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IN THE THIRD JUDICIAL DISTRICT COURT
IN AND FOR SALT LAKE COUNTY, STATE OF UTAH

LEAGUE OF WOMEN VOTERS OF UTAH, MORMON WOMEN FOR ETHICAL GOVERNMENT, STEFANIE CONDIE, MALCOLM REID, VICTORIA REID, WENDY MARTIN, ELEANOR SUNDWALL, and JACK MARKMAN,

Plaintiffs,

v.

UTAH STATE LEGISLATURE, et al.,

Defendants.

PLAINTIFFS' PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW (FINAL TRANSCRIPT CITATIONS)

Case No. 220901712

Honorable Dianna Gibson

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INTRODUCTION

In 2018, Utahns exercised their fundamental constitutional right to alter or reform their government via an initiative that, among other things, banned partisan gerrymandering and ensured that voting maps adhered to neutral criteria like respecting county and municipal lines, compactness, and communities of interest. That initiated law, known as Proposition 4 ("Prop 4"), was expansive in scope, reflecting the People's desire to use all available tools, data, and metrics to identify and eradicate increasingly sophisticated gerrymandering schemes.

On August 25, 2025, this Court permanently enjoined S.B. 200, through which the Legislature had unconstitutionally repealed Prop 4 in 2020, and the congressional map ("H.B. 2004" or "2021 congressional map") that directly resulted from that unconstitutional repeal.

In response, the Legislature advanced two pieces of legislation on October 6, 2025: S.B. 1011, which substantially redefined and narrowed Prop 4's prohibition on partisan gerrymandering, and S.B. 1012, which enacted Map C, one of five congressional map options considered by the Legislature.

S.B. 1011 amended Prop 4's broad standard defining how its prohibition on undue partisan favoritism should be assessed. Rather than maintain the People's choice to assess maps using "judicial standards and the best available data and scientific methods, including measures of partisan symmetry," Utah Code § 20A-19-103(5), S.B. 1011 redefined Prop 4's partisan gerrymandering prohibition to make one specific measure of partisan symmetry—the partisan bias test—a mandatory, determinative test to the exclusion of other relevant metrics. It layered on additional metrics (a companion metric called the mean-median difference test and a computer-simulated mapping ensemble with additional metrics), but the partisan bias test remains the primary, gateway metric to filter maps that "pass" or "fail."

But it is widely known—as even Legislative Defendants' experts testified—that the partisan bias test and the mean-median difference test return paradoxical results in noncompetitive states, and particularly in Utah. The primary feature of the partisan bias test is its hypothetical tied statewide election—a condition that simply does not occur in Utah. Indeed, the author of the partisan bias test has repeatedly warned it should be used to assess partisan favoritism in noncompetitive states.

The Court heard two days of testimony from six expert witnesses and two plaintiffs and received over a thousand of pages of exhibits. The testimony and evidentiary record make it remarkably clear that S.B. 1011 unconstitutionally impairs Prop 4's reforms in violation of Article I, Section 2 of the Utah Constitution. The evidence shows that the partisan bias test directly contravenes Prop 4's neutral redistricting criteria. It fails maps that perform best on those criteria and passes maps the perform worst on them. Likewise, it acts to structurally *mandate* partisan favoritism, by systematically disqualifying most maps that create a single Democratic congressional district under the bizarre conclusion that such maps disfavor *Democrats*. That conclusion is premised on the irrational concept that Democratic voters would be better served if they could win two districts in the imaginary world of tied statewide Utah elections rather than the real world in which they could win one district. In contrast, the partisan bias test nearly universally approves maps that create a 4-0 shutout for Republicans. In essence, the test acts as a filter to disqualify maps that by any reasonable metric would be considered politically neutral and approve those that by any reasonable metric would be considered Republican gerrymanders.

Simply put, S.B. 1011 mandates the very partisan favoritism that Prop 4 was enacted to stop.

After the Governor signed S.B. 1011, the Legislature enacted its remedial congressional map, S.B. 1012 (or Map C). Map C creates four districts in which zero Democratic statewide candidates have prevailed under the assessed elections. The least Republican district has a composite score of at least 56% Republican, reflecting a 12-point loss for Democratic candidates. Under the only reliable ensemble of computer-simulated maps that comply with Prop 4's requirements offered by the parties, Map C is an extreme partisan outlier—more Republican than over 99% of expected maps drawn without political considerations.

This result is perhaps no surprise, because contrary to Prop 4's requirements, the Court finds that Map C was drawn with partisan political considerations. The co-chair of the Legislative Redistricting Committee, Sen. Scott Sandall, has for four years objected to members of the public and the Utah Independent Redistricting Commission ("the Commission") using a mapdrawing tool called Dave's Redistricting App ("DRA") because the program by default displays partisan political data on screen as the user draws maps. He did so as recently as September 18, 2025, suggesting that the use of DRA is disqualifying and that it gave him great hesitation about the Commission's work. He said the same to the commissioners at a hearing in 2021.

It was thus remarkable that the Legislature's mapdrawer, Dr. Sean Trende, testified on direct examination that he had not considered political data in drawing Map C, only to admit on cross examination that he not only used DRA to draw Map C, but displayed partisan political data—both for the districts and for each precinct under consideration for inclusion or exclusion in a district—on the computer screen while he drew the map. In other words, the Legislature's mapdrawer did precisely what Sen. Sandall warned was disqualifying for maps considered by the Legislature.

Map C does not abide by Prop 4's requirements. The Court finds that partisan political data was considered in its adoption contrary to Prop 4's express prohibition, that it was drawn with the purpose to favor Republicans—a conclusion that follows from even S.B. 1011's metric for partisan intent—and it unduly favors Republicans and disfavors Democrats. Map C also fails to minimize the division of municipalities and counties to the greatest extent practicable as Prop 4 requires.

In short, Map C is not lawful, and because the Lieutenant Governor's November 10, 2025, deadline for a map to be finalized is upon us, the Court bears the unwelcome obligation to ensure that a lawful map is in place, which the Court discharges by ordering the use of Plaintiffs' Map **[1/2]** for Utah's congressional elections, as outlined below.

[PROPOSED] FINDINGS OF FACT

I. Parties

1. The parties have stipulated the residences of individual Plaintiffs Stefanie Condie, Malcolm Reid, Victoria Reid, Wendy Martin, Eleanor Sundwall, and Jack Markmen under each of Plaintiffs' Map 1, Plaintiffs' Map 2, Defendants' Map C, the 2021 Congressional Plan, and the 2011 Congressional Plan. *See* Stipulation re Pls.' Residences (Dkt. 704). The other named Plaintiffs are organizations the League of Women Voters of Utah and Mormon Women for Ethical Government.

2. Plaintiffs Malcolm Reid and Victoria Reid testified as to their personal experience as residents of Millcreek. While Ms. Reid is a registered Republican, she and her husband both testified as to their support of Prop 4 and their disappointment and frustration with what they saw as the Legislature's efforts to evade the law's neutral redistricting standards with respect to both the 2021 Congressional Map and Defendants' Map C (Millcreek was divided amongst all four congressional districts under the former map, and remains divided into two districts under the latter map).[1] Ms. Reid testified that Defendants' Map C was "an improvement" over the 2021 Congressional Map, but her city remained "carved up."[2] Mr. Reid testified that Defendants' Map C "hurts half as much," but his voice is still "diluted" and his vote "less effective" under the current map.[3] Under the 2011 map, the Reids live in District 4, as does Plaintiff Eleanor Sundwall. Dkt. 704.

3. The named Defendants are the Utah State Legislature, the Utah Legislative Redistricting Committee, Representative Mike Schultz, Senator J. Stuart Adams, Senator Scott Sandall, and Lieutenant Governor Deidre Henderson.

4. The Utah Legislative Redistricting Committee (LRC) was a committee of the Utah Legislature that heard testimony from the Legislature's expert, Dr. Sean Trende, presented and heard testimony on the five proposed Maps labeled A to E, and ultimately voted to advance Map C to the floor where it was voted on and adopted. The LRC likewise heard testimony on an early draft of S.B. 1011. The LRC was co-chaired by Sen. Scott Sandall and Rep. Candice Pierucci. Sen. Sandall and Rep. Pierucii chose which five maps of the ten or more presented by the Legislature's expert, Dr. Sean Trende, would be made public and presented to the Committee.[4]

II. Expert Witnesses

A. Plaintiffs' Expert Witnesses

5. Plaintiffs' expert Dr. Jowei Chen is an associate professor in the Department of Political Science at the University of Michigan, Ann Arbor. Dr. Chen is also a research associate professor at the Center for Political Studies of the Institute for Social Research at the University of Michigan and a research associate at the Spatial Social Science Laboratory at Stanford University.[5] Dr. Chen studies redistricting and gerrymandering. He is one of the preeminent scholars in the field of using computer simulations in redistricting and has published multiple peer-reviewed academic papers on his methodology.[6] Dr. Chen has authored expert reports in 20 redistricting court cases, and has testified at a deposition or trial in 15 such cases.[7] The Court

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[1] 10.23 Tr. at 143:9-12, 144:16-18, 145:13-21 (V. Reid), 291:24-292:9, 292:25-296:4 (M. Reid).
[2] *Id.* at 147:1-17 (V. Reid).
[3] *Id.* at 296:18-297:14, 299:23-300:1 (M. Reid).
[4] Legislative Redistricting Committee, Public Hearing, September 22, 2025, https://le.utah.gov/av/committeeArchive.jsp?mtgID=20165 (2:02:20-2:02:50) ("9.22 LRC Hearing"). The Court takes judicial notice of these and other legislative facts, *see* Utah R. Evid. 201, Advisory Cmte. Note (noting that Rule 201 "does not deal with instances in which a court may notice legislative facts, which is left to the sound discretion of trial and appellate courts"); *Cruz v. Middlekauff Lincoln-Mercury, Inc.*, 909 P.2d 1252, 1260 (Utah 1996) (court "can legitimately consider" "legislative facts" presented to the court by plaintiffs); *Directv, Inc., v. Utah State Tax Com'n*, No. 110402039, 2013 WL 9973019, at *6 (Utah Dist. Ct. June 27, 2013) (result achieved "through taking judicial notice of the legislative record").
[5] PX-3 at 104 (Chen Report).
[6] 10.23 Tr. at 13:11-15 (Chen).
[7] PX-3 at 1-3 (Chen Report).

accepted Dr. Chen as an expert in the fields of redistricting, political geography, statistical measures of partisan favoritism, and redistricting simulation analysis.[8] The Court found Dr. Chen's testimony credible, careful, and lucid. Dr. Chen was clear and precise in his answers on both direct and cross-examination. The Court gives great weight to Dr. Chen's methods, analysis, and testimony.

6. Plaintiffs' expert Dr. Christopher Warshaw is a professor at the McCourt School of Public Policy at Georgetown University. He studies and teaches in fields including American politics, political representation, elections, public opinion, and redistricting. Dr. Warshaw has testified or written reports in about a dozen cases, and the Court accepted him as an expert in American politics with specialties in political representation, elections, redistricting, and gerrymandering.[9] The Court found Dr. Warshaw's testimony credible and helpful to the Court in explaining the various statistical tests at issue. Dr. Warshaw was careful not to overstate conclusions and acknowledged the benefits and drawbacks of each test he analyzed and discussed. The Court credits Dr. Warshaw's testimony, and his assessment of statistical tests at issue and their application in Utah.

7. Plaintiffs' expert Dr. Kassra Oskooii is a tenured associate professor of Political Science and International Relations at the University of Delaware, and an affiliated faculty member at the university's Data Science Institute. Dr. Oskooii's research and teaching areas include American political behavior, political methodology, and redistricting. He teaches classes on topics including redistricting and map-drawing. Dr. Oskooii has been an expert witness in over a dozen cases, and has had a map he has drawn selected by a court. The Court accepted Dr. Oskooii as an expert in redistricting and mapping.[10] Dr. Oskooii was forthcoming and credible as a witness, clearly explaining his mapping process and choices, and answering questions from counsel directly and comprehensively. Dr. Oskooii exhibited an impressive command of details about the maps and other facts in the case.[11] The Court credits Dr. Oskooii's testimony that he did not use or reference political or partisan data while making the adjustments to Plaintiffs' two maps, and recognizes that he used a mapping tool, ESRI for Redistricting, that does not contain any such data.[12]

B. Defendants' Expert Witnesses

8. Defendants' expert Dr. Jonathan Katz is the Kay Sugahara Professor of Political Science and Statistics at the California Institute of Technology, and has previously served as an expert in redistricting cases.[13] The Court carefully observed Dr. Katz's testimony, including his demeanor on direct and cross examination. On direct examination, Dr. Katz's testimony largely concerned his views on the abstract theoretical definitions of partisan symmetry and partisan bias and his views on other measures like the mean-median difference and the efficiency gap, drawing almost exclusively from his own academic writings.[14] On cross examination, however, it became apparent to the Court that Dr. Katz's testimony did not include opinion on whether and how various measures, including those at issue in S.B. 1011, specifically apply in Utah, given its political context and geography. Dr. Katz stated that he had not examined Prop 4 or S.B. 1011's partisan

[8] 10.23 Tr. at 16:9-18 (Chen).
[9] PX-1A at 1 (10.7 Warshaw Report); 10.23 Tr. at 153:4-154:3 (Warshaw).
[10] PX-2 at 2-3 (Oskooii Report); 10.23 Tr. at 229:13-232:4 (Oskooii).
[11] 10.23 Tr. at 237:7-237:16, 264:4-15, 285:6-287:4 (Oskooii).
[12] 10.23 Tr. at 232:25-233:22, 236:1-3, 243:2-5 (Oskooii).
[13] 10.24 Tr. at 10:10-12:3 (Katz).
[14] 10.24 Tr. at 10:1-32:9 (Katz).

bias and mean-median difference tests and was not aware of how they functioned before the hearing. He had not mentioned Utah even once in his expert report and provided no opinion as to how or whether Utah's political geography and lack of competition in statewide elections affect the application of partisan bias, mean-median difference, and other measures.[15] It also became apparent to the Court that Dr. Katz had not fully represented his views on these issues. Dr. Katz neglected to mention that his academic writing addressing Utah directly in noting that the partisan bias test would be appealing to Republican lawmakers in Utah given its effects,[16] that no measure should be applied based on knife-edged thresholds as a matter of sound political science,[17] and that he had declined to apply the mean-median difference in a previous case because he viewed it inapplicable in lopsided states where statewide elections rarely approach 50%.[18] Apart from Dr. Katz's pattern of selective omissions, the Court observed that he was defensive and did not provide direct answers on cross examination. For these reasons, the Court gives little weight to Dr. Katz's testimony.

9. Defendants' expert Dr. Sean Trende is the senior elections analyst for Real Clear Politics, a Washington, D.C.-based company which hosts a website that provides data-focused political analysis. Dr. Trende is also a visiting scholar at the American Enterprise Institute and a lecturer at Ohio State University.[19] Dr. Trende served as an expert consultant for the Legislature during the mapdrawing process and drew Map C by hand using DRA with partisan political data displayed on the screen. The Court carefully observed Dr. Trende's testimony, including his demeanor on direct and cross examination. The Court finds that Dr. Trende was at times forthcoming in his testimony, though he seemed to recall certain aspects of the mapdrawing process in great detail when asked on direct examination but noticeably less detail when asked on cross examination. Nevertheless, Dr. Trende was forthcoming regarding the visibility of partisan data during the entire time he drew Map C and generally admitted the many errors in his report and in the analysis he conducted as part of the legislative process. The sheer number and magnitude of these errors, however, gives the Court pause and leads the Court generally to give little weight to Dr. Trende's analysis. Moreover, the Court does not credit Dr. Trende's statements on direct examination that partisan data was not considered during the mapdrawing process, in particular given his admission on cross examination that such data was visible to him during the entire mapdrawing process at the precinct-by-precinct level as the map was drawn. The Court does not find persuasive Dr. Trende's explanation that "even if [he] had looked at" the partisan data, it would have been "worthless" because it was a 2012-2020 electoral composite score.[20]

10. Defendants' expert Dr. Michael Barber is a professor of political science at Brigham Young University and director of the Center for the Study of Elections and Democracy in Provo, Utah. He has worked as an expert witness in multiple redistricting cases and has analyzed maps and various political and geographic data. On direct examination, Dr. Barber was polished and clear. However, under cross-examination about flaws in his ensemble analysis, Dr. Barber's answers were often evasive. At times, Dr. Barber refused to acknowledge obvious facts, which decreased his credibility as an expert witness. Dr. Barber criticized Plaintiffs' maps for failing to unite what he called communities of interest such as the "canyons" and certain selections of cities

[15] 10.24 Tr. at 32:20-41:15 (Katz).
[16] 10.24 Tr. at 59:17-60:10 (Katz).
[17] 10.24 Tr. at 42:11-43:19 (Katz).
[18] 10.24 Tr. at 68:25-69:10 (Katz).
[19] DX-13 at 3 (Trende Report).
[20] 10.24 Tr. at 256:7-259:10 (Trende).

in Salt Lake County, but was unaware that the Legislature had identified certain other communities of interest and did not assess any of the maps with those communities of interest in mind.[21] Dr. Barber also withheld relevant information in his report. While describing ensembles as following a "strict" adherence to population equality, he neglected to mention that the population deviation in his ensemble was not zero. And perhaps most alarmingly, he neglected to mention in his report—after stating that he programmed his algorithm to minimize county divisions—that his algorithm in fact excluded Salt Lake County from the definition of "county," while testifying this was an "intentional design."[22] In light of Dr. Barber's testimony, and having had the opportunity to observe him on the stand, the Court agrees with one federal court, which noted that "his demeanor as a witness, and his labored responses to questioning by counsel . . . serve only to highlight his unconvincing equivocations." *Jacobson v. Lee*, 411 F. Supp. 3d 1249, 1270 (N.D. Fla. 2019) (subsequent procedural history omitted).

III. Procedural History

11. In the November 2018 election, the People of Utah passed Prop 4 to enact the Utah Independent Redistricting Commission and Standards Act. Prop 4 created the Utah Independent Redistricting Commission and established objective standards, procedures, and requirements for redistricting. It bans partisan gerrymandering by prohibiting any redistricting plan "that purposefully or unduly favors or disfavors . . . any political party" (*i.e.*, that exhibits partisan favoritism). Utah Code § 20A-19-103(4)(a). It requires use of "the best available data and scientific and statistical methods, including measures of partisan symmetry" to evaluate compliance with this prohibition on partisan favoritism. *Id.* § 20A-19-103(5). And it provides a private right of action to enforce its requirements and prohibitions in court. *Id.* § 20A-19-301.

12. On March 11, 2020, the Utah Legislature voted to repeal Prop 4. The Legislature then enacted a new redistricting law, S.B. 200. S.B. 200 rescinded some of Prop 4's critical reforms and enacted watered-down versions of others. It eliminated Prop 4's requirement that the Legislature take an up or down vote on each of the Commission's proposed maps, the requirement that the Legislature provide a written explanation if it chose to reject the Commission's maps and pass its own, as well as other requirements focused on increasing transparency and accountability in the redistricting process. S.B. 200 also made Prop 4's partisan gerrymandering ban binding only on the Commission.[23]

13. During the 2021 redistricting process, the Legislature rejected the Commission's proposed maps and instead enacted its own map, H.B. 2004, in accordance with the requirements of S.B. 200. H.B. 2004 amended the Utah Code to replace references to the 2011 with the 2021 map.[24] On March 17, 2022, Plaintiffs filed their initial complaint, claiming, *inter alia*, that Defendants' repeal of Prop 4 was a violation of Plaintiffs' right under Article I, Section 2, and Article VI, Section 1, of the Utah Constitution to alter and reform their government via the initiative process ("Count V"). Dkt. 001 at 77-78.

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[21] 10.24 Tr. at 392:25-393:24 (Barber).
[22] 10.24 Tr. at 377:1-378:12 (Barber).
[23] Redistricting Amendments, S.B. 200, 2020 Gen. Sess. (Utah 2020), https://le.utah.gov/~2020/bills/static/SB0200.html.
[24] There is no dispute that the using the 2020 Census data, the 2011 map is malapportioned. Specifically, District 4 in the 2011 map is overpopulated by 65,265 people. Legis. Defs.' Opp. to MSJ on Count VIII at 1-2 (Doc. 532).

14. Legislative Defendants filed a motion to dismiss Plaintiffs' Count V, which the Court granted. Dkt. 095. On appeal, the Utah Supreme Court reversed, holding as a matter of first impression that the Utah Constitution granted a protected alter and reform right. The Court held that, to establish a violation of this right, Plaintiffs must prove that the People exercised or attempted to exercise their initiative rights to pass an "alter and reform" initiative, and that the Legislature "amended . . . the initiative in a manner that impaired the reform contained in the initiative." If Plaintiffs establish these two elements, the legislative action is unconstitutional unless the Legislature can satisfy strict scrutiny by showing that the impairment is "narrowly tailored to advance a compelling government interest. *League of Women Voters of Utah v. Utah State Legislature*, 2024 UT 21, ¶¶ 74-75, ("*LWVUT I*").

15. On remand, Plaintiffs and Legislative Defendants filed cross motions for summary judgement on Plaintiffs' Count V. Following oral argument, on August 25, 2025, the Court granted Plaintiffs' motion for summary judgment and ruled that S.B. 200 was unconstitutional and void *ab inito*. The Court found that (i) "the people exercised their initiative power through Prop 4, and the subject matter of Prop 4 contained government reforms or alterations within the meaning of the Alter or Reform Clause;" Dkt. 470 at 15, (ii) "the Legislature impaired the people's initiative to alter or reform redistricting in Utah when the Legislature repealed Proposition 4 and enacted S.B. 200;" *id.* at 52, and (iii) "the legislative action – repealing Proposition 4 in its entirety and replacing it with S.B. 200 – [was not] narrowly tailored to advance a compelling state interest," *id.* at 56.

16. The Court also declared unconstitutional the 2021 Congressional Map, concluding that "H.B. 2004 cannot be separated from the Legislature's unconstitutional repeal of Proposition 4," because it "is the fruit of that unlawful repeal, an extension of the very constitutional violation that tainted the process from the start." *Id.* at 70-72. The Court thus ordered a remedial process to implement a new congressional map. *Id.* at 76.

17. The Parties submitted a stipulated proposed scheduling order, which the Court adopted. The order took into account the Lieutenant Governor's request that a congressional map be in place by November 10, 2025, to ensure sufficient time to conduct the 2026 election in an orderly fashion. The order established the following timeline in the event that the Legislature were to choose to enact a new congressional map. By September 25, the Legislature would publish its proposed alternative map. Between September 26 and October 5, the Legislature would make the proposed alternative map available for public comment. By October 6, the Legislature would enact the proposed alternative map and submit it to the Court. If Plaintiffs chose to submit their own proposed maps, they would do so also by October 6. The parties would then submit supporting briefs, objections, and expert reports by October 17, and the Court would hold an evidentiary hearing on the alternative map(s) on October 23 and 24. By October 28, the parties would submit any proposed findings of fact and conclusions of law. Dkt. 506. The latter deadline was extended to October 29.

18. On October 6, the Legislature met in a special session and passed S.B. 1012, which enacted its proposed remedial map, widely known as Map C.

19. Shortly before doing so, the Legislature also enacted S.B. 1011. S.B. 1011 makes significant amendments to Prop 4 by mandating the use of specific tests to evaluate whether a redistricting plan "purposefully or unduly" exhibits partisan favoritism. First, S.B. 1011 mandates use of the partisan bias and mean-median difference tests to assess whether a redistricting plan unduly favors or disfavors a political party. *See* Utah Code § 20A-19-103(1)(b)-(d), 4(c). Second,

S.B. 1011 requires an ensemble analysis, which requires the use of a sequential Monte Carlo simulation to generate at least 4,000 redistricting plans for comparison with the plan in question using a metric called the ranked marginal deviation. *Id.* § 20A-19-103(1)(a). The ensemble must be generated by adherence to the state's "legal and geometric criteria" for redistricting. *Id.* § 20A-19-103(1)(f). In certain circumstances, S.B. 1011 requires comparison only to a "culled" set of plans in the ensemble; this culling is done by removing those plans that fail the partisan bias test. *Id.* § 20A-19-103(1)(c)(ii), (a)(iii)(B). Finally, S.B. 1011 increases the evidentiary standard to determine purposeful partisan favoritism to "clear and convincing evidence." *Id.* § 20A-19-103(4)(b).

20. On October 6, Plaintiffs filed a notice of two remedial map submissions for the Court's consideration, Plaintiffs' Map 1 and Plaintiffs' Map 2.

21. Also on October 6, Plaintiffs filed their Third Supplemental Complaint alleging that S.B. 1011 impairs the core anti-gerrymandering reform of Prop 4 for no compelling reason in violation of Plaintiffs' right to alter and reform their government, and violates several other core constitutional rights, including the right to free elections, equal protection, free expression, to vote, and to be assured free government. The next day, Plaintiffs filed a motion for preliminary injunction to enjoin enforcement of S.B. 1011. The Court has set a hearing on the motion for November 4.

IV. Scientific and Statistical Methods for Assessing Partisan Favoritism

22. Partisan favoritism in redistricting often manifests via packing or cracking. In "packing," a disfavored party's voters are concentrated into fewer districts in greater numbers than can be explained by compliance with a state's neutral redistricting criteria or political geography. *See Adams v. DeWine*, 195 N.E.3d 74, 91 (Ohio 2022). This leaves the disfavored party's voters with fewer districts in which they could elect their candidate of choice than they would otherwise have if partisan considerations did not predominate over consideration of neutral redistricting criteria. In contrast, "cracking" spreads the disfavored party's voters across multiple districts so that they lack a majority in more districts than would be expected from complying with the state's neutral redistricting criteria. *Id.* at 88; *see also LWVUT I*, 2024 UT 21, ¶5 ("In general, partisan gerrymandering refers to efforts by incumbent politicians to draw electoral boundaries that benefit themselves and their political party by diluting the votes of citizens they predict will vote for candidates of other parties."). Because Utah's minority party voters are highly concentrated in Salt Lake County and too few to form a majority in more than one reasonably configured district, cracking is the primary means by which their voting strength can be diluted in congressional elections, enabling the majority party to win all four seats.[25]

23. Political scientists have developed numerous scientific and statistical methods to assess whether a redistricting plan purposefully or unduly favors or disfavors a political party. Some of these methods measure partisan symmetry, or "whether supporters of each of the two parties are able to translate their votes into representation with equal ease." *Common Cause v. Rucho*, 318 F. Supp. 3d. 777, 885 (M.D.N.C. 2018), *vacated on other grounds*, 588 U.S. 684 (2019). There are multiple measures of partisan symmetry, including, but not limited to, partisan bias, mean-median difference, and the efficiency gap.[26]

[25] PX-1A at 4 (10.7 Warshaw Report); 10.23 Tr. at 178:16-179:11 (Warshaw).
[26] PX-1A at 4-6 (10.7 Warshaw Report); 10.23 Tr. at 167:10-21 (Warshaw).

24. No single measure is perfect. Every measure depends on assumptions or conditions that may or may not be satisfied in the state, and some measures do not yield reliable results in certain contexts. Whether a measure is appropriate to use to evaluate a redistricting plan can depend on the state's electoral conditions, political geography, and the type of redistricting plan under review. No single measure should be considered in isolation or divorced from context. The best practice in social science is to apply all appropriate measures and data and consider them together to determine whether a map exhibits partisan favoritism.[27]

25. **Partisan Bias**. S.B. 1011 codifies the partisan bias test, which is a measure of partisan symmetry that asks: in a hypothetical election where each of the two parties wins 50% of the statewide vote, would each party win exactly 50% of the congressional seats under the proposed map? If yes, the map passes the test; if no, the map fails the test. Evaluating a map under S.B. 1011's partisan bias test begins with calculating the statewide two-party vote share using a "partisan index," which is defined as the average of the parties' vote shares in recent statewide elections. Utah Code § 20A-19-103(1)(e). Each party's district-level vote share under the proposed map is then determined using the same index. Next, each district's vote share for a party is uniformly adjusted by the difference between that party's statewide share and 50%. This creates a hypothetical tied election, where each party has exactly 50% of the vote. Finally, using the adjusted district vote shares, the difference between each party's expected seat share and 50% of the total seats represents the map's partisan bias. Under S.B. 1011, any map with a value other than exactly 0 fails the test.[28]

26. The Court finds that the partisan bias test is unsuitable for assessing whether a redistricting plan in Utah purposefully or unduly favors or disfavors a political party. It is not among the best available measures to assess partisan favoritism in Utah.[29]

27. First, because partisan bias assesses favoritism based solely on seat shares under a hypothetical 50-50 statewide election, scholars warn that it should not be applied in states like Utah where statewide elections are uncompetitive and a tied statewide election cannot plausibly be expected. The authors of the metric, Professors Andrew Gelman and Gary King, limited its application to "competitive electoral systems," which they defined as states in which each party had won a majority of seats or votes in at least one election during the preceding two decades. Professor Gary King has since emphasized that partisan bias "is only appropriate for competitive situations where there is a potential for change in partisan outcomes (majority control, in particular)."[30]

28. The Court finds that Utah's statewide elections are highly uncompetitive. Democrats have not received a majority of the statewide vote in congressional elections in 35 years

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[27] PX-1A at 4-6 (10.7 Warshaw Report); 10.23 Tr. at 186:18-187:11 (Warshaw); PX-9 at 330 (Katz et al. 2023) ("[A] single, quantitative bright line rule for detecting gerrymandering . . . is unusual in academia or the courts. In the literature on electoral systems, as in most academic fields, scholars avoid drawing conclusions from single sources of evidence or knife-edged quantitative thresholds and instead seek broader understanding from all available observed implications of a theory."); DX-14 at 14-15 (10.17 Barber Report); 10.24 Tr. at 44:12-46:4, 47:10-47:19 (Katz), 340:7-340:21, 341:15-342:18 (Barber).

