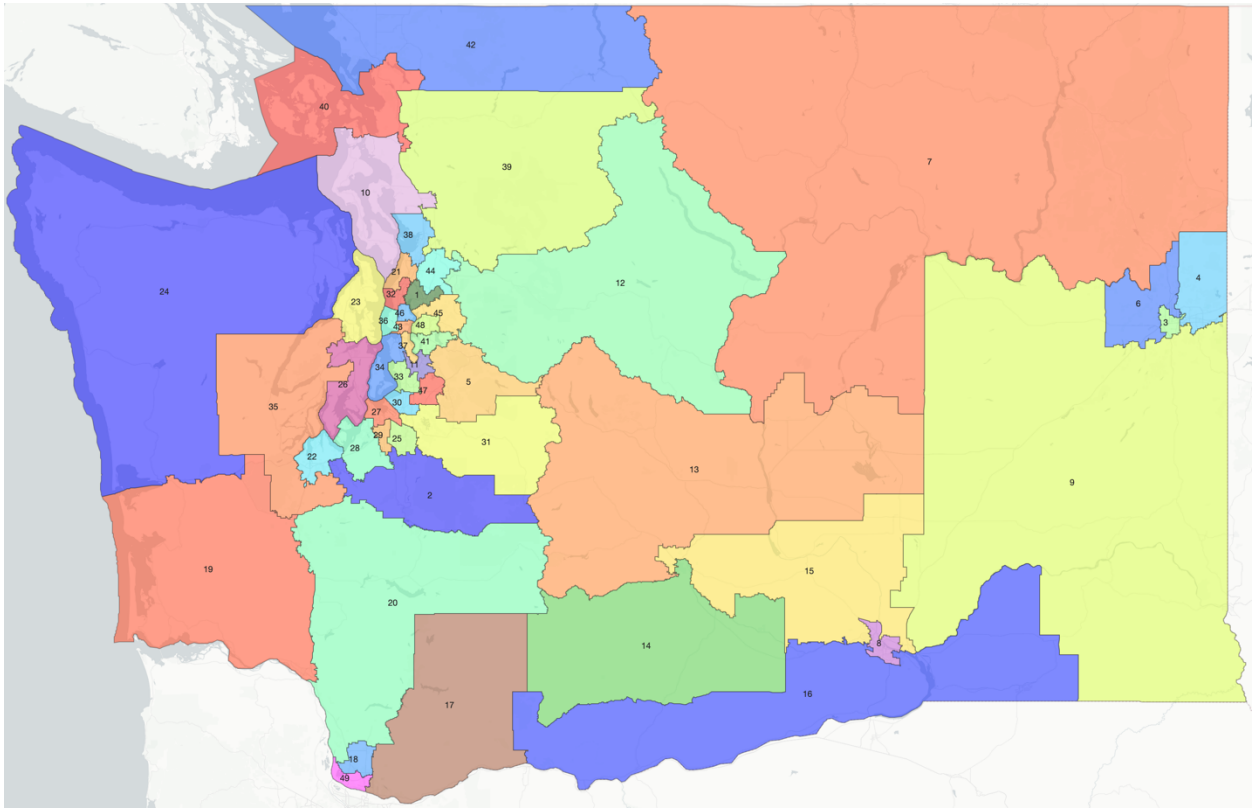


Figure 11: Remedial Map 5A

125. Remedial Map 5A is a variation on Remedial Map 5 that addresses Intervenor Alex Ybarra's concern about being paired with another house incumbent in LD 13 (only in Map 5). Very limited boundary changes, involving no more than a few precincts, were made to LDs 13 and 15 to address his concern. Remedial Map 5A is otherwise identical to Map 5. With this fix, no remedial proposal pairs Rep. Ybarra.

126. **Appendix Table 1**, located at the end of this document provides total population based on Washington's adjusted 2020 U.S. Census data and the population deviation from the target population (157,251). According to Table 1, Remedial Map 5A has a negligible total population deviation of 0.25%, which is the same as the Enacted Plan and well below the 10% population deviation threshold for state legislative plans accepted by courts.

127. **Appendix Table 2** provides the Reock and Polsby-Popper compactness scores for Remedial Map 5A, which are largely on par with the compactness scores for the Enacted Plan.