[28] PX-1A at 13 (10.7 Warshaw Report); PX-3 at 30 (Chen Report); 10.23 Tr. at 30:16-31:15 (Chen). *See also* Utah Code § 20A-19-103(1)(d)-(e), (4).

[29] PX-1A at 1 (10.7 Warshaw Report); PX-3 at 30 (Chen Report); 10.23 Tr. at 31:16-32:4 (Chen), 156:1-3, 157:5-19 (Warshaw).

[30] PX-1A at 13-14 (10.7 Warshaw Report); PX-3 at 30 (Chen Report); 10.23 Tr. at 157:5-19, 160:4-22 (Warshaw).

and have not won a majority of congressional seats since at least 1970. Republicans have also won every statewide election for president, governor, and other offices included in S.B. 1011's partisan index during the last 25 years, nearly always with 20-plus margins.[31] Utah's highly uncompetitive environment also undermines the validity of the partisan bias test's uniform shift assumption—that is, the assumption that the shift to a 50-50 statewide vote share would occur uniformly across districts. Since this scenario has not even remotely occurred in decades, it is at best unclear how electoral coalitions would shift to produce a 50-50 statewide election and whether the uniform shift assumption underlying the partisan bias test is satisfied in Utah.[32] Thus, Utah does not satisfy the electoral conditions necessary for valid application of the partisan bias test.[33]

29. Second, when applied in Utah to congressional plans, the partisan bias test yields paradoxical results that advantage Republicans and disadvantage Democrats. The test treats most 3-1 maps that include one Democratic-leaning district as biased *against* Democrats, because in a hypothetical tied statewide election Democrats would not win two seats. At the same time, it treats 4-0 maps that guarantee Republicans all four seats as neutral. This irrational result stems from the test's conflict with Utah's political geography. To pass, a map must disperse Democrats across two districts to ensure they would win two seats in the hypothetical world of a tied statewide election. But because Democrats are a small, geographically concentrated minority, doing so dilutes their only opportunity in the real world to win one seat.[34] As the Court finds below, the partisan bias test's pro-Republican bias in Utah is also evident in the large number of computer-simulated maps it disqualifies (nearly all having one Democratic district) and the smaller number of maps it approves (nearly all having four Republican districts). *See infra*, Findings, Section VI.B.

30. Scholars have recognized this effect as the "Utah paradox"—one that is known to be gameable and the reason why partisan actors in Utah would opt to use partisan bias as their metric to assess congressional plans.[35] Notably, the Legislature applied the partisan bias test only to congressional plans. Utah Code § 20A-19-103(1)(c), (g). The Legislature did not apply the partisan bias test to its own legislative maps or the state school board maps, all of which would fail the test for exhibiting pro-Republican bias.[36]

31. The Court finds that Dr. Katz's testimony did not meaningfully address whether S.B. 1011's partisan bias test can be reliably applied in Utah's unique political context to evaluate compliance with Prop 4. Dr. Katz did not look at Prop 4 or S.B. 1011, was not asked to opine on the applicability of S.B. 1011's partisan bias test or any other metric to Utah's specific political geography, and did not mention Utah in his report.[37] Although Dr. Katz claims that partisan bias is the only valid measure of partisan symmetry (under his definition), as Dr. Warshaw testified, political science recognizes many other measures that detect asymmetries in how votes translate to seats.[38] The Court credits Dr. Warshaw's testimony as the more complete representation of the relevant literature and as more consistent with Prop 4's language.

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[31] PX-1A at 15-16, Figures 4 & 5 (10.7 Warshaw Report); 10.23 Tr. at 157:20-160:3, 160:25-162:15 (Warshaw).
[32] 10.23 Tr. at 169:16-171:21 (Warshaw).
[33] 10.23 Tr. at 31:16-32:4 (Chen), 162:20-163:2 (Warshaw).
[34] PX-1A at 20 (10.7 Warshaw Report); 10.23 Tr. at 163:3-165:21 (Warshaw).
[35] PX-1A at 18 (10.7 Warshaw Report); 10.23 Tr. at 166:2-167:1 (Warshaw); PX-9 at 329 (Katz et al. 2023); DX-14 at 14 (10.17 Barber Report); 10.24 Tr. at 59:6-60:11 (Katz), 340:12-21, 341:15-25, 344:4-344:12 (Barber).
[36] PX-1A at 18-19 (10.7 Warshaw Report); 10.23 Tr. at 165:4-21 (Warshaw).
[37] 10.24 Tr. at 33:13-34:24, 36:25-37:6, 37:13-38:6, 39:19-40:5, 40:12-41:14 (Katz).
[38] 10.23 Tr. at 167:10-21 (Warshaw).

32. To the extent Dr. Katz denied any limits on applying the partisan bias test in Utah, the Court finds that his academic writing and his testimony on cross-examination contradicted that position. In an online appendix to his 2020 article (which was not disclosed in his report), Dr. Katz acknowledged that his model of partisan symmetry, including the partisan bias test, "seems empty" in "noncompetitive" states where "one party is confident of a statewide majority," and he identified "minority protection" as another component of partisan fairness in that context.[39] In a 2023 paper responding to the "Utah paradox" critique, Dr. Katz admitted that the partisan bias test is the metric Republican lawmakers in Utah would prefer.[40] He also conceded that the seats-votes curve underlying the test "is defined coherently only for all districts in an entire legislature" and that applying the test to a state's congressional districts as they constitute a legislature "is not reasonable."[41]

33. **Mean-Median Difference**. S.B. 1011 also codifies a mean-median difference test, which takes the difference between a party's mean statewide vote share and median district vote share. Utah Code § 20A-19-103(1)(b). A greater distance between the mean and median suggests skew in favor of the other party, whereas closer values suggest the party's distribution of district vote shares is more symmetric. S.B. 1011 establishes a knife-edged threshold, providing that a map fails the mean-median difference test if the score exceeds 2%.[42]

34. The Court finds that the mean-median difference test is unsuitable for assessing whether a redistricting plan in Utah purposefully or unduly favors or disfavors a political party. It is not among the best available measures, given Utah's current political geography.[43]

35. First, the mean-median difference test is designed only to detect packing gerrymanders and is insufficient to detect cracking gerrymanders. To detect cracking gerrymanders, other measures must be used.[44]

36. Second, the mean-median difference test is only probative of partisan favoritism in states with reasonably competitive elections, and it breaks down in states with highly uncompetitive elections like Utah. This is because the outcome of the mean-median difference test depends only on the *median* district's vote shares; this is meaningless where the median district cannot reasonably be expected to shift in party control.[45] The Court notes that Defendants' expert Dr. Katz conceded the mean-median difference test "is not appropriate in a state . . . where a single party is dominant and statewide vote shares are far from 50%" and admitted that he declined to apply the test in another such state.[46]

37. Third, when applied in Utah to congressional plans, the mean-median difference test yields paradoxical results that advantage Republicans and disadvantage Democrats. The test prefers maps that more evenly distribute a party's voters around the median district to discourage them from being "packed" into only one district. This has no effect on Republican seat share because the two median districts—the second- and third-most Republican—will remain well above 50% Republican, leaving no realistic scenario in which redistributing Democratic voters could flip

[39] PX-8 at 3-4 (Online Appendix B); PX-9 at 329 n.3 (Katz et al. 2023); 10.24 Tr. at 53:13-54:22; 56:17-59:4 (Katz).
[40] PX-9 at 329 (Katz et al. 2023); 10.24 Tr. at 59:6-60:11 (Katz).
[41] PX-9 at 329-30 (Katz et al. 2023); 10.24 Tr. at 63:17-64:6 (Katz).
[42] PX-1A at 14 (10.7 Warshaw Report); PX-3 at 38 (Chen Report); 10.23 Tr. at 172:9-24 (Warshaw).
[43] PX-1A at 1 (10.7 Warshaw Report); PX-3 at 38 (Chen Report); 10.23 Tr. at 180:1-7 (Warshaw).
[44] PX-1A at 14 (10.7 Warshaw Report); 10.23 Tr. at 179:12-25 (Warshaw).
[45] PX-1A at 14-15 (10.7 Warshaw Report); PX-3 at 38 (Chen Report); 10.23 Tr. at 173:17-174:6 (Warshaw).
[46] 10.24 Tr. at 66:23-69:10 (Katz); PX-10 at 13-14 (Katz New York Report).

them. But the test disfavors Democratic voters given the state's political geography. Because Democratic voters are concentrated in Salt Lake County, their high vote share there tends to inflate the difference between the statewide average vote share and median district vote share. To "pass" the mean-median difference test and close this gap, a map must crack Democratic voters to disperse them into districts on the other side of the median, effectively pulling them out of the only district where they can form a majority and into safely Republican districts. For these reasons, the mean-median difference test irrationally identifies 3-1 maps that include a single majority-Democratic district as pro-*Republican* gerrymanders, while identifying 4-0 Republican maps that crack Democratic voters as unbiased.[47]

38. Scholars have likewise recognized the "Utah paradox" to apply to the mean-median difference test.[48] The test is recognized to be gameable by partisan actors, especially through the use of knife-edged, pass/fail thresholds, like S.B. 1011's 2%.[49] The mean-median difference test's pro-Republican bias in Utah is also evident in the large number of neutrally drawn computer-simulated maps it disqualifies. Only 6 of the 10,000, or 0.06% of Dr. Chen's 10,000 neutrally drawn ensemble maps have a mean-median difference of less than 2%; the rest are disqualified.[50]

39. Additionally, Dr. Trende testified at the September 22 LRC hearing that the partisan bias test is "much more useful, in my view, and I think most political scientists would agree, for house and senate chambers where you have a large number of districts to keep track of."[51] He reaffirmed and expanded that testimony at the evidentiary hearing, further stating that "I think all of these partisan fairness metrics [including the partisan bias test and the mean-median test] are better in maps where you have lots of districts, and those will tend to be state legislative maps."[52]

40. The Court finds that by mandating the use of the partisan bias and mean-median difference tests, S.B. 1011 favors Republicans and disfavors Democrats in congressional redistricting and is thus fundamentally at odds with Prop 4's prohibition on partisan favoritism and its requirement that the "best available data and scientific and statistical methods" be used.

41. **Efficiency Gap**. The efficiency gap is a measure of partisan symmetry that evaluates whether each party's votes are translated into seats with equal efficiency. The efficiency gap is calculated by taking the difference between each party's respective inefficient votes, divided by the total number of votes cast in the election. Inefficient votes refer to votes cast for the party's candidates in the districts where its candidates lost, plus the votes for its candidates in the districts they won in excess of the 50%+1 votes needed for victory. The efficiency gap mathematically captures the practical effects of packing and cracking, which are the main ways partisan favoritism in redistricting is affected. Cracking spreads a disfavored party's voters too thinly to elect their preferred candidates, while packing concentrates the disfavored party's voters in overwhelming majorities, wasting votes that could be translated to seats elsewhere. Both tactics produce

[47] PX-1A at 21-22 (10.7 Warshaw Report); PX-3 at 38-39 (Chen Report); 10.23 Tr. at 174:7-177:17 (Warshaw); DX-14 at 14 (10.17 Barber Report).
[48] PX-1A at 17-18 (10.7 Warshaw Report); DX-14 at 14 (10.17 Barber Report) ("The signed symmetry implementations (partisan bias, mean-median) can generate well-known paradoxes when the statewide vote share is not near 50-50").
[49] PX-1A at 18 (10.7 Warshaw Report); 10.23 Tr. at 172:19-173:10 (Warshaw).
[50] PX-3 at 39 (Chen Report).
[51] PX-19 (Trende LRC Testimony).
[52] 10.24 Tr. at 213:6-214:5 (Trende).

inefficient votes, and the efficiency gap measures whether one party has more inefficient votes than the other under a proposed map.[53]

42. The efficiency gap, like every partisan symmetry measure, can exhibit volatility in states like Utah with a relatively small number of congressional districts and can be sensitive to slight changes in the partisanship of districts with vote shares near 50%. However, the Court credits Dr. Warshaw's testimony explaining that these risks are mitigated by his method of calculating the partisan lean of each district based on a weighted index of election results from a range of statewide races across five previous election years and by reporting a map's efficiency gap as the weighted average of its efficiency gap scores across each previous contest in the index.[54]

43. Unlike the partisan bias and mean-median difference tests—which yield wholly incoherent results in uncompetitive states—the efficiency gap is not inapplicable in a state as uncompetitive as Utah. As Dr. Warshaw explains, the original authors of the efficiency gap acknowledged that the efficiency gap may be inapplicable in states where one party consistently wins more than 75% of the vote, "[b]ut Utah does not fall into that category. So . . . Utah is not outside of the boundary conditions of the efficiency gap."[55]

44. The Court finds that, despite its drawbacks, the efficiency gap is an appropriate symmetry measure to consider in assessing congressional maps in Utah. It correctly identifies the party favored under a proposed congressional map and permits analysis of the extent to which that party is favored via comparison with historical congressional plans in other states. The efficiency gap is thus among the best symmetry measures available to evaluate partisan favoritism in Utah congressional maps and should be considered alongside other appropriate measures.[56]

45. **Ensemble Analysis**. Over the past decade or so, political scientists have developed a method of assessing redistricting maps that involve computers generating large numbers of maps through an algorithm. Properly constructed, the algorithm should generate maps that comply with the relevant redistricting criteria while excluding consideration of partisan political data. The resulting computer-simulated maps can then be assessed to determine the expected partisan characteristics of maps drawn without partisan intent but instead solely to satisfy the state's neutral redistricting criteria. In other words, the ensemble of simulated maps provides a baseline against which to compare when a proposed or enacted map is likely or not to have been drawn with partisan intent in light of how it compares to the distribution of neutrally-configured computer-simulated maps.[57] The Court finds that a properly constructed ensemble analysis is among the best available methods to assess whether a redistricting plan in Utah purposefully or unduly favors or disfavors a political party.

46. **Ranked Marginal Deviation**. S.B. 1011 requires use of the ranked marginal deviation (RMD) test as part of an ensemble analysis to determine whether a proposed congressional plan exhibits partisan purpose. In essence, the RMD test asks how much a proposed plan or computer-simulated plan deviates from the typical computer-simulated plan. The RMD test is assessed by calculating the RMD of the proposed plan and each of the simulated plans using the formula described in S.B. 1011. *See* Utah Code § 20A-19-103(1)(a)(ii). The RMD of the proposed

[53] PX-1A at 7 (10.7 Warshaw Report); 10.23 Tr. at 183:1-186:6 (Warshaw).
[54] PX-1C at 11 n.13 (10.16 Warshaw Report); 10.23 Tr. at 193:8-197:14, 220:14-221:5 (Warshaw).
[55] 10.23 Tr. at 187:12-23, 197:15-198:7 (Warshaw).
[56] PX-1C at 11 (10.16 Warshaw Report); 10.23 Tr. at 187:14-23, 188:21-189:20, 219:24-221:15 (Warshaw).
[57] PX-3 at 5 (Chen Report); DX-13 at 20-22 (Trende Report); DX-14 at 23 (10.17 Barber Report).

plan is then compared against the distribution of RMDs across the set of simulated plans. If the proposed plan is within the bottom 95% of the simulated plans' RMDs, then the proposed plan passes the RMD test. If the proposed plan's RMD is higher than the bottom 95% of the simulated plans' RMDs, then the proposed plan is deemed extreme and fails the RMD test.[58]

47. **Least Republican Vote Share**. Because Utah's minority party is geographically concentrated and often not large enough to form a majority in more than one district, political scientists have proposed looking to the least Republican district vote share (LRVS) as an indicator of partisan favoritism in redistricting. This measure is a partisan characteristic best evaluated in comparison to a computer-generated ensemble to determine whether a plan's LRVS falls outside the range of expected outcomes under Prop 4's neutral criteria. Legislative Defendants' expert Dr. Trende, like Plaintiffs' experts, identified and used LRVS in assessing maps.[59] The Court finds LRVS is among the best available measures to assess partisan favoritism in Utah congressional maps.[60]

48. **Standard Deviation of Vote Shares**. Political scientists also propose looking to the standard deviation of district vote shares (SDVS) as an indicator of partisan favoritism in Utah. This measure captures how even vote shares are across districts. It is a partisan characteristic best evaluated in comparison to a computer-generated ensemble to determine whether a plan's SDVS falls outside the range of expected outcomes under Prop 4's neutral criteria. An especially low SDVS indicates that vote shares have been made unusually uniform across all four districts, a pattern consistent with cracking a geographically concentrated minority party. The Court finds SDVS is among the best available methods to assess partisan favoritism in Utah congressional maps.[61]

V. Plaintiffs' and Legislative Defendants' Experts' Ensemble Analyses

49. **Dr. Chen**. Plaintiffs' expert Dr. Chen created an algorithm designed specifically to comply with the priority-ordered Prop 4 redistricting criteria. *See* Utah Code § 20A-19-103(3). Using his algorithm designed specifically for Utah's legal requirements, Dr. Chen produced 10,000 unique, simulated maps that accounted for each of Prop 4's criteria, applying them in the priority order in which the law ranked them as the computer made choices in configuring each simulated map.[62] Dr. Chen's algorithm uses the Sequential Monte Carlo method of simulations, as that term is defined by S.B. 1011.[63]

50. The Court finds that Dr. Chen's ensemble of simulated maps closely adheres to Prop 4's neutral redistricting criteria without incorporating any racial or political data.[64]

51. Each of Dr. Chen's simulated maps achieves perfect population equality.[65] The majority have three or fewer divided municipalities and each has only three county divisions (the

[58] PX-3 at 27 (Chen Report); 10.23 Tr. at 28:10-29:16 (Chen).
[59] 10.24 Tr. at 129:1-11 (Trende).
[60] PX-1A at 23-24 (10.7 Warshaw Report); 10.23 Tr. at 181:7-17.
[61] PX-1A at 10-11, 23 (10.7 Warshaw Report); PX-3 at 23-24 (Chen Report); 10.23 Tr. at 181:18-182:12, 182:19-24 (Warshaw).
[62] PX-3 at 5-6 (Chen Report); 10.23 Tr. at 18:4-19:5 (Chen).
[63] 10.23 Tr. at 17:22-18:3 (Chen).
[64] PX-3 at 7-9 (Chen Report); 10.23 Tr. at 18:4-21:16 (Chen).
[65] PX-3 at 7, 46, Figure 5.1 (Chen Report); PX-4 at 3, Figure 1 (Chen Supplemental Report).

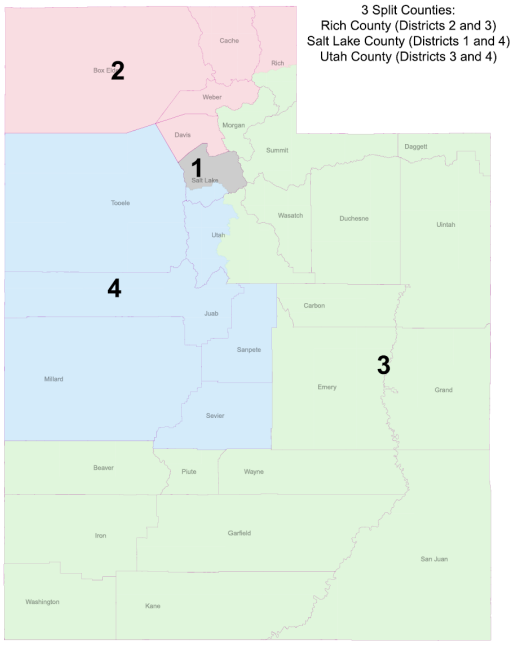
fewest possible), with no county being split into more than two districts.[66] Dr. Chen's simulated maps score highly on two common compactness metrics that assess whether the district is compact by area (Reock) and the regularity of its borders (Polsby-Popper).[67] Each simulated map has contiguous districts and the maps ensure ease of transportation by avoiding district configurations that use the Great Salt Lake or Utah Lake as the sole point of contiguity or cross the Colorado River without including a bridge.[68] Dr. Chen's maps respect, to the greatest extent practicable, the communities of interest identified both by the Commission (in 2021) and the LRC (in 2025).[69] Finally, the maps ensure boundary agreement with state legislative and board of education districts to the greatest extent practicable.[70]

52. Below are two sample simulated maps from Dr. Chen's ensemble.[71]

[66] PX-3 at 92-93, Figures 6.2 & 6.3 (Chen Report).
[67] PX-3 at 91, Figure 6.1 (Chen Report); DX-13 at 15-16 (Trende Report) (describing compactness metrics).
[68] PX-3 at 8-9 (Chen Report).
[69] PX-3 at 9, 95-98 (Chen Report). Defendants questioned whether partisan information was included in Dr. Chen's algorithm because it sought to respect, where possible, the communities of interest identified by the Commission, and some of the associated public input for a handful of submissions mentioned the political makeup of certain cities and neighborhoods. The Court is unpersuaded by this argument and finds that the incorporation of the Commission's communities of interest did not cause Dr. Chen's algorithm to be based on political data. The Court credits Dr. Chen's testimony that he never reviewed the comments, that none actually stated any electoral or party registration data, that the identified communities were likely already respected because of Prop 4's higher priority requirement to avoid dividing municipalities, and that is highly unlikely any districts in the simulated set were affected by any of the comments identified by Legislative Defendants given the relatively lower ranking of communities of interest. 10.23 Tr. at 19:22-20:15 (Chen). Legislative Defendants' expert Dr. Barber agreed that the identified comments were few and did not actually communicate any electoral or party registration data, 10.24 Tr. at 385:18-387:3 (Barber), and Legislative Defendants' expert Dr. Trende agreed that it was unlikely that simulations would be affected by community of interest boundaries given the lower priority ranking in Prop 4, DX-13 at 18 (Trende Report).
[70] PX-3 at 99-101 (Chen Report).
[71] PX-6 (Chen Sample Maps, Nos. 8977 & 3954)

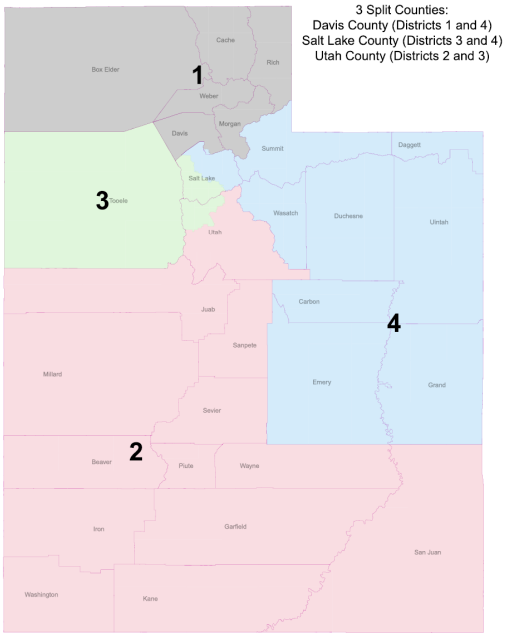
Chen Simulated Map #:8977

District:	Population:	Reock:	Popper–Polsby:
1	817,904	0.414	0.388
2	817,904	0.354	0.414
3	817,904	0.436	0.356
4	817,904	0.559	0.556
Plan Average:	817,904	0.441	0.428



Chen Simulated Map #:3954

District:	Population:	Reock:	Popper–Polsby:
1	817,904	0.388	0.489
2	817,904	0.451	0.426
3	817,904	0.467	0.486
4	817,904	0.493	0.395
Plan Average:	817,904	0.45	0.449



53. Defendants' expert Dr. Barber criticized Dr. Chen's simulated maps for frequently creating a district comprising the municipalities in northern Salt Lake County. But Dr. Chen credibly explained that this is an expected outcome from closely adhering to Prop 4's priority-ordered criteria. In particular, the Court credits Dr. Chen's explanation that the presence of two municipalities in southern Salt Lake County, Bluffdale and Draper, that cross the Utah County border will naturally lead an algorithm designed to minimize municipal and county splits to combine the southern portion of Salt Lake County with portions of Utah County.[72] The Legislature's Map C illustrates this—it creates an unnecessary additional county split of Utah County by placing Draper and Bluffdale in different districts.[73] Moreover, the Court credits Dr. Chen's explanation that a northern Salt Lake County district is likely to arise in simulations designed to avoid districts contiguous only because of the Great Salt Lake.[74]

54. The Court finds that Dr. Chen reliably generated an ensemble of computer-simulated maps that reflect the application of Prop 4's priority-ordered redistricting criteria to Utah's political geography and thus created a reliable distribution of maps that reflect what would be expected to result from a mapdrawing process designed to adhere to Prop 4's requirements without consideration of racial or partisan information.

[72] 10.23 Tr. at 85:25-88:3 (Chen).
[73] PX-2 at 10 (Oskooii Report).
[74] 10.23 Tr. at 85:25-88:3 (Chen).

55. **Dr. Trende**. Defendants' expert Dr. Trende, as part of the legislative process that culminated in the adoption of Map C, relied upon three sets of computer-simulated maps to assess legislative proposals.[75]

56. The first, referred to as the "ALARM" Project, was generated in 2021 by a group of political scientists affiliated with Harvard University. Dr. Trende got the idea to use the ALARM set of simulated Utah maps to assess the partisan characteristics of proposed maps from a Twitter comment by one of the ALARM founders.[76] The ALARM set of Utah simulations contained 6,000 maps and was created specifically to follow the redistricting criteria applicable to the commission under S.B. 200, which the Court enjoined as unconstitutional.[77] The S.B. 200 criteria differ from the Prop 4 criteria, with the S.B. 200 criteria requiring the preservation of the cores of prior districts, for example. *Compare* Utah Code § 20A-19-103(3) (Prop 4) *with* Utah Code § 20A-20-302(5).[78]

57. The Court finds that the ALARM Project's simulated maps are an inappropriate set to use for assessing proposed or enacted maps in Utah because they were generated to follow the defunct S.B. 200 redistricting criteria rather than Prop 4's redistricting criteria, which are meaningfully different in substance and prioritization. The ALARM Project's ensemble does not provide a relevant comparator.

58. Dr. Trende's second set of simulations are called his "Base" set, which he generated using an open-source coding software called "R" by running the off-the-shelf redistricting simulation package called "redist"—an algorithm that was developed by the founders of ALARM.[79] He intended this set of 100,000 simulated maps to focus on population equality, minimizing municipal and county splits, and compactness.[80]

59. Dr. Trende's third set of simulations are called his "Restricted" set, which he likewise generated using the "redist" package in R. This set also contained 100,000 maps and was intended to focus on imposing various geographical restrictions to prevent districts that were connected via impassable mountains or waterways.[81] As Dr. Trende refined his "Restricted" set of simulations, he consulted partisan political data to assess the partisan implications of the geographical restrictions he was applying.[82]

60. Dr. Trende's "Base" and "Restricted" ensembles suffer substantial and fundamental flaws in their attempted adherence to Prop 4's redistricting criteria, making them unreliable—at least in their totality—as a point of reference against which to compare Map C or Plaintiffs' proposed remedial maps.

61. *Population Deviation*. Dr. Trende's simulated maps substantially deviate from the precise population equality required for congressional districts, with the middle 95% range of his maps having a total sum deviation of roughly 5,500 to 25,000 people, compared to the 0 person

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[75] PX-12 (Trende Map Analyses); 10.24 Tr. at 126:18-128:3 (Trende).
[76] 10.24 Tr. at 126:18-127:21 (Trende).
[77] 10.23 Tr. at 38:7-39:2 (Chen); 10.24 Tr. at 134:25-135:11, 199:7-11 (Trende).
[78] At the September 22, 2025 LRC hearing during a colloquy with Dr. Trende, Sen. Sandall noted with reference to the 2021 map and the Commission maps, "they were developed under Senate Bill 200—different criteria" than Prop 4. 9.22 LRC Hearing at 2:25-2:31.
[79] DX-13 at 36 (Trende Report); 10.24 Tr. at 127:22-128:3 (Trende).
[80] 10.24 Tr. at 127:22-128:3 (Trende); DX-13 at 36 (Trende Report).
[81] 10.24 Tr. at 126:18-128:3 (Trende).
[82] DX-13 at 37 (Trende Report).

deviation in Dr. Chen's maps.[83] The "redist" package used by Dr. Trende cannot achieve 0 population deviation because it can only assign whole precincts to districts.[84] Relaxing the allowable population deviation in this manner makes the ensemble less reliable as an indicator of a map's partisan characteristics because it disregards a constraint that could limit the expected partisan distribution of neutrally drawn maps and potentially causes the ensemble to understate the number of municipality divisions that would arise once population equality was achieved.[85]

62. *Excessive County Divisions*. Dr. Trende's simulated maps do not minimize county divisions to the greatest extent practicable, as Prop 4 requires. Among his "Base" ensemble, the most common number of county divisions is 8, and over 8% of the "Base" maps have between 10 and 14 county divisions, compared to Dr. Chen's simulations, each of which has only 3 county divisions.[86] Among Dr. Trende's "Restricted" ensemble, most maps have either 5 or 6 county divisions.[87]

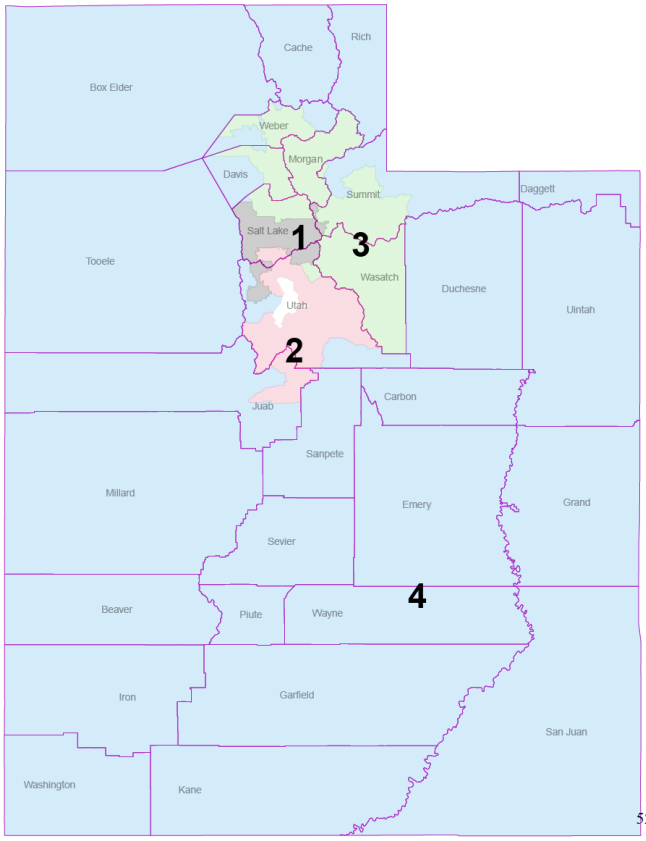
63. Dr. Trende incorrectly asserted in his expert report that his ensembles limited each county to being divided only once.[88] In fact, Dr. Trende programmed the algorithm to entirely ignore the county boundaries of several counties, including Salt Lake, Davis, Weber, Summit, and Utah Counties, such that his algorithm did not even recognize them as counties at all and was free to divide them without limit.[89] That instruction rendered Dr. Trende's algorithm wholly inconsistent with Prop 4's criteria, which place minimizing county divisions high in the priority rank without exception for particular counties. Below is an example from Dr. Trende's simulated maps, illustrating the excessive county divisions (here, 6 counties with 11 divisions) that plague his simulated maps.[90]

[83] PX-3 at 45-46, Figure 5.1 & App. F, Figure 5.20 (Chen Report).
[84] 10.24 Tr. at 230:23-25 (Trende).
[85] PX-3 at 47 (Chen Report); PX-4 at 16 (Chen Supplemental Report).
[86] PX-3 at 48-49, Figure 5.2 & App. F, Figure 5.21 (Chen Report).
[87] PX-3 at App. F, Figure 5.21 (Chen Report).
[88] DX-13 at 36 (Trende Report).
[89] 10.24 Tr. at 228:11-229:7 (Trende).
[90] PX-3 at 52, Figure 5.3 (Chen Report).

Figure 5.3: Trende 'Base' Simulated Map #13,245 of 100,000

District:	Population:	Reock:	Polsby-Popper:	Contiguity Violation:
1:	812,563	0.342	0.115	No
2:	816,505	0.374	0.116	No
3:	819,096	0.315	0.101	No
4:	823,448	0.545	0.254	Yes
Unassigned:	4			
Plan Average:	817,903	0.394	0.146	

6 Divided Counties (11 County Divisions):
Davis County (Districts 3 and 4)
Juab County (Districts 2 and 4)
Salt Lake County (Districts 1,2,3 and 4)
Summit County (Districts 1,3 and 4)
Utah County (Districts 1,2,3 and 4)
Weber County (Districts 3 and 4)

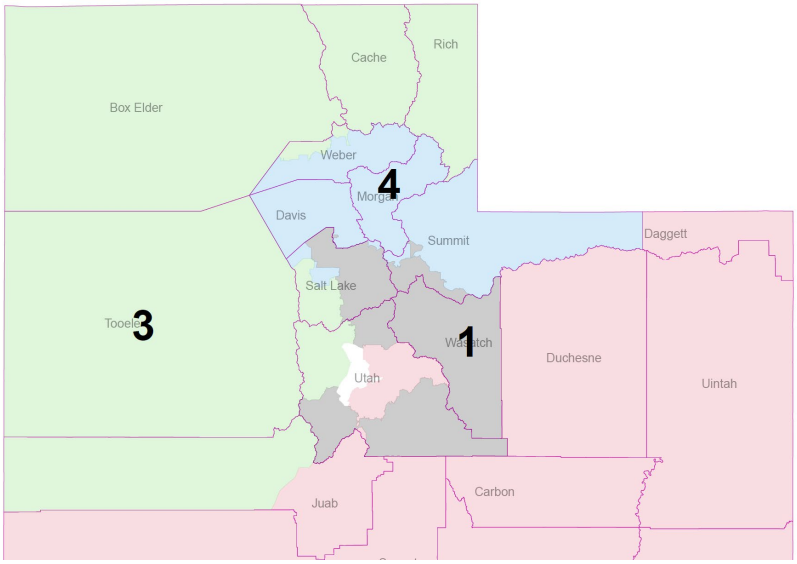


64. *Lack of Geographic Compactness*. Dr. Trende's ensembles did not create districts that are geographically compact to the greatest extent practicable. *See* Utah Code § 20A-19-103(3)(c). The map image above illustrates as much, as do the others in the record.[91] The middle 95% range of Dr. Trende's maps' compactness scores (on the Polsby-Popper measure) falls entirely beneath that of Dr. Chen's.[92] Indeed, Dr. Trende testified that he was unaware that Prop 4's "greatest extent practicable" standard even applied to the compactness criterion.[93] Commenting on Dr. Chen's simulated maps, Dr. Trende testified: "I just think his maps are too compact for what real people were thinking when they were drawing."[94] But after reviewing examples and summary statistics regarding both Dr. Trende's and Dr. Chen's simulated maps, the Court finds that Dr.

[91] PX-3 at 73, Figure 5.12 & App. E (Chen Report).
[92] PX-3 at 71, Figure 5.11 (Chen Report).
[93] 10.24 Tr. at 254:2-12 (Trende).
[94] 10.24 Tr. at 255:19-21 (Trende).

Chen's are not "too compact," but rather adhere to Prop 4's requirement that districts be drawn to be geographically compact to the greatest extent practicable.[95] Dr. Trende's maps do not.

65. *Noncontiguous Districts.* Dr. Trende's report incorrectly asserted that his "[m]aps are all contiguous."[96] Nearly half of the maps in Dr. Trende's "Base" ensemble and roughly 42% of them in his "Restricted" ensemble contain noncontiguous districts—some in which all four districts are noncontiguous.[97] An example is shown below from Dr. Trende's Base Map No. 42,874:[98]



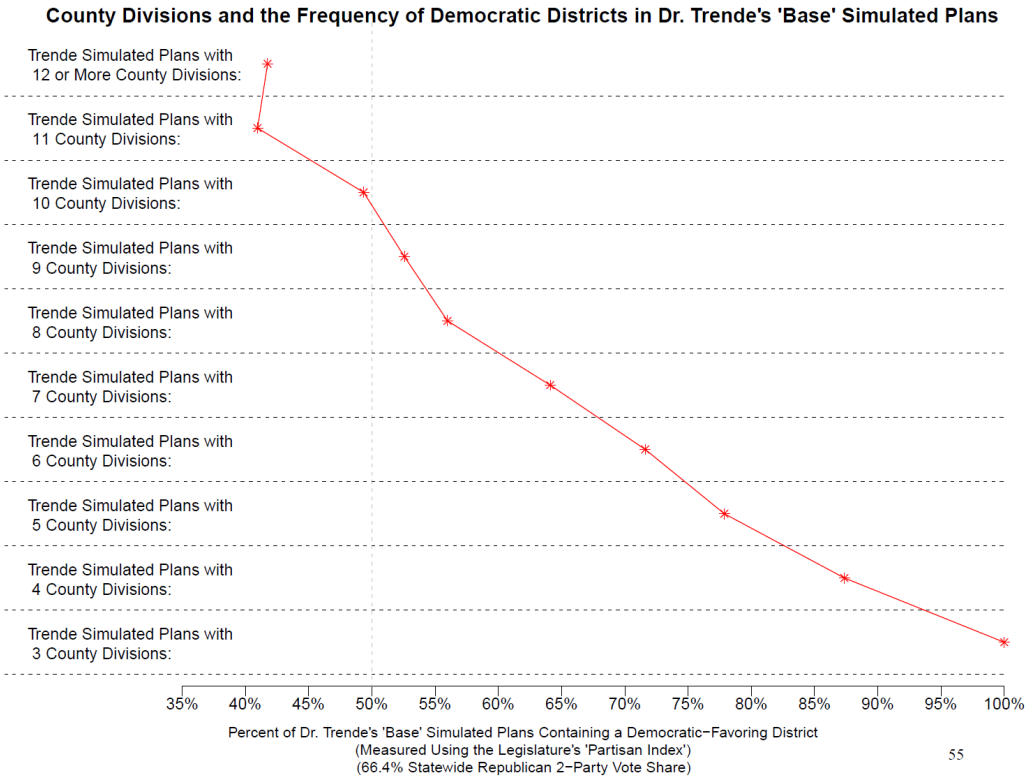
66. The Court finds that Dr. Trende's "Base" and "Restricted" Ensembles were not configured to comply with Prop 4's redistricting criteria and thus cannot—at least in their totality—be a proper basis against which to assess other maps' partisan characteristics. For this reason, Dr. Trende's ensembles to not satisfy the definition of "sequential Monte Carlo simulation" in S.B. 1011 because they do not accord with "legal and geometric criteria." Utah Code § 20A-19-103(1)(f).

67. *Republican Favoritism in Dr. Trende's Ensembles.* The Court also finds that the many shortcomings in Dr. Trende's ensembles skewed the set to a substantial degree in favor of Republicans. The Court gives great weight to the testimony and evidence proffered by Dr. Chen illustrating as much.

68. The excessive county divisions in Dr. Trende's ensembles skewed the simulations in favor of Republicans. Dr. Chen persuasively testified that, when county borders are disrespected in this manner, the effect is to randomly assign voters without regard to their counties of residence, leading to districts that simply reflect the statewide partisan composition.[99] This was evident in Dr. Trende's ensembles. There is a direct, inverse relationship between the number of county divisions

[95] PX-6 (Sample Chen Maps).
[96] 10.24 Tr. at 231:14-19 (Trende).
[97] PX-3 at App. G, Tables G1 and G4 (Chen Report).
[98] PX-3 at App. E, Figure E12 (Chen Report).
[99] 10.23 Tr. at 44:7-46:24 (Chen).

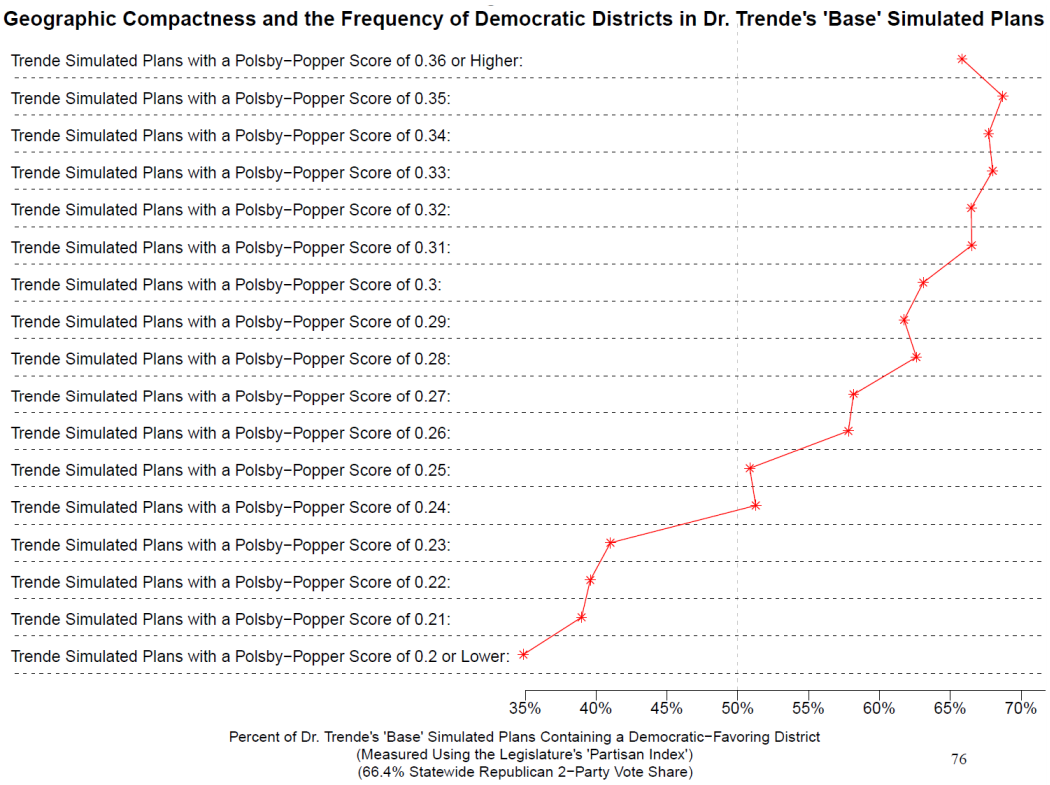
in Dr. Trende's simulated maps and the percentage of his maps that contain a Democratic-favoring district, as shown below.[100]



69. Likewise, as the number of county splits increased in Dr. Trende's ensembles, so too did the Republican vote share of the least Republican district.[101]

70. The same pattern was evident when considering the compactness scores for Dr. Trende's maps. As illustrated below, as the compactness scores for Dr. Trende's simulated maps increased, so too did the percentage of his maps containing a Democratic-favoring district:[102]

[100] PX-3 at 55, Figure 5.4 (Chen Report).
[101] PX-3 at 56, Figure 5.5 (Chen Report); 10.23 Tr. at 44:6-45:22 (Chen).
[102] PX-3 at 76, Figure 5.13 (Chen Report).



71. Similarly, as the compactness scores of Dr. Trende's simulated maps decrease, the Republican vote share of the least Republican districts increases.[103]

72. This same pattern holds true for the noncontiguous districts in Dr. Trende's ensembles. Among Dr. Trende's "Base" ensemble, as the number of noncontiguous districts rises from 0 to 1 to 2 to 3 to 4, so too does the percentage of maps with 4 Republican districts increase (from 34.5% to 41.6% to 52.6% to 57.2% to 75.0%).[104] Among Dr. Trende's "Restricted" ensemble, the same pattern is true, with the percentages of maps with 4 Republican districts increasing from 27.7% to 28.7% to 39.5% to 42.3% to 66.7% as the number of noncontiguous districts increases from 0 to 4.[105]

73. Dr. Trende's failure to conform his ensembles to Prop 4's requirements caused his simulated maps to be substantially skewed in favor of Republicans. Had he conformed his ensembles to Prop 4's criteria, their partisan composition would have shifted substantially. Accordingly, the Court finds them to be an inappropriate benchmark—at least when considered as a full set. If Dr. Trende's ensembles were to be used to assess maps—as they were by the Legislature—it would have the effect of potentially excusing maps that in fact purposefully favor Republicans while falsely labeling neutral maps as purposefully favoring Democrats.

74. **Dr. Barber**. Dr. Barber generated an ensemble of 50,000 computer-simulated maps using the same "redist" R package as Dr. Trende.[106] Like Dr. Trende's ensembles, Dr. Barber's ensemble fails to conform with Prop 4's requirements and thus does not serve as an appropriate

[103] PX-3 at 79, Figure 5.14 (Chen Report).
[104] PX-3 at App. G, Table G2 (Chen Report).
[105] PX-3 at App. G, Table G5 (Chen Report).
[106] DX-14 at 23 (10.17 Barber Report).

benchmark against which to assess maps. His ensemble does not satisfy S.B. 1011's definition of "sequential Monte Carlo simulation" because it does not accord with the "legal and geometric criteria." Utah Code § 20A-19-103(1)(f).

75. *Population Deviation*. Dr. Barber wrote in his expert report that his simulations were programmed to create districts with "strict population equality."[107] He did not explain in his report that this meant something other than 0 population deviation, but on cross examination acknowledged that he programmed the "redist" algorithm to have a +/- 0.1% population deviation.[108] Legislative Defendants' other expert, Dr. Trende, testified that taking this approach is inadvisable because it restricts too greatly which precincts can be allocated to which districts, limiting the plan diversity of the ensemble.[109] Indeed, Dr. Trende testified that the approach taken by Dr. Barber causes "redist" to "stop[] working and you start to really constrain the maps."[110] Dr. Trende agreed that "it wouldn't be a valid set to compare against" if one were to limit "redist" to producing maps below a 1% deviation range, given "redist's" inability to split precincts.[111] This is only a limitation of "redist," as Dr. Trende acknowledged that Dr. Chen's algorithm can split precincts and assign Census blocks in order to perfectly equalize population.[112]

76. *Excessive Division of Salt Lake County*. Dr. Barber's report asserted that he programmed his algorithm to minimize county splits.[113] But he did not disclose in his report that in fact he programmed his algorithm to avoid splitting all counties except Salt Lake County.[114] Indeed, Dr. Barber instructed his algorithm to eliminate, on the front end, Salt Lake County from the definition of "county" his algorithm used and allow it to make unlimited divisions of Salt Lake County.[115]

77. Accordingly, Dr. Barber's algorithm responded as would be expected—it sought to avoid splitting 28 of Utah's 29 counties and it was forced, by Dr. Barber's redefinition of "county" to exclude Salt Lake County, to concentrate the dividing lines of the districts in Salt Lake County.[116] As far as Dr. Barber's algorithm was concerned, it could do well on minimizing county splits by focusing its divisions in the highly populated area known in the real world as "Salt Lake County," but known to the algorithm as a county-less region of sizeable population.

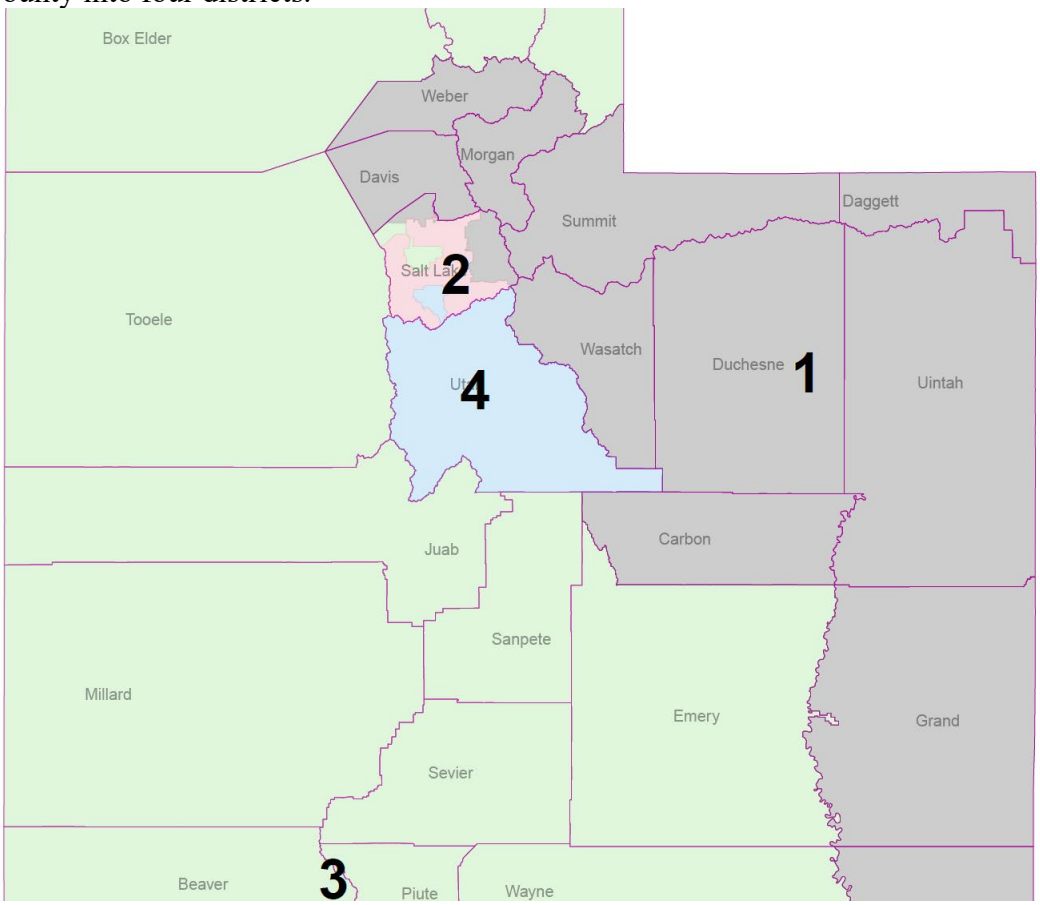
78. In a supplemental report, Dr. Barber acknowledged that his treatment of Salt Lake County was an intentional design.[117] Given this, the Court finds it troubling that Dr. Barber did not state as much in his opening report when he asserted that he programmed his algorithm to minimize county divisions.

79. Nevertheless, the effect of Dr. Barber's programming his algorithm to blind itself to the existence of Salt Lake County was that his ensemble excessively splits Salt Lake County in the simulated maps, with 63.6% of his maps dividing Salt Lake County into four districts and

[107] DX-14 at 23 (10.17 Barber Report).
[108] 10.24 Tr. at 368:16-369:17 (Barber).
[109] 10.24 Tr. at 230:9-231:13 (Trende).
[110] 10.24 Tr. at 230:9-17 (Trende).
[111] 10.24 Tr. at 230:18-25 (Trende).
[112] 10.24 Tr. at 230:23-231:4 (Trende).
[113] DX-14 at 23 (10.17 Barber Report).
[114] 10.24 Tr. at 377:1-12 (Barber); PX-4 at 4-5 (Chen Supplemental Report).
[115] 10.24 Tr. at 375:7-16 (Barber); 10.23 Tr. at 71:11-72:14 (Chen); PX-4 at 4-5 (Chen Supplemental Report).
[116] PX-4 at 4 (Chen Supplemental Report).
[117] DX-15 at 20 (10.22 Barber Report).

34.4% dividing Salt Lake County into three districts. Less than 2% of his maps divide Salt Lake County into two districts—the number necessary to achieve equal population.[118] The median number of county divisions in Dr. Barber's ensemble is 4, unlike the minimum 3 in each of Dr. Chen's simulated maps.[119]

80. Below is an example of a simulated map from Dr. Barber's ensemble splitting Salt Lake County into four districts.[120]



81. The Court finds that Dr. Barber's ensemble is an inappropriate set against which to compare maps because it does not comply with Prop 4's requirement that maps minimize, to the greatest extent practicable, the division of counties across multiple districts. His algorithm allowed—and in effect encouraged—the division of Salt Lake County into multiple districts. And Dr. Barber acknowledged on cross examination knowing that Salt Lake County was the one county in Utah with a large concentration of Democratic voters.[121] The Court finds that Dr. Barber's ensemble is not a reliable comparator to determine the partisan composition of maps that could be expected from adhering to Prop 4's redistricting criteria in a partisan neutral manner.

82. *Other Flaws in Dr. Barber's Ensemble*. There are other flaws in Dr. Barber's ensemble and his report that cause the Court not to credit his analysis. Dr. Barber failed to use the stipulated municipal boundaries from the U.S. Census Bureau, causing him to understate the

[118] PX-4 at 4-6 (Chen Supplemental Report).
[119] DX-14 at 25 (10.17 Barber Report); PX-3 at 47 (Chen Report).
[120] PX-22 (Barber Map Samples, 4,244).
[121] 10.24 Tr. at 380:12-381:4 (Barber).

number of municipal divisions in his simulated maps.[122] Dr. Barber overstated the Polsby-Popper compactness scores for his simulated maps.[123] Indeed, like with Dr. Trende, the middle 95% range of Dr. Barber's ensemble falls entirely below the middle 95% range for Dr. Chen's ensemble for the Polsby-Popper compactness metric.[124]

83. Dr. Barber's ensemble also contains a remarkable number of exact duplicates. Indeed, he does not actually have an ensemble of 50,000 distinct maps because 41,629 of the 50,000 maps are identical to at least one other map in his ensemble. One map is repeated—in its exact form—113 times in a row. Removing all exact duplicates, Dr. Barber produced 14,668 unique maps.[125] The high presence of exact duplicates in Dr. Barber's ensemble is notable in light of the testimony of Legislative Defendants' other expert, Dr. Trende, that constructing the ensemble with the population deviation allowance Dr. Barber used would restrict the possible maps too much. It appears to the Court that Dr. Trende's criticism of Dr. Barber's approach has merit.

84. The Court is unpersuaded by Dr. Barber's insistence that the presence of so many exact duplicate maps in his ensemble is a good thing while he simultaneously criticizes Dr. Chen's ensemble—which had zero exact duplicates—for often generating a northern Salt Lake County district.[126] Dr. Barber opined that by repeating the same map over and over, his algorithm had landed on one that performed well on the redistricting criteria and should be given greater weight in the ensemble.[127] But when shown maps from his ensemble that were exactly duplicated many times with oddly-configured districts, Dr. Barber equivocated and refused to directly acknowledge the obvious flaw in his opinion. For example, Dr. Barber insisted the District 2 from Map 4,544 (which is repeated 15 times in his ensemble) shown in pink below, was best described as "wholly contained in Salt Lake County" and refused until multiple questions were asked to acknowledge its odd shape, even then wrongly insisting it was no odder than one of Plaintiffs' proposed maps.[128]

[122] PX-4 at 16-17, Figure 8 (Chen Supplemental Report); 10.23 Tr. at 75:4-76:12 (Chen); 10.24 Tr. at 372:17-374:3 (Barber).
[123] 10.24 Tr. at 378:18-21 (Barber); PX-4 at 18 (Chen Supplemental Report).
[124] PX-4 at 19, Figure 9 (Chen Supplemental Report); 10.24 Tr. at 378:22-379:12 (Barber).
[125] PX-5 at 1-3, Tables 1 & 2 (Chen Rebuttal Report).
[126] The Court is also unpersuaded by Dr. Barber's criticism that Dr. Chen's simulated maps have a Salt Lake County based district (with 95% of its population in Salt Lake County) that often has a small part of Davis, rather than Tooele or Summit, Counties, for population equalization. DX-15 at 16 (10.22 Barber Report). Dr. Chen's maps frequently combine Tooele and Summit Counties with Salt Lake County based districts, *e.g.*, PX-20 (Sample Chen Maps), and Dr. Barber's 95% constraint on his definition lacks any apparent relevant meaning other than to arrive at the conclusion he did.
[127] DX-16 at 4 (10.23 Barber Report).
[128] 10.24 Tr. at 362:20-366:7; 374:4-375:3 (Barber); PX-22 (Barber Map Samples, 4,244).

85. Dr. Barber likewise did not restrict his ensemble from generating districts whose only source of contiguity was the Great Salt Lake and created many such districts.[129]

86. Ultimately, Dr. Barber's ensemble was not designed to, and does not, comply with Prop 4's redistricting criteria and his report contains many errors and omissions. The Court finds that his ensemble is not an appropriate comparator to assess partisanship of maps, and the Court generally gives little weight to Dr. Barber's analysis and testimony for the reasons discussed above.