128. Remedial Map 5A's districts are comprised of convenient, contiguous territory and are traversable.

129. **Appendix Table 3** provides statistics regarding county splits for Remedial Map 5A, including county-district splits and district-county splits. Remedial Map 5A performs about the same on county split metrics as compared to the Enacted Plan.

130. **Appendix Table 4** provides the district and plan partisan lean composite scores (2016-2020), which were compiled and calculated only after the drawing of Remedial Map 5A was finalized. The results show that neither Democrats nor Republicans were substantively advantaged or disadvantaged by any boundary changes.

131. **Appendix Table 5** provides EG and Declination scores, which show that Remedial Map 5A, like the Enacted Plan, is close to fair and maintains the very slight Republican bias found in the Enacted Plan.

132. **Appendix Table 6** provides the core retention metrics for Remedial Map 5A.

133. In summary, Remedial Map 5A is compliant with all relevant redistricting criteria and does not introduce any other boundary changes outside of the boundaries of LD 13 and 15.

IX. Yakama Nation Off-Reservation Trust Lands

134. As I stated in my December 1, 2023 declaration, I drew LD 14 in Remedial Maps 3 and 4 to include the Yakama Nation Reservation and the off-reservation trust lands and fishing villages. To do so, I inspected the U.S. Census boundary file "Yakama Nation and Off-Reservation Trust Land" available on Dave's Redistricting App and made sure every parcel of off-Reservation trust land was included in LD 14.

135. On page 12 of their response brief, Intervenors claim, without support, that LD 14 in Remedial Maps 3 and 4 excludes "several off-Reservation trust parcels and traditional family homesteads in a separate legislative district from the Yakama Reservation."

136. They have provided no data showing the geographic locations of the off-Reservation trust parcels and traditional family homesteads supposedly excluded from the remedial district in Remedial Maps 3 and 4. Dr. Trende similarly offers no data to support this claim, nor does he opine on this issue. I am therefore unable to evaluate their claims.

X. Conclusion

137. I reserve the right to modify, update, or supplement my report as additional information is made available to me.

138. Pursuant to 28 U.S.C. § 1746, I, Kassra AR Oskooii, declare under penalty of perjury that the foregoing is true and correct.

Executed by:

Dr. Kassra AR Oskooii

Dated: January 5, 2024

Appendix

Table 1 – Population Deviation, Remedial Maps 1A-5A

District	Enacted Map			Remedial Map 1A			Remedial Map 2A			Remedial Map 3A			Remedial Map 4A			Remedial Map 5A		
	Total Pop	*Deviation*	*%*	*Total Pop*	*Deviation*	*%*	*Total Pop*	*Deviation*	*%*	*Total Pop*	*Deviation*	*%*	*Total Pop*	*Deviation*	*%*	*Total Pop*	*Deviation*	*%*
1	157284	33	0.021%	157284	33	0.021%	157284	33	0.021%	157284	33	0.021%	157284	33	0.021%	157284	33	0.021%
2	157441	190	0.121%	157371	120	0.076%	157244	-7	-0.004%	157429	178	0.113%	157429	178	0.113%	157441	190	0.121%
3	157244	-7	-0.004%	157244	-7	-0.004%	157244	-7	-0.004%	157244	-7	-0.004%	157244	-7	-0.004%	157244	-7	-0.004%
4	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%
5	157289	38	0.024%	157361	110	0.070%	157289	38	0.024%	157378	127	0.081%	157289	38	0.024%	157289	38	0.024%
6	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%
7	157250	-1	-0.001%	157248	-3	-0.002%	157250	-1	-0.001%	157313	62	0.039%	157250	-1	-0.001%	157250	-1	-0.001%
8	157266	15	0.010%	157120	-131	-0.083%	157319	68	0.043%	157198	-53	-0.034%	157198	-53	-0.034%	157266	15	0.010%
9	157247	-4	-0.003%	157125	-126	-0.080%	157156	-95	-0.060%	157125	-126	-0.080%	157156	-95	-0.060%	157247	-4	-0.003%
10	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%
11	157228	-23	-0.015%	157228	-23	-0.015%	157228	-23	-0.015%	157228	-23	-0.015%	157228	-23	-0.015%	157228	-23	-0.015%
12	157247	-4	-0.003%	157175	-76	-0.048%	157247	-4	-0.003%	157096	-155	-0.099%	157247	-4	-0.003%	157247	-4	-0.003%
13	157248	-3	-0.002%	157145	-106	-0.067%	157250	-1	-0.001%	157360	109	0.069%	157312	61	0.039%	157259	8	0.005%
14	157253	2	0.001%	157166	-85	-0.054%	157166	-85	-0.054%	157318	67	0.043%	157318	67	0.043%	157377	126	0.080%
15	157231	-20	-0.013%	157409	158	0.100%	157203	-48	-0.031%	157122	-129	-0.082%	157070	-181	-0.115%	157108	-143	-0.091%
16	157254	3	0.002%	157159	-92	-0.059%	157197	-54	-0.034%	157182	-69	-0.044%	157221	-30	-0.019%	157242	-9	-0.006%
17	157239	-12	-0.008%	157405	154	0.098%	157405	154	0.098%	157346	95	0.060%	157346	95	0.060%	157239	-12	-0.008%
18	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%
19	157236	-15	-0.010%	157236	-15	-0.010%	157236	-15	-0.010%	157236	-15	-0.010%	157236	-15	-0.010%	157236	-15	-0.010%
20	157243	-8	-0.005%	157401	150	0.095%	157401	150	0.095%	157353	102	0.065%	157353	102	0.065%	157243	-8	-0.005%
21	157212	-39	-0.025%	157212	-39	-0.025%	157212	-39	-0.025%	157212	-39	-0.025%	157212	-39	-0.025%	157212	-39	-0.025%
22	157257	6	0.004%	157257	6	0.004%	157257	6	0.004%	157257	6	0.004%	157257	6	0.004%	157257	6	0.004%
23	157258	7	0.004%	157258	7	0.004%	157258	7	0.004%	157258	7	0.004%	157258	7	0.004%	157258	7	0.004%
24	157233	-18	-0.011%	157233	-18	-0.011%	157233	-18	-0.011%	157233	-18	-0.011%	157233	-18	-0.011%	157233	-18	-0.011%
25	157268	17	0.011%	157268	17	0.011%	157268	17	0.011%	157268	17	0.011%	157268	17	0.011%	157268	17	0.011%
26	157227	-24	-0.015%	157227	-24	-0.015%	157227	-24	-0.015%	157227	-24	-0.015%	157227	-24	-0.015%	157227	-24	-0.015%
27	157239	-12	-0.008%	157239	-12	-0.008%	157239	-12	-0.008%	157239	-12	-0.008%	157239	-12	-0.008%	157239	-12	-0.008%
28	157289	38	0.024%	157289	38	0.024%	157289	38	0.024%	157289	38	0.024%	157289	38	0.024%	157289	38	0.024%
29	157054	-197	-0.125%	157054	-197	-0.125%	157054	-197	-0.125%	157054	-197	-0.125%	157054	-197	-0.125%	157054	-197	-0.125%
30	157277	26	0.017%	157277	26	0.017%	157277	26	0.017%	157277	26	0.017%	157277	26	0.017%	157277	26	0.017%
31	157223	-28	-0.018%	157346	95	0.060%	157304	53	0.034%	157211	-40	-0.025%	157242	-9	-0.006%	157223	-28	-0.018%
32	157211	-40	-0.025%	157211	-40	-0.025%	157211	-40	-0.025%	157211	-40	-0.025%	157211	-40	-0.025%	157211	-40	-0.025%
33	157256	5	0.003%	157256	5	0.003%	157256	5	0.003%	157256	5	0.003%	157256	5	0.003%	157256	5	0.003%
34	157234	-17	-0.011%	157234	-17	-0.011%	157234	-17	-0.011%	157234	-17	-0.011%	157234	-17	-0.011%	157234	-17	-0.011%
35	157268	17	0.011%	157268	17	0.011%	157268	17	0.011%	157268	17	0.011%	157268	17	0.011%	157268	17	0.011%
36	157250	-1	-0.001%	157250	-1	-0.001%	157250	-1	-0.001%	157250	-1	-0.001%	157250	-1	-0.001%	157250	-1	-0.001%
37	157247	-4	-0.003%	157247	-4	-0.003%	157247	-4	-0.003%	157247	-4	-0.003%	157247	-4	-0.003%	157247	-4	-0.003%
38	157215	-36	-0.023%	157215	-36	-0.023%	157215	-36	-0.023%	157215	-36	-0.023%	157215	-36	-0.023%	157215	-36	-0.023%
39	157306	55	0.035%	157306	55	0.035%	157306	55	0.035%	157306	55	0.035%	157306	55	0.035%	157306	55	0.035%
40	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%	157261	10	0.006%
41	157234	-17	-0.011%	157234	-17	-0.011%	157234	-17	-0.011%	157234	-17	-0.011%	157234	-17	-0.011%	157234	-17	-0.011%
42	157263	12	0.008%	157263	12	0.008%	157263	12	0.008%	157263	12	0.008%	157263	12	0.008%	157263	12	0.008%
43	157247	-4	-0.003%	157247	-4	-0.003%	157247	-4	-0.003%	157247	-4	-0.003%	157247	-4	-0.003%	157247	-4	-0.003%
44	157248	-3	-0.002%	157248	-3	-0.002%	157248	-3	-0.002%	157248	-3	-0.002%	157248	-3	-0.002%	157248	-3	-0.002%
45	157270	19	0.012%	157270	19	0.012%	157270	19	0.012%	157270	19	0.012%	157270	19	0.012%	157270	19	0.012%
46	157255	4	0.003%	157255	4	0.003%	157255	4	0.003%	157255	4	0.003%	157255	4	0.003%	157255	4	0.003%
47	157240	-11	-0.007%	157240	-11	-0.007%	157240	-11	-0.007%	157240	-11	-0.007%	157240	-11	-0.007%	157240	-11	-0.007%
48	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%
49	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%	157252	1	0.001%
Total Deviation	-	-	**0.25%**	-	-	**0.23%**	-	-	**0.22%**	-	-	**0.24%**	-	-	**0.24%**	-	-	**0.25%**