VI. S.B. 1011's partisan bias test contravenes Prop 4's neutral redistricting criteria and its prohibition on partisan favoritism.

87. The Court finds that application of the partisan bias test, given Utah's current electoral conditions and political geography, contravenes Prop 4's neutral redistricting criteria and its prohibition on partisan favoritism. This was evident from the testimony and analysis of Drs. Chen, Trende, and Barber.

A. S.B. 1011's partisan bias test contravenes Prop 4's neutral redistricting criteria.

88. S.B. 1011's partisan bias test works directly at odds with Prop 4's neutral redistricting criteria. The evidence shows that it works to reject maps that best comply with those criteria while accepting maps that perform the worst on those criteria.

89. As the Court has found, Dr. Chen produced a reliable ensemble of 10,000 maps that adhere to Prop 4's neutral redistricting criteria. But if that ensemble were to be subjected to S.B. 1011's partisan bias test culling, only 11 maps would remain.[130] This starkly illustrates the inconsistency with grafting S.B. 1011's partisan bias test onto Prop 4's requirements.

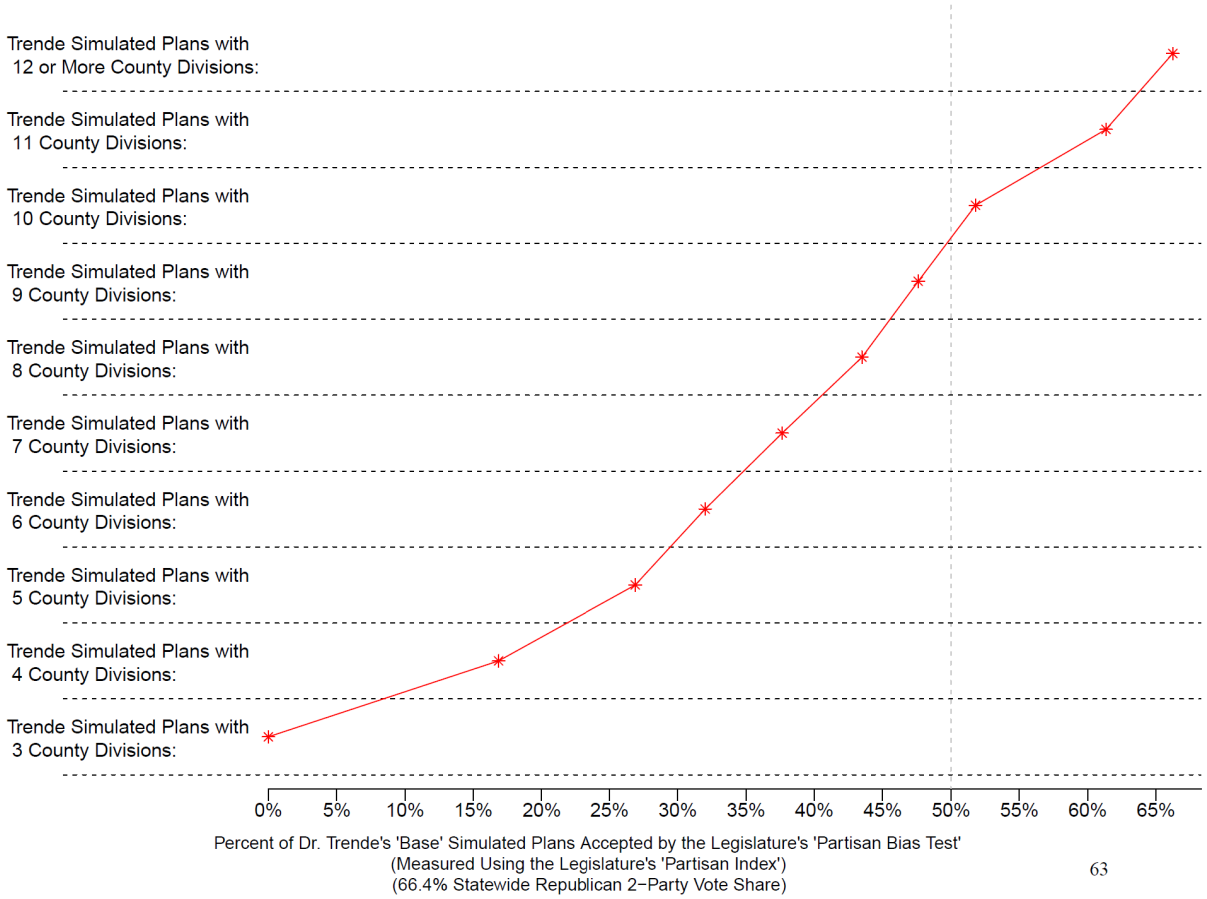
90. Dr. Chen also credibly and persuasively analyzed Dr. Trende's ensemble to determine the relationship between the maps that were accepted as passing the partisan bias test

[129] 10.24 Tr. at 366:9-367:7 (Barber); PX-23 (Barber Map Samples).
[130] PX-3 at 31-32, Table 1 (Chen Report).

and those that were "culled" for failing the partisan bias test. The result shows that the partisan bias test works at direct cross purposes with Prop 4's neutral redistricting criteria.

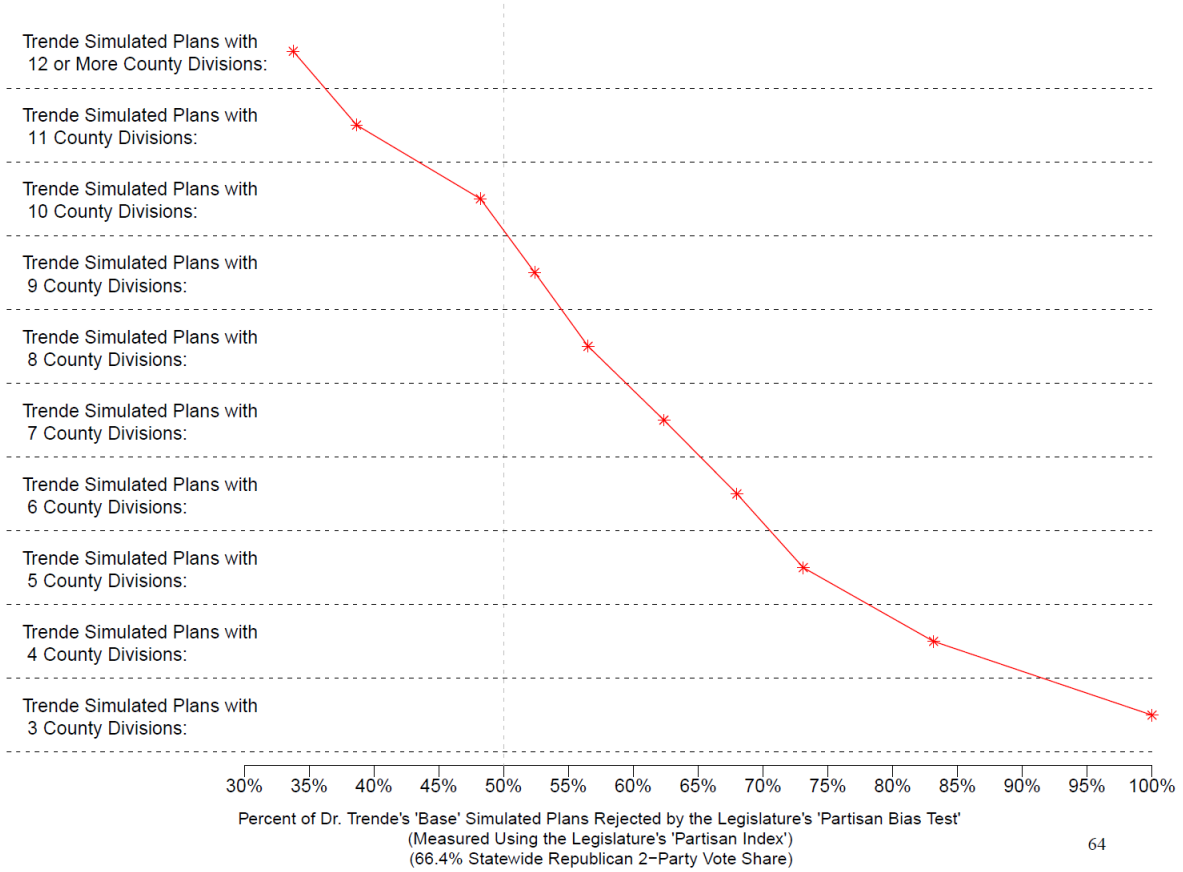
91. *County Divisions*. As the figures below illustrate, the fewer county divisions a simulated map from Dr. Trende's set had, the likelier it was to be culled from Dr. Trende's ensemble for failing to pass the partisan bias test—and vice versa.[131]

Figure 5.7: County Divisions and the Most−Democratic District in Each of Dr. Trende's 'Base' Simulated Plans



[131] PX-3 at 63-64, Figures 5.7 & 5.8 (Chen Report); 10.23 Tr. at 50:11-52:1 (Chen).

Figure 5.8: County Divisions and the Most−Democratic District in Each of Dr. Trende's 'Base' Simulated Plan



92. *Geographic Compactness*. Likewise, the more geographically compact a map is among Dr. Trende's ensemble, the likelier it is to fail the partisan bias test, and vice versa, as the figures below show.[132]

[132] PX-3 at 83-84, Figures 5.16 & 5.17 (Chen Report); 10.23 Tr. at 60:6-61:17 (Chen).

Figure 5.16:
Geographic Compactness Simulated Plans Accepted by the Legislature's 'Partisan Bias Test'

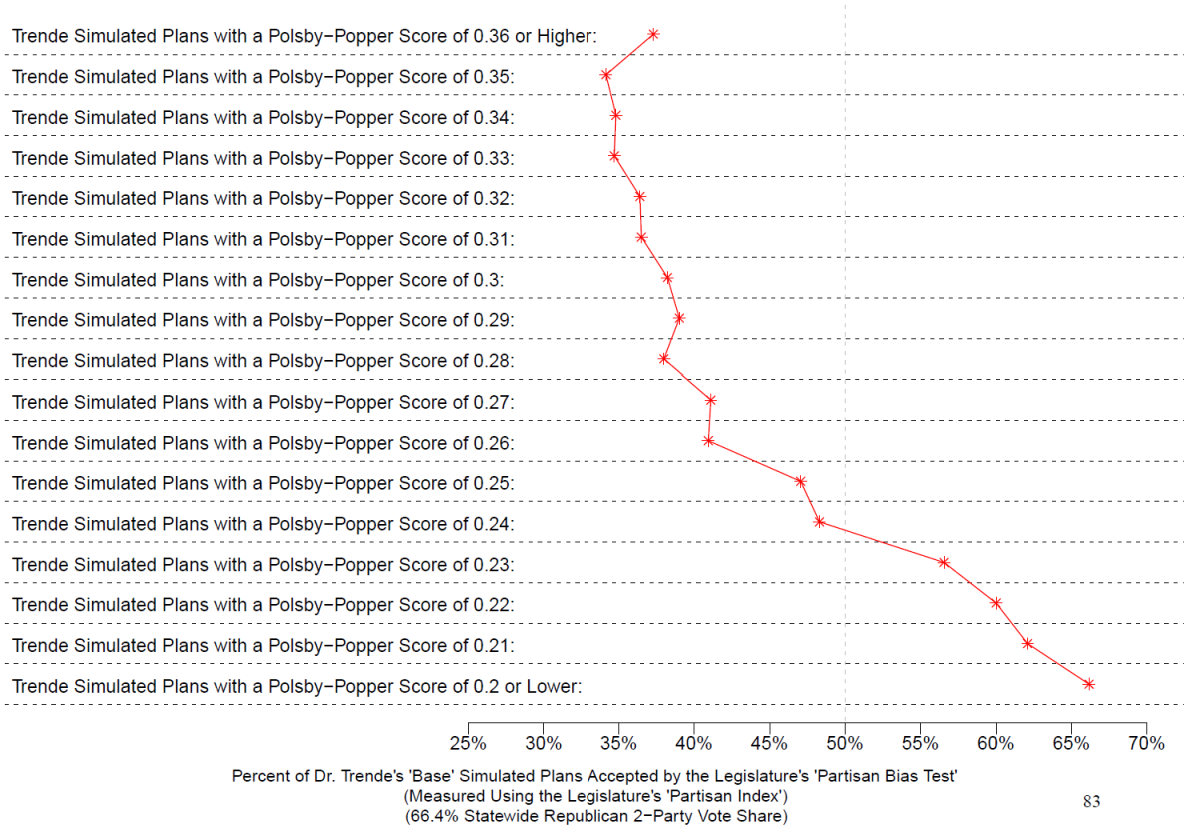
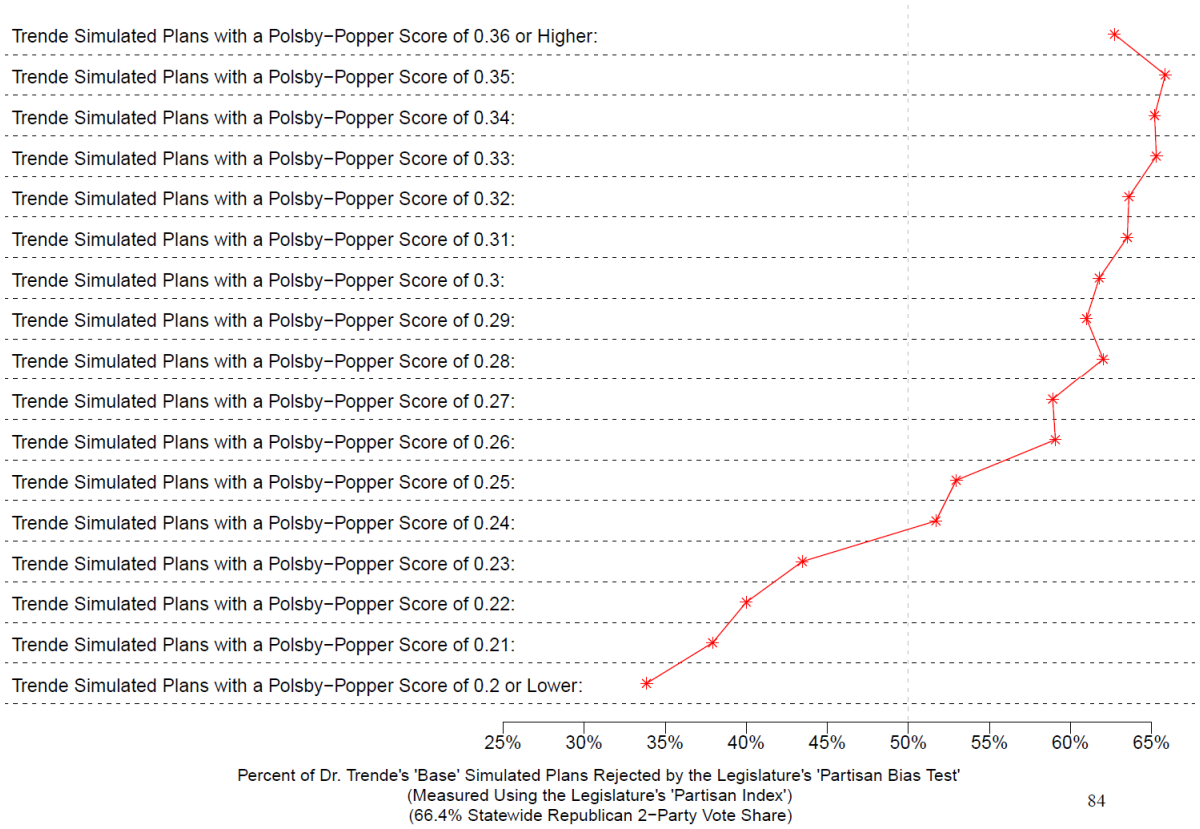


Figure 5.17:
Geographic Compactness and Simulated Plans Rejected by the Legislature's 'Partisan Bias Test'



93. *Contiguity*. The same pattern is true for the contiguous versus noncontiguous districts among Dr. Trende's simulations. The maps with the fewest noncontiguous districts are the least likely to pass S.B. 1011's partisan bias test, while the maps that have the greatest number of contiguity violations are the most likely to pass S.B. 1011's partisan bias test, as the tables below show for Dr. Trende's Base and Restricted Ensembles.[133]

[133] PX-3 at App. G, Tables G3 & G6 (Chen Report).

Table G3:
Percent of Dr. Trende's 'Base' Simulated Plans Rejected (or "Culled") by Trende's Partisan Bias Test:

	Percent of Trende Simulated Plans Rejected by Trende's Partisan Bias Test:
Trende 'Base' Simulated Plans with no contiguity violations:	62.4%
Trende 'Base' Simulated Plans containing one non-contiguous district:	58.5%
Trende 'Base' Simulated Plans containing two non-contiguous districts:	49.4%
Trende 'Base' Simulated Plans containing three non-contiguous districts:	44.9%
Trende 'Base' Simulated Plans containing four non-contiguous districts:	25.0%

Table G6:
Percent of Dr. Trende's 'Restricted' Simulated Plans Rejected (or "Culled") by Trende's Partisan Bias Test:

	Percent of Trende Simulated Plans Rejected by Trende's Partisan Bias Test:
Trende 'Restricted' Simulated Plans with no contiguity violations:	68.9%
Trende 'Restricted' Simulated Plans containing one non-contiguous district:	69.0%
Trende 'Restricted' Simulated Plans containing two non-contiguous districts:	57.6%
Trende 'Restricted' Simulated Plans containing three non-contiguous districts:	52.7%
Trende 'Restricted' Simulated Plans containing four non-contiguous districts:	27.8%

94. As Dr. Chen's analysis of Dr. Trende's ensembles shows, S.B. 1011's partisan bias test works at direct cross purposes with Prop 4's neutral redistricting criteria, disqualifying the maps that come closest to adhering to Prop 4's neutral redistricting criteria while accepting those maps that perform the poorest on those criteria.

95. The Court finds that S.B. 1011's partisan bias test thus directly contravenes and interferes with adherence to the neutral redistricting criteria established as one of Prop 4's key government reforms.

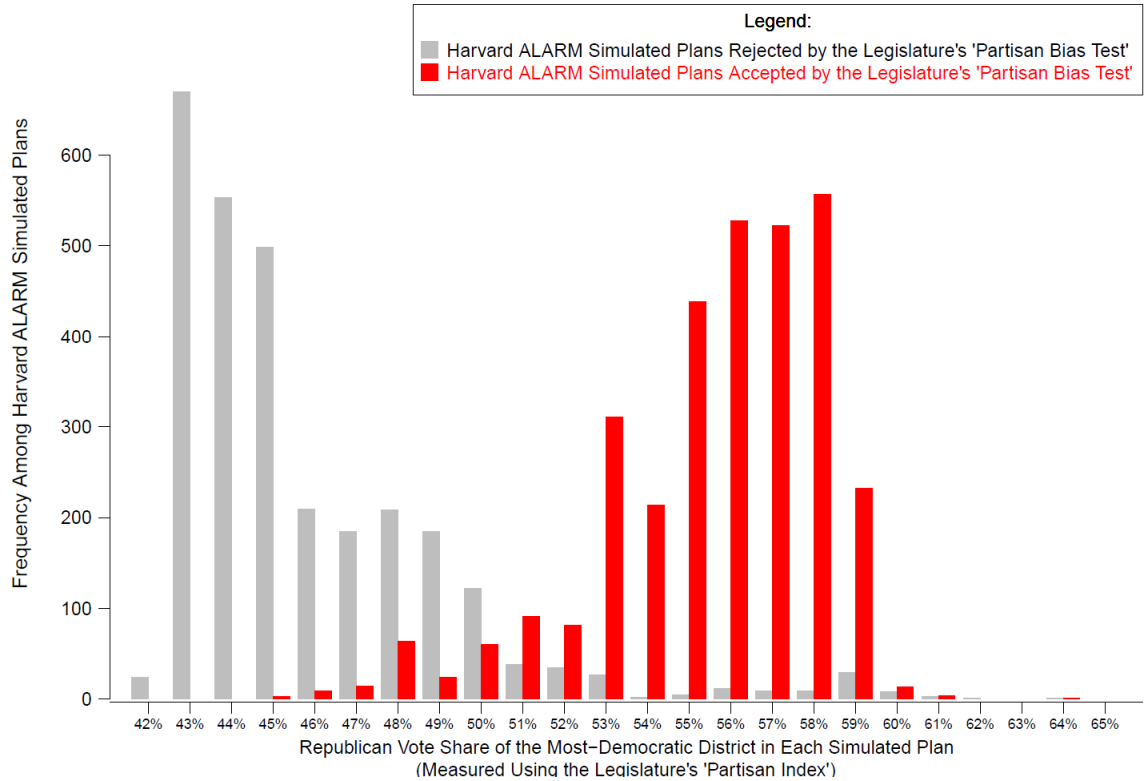
B. S.B. 1011's partisan bias test structurally mandates partisan favoritism for Republicans under Utah's current electoral conditions and political geography.

96. The evidence also shows that S.B. 1011's partisan bias test structurally mandates partisan favoritism for Republicans given Utah's current electoral conditions and political geography. This is evident from the partisan effect of culling all the various ensembles presented in this case based upon passing or failing the partisan bias test.

97. Among Dr. Chen's 10,000 simulated maps, only 11 would pass S.B. 1011's partisan bias test, and 6 of those 11 would create a 4-0 Republican map. Indeed, following Prop 4's neutral redistricting criteria, only 7 of Dr. Chen's simulated maps created a 4-0 Republican map, while 9,993 created a 3-1 map. S.B. 1011's partisan bias test, if applied to Dr. Chen's ensemble, would disqualify 9,988 maps that create 1 Democratic district and just 1 map that creates zero Democratic districts.[134]

98. The pattern is similar for the ALARM ensemble, where of the 6,000 maps, S.B. 1011's partisan bias test would disqualify 2,594 maps that create 1 Democratic district (passing just 130 maps that do so) and 240 maps that create 4 Republican districts (passing 3,037 maps that do so). In essence, S.B. 1011's partisan bias test filters out the maps that create a Democratic district and accepts those that do not.[135] The figure below illustrates how the S.B. 1011 partisan bias culling disqualifies (in gray) ALARM maps that create a Democratic district while approving those that create more Republican districts (in red), shifting the composition of the ensemble substantially in favor of Republicans.[136]

Figure 4.4:
The Most−Democratic District in Each Harvard ALARM Simulated Plan

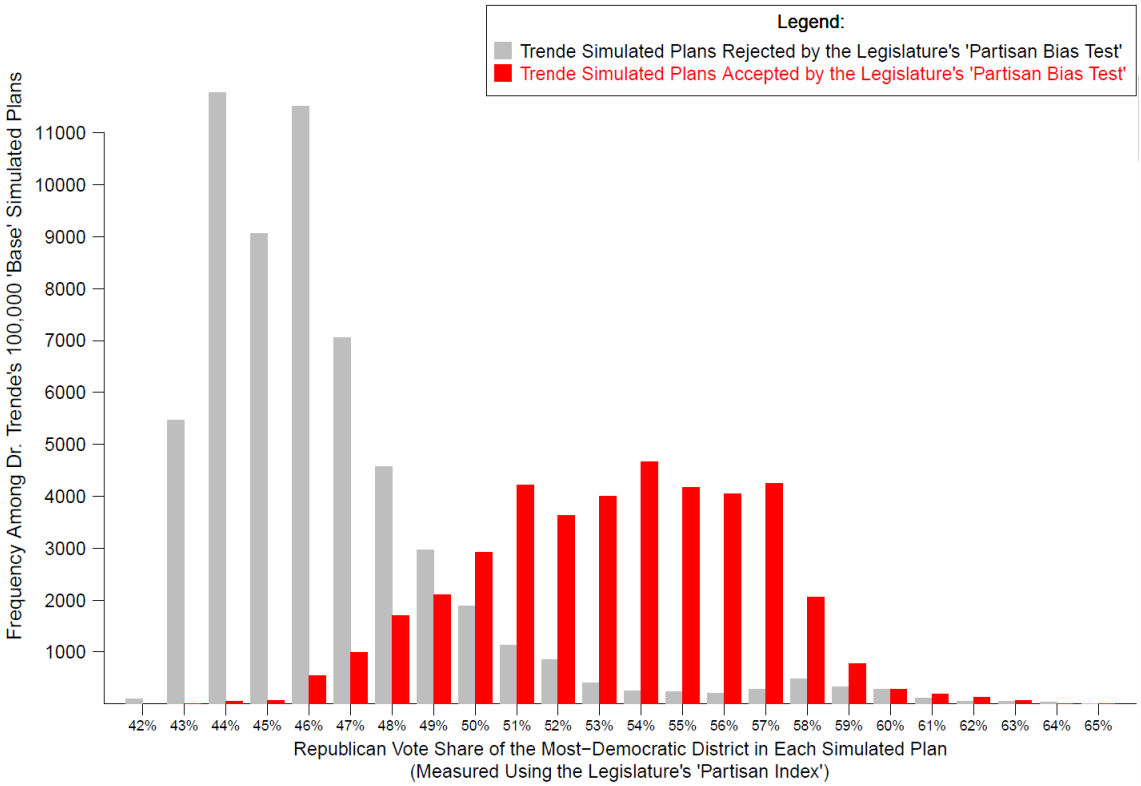


99. This is true as well for Dr. Trende's Base and Restricted ensembles. Among his Base ensemble, S.B. 1011's partisan bias test disqualifies 53,665 maps that create 1 Democratic district (and 5,458 that create 4 Republican districts) while accepting 34,143 maps that create 4

[134] PX-3 at 32, Table 1 (Chen Report).
[135] PX-3 at 33, Table 4 (Chen Report); 10.23 Tr. at 35:14-25 (Chen).
[136] PX-3 at 37 (Chen Report).

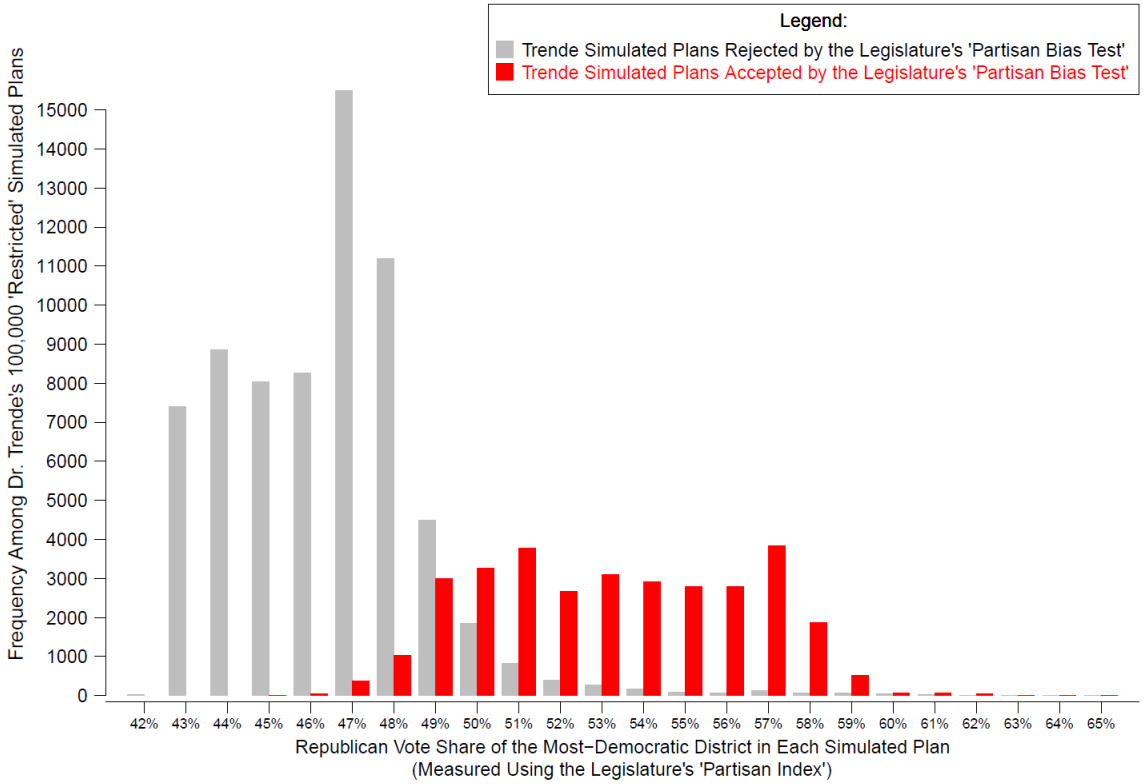
Republican districts (and 6,734 maps that create 1 Democratic district).[137] The two figures below illustrate this effect in Dr. Trende's two ensembles.[138]

Figure 4.2:
The Most−Democratic District in Each of Dr. Trende's 'Base' Simulated Plans



[137] PX-3 at 32, Table 2 (Chen Report); 10.23 Tr. at 34:1-35:13 (Chen).
[138] PX-3 at 35-36, Figures 4.2 & 4.3 (Chen Report).

Figure 4.3:
The Most−Democratic District in Each of Dr. Trende's 'Restricted' Simulated Plans



100. This pattern was also evident among Dr. Barber's ensemble. As the Court found above, Dr. Barber's set paints an unreliable picture of the expected partisan composition of maps that comply with Prop 4's criteria when drawn without partisan data because he allowed Salt Lake County—where the largest concentration of Democratic voters are located—to be split into multiple districts without limitation. But even among this set, prior to culling for S.B. 1011's partisan bias test, roughly half of Dr. Barber's simulated maps created 1 Democratic district.[139] That number dropped dramatically to just 6.5% among the set culled for passage of S.B. 1011's partisan bias test, with a remarkable 93.5% of Dr. Barber's simulated maps that pass S.B. 1011's partisan bias test creating 4 Republican districts.[140]

101. The Court credits the testimony of Dr. Chen that "the partisan bias test is essentially just a filter. It is effectively just a filter for whether or not a plan has a Democratic district or not."[141] While a small number of maps that create a Democratic district satisfy S.B. 1011's partisan bias test, the vast majority do not. In contrast, the vast majority of maps that create 4 Republican districts satisfy the partisan bias test, while few fail it.

102. The Court finds that S.B. 1011's partisan bias test works systematically and structurally to favor Republicans and disfavor Democrats in this manner. The ensemble evidence in this case discussed above illustrates this fact, and illustrates the findings above that applying S.B. 1011's partisan bias test in light of Utah's unique political geography—where Democratic

[139] DX-14 at 30 (10.17 Barber Report).
[140] *Id.*
[141] 10.23 Tr. at 50:1-4 (Chen).

voters are concentrated in a geographically compact set of municipalities within Salt Lake County—leads to perverse outcomes that would mandate resisting Prop 4's neutral redistricting criteria in service of a test that in essence mandates, rather than prohibits, partisan favoritism in redistricting.

VII. Legislative Process

A. The Legislature retains Dr. Trende to assess and draw maps.

103. During the 2025 remedial redistricting process leading up to the October 6, 2025, special session of the Legislature, the Utah Legislature retained Dr. Trende, first to assess maps, and then to draw maps. All of the instructions Dr. Trende received related to his mapping work came via Legislative Defendants' litigation counsel.[142]

104. Sometime after August 25, 2025, Dr. Trende began his mapping work. But Dr. Trende did not start drawing maps from scratch. Instead, he started from the 2021 Map, in which Salt Lake County was split into four quadrants.[143] Starting from this map that quartered Salt Lake County, Dr. Trende drew three maps by hand. The first map combined the two eastern quadrants and two western quadrants of Salt Lake County, creating a north-south dividing line between the districts. In this first map, Salt Lake City was placed in the eastern district with Summit County and southward to San Juan County.[144] This map would ultimately be labeled Map C. Next, Dr. Trende drew another map that also split Salt Lake County on a north-south axis, combining the two eastern quadrants into one district, and the two western quadrants into another district. In this map, Salt Lake City was placed with Tooele County. This map would ultimately be labeled Map A. Dr. Trende also drew a third map. Unlike the other two hand-drawn maps, this map split Salt Lake County on an east-west axis, creating one district that included the northern part of Salt Lake County, and another district containing the southern part of South Lake County.[145]

105. In addition to these hand-drawn maps, Dr. Trende also selected maps from the ALARM set and from his own ensembles.[146] In total, Dr. Trende submitted ten or more maps to the Legislature via the attorneys representing Legislative Defendants. These maps included maps from the ALARM set, from Dr. Trende's ensembles, and the three hand-drawn maps (two with a north-south dividing line in Salt Lake County, and one with an east-west dividing line in Salt Lake County).[147] Along with the maps, Dr. Trende also submitted to the Legislature an information sheet about each map, including whether the maps passed the partisan bias test and whether it was in the middle 95% partisan distribution of his two ensembles and the ALARM ensemble, what he called the "quantile" test.[148] All the maps Dr. Trende submitted to the Legislature passed the partisan bias test.[149]

106. To conduct his map-drawing, Dr. Trende used the platform Dave's Redistricting Application ("DRA").[150] When using DRA to draw a map, the program displays a variety of

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[142] 10.24 Tr. at 165:7-166:2 (Trende).
[143] 10.24 Tr. at 190:16-191:6 (Trende).
[144] 10.24 Tr. at 193:10-12, 190:6-191:6 (Trende).
[145] 10.24 Tr. at 172:16-20, 175:8-177:15 (Trende); PX-12 (Trende Map Analyses).
[146] 10.24 Tr. at 172:4-173:1 (Trende).
[147] 10.24 Tr. at 167:21-168:6 (Trende); *see also id.* at 193:10-12, 190:6-191:6 & 172:16-20, 178:5-177:15.
[148] PX-12 (Trende Map Analyses).
[149] 10.24 Tr. at 178:23-179:3, 179:22-180:3 (Trende).
[150] 10.24 Tr. at 179:17-180:24 (Trende).

information including county and city lines, population numbers, racial demographics, and—critically for this case—political data. The partisan political data is displayed for each selected district as well as for each precinct as one selects them for inclusion or exclusion in a district.[151] There is an option to turn off or hide political data, but Dr. Trende did not hide the data.[152] Instead, he had the political data on the screen while he drew the maps that he ultimately submitted to the Legislature. Dr. Trende testified that no one from the Legislature or the Legislature's lawyers with whom he was communicating told him not to use a platform that contained political data, or that DRA in particular had been the focus of Sen. Sandall's ire during both the 2021 and 2025 redistricting processes.[153, 154]

107. Out of the ten or more maps the Legislature received from Dr. Trende, the co-chairs of the LRC, Sen. Sandall and Rep. Pierucci, selected five maps to make public. These five maps became known as Maps A-E.[155] Three of these public maps came from simulation sets: Maps B and E came from the ALARM set, and Map D came from Dr. Trende's simulations, with alterations by Dr. Trende. Two of the publicly-released maps were drawn by hand: Maps A and C were the two maps Dr. Trende had drawn that divided Salt Lake County on a north-south axis.[156] The third hand-drawn map Dr. Trende had given the Legislature that divided Salt Lake County on an east-west axis, creating a northern Salt Lake County-based district, was not introduced in the LRC, and was not released to the public.

108. On September 18, 2025, four days before the first meeting of the 2025 Legislative Redistricting Committee, Sen. Sandall appeared on a podcast with Rep. Pierucci where he discussed the redistricting process in 2021 and 2025. On that podcast, Sen. Sandall explained that because one of the maps submitted by the Commission in 2021 was drawn by a constituent who used DRA, a tool that "has political data in it," as a chair, Sen. Sandall was "really hesitant" with regard to the work the Commission had done.[157] This was not the first time Sen. Sandall shared his views on this subject. On November 1, 2021, Sen. Sandall had told the chair of the Commission that the constituent who drew the SH2 Commission map "admitted to our committee that he drew off of Dave's Redistricting tool exclusively" and that as a result, the Commission had "accepted a map that has political data involved exclusively in it."[158] Sen. Sandall's concern about using DRA to draw a map came up once again in his questioning of a member of the public at the September 24, 2025 hearing of the LRC.[159]

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[151] 10.24 Tr. at 183:24-184:11 (Trende).
[152] 10.24 Tr. at 182:12-184:12 (Trende).
[153] 10.24 Tr. at 258:18-259:11 (Trende).
[154] Dr. Trende claimed that because the composite of elections that is visible on Dave's Redistricting includes data from 2012 to 2020, it made the data "worthless" and would not have provided any useful information as Dr. Trende was drawing maps. 10.24 Tr. at 259:5-10 (Trende). The Court is not persuaded by this point. Even if it is not the most up-to-date data, knowing the partisanship of each precinct over an 8-year period in the recent past, would surely provide relevant information about the partisanship of the districts. Indeed, this includes two of the three election cycles mandated for consideration by S.B. 1011 (2020 and 2016). And at any rate, Prop 4's prohibition on using partisan data is not limited to particular time periods, nor were Sen. Sandall's admonitions about using DRA.
[155] 10.24 Tr. at 169:18-25 (Trende); 9.22 LRC Hearing at 2:02:20-2:02:50.
[156] 10.24 Tr. at 172:17-173:1 (Trende).
[157] PX-17 (Sandall, 9.18.25 Podcast).
[158] PX-16 (Sandall, 11.1.21 LRC Hearing).
[159] Legislative Redistricting Committee, Public Hearing, September 24, 2025, https://le.utah.gov/av/committeeArchive.jsp?mtgID=20167 (2:00:47-2:01:56) ("9.24 LRC Hearing") (Sen. Sandall: "My question is, around the maps that you've drawn and submitted. In the past you've drawn them on Dave's

B. Legislative Redistricting Committee holds public meetings.

109. Following the Court's approval of the parties' stipulated scheduling order, the LRC held three hearings. The first was held on September 22, the second on September 24, and the third on October 6.

110. At the initial meeting on September 22, Sen. Brammer introduced a bill that would mandate that only the partisan bias test could be used as Prop 4's "judicial standards and the best available data and scientific and statistical methods including measures of partisan symmetry" (to the exclusion of any other metrics or standards). Sen. Brammer gave a slideshow presentation about the partisan bias test, legislative counsel provided an illustration of how the partisan bias test would work, and members of the LRC asked Sen. Brammer questions about the partisan bias test.[160]

111. Also at the September 22 hearing, the LRC introduced five map proposals labeled as Maps A-E. The Legislature's litigation expert and map drawer, Dr. Trende, testified at the hearing as to the specifics of the Prop 4 neutral redistricting criteria and how he had applied them to the LRC maps. He also testified that he had applied the partisan bias test to all five maps, and that all five maps had passed.[161] In particular, Dr. Trende produced a one-page analysis sheet for each proposed map (and each map submitted by a legislator) assessing whether it satisfied the partisan bias test and whether it fell within the middle 95% range of the partisan distribution for the least Republican district among six simulations sets: the ALARM set, his Base set, his Restricted set, and then each of those three sets as culled to remove maps failing the partisan bias test.[162] He called this latter analysis the "quantile" test.

112. Again, at the September 24 hearing, the LRC discussed each of its maps in turn.[163]

113. On Friday, October 3, a revised version of Sen. Brammer's bill was posted on the Legislature's website as S.B. 1011. This new version retained the requirement to use the partisan bias test but also included significant changes. Specifically, S.B. 1011 also mandates the use of additional metrics, including the use of the mean-median test and an ensemble analysis subject to "culling" for maps that fail the "partisan bias" test.[164]

114. At the third meeting on October 6, the LRC voted to advance Map C to the full Legislature and then adjourned. The LRC did not discuss the changes to Sen. Brammer's bill, nor did they discuss S.B. 1011. There was no public comment.[165]

Redistricting tool, is that correct?" Stuart Hepworth: "Dave's Redistricting has an option, before you begin drawing the map, to turn off partisan data." Sen. Sandall: "So when you submitted your video—which I watched—on drawing, what are the red and the blue shades on that map? And what is the box in the right-hand corner that looks at political data? . . . So at least that map was drawn with political data available? . . . As part of all the maps I'm considering, I want to make sure.")

[160] Leg. Redistricting Cmte. Minutes, Sep. 22, 2025, https://le.utah.gov/interim/2025/pdf/00003658.pdf.

[161] Leg. Redistricting Cmte. Minutes, Sep. 22, 2025, available at https://le.utah.gov/interim/2025/pdf/00003658.pdf.

[162] PX-12 (Trende Map Analyses).

[163] Leg. Redistricting Cmte. Minutes, Sep. 24, 2025, available at https://le.utah.gov/interim/2025/pdf/00003705.pdf.

[164] S.B. 1011, 10-03 17:19, https://le.utah.gov/~2025S1/bills/static/SB1011.html.

[165] Leg. Redistricting Cmte. Audio/video, Oct. 6, 2025, available at https://le.utah.gov/av/committeeArchive.jsp?mtgID=20174.

C. October 6, 2025 special legislative session

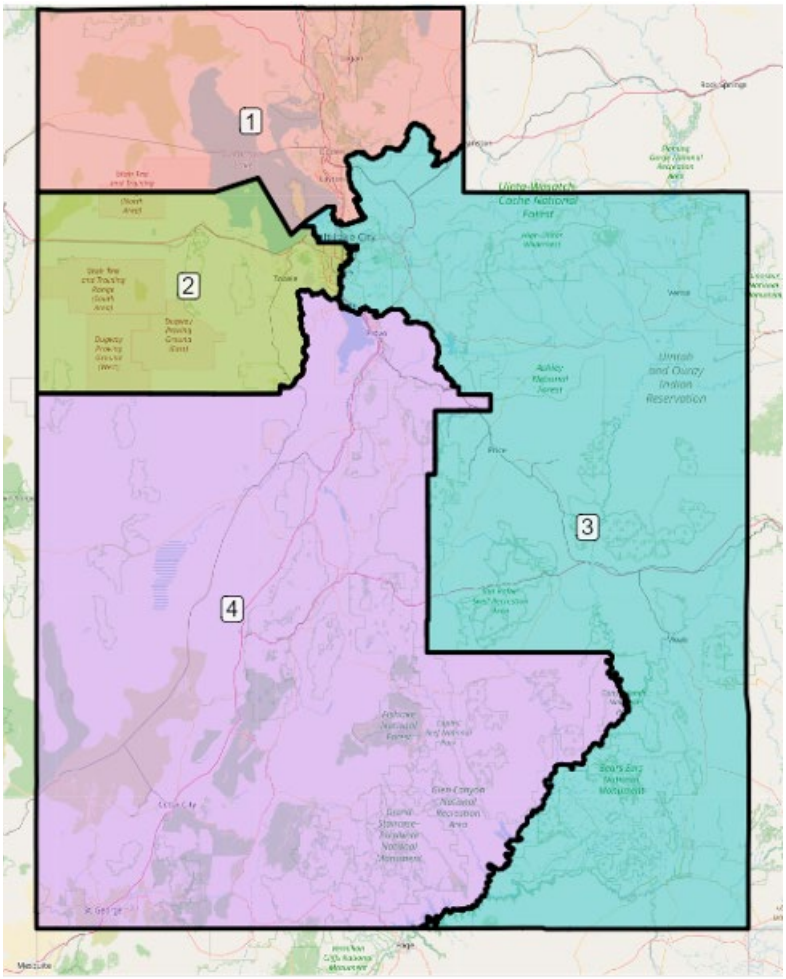
115. The Utah Legislature met for a special legislative session on October 6, 2025. Both S.B. 1011 and S.B. 1012, the Legislature's Map C, were considered.

116. During the brief debate of S.B. 1011 on the House floor, Rep. Thurston moved to substitute an updated version of the bill. This new version further explained and altered the description of how the ensemble analysis mandated in S.B. 1011 was to be conducted, with the addition of the RMD test. This updated version of S.B. 1011 also retained all the metrics from the previous version.

117. S.B. 1011 was passed by both chambers of the Legislature and then signed into law shortly thereafter by the Governor. Following S.B. 1011's enactment into law, the Legislature passed S.B. 1012 (Map C), which the Governor also signed promptly after its passage.

VIII. Map C

118. Map C is depicted below.[166]



119. Map C splits three municipalities into eleven pieces total. It splits North Salt Lake into two pieces, it splits Pleasant Grove into three pieces, and it splits Millcreek into six pieces

[166] DX-13 at 9 (Trende Report).

scattered across two districts.[167] Map C also splits three counties four times. It splits Salt Lake and Davis counties once, and it splits Utah County twice, resulting in four total county divisions.[168] Splitting a municipality into multiple pieces can have multiple negative effects. It can make it more confusing for residents to know which district they are in, and it can make it more difficult for election officials to assign precinct boundaries.[169] These municipal and county divisions were not necessary, and could have easily been minimized, as Dr. Oskooii's adjustments demonstrate. Starting from Map C, Dr. Oskooii was able to easily adjust the map to eliminate the excess county division, reduce the number of split municipalities from three to one, and further minimize the pieces into which the remaining split municipality is divided.[170]

120. Map C's compactness is comparable or slightly worse than Plaintiffs' Maps 1, and on par with Plaintiffs' Map 2. All three maps have identical Reock scores of .49. Map C has a Polsby-Popper score .04 lower than Map 1 and .03 higher than Map 2. Overall, the Court finds all three maps have similar compactness scores.[171]

121. The Court finds that Map C's districts are contiguous and allow ease of transportation. Map C generally preserves the communities of interest identified by the Legislature, and it follows geographic and natural boundaries in most instances. Maps C's boundary agreement with state senate and house districts is lower than that of Plaintiffs' maps, and Dr. Trende noted he did not prioritize this criterion while drawing maps.[172]

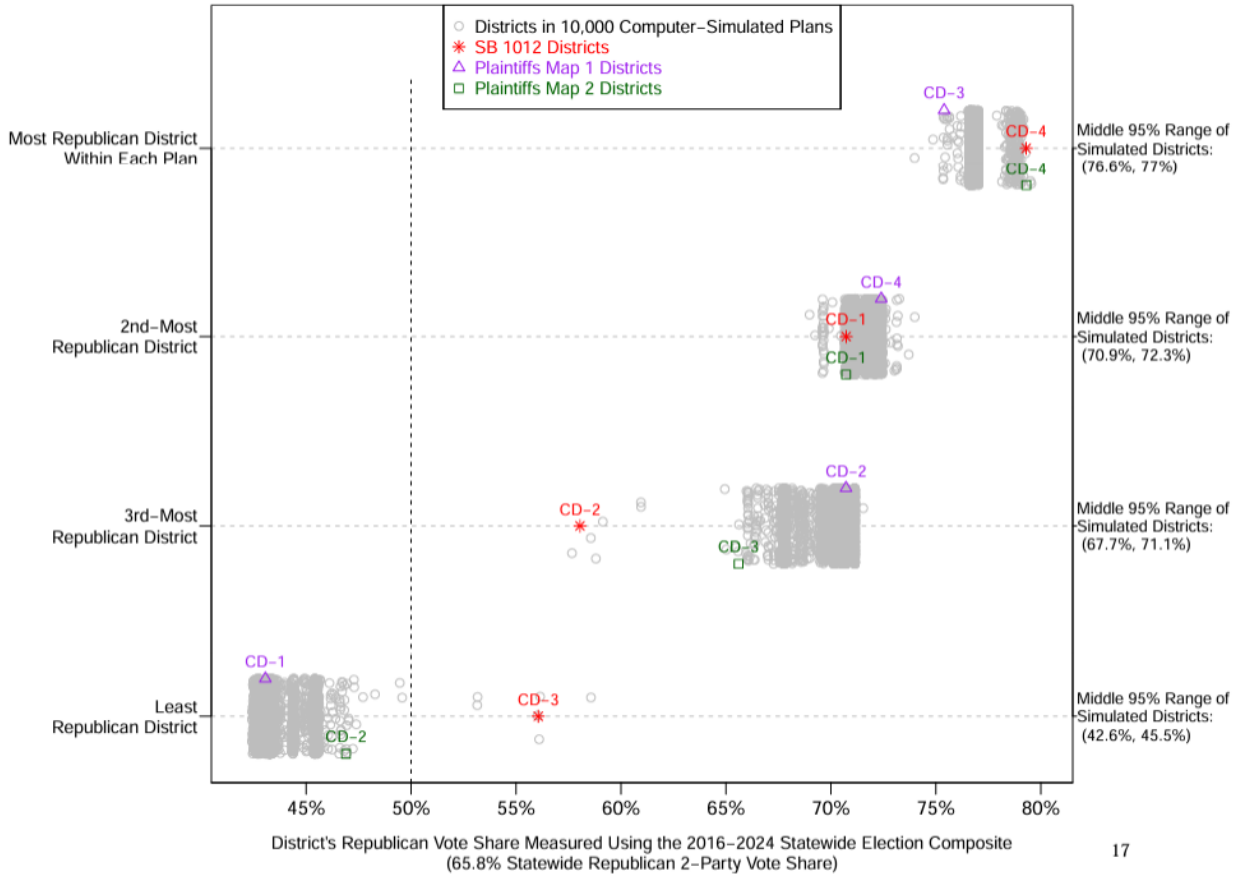
122. With respect to partisanship, the Court finds that Map C is an extreme partisan outlier, exhibiting a level of pro-Republican favoritism that dramatically departs from those of thousands of computer-simulated plans drawn to accord with Prop 4's neutral redistricting criteria. As the Court has found above, Dr. Chen algorithmically generated 10,000 plans that were reliably programmed to follow Prop 4's neutral criteria in priority order. Dr. Chen's ensemble reveals that Utah's political geography nearly always produces—when maps are drawn without regard to partisan data—a Democratic-leaning district anchored in the northern portion of Salt Lake County, with a Republican vote share generally between 42% and 46%.[173] By contrast, Map C splits northern Salt Lake County into two districts, cracking Democratic voters, placing them in Republican districts, and eliminating a moderately Democratic-majority seat that appears in 99.94% of neutrally-configured simulations.[174]

123. As shown in red below, the least Republican district in Map C (CD-3) has a 56.1% Republican vote share, higher than the least Republican vote share in 99.97% of simulated plans, making it an extreme statistical outlier.[175] This inflated Republican vote share in CD-3 is achieved by pulling Republican voters out of the other safely Republican districts (CD-1, CD-2, and CD-4), producing an unnaturally low (but still safe) Republican vote share in the third-most Republican district (CD-2). Indeed, CD-2's Republican vote share is lower than in 99.99% of the simulations,

[167] PX-2 at 16, Table 2A (Oskooii Report); 10.23 Tr. at 247:16-248:14 (Oskooii); DX-14 at 25 (10.17 Barber Report).
[168] PX-2 at 16, Table 2A (Oskooii Report).
[169] 10.23 Tr. at 241:13-242:11 (Oskooii); 10.23 Tr. at 147:6-22 (V. Reid).
[170] PX-2 at 10-11 (Oskooii Report); 10.23 Tr. at 237:4-239:7 (Oskooii).
[171] PX-2 at 16, Table 1A (Oskooii Report); 10.23 Tr. at 246:14-247:15 (Oskooii).
[172] DX-13 at 19 (Trende Report).
[173] PX-3 at 18 (Chen Report); 10.23 Tr. at 21:17-23:4 (Chen)
[174] PX-3 at 18-19 (Chen Report).
[175] PX-3 at 19 (Chen Report); 10.23 Tr. at 23:5-15 (Chen).

making it an extreme statistical outlier as well.[176] Dr. Chen estimates these two-party party vote shares in each district based on an index of 17 statewide contests in recent elections, but the same partisan outlier pattern is observed using S.B. 1011's partisan index.[177]

Figure 3.1:
District–Level Comparisons of SB 1012 and Plaintiffs' Maps 1 and 2 to 10,000 Computer–Simulated Plans



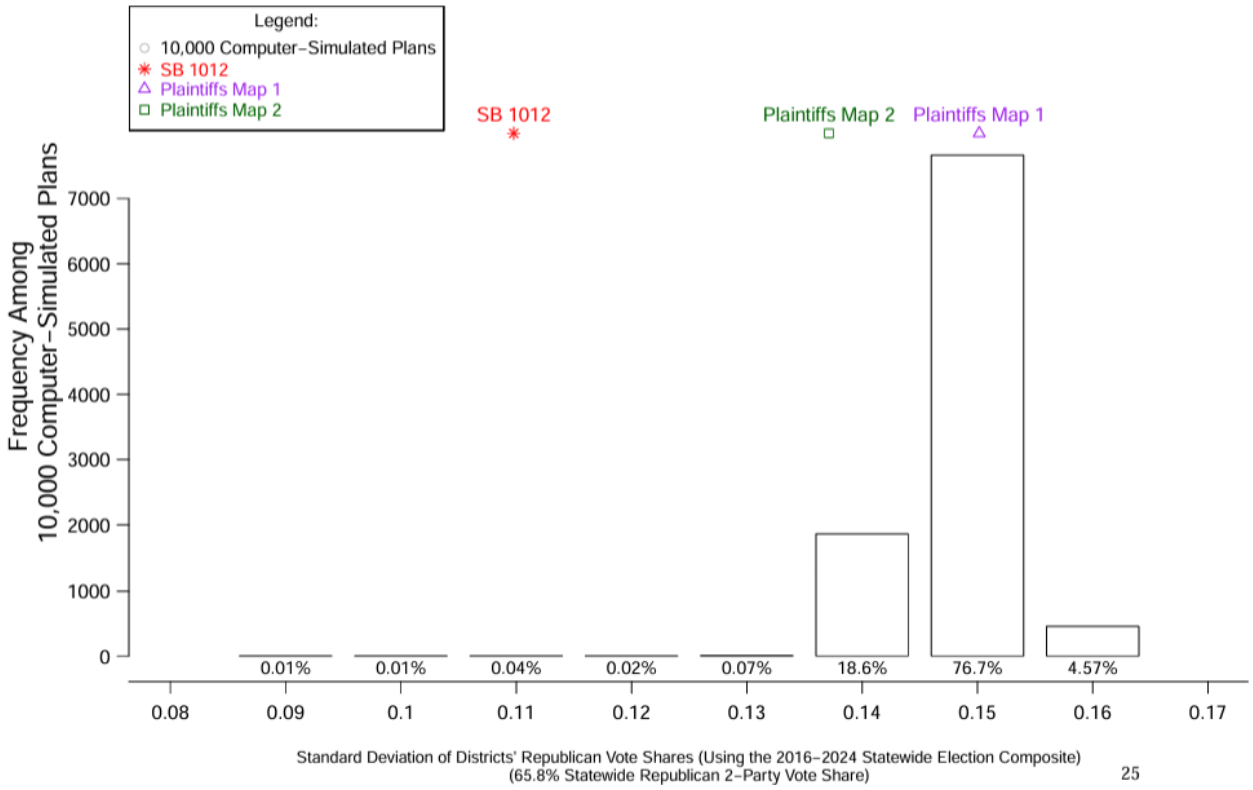
124. Map C thus creates four Republican-leaning districts and not a single Democratic-leaning district, based on Dr. Chen's index of past elections. This is a result observed in only 0.06% percent of Dr. Chen's neutral simulations, making Map C an extreme statistical outlier more favorable to Republicans than nearly all neutral simulated plans.[178] Dr. Barber's analysis confirms that Map C forecloses Democratic representation: Democrats would not win a single district under S.B. 1011's partisan index or in any one of the election contests comprising that index.[179]

125. Map C is also an extreme statistical outlier in terms of its standard deviation of district vote shares (SDVS). As shown below, the vast majority of Dr. Chen's neutral computer simulations have a SDVS of about 0.14 or 0.15, but Map C has an SDVS of 0.11, lower than 99.96% of the simulations. This divergence makes Map C's SDVS an extreme outlier. It shows that Map C's cracking of Democratic voters in Salt Lake County to disperse them across four majority-Republican districts could not plausibly have emerged from a mapdrawing process

[176] PX-3 at 19-20 (Chen Report); 10.23 Tr. at 23:25-24:21 (Chen).
[177] PX-3 at App. A, Figure 3.1 (Chen Report); 10.23 Tr. at 24:22-25:24 (Chen).
[178] PX-3 at 21-22, Figure 3.2 (Chen Report).
[179] DX-14 at 33 (10.17 Barber Report).

applying only neutral redistricting criteria.[180] The same partisan outlier pattern is observed when SDVS based on S.B. 1011's partisan index.[181]

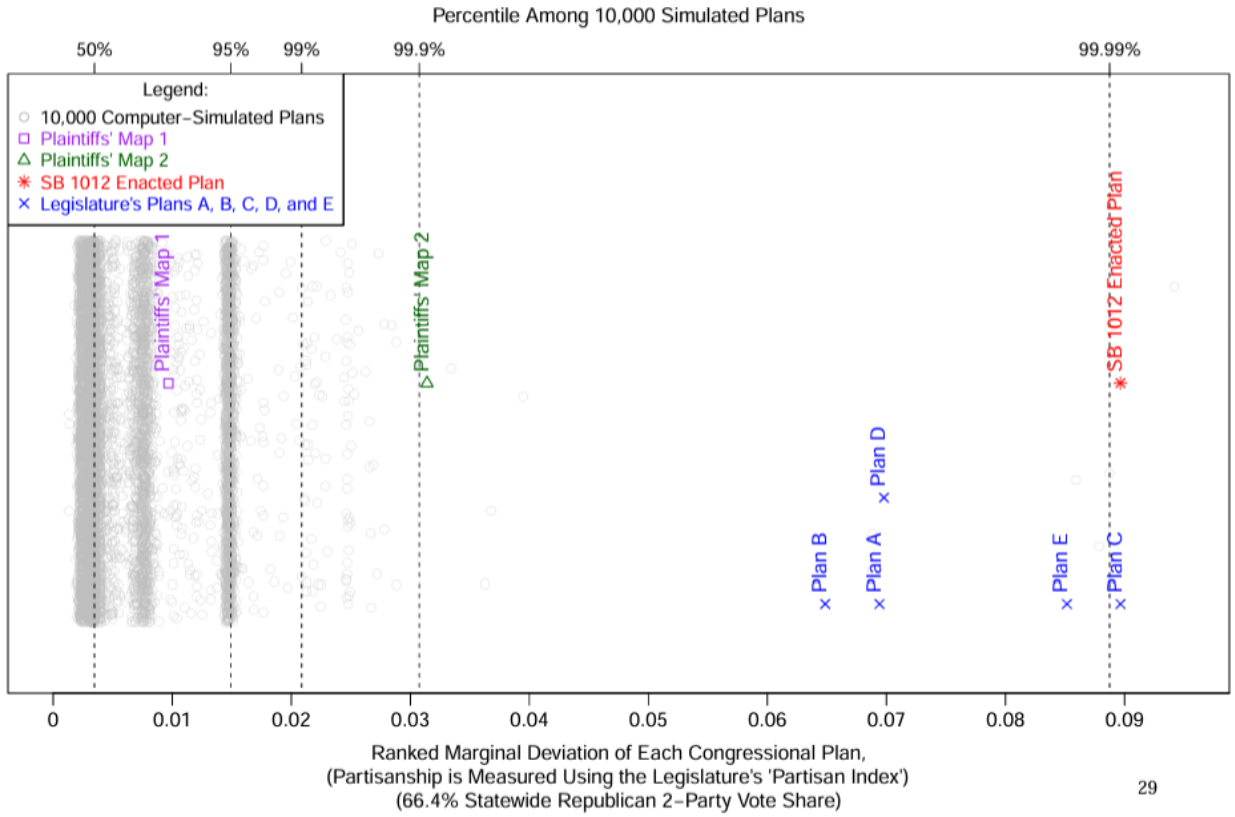
Figure 3.3:
Standard Deviation of Districts' Republican Vote Shares:
Comparisons of SB 1012 and Plaintiffs' Maps 1 and 2 to 10,000 Computer–Simulated Plans



126. The Court finds that Map C also fails the RMD test set out in S.B. 1011. Recall that the RMD measures how different a proposed map is from a typical computer-simulated plan's district-level partisanship. If a proposed map's RMD exceeds that of 95% of an ensemble, then it is deemed extreme and fails the test. As shown below, Map C is an extreme outlier in terms of its RMD, exceeding the RMD of 99.99% of Dr. Chen's simulated plans.[182]

[180] PX-3 at 26 (Chen Report); 10.23 Tr. at 25:25-28:3 (Chen).
[181] PX-3 at 26, App. A (Chen Report).
[182] PX-3 at 27-29, Figure 4.1 (Chen Report); 10.23 Tr. at 28:10-30:15 (Chen).