Table 2 – Compactness Scores, Remedial Maps 1A-5A

	Enacted Map	Remedial Map 1A	Remedial Map 2A	Remedial Map 3A	Remedial Map 4A	Remedial Map 5A
Reock	0.44	0.42	0.42	0.43	0.42	0.43
Polsby-Popper	0.33	0.32	0.31	0.32	0.32	0.32

Table 3 – County Split Metrics, Remedial Maps 1A-5A

	Enacted Map	Remedial Map 1A	Remedial Map 2A	Remedial Map 3A	Remedial Map 4A	Remedial Map 5A
Number of Counties Split	18	20	19	20	19	19
County-District Splitting	1.61	1.61	1.65	1.61	1.64	1.62
District-County Splitting	1.25	1.25	1.27	1.25	1.26	1.26

Table 4 – Partisan Performance by District and Plan, Remedial Maps 1A-5A

District	Enacted Map		Remedial Map 1A		Remedial Map 2A		Remedial Map 3A		Remedial Map 4A		Remedial Map 5A	
	Dem	*Rep*	*Dem*	*Rep*	*Dem*	*Rep*	*Dem*	*Rep*	*Dem*	*Rep*	*Dem*	*Rep*
2	40.62%	57.43%	40.28%	57.76%	40.28%	57.76%	40.79%	57.24%	40.79%	57.24%	40.62%	57.43%
5	56.73%	41.48%	54.58%	43.67%	56.73%	41.48%	54.98%	43.26%	56.73%	41.48%	56.73%	41.48%
7	33.65%	65.30%	34.65%	64.25%	33.65%	65.30%	34.33%	64.57%	33.65%	65.30%	33.65%	65.30%
8	39.79%	58.39%	38.10%	60.19%	37.32%	60.96%	36.87%	61.49%	36.87%	61.49%	39.79%	58.39%
9	40.35%	58.10%	40.94%	57.51%	40.57%	57.88%	40.94%	57.51%	40.57%	57.88%	40.35%	58.10%
12	45.61%	52.82%	47.87%	50.48%	45.61%	52.82%	47.55%	50.83%	45.61%	52.82%	45.61%	52.82%
13	34.96%	63.85%	35.54%	63.32%	35.68%	63.07%	35.67%	63.21%	36.35%	62.42%	34.25%	64.66%
16	38.49%	59.92%	39.92%	58.37%	42.15%	56.18%	40.76%	57.47%	41.59%	56.64%	40.64%	57.95%
17	49.36%	49.08%	50.52%	47.96%	50.52%	47.96%	50.83%	47.63%	50.83%	47.63%	49.36%	49.08%
20	35.17%	63.44%	35.46%	63.22%	35.46%	63.22%	35.12%	63.55%	35.12%	63.55%	35.17%	63.44%
31	44.13%	54.16%	43.59%	54.66%	43.98%	54.24%	43.49%	54.76%	43.43%	54.82%	44.13%	54.16%
# R/D Performing Districts	**1**	**8**	**1**	**8**	**1**	**8**	**1**	**8**	**1**	**8**	**1**	**8**