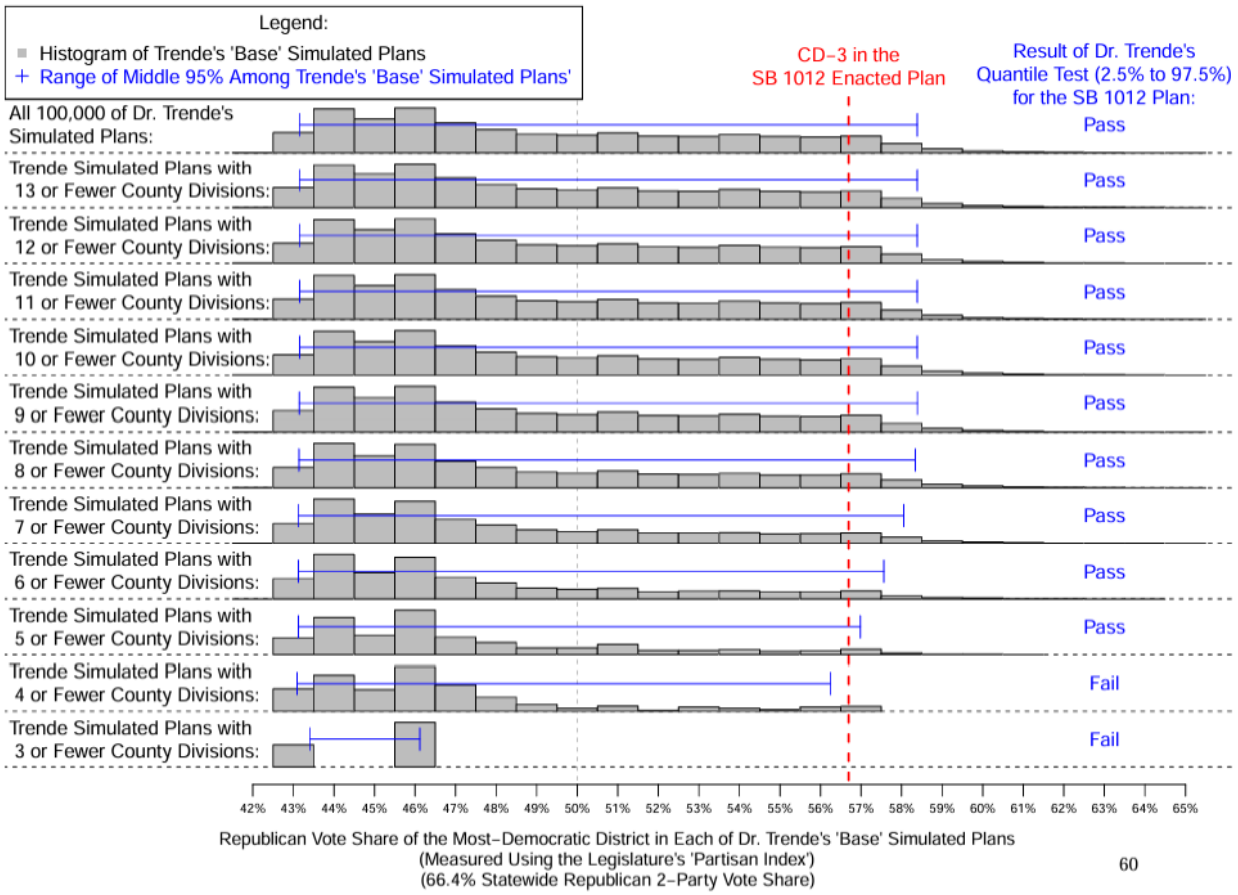
Figure 4.1:
Ranked Marginal Deviation of Plaintiffs' Map 1, Plaintiffs' Map 2, the SB 1012 Enacted Plan, and 10,000 Computer–Simulated Plans



127. Map C is also an extreme partisan outlier compared to Dr. Trende's "Base" and "Restricted" simulations, after limiting those ensembles to plans that comply with Prop 4's requirements to minimize county divisions and create geographically compact districts to the greatest extent practicable.[183] As shown in the below, Map C fails Dr. Trende's "quantile test" once his simulation sets are filtered to include maps that have four or fewer county divisions.[184]

[183] PX-3 at 44, 58-60, 65-68, 87-88 (Chen Report).
[184] PX-3 at 58-60, Figure 5.6 (Chen Report); *id.* at App. F (showing same result for Dr. Trende's "restricted" simulation set); 10.23 Tr. at 46:25-49:16, 63:12-64:10 (Chen).

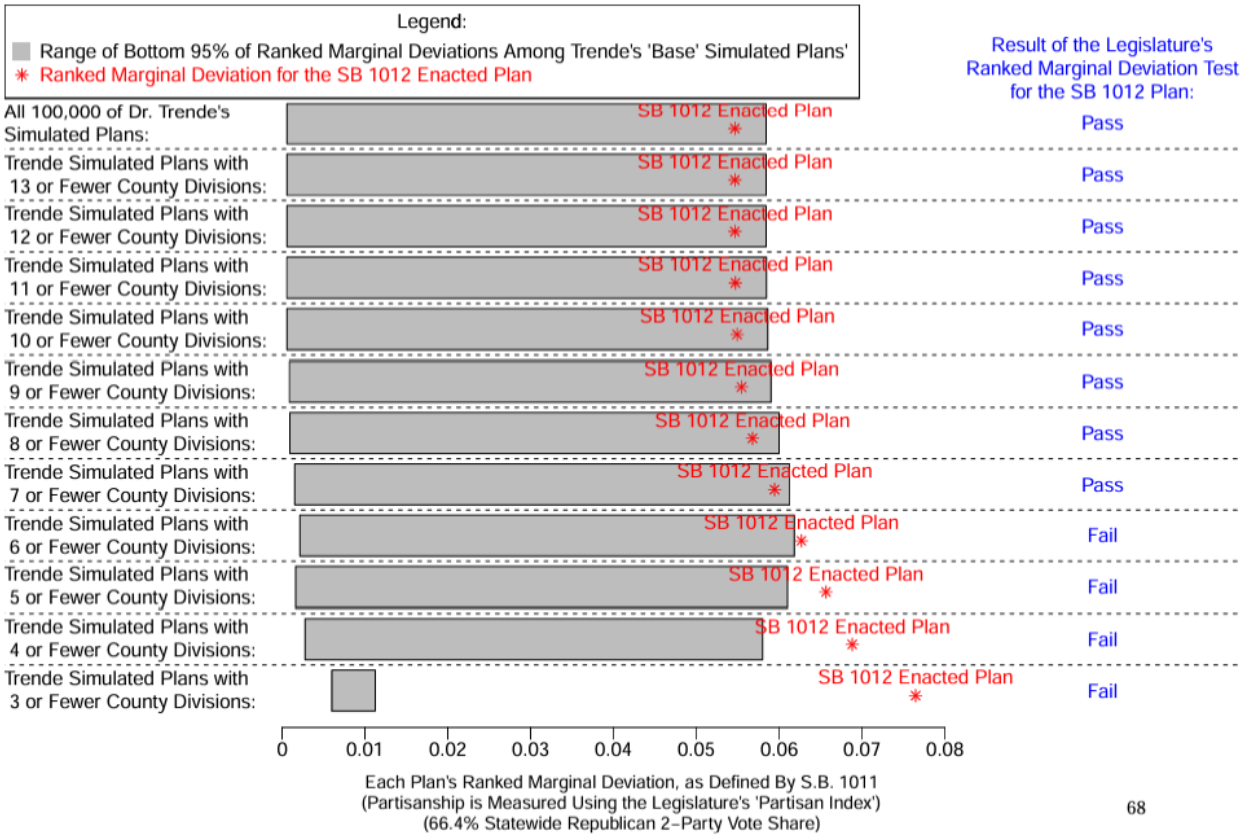
Figure 5.6:
County Divisions and the Most-Democratic District in Each of Dr. Trende's 'Base' Simulated Plans



128. Similarly, as shown in Figure 5.10, Map C likewise fails the RMD test once Dr. Trende's simulation sets are filtered to include maps that have six or fewer county divisions.[185]

[185] PX-3 at 65-68, Fig. 5.10 (Chen Report); *id.* at App. F (showing same result for Dr. Trende's "restricted" simulation set); 10.23 Tr. at 52:2-53:14, 63:12-64:10 (Chen).

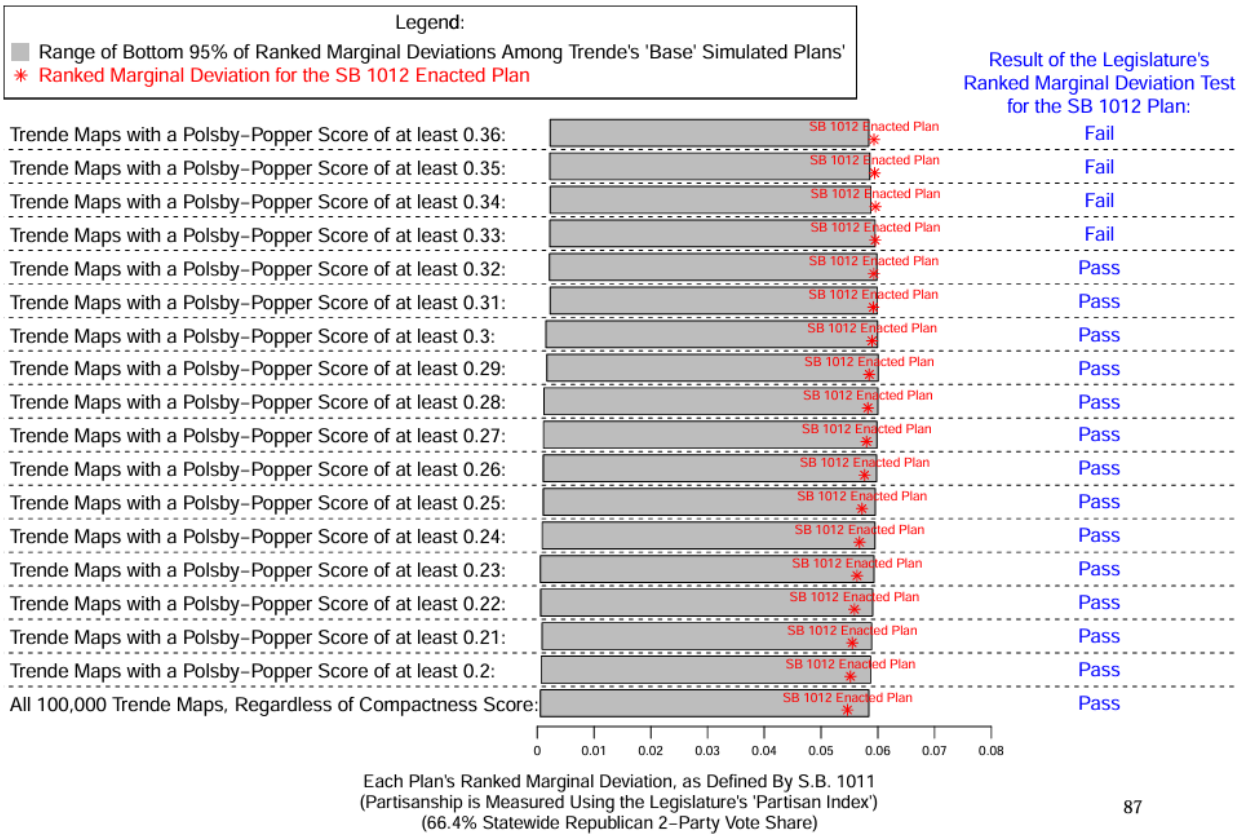
Figure 5.10: The 'Ranked Marginal Deviation' Test for the SB 1012 Plan Using Subsets of Dr. Trende's 'Base' Simulated Plans



129. And, as shown in Figure 5.19, Map C also fails the RMD test once Dr. Trende's simulation sets are filtered to include maps that have Polsby-Popper compactness scores of at least 0.33.[186]

[186] PX-3 at 87-88, Fig. 5.19 (Chen Report); *id.* at App. F (showing same result for Dr. Trende's "restricted" simulation set); 10.23 Tr. at 61:23-63:11, 63:12-64:10 (Chen).

Figure 5.19: The 'Ranked Marginal Deviation' Test for the SB 1012 Plan Using Subsets of Dr. Trende's 'Base' Simulated Plans



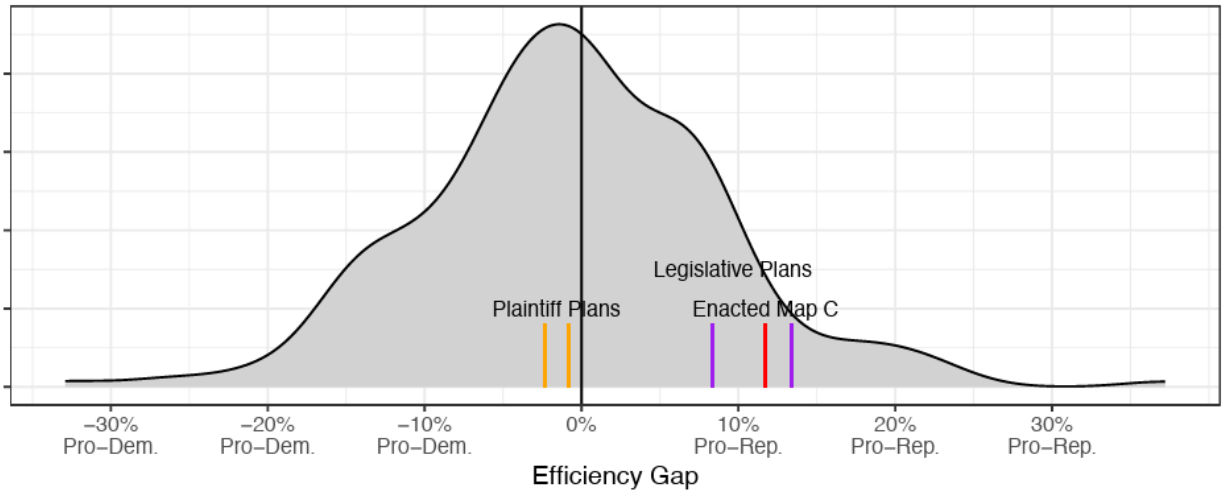
130. The Court therefore finds that Map C is an extreme statistical outlier not only when compared to Dr. Chen's simulations, which universally comply with Prop 4's neutral criteria, but also when compared to subsets of Dr. Trende's simulations as they approach compliance with Prop 4's neutral criteria.

131. Given Map C's level of pro-Republican favoritism and extreme statistical departure from maps drawn to comply with Prop 4's neutral criteria given the state's political geography, the Court credits Dr. Chen's conclusion that Map C's partisan characteristics cannot be attributed to compliance with those criteria or the state's political geography.[187]

132. Map C's pro-Republican favoritism is further confirmed by its pro-Republican efficiency gap. Dr. Warshaw calculated the efficiency gap of Map C, as well as the four additional plans proposed by the Legislature's redistricting committee (Maps A, B, D, and E) and Plaintiffs' maps.[188] Consistent with best practice, Dr. Warshaw used the turnout-adjusted efficiency gap[189] and based the calculation on a weighted composite index of 17 recent contested statewide elections.[190] As shown in the figure below, Dr. Warshaw then compared the efficiency gap of these

[187] PX-3 at 90-103 (Chen Report); 10.23 Tr. at 88:23-89:6 ("[W]hen you apply Utah's natural political geography, combined with strict adherence to the Prop 4 redistricting criteria, [you] end up with, as I found in over 99 percent of my simulated plans, a three-one plan").
[188] 10.23 Tr. at 188:21-189:4 (Warshaw).
[189] 10.23 Tr. at 185:2-25 (Warshaw).
[190] PX-1C at 11 n.13 (10.16 Warshaw Report); 10.23 Tr. at 194:7-19 (Warshaw).

plans to all congressional plans in all states with at least four districts over the last 50 years.[191] The efficiency gap of Map C (indicated in red) is 11.7% pro-Republican, which is more biased than 80% of all prior congressional redistricting plans in all states with at least four districts over the last 50 years, and more pro-Republican than 88% of those historical plans.[192] Dr. Warshaw described Map C's efficiency gap as not the largest he'd ever seen but "historically large."[193] Map C's efficiency gap is also higher than three of the other maps considered by the LRC and higher than that of plaintiffs' maps, which have scores very close to zero, or "almost perfectly fair."[194]



133. Dr. Warshaw notes that he calculated the efficiency gap conservatively in the Legislature's favor by including in his composite index the 2022 Senate race and treating Evan McMullin as the Democratic candidate of choice.[195] There is no dispute that Dr. Warshaw correctly calculated the efficiency gap, and Dr. Barber's exclusion of the 2022 Senate race indeed results in a higher pro-Republican efficiency gap of 18.06%.[196]

134. Dr. Trende claims that Dr. Warshaw's efficiency gap calculation is unreliable because Democrats have historically over-performed in Utah's congressional elections, making past statewide results a poor predictor of future outcomes. As Dr. Warshaw credibly explains, while Democrats could occasionally outperform expectations, it is now Republicans who consistently outperform presidential baselines, and the nationalization of elections has made it increasingly difficult for any candidate to exceed a district's underlying partisanship.[197]

135. The Court therefore finds that the efficiency gap offers persuasive evidence of Map C's pro-Republican bias, corroborating other evidence showing that Map C systematically favors Republicans and disfavors Democrats.

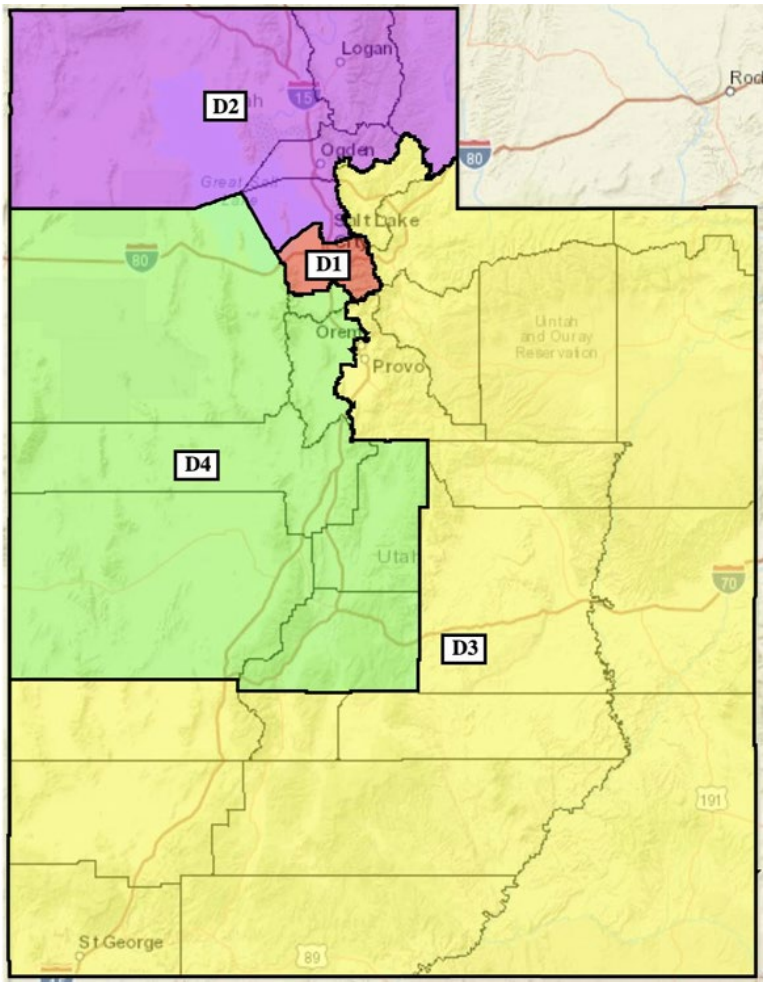
[191] PX-1C at 11-12, Fig. 10 (10.16 Warshaw Report).
[192] *Id.* at 11; 10.23 Tr. at 189:14-20, 190:18-20, 191:18-192:5 (Warshaw).
[193] 10.23 Tr. at 192:1-5 (Warshaw).
[194] PX-1C at 11 (10.16 Warshaw Report); 10.23 Tr. at 189:14-25, 190:18-191:2 (Warshaw).
[195] PX-1C at 11 n.14 (10.16 Warshaw Report); 10.23 Tr. at 190:1-11 (Warshaw).
[196] DX-14 at 44 (10.17 Barber Report).
[197] 10.23 Tr. at 198:8-200:6 (Warshaw).

136. Under S.B. 1011, Map C passes the partisan bias test and likewise has a passing mean-median difference of 1.45.[198] However, the Court finds that the partisan bias and mean-median difference tests are not probative of partisan favoritism in Utah given its current political geography and electoral context. Neither test can contradict evidence of Map C's clear pro-Republican skew evident from the efficiency gap and a slew of other metrics benchmarked against a neutral ensemble. For this reason, the Court accords these results little to no weight.

137. The Court thus finds that Map C favors Republicans and disfavors Democrats.

IX. Plaintiffs' Map 1

138. Plaintiffs' Map 1 is depicted below.[199]



139. Map 1 was derived from Dr. Chen's ensemble of computer-generated maps[200] programmed to follow only Prop 4's neutral criteria without any regard to partisanship, with minor adjustments made by Dr. Oskooii.[201] Dr. Oskooii used the program ESRI for Redistricting which

[198] DX-14 at 19, 22 (10.17 Barber Report).
[199] PX-2 at 13 (Oskooii Report).
[200] PX-6 (Chen Sample Maps, 8,977).
[201] PX-2 at 3-4 (Oskooii Report); PX-6 (Chen Sample Maps, 8,977); 10.23 Tr. at 234:41-14 (Oskooii); 10.23 Tr. at 250:21-251:14 (Oskooii); PX-3 at 5 (Chen Report).

does not contain partisan or political data to make these adjustments, nor did he reference any such data.[202]

140. There is no meaningful dispute that Map 1 adheres to all of Prop 4's neutral criteria.

141. Map 1 has perfect population equality across the districts.[203]

142. Map 1 minimizes the division of municipal and county splits. In Map 1, only one municipality is split: Midvale is divided one time into two pieces. Map 1 splits three counties only one time each: Salt Lake, Utah, and Weber counties are split into two districts each.[204]

143. Map 1 has districts that are reasonably compact, as Dr. Oskooii and Dr. Barber both agreed, using a variety of compactness metrics.[205]

144. Map 1 has districts that are contiguous.[206] Additionally, Map 1 has districts that allow for ease of transportation throughout the district. While some drive times between certain points in the state can be four to five hours, this is a feature of the geography and population distribution in the state.[207] There is road connectivity throughout the districts that would allow a member of Congress to reasonably traverse the district.

145. Traditional neighborhoods and local communities of interest are preserved in Map 1. Maintaining communities of interest is largely accounted for by keeping municipalities and counties whole which Map 1 does, splitting only one municipality and three counties one time each. Additionally, Map 1 was derived from Dr. Chen's ensemble which included the approximately 590 communities of interest identified by the Commission.[208] Finally, Map 1 preserves the four communities of interest identified by the LRC: the Uintah Basin is preserved by keeping Duchesne and Uintah Counties together in a district, while tribal reservations and lands, and institutions of higher education, do not cross district boundaries. Military installations are also largely kept intact across the map.[209]

146. Map 1 follows natural and geographic features, boundaries and barriers. Dr. Chen's algorithm, which produced the neutral ensemble of maps from which Map 1 was derived, was programmed to account for geographic features such as the Great Salt Lake and the Colorado River.[210]

147. Map 1 maximizes boundary agreement among different types of districts. Map 1 was derived from Dr. Chen's ensemble of maps produced by an algorithm which was programmed to maximize boundary agreement with state house and senate districts and state board of education districts wherever doing so did not violate any of the previous criteria. Map 1 keeps more house and senate districts whole within districts than Map C or Plaintiffs' Map 2.[211]

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[202] PX-2 at 4 (Oskooii Report); 10.23 Tr. at 233:4-22 (Oskooii).
[203] PX-2 at 7 (Oskooii Report); 10.23 Tr. at 235:19-21 (Oskooii).
[204] PX-2 at 16, Table 2A (Oskooii Report).
[205] PX-2 at 16, Table 1A (Oskooii Report); 10.23 Tr. at 235:24-25, 246:14-247:15 (Oskooii); DX-14 at 24-25 (10.17 Barber Report).
[206] 10.23 Tr. at 235:22-23 (Oskooii); PX-2 at 7 (Oskooii Report).
[207] 10.24 Tr. at 255:22-256:6 (Trende).
[208] 10.23 Tr. at 19:12-22 (Chen).
[209] 10.23 Tr. at 244:13-246:13 (Oskooii); PX-2 at 17-18 (Oskooii Report); PX-3 at 96-98 (Chen Report).
[210] PX-3 at 8-9 (Chen Report); 10.23 Tr. at 87:8-16 (Chen)
[211] PX-3 at 9, 99-101 (Chen Report).

148. With respect to partisanship, Map 1 does not exhibit partisan favoritism.

149. Map 1 falls within the norm of Dr. Chen's neutrally drawn ensembles. Like nearly all ensemble maps, Map 1 includes one Democratic-leaning district anchored in northern Salt Lake County.[212] Map 1's least Republican district (CD-1) has a Republican vote share of approximately 43%, well within the LRVS distribution among the ensemble maps.[213] Map 1's SDVS of 0.15 matches that of 77% of Dr. Chen's computer-simulated plans, confirming that the map does not exhibit cracking.[214] Map 1 likewise passes S.B. 1011's RMD test, falling well below the 95th percentile of RMDs in Dr. Chen's ensemble.[215]

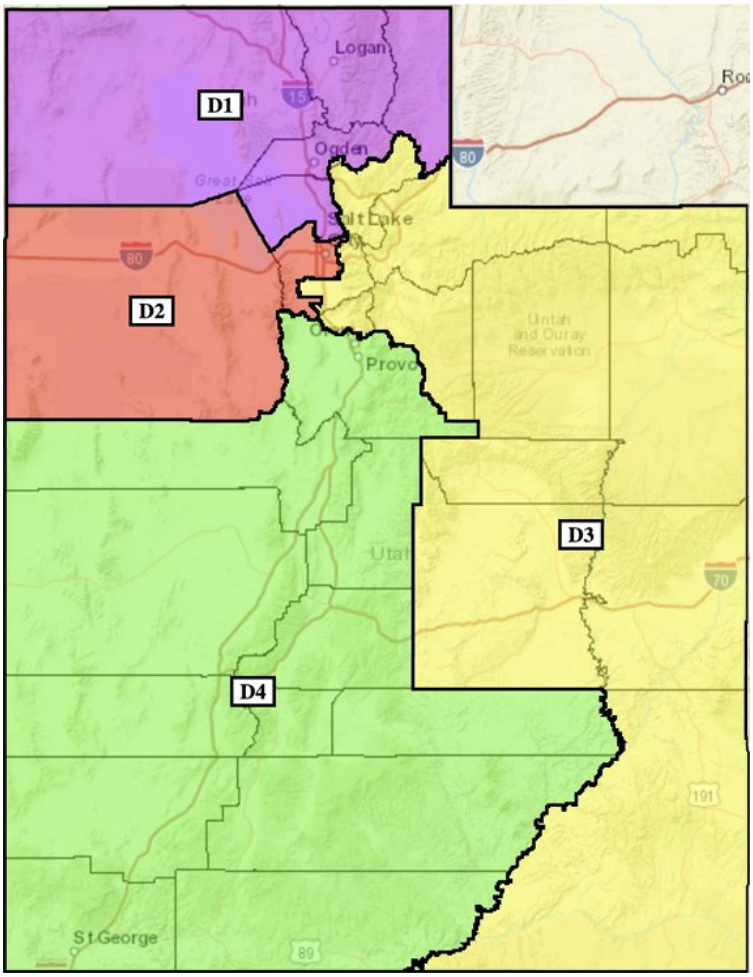
150. Map 1 has a slightly pro-Democratic efficiency gap of -2.4%, which is close to perfectly fair and at the center of the distribution of efficiency gap of historical congressional maps across all states with at least four districts.[216]

151. Map 1 does not pass S.B. 1011's partisan bias test and has a mean-median difference of -5.82 below S.B. 1011's +/- 2% passing threshold.[217]

X. Plaintiffs' Map 2

152. Plaintiffs' Map 2 is depicted below.[218]

[212] PX-3 at 15, 17, Fig. 3.1, 21-22, Fig. 3.2 (Chen Report).
[213] PX-3 at 17, Fig. 3.1 (Chen Report); DX-14 at 33 (10.17 Barber Report).
[214] PX-3 at 24-25, Fig. 3.3 (Chen Report).
[215] PX-3 at 28-29, Fig. 4.1 (Chen Report).
[216] PX-1C at 11-12, Fig. 10 (10.16 Warshaw Report); 10.23 Tr. at 189:14-20, 190:21-191:2 (Warshaw).
[217] DX-14 at 19, 22 (10.17 Barber Report).
[218] PX-2 at 15 (Oskooii Report).



153. Plaintiffs' Map 2 is based on the Legislature's Map C. Dr. Oskooii created Map 2 by making adjustments to Map C to reduce municipal and county splits. Dr. Oskooii did not consult political or partisan data while he made these adjustments, and he used the application ESRI for Redistricting to do so, which does not include any partisan or political data.[219] The adjustments made by Dr. Oskooii reduced the municipal and county divisions while making the least disruptive changes to the map, largely preserving the legislative choices underlying Map C.[220] Map 2 has a high core retention with Map C: CD-1 retains 99.96% of the population from Map C, CD-2 retains 69.65%, CD-3 retains 69.51%, and CD-4 retains 99.91%. Overall, Map 2 has an 84.76% core retention compared to Map C.[221]

154. There is no dispute Map 2 adheres to all the neutral criteria of Proposition 4.

155. Map 2 has perfect population equality across the districts.[222]

156. Map 2 minimizes divisions of municipalities and counties. To do this, Dr. Oskooii eliminated Map C's splits of North Salt Lake and Millcreek, and eliminated the extra division of Utah County. In Map 2, Pleasant Grove is the only municipality that is split, and Map 2 reduces

[219] 10.23 Tr. at 233:4-22, 243:2-5 (Oskooii); PX-2 at 3-4 (Oskooii Report)
[220] 10.23 Tr. at 266:14-19 (Oskooii).
[221] PX-2 at 11 (Oskooii Report).
[222] *Id.*; 10.23 Tr. at 242:18-22 (Oskooii).

the pieces into which Pleasant Grove is split from three in Map C to two in Map 2. As a result, Map 2 splits only one municipality (Pleasant Grove) and three counties (Salt Lake, Utah, and Weber).[223]

157. Map 2 has districts that are reasonably compact, as both Dr. Oskooii and Dr. Barber agreed.[224]

158. Map 2 has districts that are contiguous and allow for ease of transportation throughout each district.[225]

159. Traditional neighborhoods and local communities of interest are preserved in Map 2. Maintaining communities of interest is largely accounted for by keeping municipalities and counties whole which Map 2 does, splitting only one municipality and three counties one time each. Additionally, Map 2 was derived from the Legislature's Map C, so to the extent the Legislature's map respects communities of interest around the state, Map 2 largely respects those same ones. Specifically, Map 2 preserves the four communities of interest identified by the LRC: the Uintah Basin is preserved by keeping Duchesne and Uintah Counties together in a district, while tribal lands and institutions of higher education do not cross district boundaries. Military installations are also largely kept intact across the map, and where they span districts, they do so to the same extent as in Map C.[226] Legislative Defendants attempted to suggest that Map 2 fails to preserve communities of interest because certain cities are not in the same district, or because some of the canyons in Salt Lake County are in a different district from the communities at the "mouths" of those canyons. The Court finds these arguments unpersuasive.[227] As Defendants' expert Dr. Trende testified, communities of interest can often "be used as post-hoc rationalizations or justifications," especially if those communities of interest are identified only after a map has been drawn.[228] The Court finds that to be the case with Legislative Defendants' criticisms of Plaintiffs' Map 2.

160. Map 2 follows natural and geographic features, boundaries and barriers. The Colorado River forms part of the boundary between districts 3 and 4, and districts are configured so that the Great Salt Lake and Utah Lake do not form the only connection between parts of the district.

161. Map 2 maximizes boundary agreement among different types of districts. While this is the lowest ranked of the neutral criteria, Map 2 respects these boundaries where possible with numbers comparable to Maps 1 and C.[229]

162. With respect to partisanship, Map 2 does not exhibit partisan favoritism.

163. Map 2 falls within the norm of Dr. Chen's neutrally drawn ensembles in that it does not crack Democratic voters in northern Salt Lake County and includes one Democratic-leaning district.[230] The least Republican district (CD-2) in Map 2 has a Republican vote share of

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[223] PX-2 at 16, Table 2A (Oskooii Report); 10.23 Tr. at 236:4-242:17 (Oskooii).
[224] PX-2 at 16, Table 1A (Oskooii Report); 10.23 Tr. at 242:25-243:1, 246:14-247:15 (Oskooii); DX-14 at 25, Table 5 (10.17 Barber Report).
[225] 10.23 Tr. at 242:23-24 (Oskooii); PX-2 at 11 (Oskooii Report).
[226] 10.23 Tr. at 244:13-246:13 (Oskooii); PX-2 at 17-18 (Oskooii Report).
[227] 10.23 Tr. at 284:4-287:4 (Oskooii); 10.23 Tr. at 300:2-23 (M. Reid).
[228] 10.24 Tr. at 235:9-21 (Trende).
[229] PX-3 at 99-101 (Chen Report).
[230] PX-3 at 21-22, Fig. 3.2 (Chen Report).

approximately 47%, which is at the higher end of the LRVS distribution of the ensemble maps given Map 2's deliberate resemblance to Map C.[231] Map 2's SDVS of 0.137 is within the SDVS distribution of Dr. Chen's computer-simulated plans.[232] Map 2 does not pass S.B. 1011's RMD test, but is a less distant outlier than Map C.[233]

164. Map 2 has a slightly pro-Democratic efficiency gap of -0.8%, which is close to perfectly fair and at the center of the distribution of efficiency gap of historical congressional maps across all states with at least four districts.[234]

165. Map 2 passes S.B. 1011's partisan bias test and has a mean-median difference of -2.38.[235]

[PROPOSED] CONCLUSIONS OF LAW

There are three issues relevant to assessing the remedial congressional redistricting proposals before the Court.

First, can S.B. 1011 supply the governing standard to assess whether a remedial proposal purposefully or unduly favors or disfavors a political party? No, it cannot because S.B. 1011 likely violates Plaintiffs' right to alter and reform their government under Article I, Section 2,[236] and its enforcement must be preliminarily enjoined.

Second, does the Legislature's Map C comply with Prop 4? No, it does not. To start, the Legislature considered political data in its creation, in contravention of Prop 4's prohibition on considering such data. On repeated occasions since 2021, Sen. Sandall (the LRC co-chair) has objected to the commission having accepted a map drawn in DRA with political data shown on the screen—including in a September 2025 podcast released just days before the first LRC hearing on the proposed remedial maps. Yet the Legislature's mapdrawer, Dr. Trende, conceded on cross examination to having used this very mapdrawing program, having not hidden the political data from view, and in fact having displayed it the entire time he drew Map C. Indeed, the partisan political score was shown for each individual precinct as it was selected for inclusion or exclusion from a district. In addition, Map C violates Prop 4's prohibition on partisan favoritism by dividing districts in a manner that both unduly and purposefully favors the Republican Party and disfavors the Democratic Party. Even if S.B. 1011 did apply, Map C still fails its test for purposeful partisan favoritism. Map C likewise violates Prop 4's mandate to minimize the division of municipalities and counties across multiple districts to the greatest extent practicable. The Court therefore enjoins Defendants from using or enforcing S.B. 1012 (Map C). Because this Court previously enjoined the enforcement of the 2021 Congressional Map, the 2011 map remains the state's operative map but is malapportioned. Given the impending deadline from the Lieutenant Governor for a map to be in place, the Court thus bears the unwelcome obligation to order the use of a different congressional map to ensure a constitutionally apportioned map compliant with Prop 4 is in effect.

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[231] PX-3 at 17, Fig. 3.1 (Chen Report); DX-14 at 33 (10.17 Barber Report).
[232] PX-3 at 24-25, Fig. 3.3 (Chen Report).
[233] PX-3 at 28-29, Fig. 4.1 (Chen Report).
[234] PX-1C at 11-12, Fig. 10 (10.16 Warshaw Report); 10.23 Tr. at 189:14-20, 190:21-191:2 (Warshaw).
[235] DX-14 at 19, 22 (10.17 Barber Report).
[236] Plaintiffs have also alleged and sought preliminary relief premised on violations of other constitutional rights. Because the Court finds S.B. 1011 likely violates Article I, Section 2, it need not address the other asserted constitutional violations.

Third, can either of Plaintiffs' Maps 1 or 2 serve as a lawful remedy? Yes, Plaintiffs' Map **[1 or 2]** complies with Prop 4's neutral criteria and its prohibition on purposeful and undue partisan favoritism. The Court therefore orders the Lieutenant Governor to implement Plaintiffs' Map **[1 or 2]** for congressional elections.

The Court addresses each issue in turn.

I. S.B. 1011 does not govern this remedial proceeding because it likely violates Plaintiffs' alter and reform rights and its enforcement must be preliminarily enjoined.

S.B. 1011 does not supply the governing law for this remedial proceeding, and its enforcement must instead be preliminarily enjoined because Plaintiffs are likely to prevail on the merits of their Alter and Reform claim under Article I, Section 2 and the equities favor granting an injunction. *See* Utah R. Civ. P. 65A(f).

A. Plaintiffs are likely to succeed on the merits of their alter and reform claim.

Plaintiffs are likely to prevail on their claim that S.B. 1011 violates their alter and reform rights under Article I, Section 2. To establish a violation of their alter and reform rights, Plaintiffs must prove (1) that the People exercised or attempted to exercise their initiative power, to pass a government reform or alteration, and (2) that the Legislature infringed the exercise of these rights because it "amended . . . the initiative in a manner that impaired the reform contained in the initiative." *LWVUT I*, 2024 UT 21, ¶ 74. If Plaintiffs establish these two elements, the legislative action is unconstitutional unless the Legislative Defendants show that the impairment is "narrowly tailored to advance a compelling government interest." *Id.* ¶ 75.

The Court has previously concluded that the People exercised their initiative power through Prop 4, and that the subject matter of Prop 4 contained government reforms or alterations within the meaning of the Alter or Reform Clause. *See* Order Granting Pls. Mot. for Summ. J. (Dkt. 470) at 15-52. The remaining questions are whether S.B. 1011 unconstitutionally impairs Prop 4, and if so, whether its impairments satisfy strict scrutiny. For the following reasons, the Court concludes that S.B. 1011 impairs Prop 4's partisan gerrymandering prohibition and does not satisfy strict scrutiny.

1. Prohibiting partisan gerrymandering is a core reform of Prop 4.

The central goal of Prop 4 is ending partisan gerrymandering. Prop 4's Voter Pamphlet explained that prohibiting partisan gerrymandering was its "most important" provision.[237] To that end, Prop 4 adopted redistricting standards that are enforceable by the People of Utah. Essential to those core reforms is that the standards chosen by the People are binding on the Legislature. The U.S. Supreme Court, in finding that partisan gerrymandering was nonjusticiable under the federal constitution, explained that a solution to partisan gerrymandering could be found in "[p]rovisions in state statutes . . . [that] provide standards and guidance for state courts to apply." *Rucho v. Common Cause*, 588 U.S. 684, 719 (2019). Prop 4 is that solution for Utah.

Prop 4 effectuated its anti-partisan gerrymandering purpose by requiring redistricting plans to abide by a ranked-ordered set of neutral criteria, Utah Code § 20A-19-103(3), and by prohibiting any plans that "divide districts in a manner that purposefully or unduly favors or disfavors . . . any

[237] 2018 Voter Information Pamphlet, Leg. Defs.' Ex. A, Dkt. 406, p. 5.

political party," *id.* § 20A-19-103(4). The express prohibition on partisan favoritism, whether intentional or in effect, mirrors similar language in several other states. *See, e.g.*, Ohio Const. art. XIX, § 1(C)(3)(a); Haw. Const. art. IV, § 6; Del. Code Ann. tit. 29, § 804; Va. Code § 24.2-304.04(8).

To ensure that its prohibition on partisan favoritism is effective, Prop 4 further specifies that compliance must be assessed by "judicial standards and the best available data and scientific and statistical methods, including measures of partisan symmetry." Utah Code § 20A-19-103(5). This standard includes a quality requirement that the applied methods be most appropriate to the context (i.e., "best"), an understanding that the methods and their applicability may evolve over time (i.e., "available"), and flexibility in the types of evidence that can serve as proof (*i.e.*, "data and scientific and statistical methods, including measures of partisan symmetry"). This is a common legal standard that government bodies and courts routinely apply. *See, e.g., Keep the N. Shore Country v. Bd. of Land & Nat. Res.*, 506 P.3d 150, 169 (Haw. 2022) (interpreting "best scientific and other reliable data available" to require evaluation of "applicability and quality of the information" and to allow some information to be deemed inapplicable or insufficiently reliable); *Nation Ford Chem. Co. v. United States*, 166 F.3d 1373, 1377 (Fed. Cir. 1999) (holding that "best available information" standard allowed agency assessments to "depend on the circumstances" of a given case and what information is available); *Cent. Coast Forest Ass'n v. Fish & Game Comm'n*, 389 P.3d 840, 845 (Cal. 2017) (interpreting requirement under California Endangered Species Act that assessments be "based upon the best scientific information available" to be "legislative recognition that information and scientific understanding are subject to change" (cleaned up)).

The requirement to apply "judicial standards" and the "best available" methods also aligns with how state courts have assessed other states' similarly worded prohibitions in practice. *See, e.g.*, *Adams v. DeWine*, 195 N.E.3d 74, 84 (Ohio 2022) (relying on competing expert testimony to weigh evidence derived from a wide range of scientific and statistical methods applicable to Ohio). And it makes eminent sense in the redistricting context. There is a wide variety of scientific and statistical methods to assess partisan gerrymandering. The appropriateness of any given method or measure depends on the context (including the state's political environment, political geography, and the type of plan under review) and may change over time. And in some contexts, certain methods cannot yield reliable or interpretable results. *See supra*, Findings, Section IV.

2. S.B. 1011 impairs Prop 4.

S.B. 1011 impairs Prop 4's partisan gerrymandering prohibition in several ways. Instead of the "best" tests that yield meaningful results for Utah, S.B. 1011 mandates the exclusive use of three statistical tests—partisan bias, mean-median difference, and a flawed ensemble analysis—that cannot detect partisan favoritism in Utah and yield false, irrational results privileging maps favoring Republican voters and disfavoring Democratic voters. S.B. 1011 also restricts the ability of courts to conduct effective judicial review. Whereas Prop 4 sought to eliminate partisan gerrymandering, S.B. 1011's standards effectively mandate the practice and make it impossible to police as voters intended.

First, the Court concludes that S.B. 1011's mandatory use of the partisan bias test to assess undue partisan favoritism, to the exclusion of other more applicable tests, impairs Prop 4's prohibition on partisan favoritism and its neutral criteria.

The partisan bias test cannot detect partisan favoritism because it depends on an unrealistic hypothetical of tied statewide elections that bears no resemblance to reality in Utah. This is why scholars, including its author, warn that the partisan bias test should only be applied "to jurisdictions where it is factually reasonable to assume that elections can be competitive" statewide. Bernie Grofman & Gary King, *The Future of Partisan Symmetry as a Judicial Test for Partisan Gerrymandering after LULAC v. Perry*, 6:1 Election L.J. 2, 19 (2007). Utah—where statewide elections are known to be uncompetitive and no Democrat has won statewide office in decades—is not currently such a state. The partisan bias test also generates well-known paradoxes when applied in Utah, identifying 3-1 plans that include one Democratic district as biased against Democrats while identifying 4-0 Republican plans as unbiased. *See supra*, Findings, Section IV. The effect of culling Dr. Chen's and Dr. Trende's ensembles for compliance with the partisan bias test also illustrates how the test structurally mandates partisan favoritism for Republicans under Utah's current electoral conditions and political geography, impairing Prop 4's fundamental purpose. *See supra*, Findings, Section VI.B.

The partisan bias test also contravenes Prop 4's neutral redistricting criteria, which are another important way Prop 4 protects against partisan gerrymandering. The evidence on this front was clear and stark. The Court found one set of 10,000 computer simulated maps to closely adhere to Prop 4's partisan-neutral redistricting criteria, including respect for municipal and county lines, geographic compactness, contiguity, etc. But nearly all such maps fail S.B. 1011's partisan bias test. Likewise, even among Defendants' expert's ensemble of computer-simulated maps, a perverse relationship exists: the likelier a map is to comply with Prop 4's neutral redistricting criteria, the likelier it is to fail S.B. 1011's partisan bias test. The fewer counties it splits, the likelier it is to fail. The more counties it splits, the likelier it is to pass. The more compact it is, the likelier it is to fail. The less compact it is, the likelier it is to pass. The more contiguous districts it has, the likelier it is to fail. The fewer contiguous districts it has, the likelier it is to pass. This stark, inverse relationship between a map's compliance with Prop 4's neutral criteria and its satisfaction of S.B. 1011's partisan bias test illustrates in clear terms how the latter profoundly impairs the former. *See supra*, Findings, Section VI.A.

Second, the Court concludes that S.B. 1011's mandated use of the mean-median difference test, to the exclusion of other more applicable tests, impairs Prop 4 for similar reasons. Like the partisan bias test, the mean-median difference only tends to be probative in states with competitive statewide elections and produces similarly paradoxical results in Utah that singularly favor the state's majority party. This is in part because the mean-median difference test was designed only to detect packing gerrymanders, not cracking gerrymanders, which is the more likely way to disfavor Democratic voters in Utah given their concentration in Salt Lake County. Like the partisan bias test, the mean-median test also yields paradoxical results when applied in Utah that systematically favor Republicans and disfavor Democrats. By setting an arbitrary cut-off of 2% for a passing score, S.B. 1011 ensures that most 3-1 maps that include a Democratic-leaning district will fail the test, while maps with more uniform vote shares across districts favoring Republicans will pass the test. As such, the mean-median test blesses maps that unduly favor Republicans and disfavor Democrats. *See supra*, Findings, Section IV. Because Proposition 4 seeks to prohibit such partisan favoritism, the Court concludes that S.B. 1011's imposition of the mean-median test impairs its reforms.

Third, the Court concludes that S.B. 1011's "culled" ensemble analysis undermines Prop 4's prohibition on undue partisan favoritism and its neutral criteria. Even if a plan passes the

partisan bias test, S.B. 1011 still deems the map unlawful if it does not also pass a version of an ensemble analysis where the ensemble is "culled" to exclude all maps that do not pass the partisan bias test. Utah Code § 20A-19-103(1)(c)(ii), (4)(c). This defeats the purpose of an ensemble analysis and has the effect in Utah of disqualifying congressional plans that include a Democratic district and that comply with Prop 4's neutral criteria, impairing Prop 4. *See supra*, Findings, Section VI.

Fourth, mandated consideration of all three of these tests to the exclusion of more applicable methods that can detect partisan favoritism directly contravenes Prop 4's private right of action and provision of judicial review. Prop 4 requires that plans be assessed for compliance with its prohibition on undue partisan favoritism according to "judicial standards" and the "best" data and scientific methods available. Yet S.B. 1011 instead mandates the exclusive use of the worst methods in Utah. And it likewise impairs Prop 4's judicial review provision—one of its key reforms to ensure enforcement of its provisions—by elevating the standard of proof for purposeful partisan gerrymandering in certain circumstances. Utah Code § 20A-19-103(4)(b) (applying a clear and convincing standard). Not only does this conflict with Prop 4's existing judicial review provision, which sets both a de novo and preponderance of evidence standard, *see* Utah Code § 20A-19-301(2) & (4), but it also places a thumb on the scale in favor of the Legislature via an exception to the nearly universally applicable burden of proof in civil litigation. It accords the Legislature greater protection at the expense of the People—the very opposite of the purpose behind Prop 4.

Even Legislative Defendants' experts seem to agree that S.B. 1011 takes a flawed approach. During testimony before the LRC and again in court, Dr. Trende explained that both the partisan bias test and the mean-median difference test were more appropriate to use in assessing state legislative maps rather than congressional maps. Yet S.B. 1011 applies these tests exclusively to congressional maps and not state legislative maps. Notably, the evidence reflects that Utah's legislative maps would fail these tests on account of a pro-Republican bias. Dr. Barber has opined that "[n]o single metric is perfect, especially in Utah. Every test carries assumptions that can misfire in a four-seat, lopsided state. The signed symmetry implementations (partisan bias, mean-median) can generate well-known paradoxes when the statewide vote is not near 50-50 . . . ."). [238] Yet S.B. 1011 mandates these very tests to the exclusion of other relevant information, tests, and data, with no recognition that the result may be paradoxical. Dr. Katz admitted that relying on one or two knife-edged quantitative thresholds to assess partisan gerrymandering is ill-advised and unusual for academics and the courts, yet that is precisely what S.B. 1011 does. Dr. Katz also admitted, remarkably, that the partisan bias test would be preferred to Republican lawmakers in Utah, given its known effects in the state, and that the mean-median difference test does not apply at all in lopsided states like Utah where the statewide vote share does not approach 50%. [239]

Thus, the Court concludes that S.B. 1011 impairs Prop 4.

3. S.B. 1011 fails strict scrutiny.

The Court finds that the interests asserted by Legislative Defendants are not compelling and S.B. 1011 is not narrowly tailored to address them.

[238] DX-14 at 14 (10.17 Barber Report).
[239] 10.24 Tr. at 59:6-60:11, 68:25-69:10 (Katz).

First, Legislative Defendants have claimed an interest in ensuring neutral maps through their preferred tests. But mandating statistical tests that fail to detect when redistricting maps disfavor the state's minority party is not a compelling interest, even if those are the tests preferred by the Legislature. Prop 4 was passed to provide guardrails on the Legislature's redistricting authority, not to provide a blank check for them to adopt tests that mandate certain partisan outcomes that favor the majority party. Nor is S.B. 1011 narrowly tailored to serve any purpose approaching neutrality, as requiring the use of partisan bias, mean-median difference, and a culled ensemble to the exclusion of other available methods directly contravenes a prohibition on partisan favoritism.

Second, Legislative Defendants seek to justify their selection of these exclusive tests for undue partisan favoritism by appealing to Prop 4's inclusion of "measures of partisan symmetry" among the methods that may be considered in assessing compliance with its standards. But "measures of partisan symmetry" are just one *non-exclusive* method contemplated under Prop 4's plain language. *See* Utah Code § 20A-19-103(5).

At times, Legislative Defendants have also contended that the *only* measure of partisan symmetry is the partisan bias test. But Prop 4 refers to measure**s** of partisan symmetry, in the plural, not just one. *Id.* Indeed, courts and political scientists understand partisan symmetry broadly to mean "whether supporters of each of the two parties are able to translate their votes into representation with equal ease." *Common Cause v. Rucho*, 318 F. Supp. 3d 777, 885 (M.D.N.C. 2018), *vacated on other grounds*, 588 U.S. 684 (2019). By the time Prop 4 was enacted in 2018, the U.S. Supreme Court and other courts had recognized multiple metrics qualify as measures of partisan symmetry, including the efficiency gap, which is effectively barred from consideration under S.B. 1011. Indeed, in June 2018, the U.S. Supreme Court issued its decision in *Gill v. Whitford*, a case about whether Wisconsin's state legislative districts were unlawful partisan gerrymanders. 585 U.S. 48 (2018). While the Court's holding addressed standing, the decision specifically spoke about "partisan symmetry," and its conception was not nearly as blinkered as that proffered by S.B. 1011. The *Whitford* Court spoke of "the efficiency gap and similar *measures* of partisan asymmetry[,]" and to "[p]artisan-asymmetry metrics such as the efficiency gap." *Id.* at 71-72 (emphasis added); *id.* at 72 (referring again to the "efficiency gap" and "other measures of partisan symmetry"); *see also Rucho*, 318 F. Supp. 3d at 885 (recognizing "three standard measures of partisan symmetry: the 'efficiency gap,' 'partisan bias,' and 'the mean-median difference"); *Ga. State Conf. of NAACP v. State*, 269 F. Supp. 3d 1266, 1284 (N.D. Ga. 2017) ("partisan symmetry, measured by the efficiency gap, is one way to make a political gerrymandering claim").

Political scientists also recognize multiple metrics as measuring aspects of partisan symmetry.[240] And indeed, Legislative Defendants have themselves conceded that the mean-median difference is a measure of partisan symmetry (although not defined as such in S.B. 1011). *See* Leg. Defs. Opp. to Pls. Mot. for Preliminary Injunction on Pls. Third Supp. Complaint ("PI Opp") at 13, 18.

Moreover, the *Whitford* Court noted the major problem with using the partisan bias test to measure partisan symmetry. Discussing Justice Kennedy's opinion in *League of United Latin Am. Citizens v. Perry*, 548 U.S. 399 (2006) ("*LULAC*"), the Court noted that "Justice Kennedy noted some wariness at the prospect of 'adopting a constitutional standard that invalidates a map based on unfair results that would occur in a hypothetical state of affairs.'" *Whitford*, 585 U.S. at 64

[240] PX-1A at 4-6 (10.7 Warshaw Report); 10.23 Tr. at 167:10-21, 186:1-6 (Warshaw).

(quoting *LULAC*, 548 U.S. at 419 (Kennedy, J.)). In *LULAC*, this concern about the hypothetical-world nature of the partisan bias test led him to conclude that it "alone is not a reliable measure of unconstitutional partisanship." *LULAC*, 548 U.S. at 420.

Thus, at the time Utah voters adopted Prop 4 in 2018, the state of legal affairs was such: the U.S. Supreme Court had recognized that there were multiple measures of partisan symmetry, including the efficiency gap, that the partisan bias test had a major drawback in that it relied upon measuring partisan bias in a hypothetical state of affairs, and that these measures "alone" should not dictate whether a map is lawful or not. *Id.* Accordingly, the text of Prop 4 makes *measures* (plural) of partisan symmetry relevant to the assessment but provides that such metrics are non-exclusive and instead part of a broad range of methods, data, and information to be considered.