Table 5 – Comparison of Partisan Bias Metrics Across Plans, Remedial Maps 1A-5A

Plans	***Efficiency Gap***	***Declination***
Enacted Map	3.2% R	0.07 R
Remedial Map 1A	2.1% R	0.02 R
Remedial Map 2A	2.2% R	0.02 R
Remedial Map 3A	2.0% R	0.02 R
Remedial Map 4A	2.2% R	0.01 R
Remedial Map 5A	2.2% R	0.02 R

Table 6 – Core Population Retention Percentages, Remedial Maps 1A-5A

District	Remedial Map 1A	Remedial Map 2A	Remedial Map 3A	Remedial Map 4A	Remedial Map 5A
1	100.0%	100.0%	100.0%	100.0%	100.0%
2	86.6%	86.6%	90.1%	90.1%	100.0%
3	100.0%	100.0%	100.0%	100.0%	100.0%
4	100.0%	100.0%	100.0%	100.0%	100.0%
5	86.7%	100.0%	90.0%	100.0%	100.0%
6	100.0%	100.0%	100.0%	100.0%	100.0%
7	86.7%	100.0%	90.1%	100.0%	100.0%
8	71.0%	62.0%	60.3%	60.3%	100.0%
9	95.2%	98.0%	95.2%	98.0%	100.0%
10	100.0%	100.0%	100.0%	100.0%	100.0%
11	100.0%	100.0%	100.0%	100.0%	100.0%
12	86.8%	100.0%	90.1%	100.0%	100.0%
13	80.5%	86.5%	80.4%	85.1%	90.0%
14	62.2%	62.2%	60.5%	60.5%	51.3%
15	56.5%	56.6%	55.8%	55.9%	51.3%
16	55.3%	39.4%	47.8%	44.4%	86.0%
17	86.5%	86.5%	90.0%	90.0%	100.0%
18	100.0%	100.0%	100.0%	100.0%	100.0%
19	100.0%	100.0%	100.0%	100.0%	100.0%
20	86.5%	86.5%	90.0%	90.0%	100.0%
21	100.0%	100.0%	100.0%	100.0%	100.0%
22	100.0%	100.0%	100.0%	100.0%	100.0%
23	100.0%	100.0%	100.0%	100.0%	100.0%
24	100.0%	100.0%	100.0%	100.0%	100.0%
25	100.0%	100.0%	100.0%	100.0%	100.0%
26	100.0%	100.0%	100.0%	100.0%	100.0%
27	100.0%	100.0%	100.0%	100.0%	100.0%
28	100.0%	100.0%	100.0%	100.0%	100.0%
29	100.0%	100.0%	100.0%	100.0%	100.0%
30	100.0%	100.0%	100.0%	100.0%	100.0%
31	86.6%	86.6%	90.1%	90.1%	100.0%
32	100.0%	100.0%	100.0%	100.0%	100.0%
33	100.0%	100.0%	100.0%	100.0%	100.0%
34	100.0%	100.0%	100.0%	100.0%	100.0%
35	100.0%	100.0%	100.0%	100.0%	100.0%
36	100.0%	100.0%	100.0%	100.0%	100.0%
37	100.0%	100.0%	100.0%	100.0%	100.0%
38	100.0%	100.0%	100.0%	100.0%	100.0%
39	100.0%	100.0%	100.0%	100.0%	100.0%
40	100.0%	100.0%	100.0%	100.0%	100.0%
41	100.0%	100.0%	100.0%	100.0%	100.0%
42	100.0%	100.0%	100.0%	100.0%	100.0%
43	100.0%	100.0%	100.0%	100.0%	100.0%
44	100.0%	100.0%	100.0%	100.0%	100.0%
45	100.0%	100.0%	100.0%	100.0%	100.0%
46	100.0%	100.0%	100.0%	100.0%	100.0%
47	100.0%	100.0%	100.0%	100.0%	100.0%
48	100.0%	100.0%	100.0%	100.0%	100.0%
49	100.0%	100.0%	100.0%	100.0%	100.0%
Plan Average	**94.10%**	**94.9%**	**94.5%**	**95.2%**	**97.5%**