S.B. 1011's rewrite of Prop 4 cannot be justified by a contention that its partisan bias test is the exclusive metric that Utah voters intended in adopting Prop 4. Such a view comports neither with the plain text of Prop 4 nor the contemporary legal understanding at the time the law was adopted.[241] In any event, mandating use of the partisan bias test *to the exclusion* of other measures is not narrowly tailored to ensuring consideration of the Legislature's preferred measure of partisan symmetry. The Legislature could have, for example, specified particular relevant tests to be included among the list of non-exclusive metrics, rather than mandating particular (currently) inapplicable tests as the determinative factor.

Third, Legislative Defendants have asserted an interest in adding clarity to make Prop 4 "workable." PI Opp at 4. This interest is hardly compelling because Prop 4's standards, including its prohibition on partisan favoritism, requires no further clarification or amendment to be administrable. Several other states have virtually identical prohibitions on undue partisan favoritism that courts have readily interpreted and administered using the usual tools of statutory interpretation. In *Adams*, for example, the Ohio Supreme Court rejected the legislature's contention that identical language there was not judicially administrable. *Adams*, 195 N.E.3d at 84. The court reasoned that it presents no less manageable a standard than the Fourteenth Amendment's prohibition on racial discrimination. And, indeed, this Court has ruled here that even broader constitutional guarantees of the Utah Constitution like the Free Elections Clause can supply a judicially manageable standard to assess partisan gerrymandering. *See* Ruling & Order Granting in Part & Denying in Part Defs.' Mot. to Dismiss (Dkt. 140) at 16-20. The *Adams* court also noted the U.S. Supreme Court's assessment in *Rucho* specifically identifying a prohibition on "intent to favor or disfavor a political party" as providing sufficient guidance to courts. *Id.* at 84 (citing *Rucho v. Common Cause*, 588 U.S. 684, 719 (2019)). And, in recognizing that the voters of Ohio (as here) "intended that th[eir] anti-gerrymandering requirements . . . have teeth," the Ohio court concluded

[241] The Court is likewise unpersuaded by the legal interpretation proffered by Defendants' expert Dr. Trende. Dr. Trende professed to dislike the partisan bias standard but claimed that the text of Prop 4 mandated partisan bias alone as a metric of partisan symmetry because in 2020—two years *after* Prop 4 was adopted—three political science professors (including the author of the partisan bias test) disputed the claim that any other metric could possibly measure partisan symmetry and asserted that their measure alone was the true metric. The Court need not wade into this academic dispute because it suffices that voters in 2018 could not possibly have based their understanding of Prop 4's text on a 2020 political science journal article. Nor does that article define the scope of the plain meaning of partisan symmetry from a legal perspective, but rather engages in a technical dispute of academic concepts. That differs greatly from how courts interpret statutes. *See, e.g.*, *Croft v. Morgan County*, 2021 UT 46, ¶ 21, 496 P.3d 83 (interpreting statute to give it its "common, ordinary usage and understanding of language" (internal quotation marks omitted)).

that they had "articulate[d] a standard that is 'grounded in a limited and precise rationale and [that is] clear, manageable, and politically neutral.'" *Id.* (quoting *Rucho*, 688 U.S. 703).

Insofar as Legislative Defendants contend that this Court invited S.B. 1011, they are mistaken. The Court only recognized that the Legislature has "discretion in determining what judicial standards are applicable and . . . to determine 'the best available data and scientific and statistical methods' to use in evaluating redistricting plans for compliance." Dkt. 470 at 29. Clearly, discretion does not extend to *impairment* of Prop 4. Indeed, as the Court recognized, fundamental to Prop 4's privately enforceable prohibition on partisan favoritism is that the Legislature *lacks* discretion to disobey it. Dkt. 470 at 28.

Finally**,** Legislative Defendants note that Prop 4 does not prohibit the consideration of certain tests such as partisan bias or mean-median difference. PI Opp at 14. But Legislative Defendants confuse the lack of such a prohibition as invitation to require *only* the use of such tests, even where doing so would undermine the core reforms of Prop 4. The Court finds that while Prop 4 does not prohibit the use of any particular test outright, Prop 4 mandates that any tests be given the weight they are due in context.

B. The equities favor granting Plaintiffs' requested injunction.

Plaintiffs also satisfy the remaining preliminary injunction factors: (1) they "will suffer irreparable harm unless the . . . injunction issues," (2) "the threatened injury to [them] outweighs whatever damage the proposed . . . injunction may cause the party . . . enjoined," and (3) the "injunction, if issued, would not be adverse to the public interest." Utah R. Civ. P. 65A(f)(2)-(4); *see also* Utah Code § 20A-19-301(2)(b) (allowing preliminary relief if it is in the public interest).

Plaintiffs will suffer irreparable harm in the absence of an injunction against S.B. 1011 in the form of a loss of constitutional rights, which "cannot be adequately compensated in damages or for which damages cannot be compensable in money." *League of Women Voters of Utah v. Utah State Legislature*, 2024 UT 40, ¶ 148, 559 P.3d 11, 42 ("*LWVUT II*") (quoting *Hunsaker v. Kersh*, 1999 UT 06, ¶ 9, 991 P.2d 67).

The balance of the equities and the public interest also favor granting an injunction. Without the requested relief, Plaintiffs and the Utah public will suffer the harm of having all potential congressional maps subjected to S.B. 1011's cherry-picked tests designed to ensure that any map chosen favors the majority party. But Legislative Defendants face no cognizable harm from being unable to enforce an unconstitutional statute. *See United States v. Alabama*, 691 F.3d 1269, 1301 (11th Cir. 2012) (there can be "no harm from [a] state's nonenforcement of invalid legislation"). Nor do Defendants face a greater risk of Map C being struck down absent S.B. 1011 because Map C is *also* unlawful under S.B. 1011's RMD test for assessing partisan intent. Furthermore, absent S.B. 1011, Legislative Defendants remain free to advocate for and apply whatever data and methods they believe are best.

The Court thus concludes that Plaintiffs are entitled to a preliminary injunction enjoining Defendants from enforcing S.B. 1011, and its standards for assessing redistricting plans do not apply to this remedial proceeding.

II. Map C does not comply with Prop 4.

A. Map C was drawn with consideration of partisan political data.

Map C fails to conform and abide by Prop 4 because in adopting it the Legislature violated Prop 4's requirement that "[p]artisan political data and information . . . may not be considered by the Legislature" in drawing maps. Utah Code § 20A-19-103(6). In 2021, Sen. Sandall, co-chair of the LRC, pointedly criticized the commission because one of its proposed maps, the SH-2 map, was submitted by a member of the public who drew the map using the platform DRA, which has a default setting that displays partisan political information regarding the districts as they are being drawn—including precinct-by-precinct partisan information as they are being selected for inclusion or exclusion from a district. Below is what Sen. Sandall said to Commissioner Rex Facer in 2021:[242]

Sen. Sandall: So uh, a couple of follow up questions. That [the Green Map] then was replaced by the SH congressional map 2?

Comm'r Facer: That's correct.

Sen. Sandall: Will you confirm to me that was submitted by a Stuart Hepworth?

Comm'r Facer: That is correct.

Sen. Sandall: Were you also aware that he admitted to our committee that he drew off of Dave's Redistricting tool exclusively and imported his data into our systems and thus you have accepted a map that has political data involved exclusively in it?

Sen. Sandall continued his objections to maps drawn using DRA in the lead up to the adoption of Map C in 2025. In a House Republicans podcast released on September 18, 2025, just days before the first public hearing on September 22, Sen. Sandall said the following about the commission's map proposals in 2021:[243]

> The independent redistricting commission came back with three maps. Of those three maps, I've got to back up for a second because I think this is important. One of those maps was actually a substitute of a map they were working on and it was from a constituent who actually drew the map on a tool called Dave's Redistricting tool, and it has political data in it. So when we observed that as a committee – first of all as a chair, I was really hesitant at the work they had done. But at the end of the day, we did not adopt any of those three maps.

Despite considering the public's and the Commission's use of DRA to draw maps disqualifying, the Legislature's Map C was drawn by its expert consultant, Dr. Trende, using DRA. Dr. Trende testified that he hand drew Map C using DRA. He proceeded by navigating to DRA's homepage and from there to the Utah page, where he created a copy of the official version of Utah's 2021 congressional map to commence his drawing. He used the 2021 map—including its four-way division of Salt Lake County—as the starting point for his mapdrawing. He did not select

[242] PX-16 (Sandall, 11.1.21 LRC Hearing).
[243] PX-17 (Sandall, 9.18.25 Podcast).

the option to hide political data from the screen, and instead he left the partisan political composite score (for elections from 2012-2020) displayed on the screen during his mapdrawing process. This included partisan data on the left panel of the screen about the district under consideration as well as partisan data about each precinct being considered for inclusion or exclusion from a district on the right panel of the screen.[244]

Dr. Trende only revealed this information when probed on cross examination. On direct examination he claimed not to have considered political data while drawing the map. When confronted about his mapdrawing process on cross examination, he testified that "even if I had looked at [the political data displayed on the DRA screen], it wouldn't have told me anything" because it included in the composite 2012 elections.[245] Moreover, Dr. Trende testified that neither any member of the Legislature nor their counsel advised him that he should not use DRA to draw the map and that he should not display political data while drawing the map.[246]

The Court is unpersuaded by Dr. Trende's contention that "even if" he looked at the political data it would not have been useful to him and does not credit it. Dr. Trende had a partisan political composite with election data from, *inter alia*, the 2016, 2018, and 2020 elections—including data for each voting precinct—displayed prominently on the computer screen during the entirety of the mapdrawing process. He could have chosen to hide that data but did not. No one from the Legislature—despite repeatedly and pointedly disqualifying public and commission maps that were drawn on DRA with political data visible—advised him not to use DRA and not to display political data while drawing the map. Nor did the Legislature's counsel. None of these details were revealed on direct examination, which standing alone would have incorrectly led the Court to believe that no political data was available during the mapdrawing process. Instead, the truth about the mapdrawing process was only revealed on cross examination. This evidence, together with the actual manner in which Map C favors the Republican Party as explained below, leads the Court to reject any contention that political data was not considered in the drawing of Map C. It was displayed prominently on the screen using the very program that Sen. Sandall had considered disqualifying when used by others. The Court finds that the Legislature violated Prop 4's prohibition on considering political data in drawing Map C.

B. Map C violates Prop 4's partisan gerrymandering prohibition.

Prop 4 provides that "[t]he Legislature . . . may not divide districts in a manner that purposefully or unduly favors or disfavors any incumbent elected official, candidate or prospective candidate for elective office, or any political party." Utah Code § 20A-19-103(4). Prop 4 thus prohibits partisan favoritism in both *purpose* and *effect*. In accordance with Prop 4, the Court "shall review or evaluate the redistricting plan at issue de novo" in ascertaining its compliance with Prop 4's requirements. *Id.* § 20A-19- 301(4). In doing so, the Court "shall use judicial standards and the best available data and scientific and statistical methods, including measures of partisan symmetry." *Id.* § 20A-19-103(5). Applying this standard, the Court concludes that Map C purposefully and unduly favors the Republican Party and disfavors the Democratic Party.

[244] 10.24 Tr. at 181:2-183:19, 259:2-11 (Trende).
[245] 10.24 Tr. at 259:2-11 (Trende).
[246] 10.24 Tr. at 257:1-259:11 (Trende).

1. Map C unduly favors the Republican Party and disfavors the Democratic Party.

The Court finds that Map C unduly favors the Republican Party and disfavors the Democratic Party, meaning it has the unlawful *effect* of favoring or disfavoring a political party under Prop 4.

Although this is the first case in Utah to apply an undue favoritism to redistricting, many states similarly prohibit maps that have the effect of unduly favoring or disfavoring parties without a showing of intent. *See* Ohio Const. art. XIX, § 1(C)(3)(a); Haw. Const. art. IV, § 6; Del. Code Ann. tit. 29, § 804; Va. Code § 24.2-304.04(8). And other courts have in practice applied "judicial standards and the best available data and scientific and statistical methods, including measures of partisan symmetry" to assess redistricting plans. Utah Code § 20A-19-103(5).

In construing the Ohio Constitution's prohibition on maps that unduly favor a political party, the Ohio Supreme Court looked to dictionary definitions of "unduly" for guidance, concluding that it meant "[e]xcessive or unwarranted." *Adams v. DeWine*, 195 N.E.3d 74, 84 (Ohio 2022) (quoting *Black's Law Dictionary* 1838 (11th ed. 2019); *see also Webster's Third New Int'l Dictionary* 2492 (2002) (defining "unduly" as "in an undue manner, *esp:* EXCESSIVELY" and defining "undue" as "exceeding or violating propriety or fitness: EXCESSIVE, IMMODERATE, UNWARRANTED")). The Ohio Supreme Court then observed that "[t]his, of course, raises questions: In excess of what? Or, unwarranted by what?" *Adams*, 195 N.E. 3d at 84. The answer, the court held, was found in the Ohio Constitution's neutral redistricting criteria. Ohio requires, *inter alia*, that congressional maps comply with federal law, consist of contiguous territory, avoid splitting municipalities and counties, and be compact. *Id.* at 85 (citing Ohio Const. art. XIX, § 2). Applying the principle that provisions addressing like subjects "be read *in pari materia* and harmonized if possible," the court concluded that its Constitution "prohibits the General Assembly from passing . . . a plan that favors or disfavors a political party . . . to a degree that is in excess of, or unwarranted by, the application of [the neutral redistricting criteria] to Ohio's natural political geography." *Id.* "In other words, [the provision] does not prohibit a plan from favoring or disfavoring a political party . . . to the degree that inherently results from the application of neutral criteria, but it does bar plans that embody partisan favoritism or disfavoritism in excess of that degree—i.e., favoritism not warranted by legitimate, neutral criteria." *Id.*

To adjudicate the partisan favoritism effects claim here, the Court follows the reasoning of the Ohio Supreme Court in *Adams*, interpreting each Prop 4 provision "in connection with every other part or section so as to produce a harmonious whole." *Berneau v. Martino*, 2009 UT 87, ¶ 12, 223 P.3d 1128 (quoting *Sill v. Hart*, 2007 UT 45, ¶ 7, 162 P.3d 1099). The Court thus applies a two-part test. First, considering the "best available" data and methods, including applicable "measures of partisan symmetry," the Court assesses whether a map has the effect of favoring or disfavoring any political party. Utah Code § 20A-19-103(5). Second, if the evidence shows that the map favors or disfavors any political party, the Court assesses whether it does so unduly, *i.e.*, "to a degree that is in excess of, or unwarranted by, the application of [Prop 4's neutral redistricting criteria] to [Utah's] natural political geography." *See Adams*, 195 N.E.3d at 85; Utah Code § 20A-19-103(3) (neutral criteria).

In *Adams*, the Ohio Supreme Court held that a challenge congressional map unduly favored Republicans to a degree in excess of what the neutral criteria would require. The court weighed competing expert testimony to weigh evidence from a range of scientific and statistical methods

applicable to Ohio. *Id.* at 85-92. In arriving at its ultimate conclusion, the court relied on the testimony and analysis of the petitioners' experts, including Dr. Chris Warshaw and Dr. Jowei Chen. *Id.* at 86-87. The court noted that Dr. Warshaw "found that Republicans [were] likely to win 80 percent of the congressional seats (12 out of 15) under the enacted plan, even though Republicans have received about 53 percent of the vote in recent statewide elections." *Id.* at 86. Dr. Warshaw reported on measures of partisan symmetry, including the efficiency gap, and the court credited his finding that the challenged Ohio map was "more extremely biased than 70 percent of previous plans and 'more pro-Republican' than 85 percent of previous plans." *Id.* at 92. Likewise, the court relied upon the analysis and testimony of Dr. Chen, who generated 1,000 maps using the Ohio Constitution's neutral redistricting criteria and found that "only 1.3 percent of the simulated plans created 12 Republican-favoring districts. Dr. Chen concluded that the enacted plan is a 'statistical outlier' and that the plan's 'extreme' partisan bias cannot be attributable to Ohio's political geography, which he accounted for in his simulations." *Id.* at 87.

Here, Map C unduly favors Republicans and disfavors Democrats in violation of Prop 4 for similar reasons.

First, the "best available data and scientific and statistical methods, including measures of partisan symmetry," demonstrate that Map C favors Republicans and disfavors Democrats to an extreme degree. Utah Code § 20A-19-103(5). To begin, the *Adams* court "examine[d] how the two major political parties are expected to perform under the enacted plan," based on "voting history in prior elections," to assess whether the plan creates a significant disparity between a party's statewide vote share and expected seat share. *Adams*, 195 N.E.3d at 85. Here, as Dr. Chen's analysis shows, although Democratic voters comprise about 34.2% of voters in recent statewide elections, they can expect to win *none* of the state's four congressional seats while Republicans win 100% of the seats under Map C.[247] Dr. Barber's analysis confirms this fact: Democrats would not carry a single district in Map C under any of the thirteen recent statewide elections he analyzed.[248] This level of disproportionality raises a serious question that the plan may be biased in favor of Republicans.[249] *See Adams*, 195 N.E.3d at 86 (striking down map granting Republicans 80% of congressional seats despite comprising 53% of statewide vote share).

The best available methods and measures of symmetry applicable in this case confirm that Map C exhibits an extreme level of pro-Republican favoritism. Map C's pro-Republican skew is apparent from an ensemble analysis, which involves comparing the map's partisan characteristics to a set of many thousands of computer-generated maps programmed to consider only Prop 4's neutral criteria and no partisan data. *See supra*, Findings, Section IV. Courts rely upon ensemble analyses to assess undue partisan favoritism in redistricting plans. *See id.* at 87, 92; *Rucho*, 588 U.S. at 737 (Kagan, J., dissenting) (describing this "extreme outlier approach" as an established way to demonstrate a map's partisan effects).[250] Here, Dr. Chen credibly compared Map C with 10,000 computer-simulated maps and observed that over 99.94% of simulations create one Democratic-leaning district including northern Salt Lake County and three Republican-majority districts—reflective of Utah's political geography and makeup. By contrast, Map C cracks Salt Lake County's Democratic voters in half, creating four safe Republican districts, a result almost never observed among neutral simulations programmed to follow Prop 4's neutral criteria. *See*

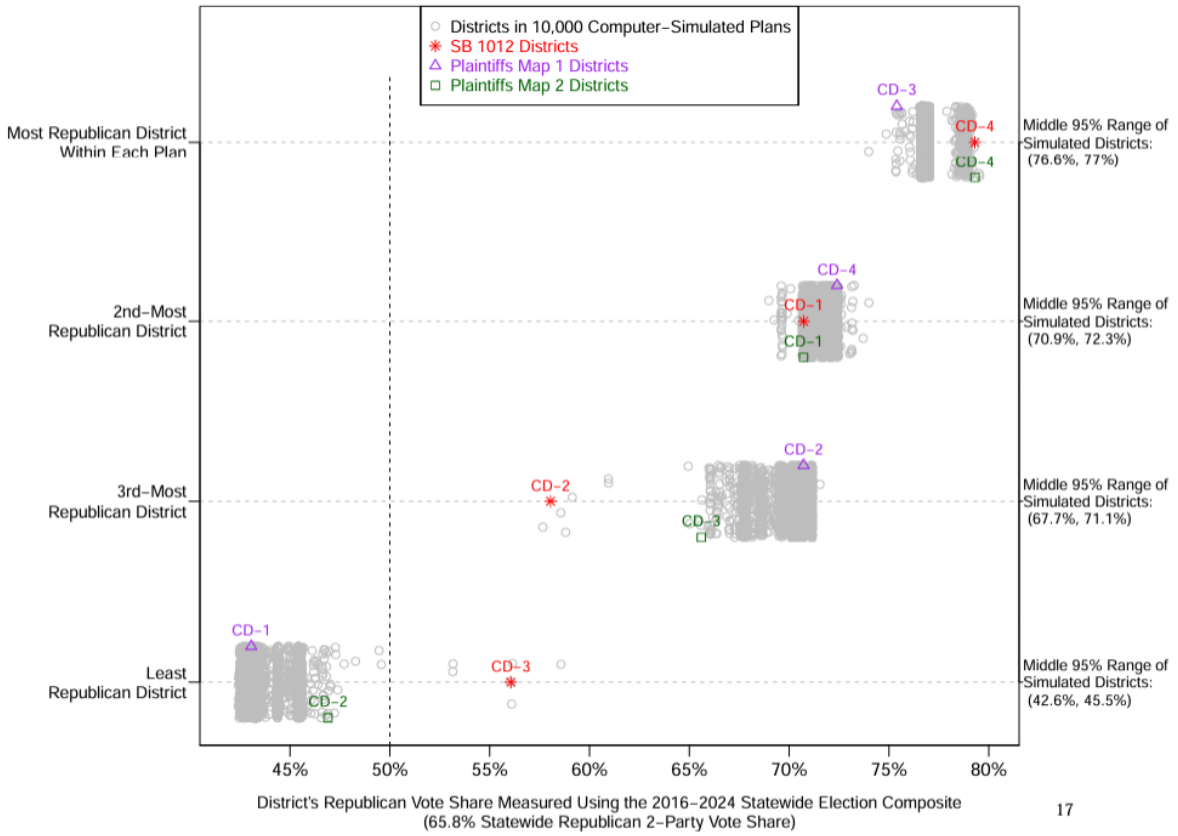
[247] PX-3 at 17 (Chen Report).
[248] DX-14 at 33 (10.17 Barber Report).
[249] 10.23 Tr. at 200:25-201:7 (Warshaw).
[250] PX-3 at 7 n.3 (Chen Report) (citing cases).

supra, Findings, Section VIII. Map C is thus "an extreme partisan outlier in favor of Republicans."[251]

Map C's pro-Republican bias is also apparent from comparison with simulation maps along two additional measures—the least Republican vote share (LRVS) and standard deviation of Republican vote shares (SDVS)—which are among the best methods to assess partisan bias in Utah given its political geography. Both methods show statistically how Map C cracks Salt Lake County Democratic voters into heavily Republican districts to prevent them from electing a congressional representative.

The LRVS method compares the two-party vote share in the least Republican districts in the enacted map with that of ensemble maps. Dr. Chen found that in the middle 95% of neutral Prop 4 simulations, the expected Republican vote share in the least Republican district ranges from 42.6-45.5%—meaning it is a district Democrats should expect to carry. But the LRVS in Map C (CD-3) is 56.1%, a comfortable Republican majority and an outlier greater than 99.97% of neutral simulations.[252] This inflated Republican vote share in CD-3 is achieved by pulling Republican voters out of the other safely Republican districts, resulting in an unnaturally low (but still safe) Republican vote share in the third-most Republican district (CD-2) compared to the ensemble.[253]

Figure 3.1:
District–Level Comparisons of SB 1012 and Plaintiffs' Maps 1 and 2 to 10,000 Computer–Simulated Plans



[251] PX-3 at 3 (Chen Report).
[252] PX-3 at 19 (Chen Report); 10.23 Tr. at 23:5-15 (Chen).
[253] PX-3 at 19-20 (Chen Report); 10.23 Tr. at 23:25-24:21 (Chen).

The standard deviation of Republican vote shares across Map C's districts is also anomalously low and, as Dr. Chen found, much smaller than any deviation produced by neutral computer simulations. This deviation quantifies how unusually and severely Democratic voters in the Salt Lake area are cracked and dispersed among safe Republican-majorities across all districts. Map C's SDVS is an outlier compared to the simulated maps, indicating that Democrats naturally concentrated in northern Salt Lake County are efficiently cracked under the map.[254]

Although it is not required to be considered, S.B. 1011's ranked marginal deviation (RMD) metric provides further persuasive evidence of Map C's pro-Republican bias. The RMD metric essentially shows how similar a map's district-level vote shares are to the average ensemble map.[255] S.B. 1011 considers an RMD greater than 95% of an ensemble to be a statistical outlier. Map C exceeds the RMD of 99.99% of Dr. Chen's simulated maps, confirming it is an extreme partisan outlier. Map C even registers an RMD above 95% of Dr. Trende's simulated maps, after limiting his simulated maps to those that comply with Prop 4's requirements to minimize county divisions and create geographically compact districts. *See supra*, Findings, Section VIII.

Finally, Map C's pro-Republican bias is reflected in its efficiency gap, which measures the asymmetry between each party's respective inefficient votes due to cracked or packed districts.[256] A positive efficiency gap suggests Republican votes are made more inefficient, a negative score indicates Democratic votes are made more inefficient, and zero means perfect symmetry between each party's inefficient votes.[257] Based on recent election results, Map C has a 11.7% pro-Republican efficiency gap, a bias greater than "80% of all prior congressional plans in all U.S. states with at least 4 districts over the last 50 years" and "more pro-Republican than 88% of all previous districting plans."[258] Courts have invalidated maps with less bias relative to past plans. *See Adams*, 195 N.E.3d at 92 (invalidating map more biased than 70% and more pro-Republican than 85% of past plans).[259]

In sum, the record overwhelmingly supports the Court's conclusion that Map C exhibits substantial pro-Republican bias.

Second, having concluded that Map C has pro-Republican bias, the next question under the *Adams* inquiry is whether it does so unduly, or "to a degree that is in excess of, or unwarranted by, the application of" Prop 4's neutral redistricting criteria to the state's natural political geography. 195 N.E.3d at 84-85. Dr. Chen's "extreme outlier" analysis confirms that that it is. *Rucho*, 588 U.S. at 737. His algorithm followed Prop 4's neutral criteria exactly, using Utah's political geography represented in its census population data, political boundaries, and natural features. And, most critically, it ignored partisan data. As Dr. Chen credibly opines, because Map C's "degree" of Republican advantage is "in excess of" nearly all of the 10,000 neutral simulations

[254] PX-3 at 26 (Chen Report); 10.23 Tr. at 25:25-28:3 (Chen).
[255] PX-3 at 27-29 (Chen Report); 10.23 Tr. at 28:10-30:15 (Chen).
[256] PX-1A at 7-9 (10.7 Warshaw Report).
[257] PX-1C at 11 n.15 (10.16 Warshaw Report).
[258] PX-1C at 11 (10.16 Warshaw Report).
[259] The Court notes that Map C passes the partisan bias test and mean-median tests under S.B. 1011. The Court gives these results low weight commensurate to their unreliability in a lopsided state like Utah. *See supra*, Findings, Section VIII. The Court further notes that measures of partisan symmetry are just one non-exclusive scientific method among others contemplated by Prop 4. *See* Utah Code § 20A-19-103(5).

drawn to follow Prop 4's criteria (99.94%), its bias cannot be explained by geography or application of those criteria.[260] *Adams*, 195 N.E.3d at 86. The contrast with Plaintiffs' Map 2 underscores the point. Map 2 retains 84.76% of Map C's population in the same district but improves compliance with Prop 4's neutral criteria, namely minimization of municipal and county divisions.[261] This improvement substantially reduces Map C's pro-Republican partisan bias, bringing it closer to that of the neutral ensemble. Thus, Map C's pro-Republican bias cannot plausibly be attributed to the neutral criteria or Utah's political geography and is undue.

The Court therefore concludes that Map C unduly favors Republicans and disfavors Democrats in violation of Utah Code § 20A-19-103(4) and cannot be approved as a lawful remedy.

2. Map C purposefully favors the Republican Party and disfavors the Democratic Party.

In addition to prohibiting redistricting maps that have the *effect* of unduly favoring or disfavoring political parties, Prop 4 also prohibits maps that *purposefully* favor or disfavor political parties. The Court concludes that Map C was purposefully configured to favor the Republican party and disfavors the Democratic Party in violation of Prop 4. Map C likewise fails the RMD test for partisan intent provided by S.B. 1011.

To determine whether a map purposefully favors or disfavors a party, the analysis "must be on both direct and circumstantial evidence of intent." *League of Women Voters of Fla. v. Detzner*, 172 So. 3d 363, 375-76 (Fla. 2015); *see also Harkenrider v. Hochul*, 197 N.E.3d 437, 452 (N.Y. 2022) (unlawful partisan intent "could be demonstrated directly or circumstantially through proof of a partisan process excluding participation by the minority party and evidence of discriminatory results").

As the Florida Supreme Court explained in construing the Florida Constitution's similar prohibition on maps that purposefully favor or disfavor political parties, "there is no acceptable level of improper intent." *Detzner*, 172 So. 3d at 375. "[T]he focus of the analysis must be on both direct and circumstantial evidence of intent. One piece of evidence in isolation may not indicate intent, but a review of all the evidence together may lead this Court to the conclusion that the plan was drawn for a prohibited purpose." *Id.* at 375-76 (cleaned up). A finding of an unlawful partisan purpose "does not necessarily mean that those who made the decisions acted with malevolent or evil purpose, which is not required" to find a violation. *Id.* at 378 (cleaned up). Unlike in other contexts where legislative intent is assessed by reviewing statutory text and context, where questions of unlawful intent are at issue, "the actions and statements of legislators and staff, especially those directly involved in the map drawing process" may also be considered. *Id.* at 388 (cleaned up).

A finding of unlawful purpose "implies more than intent as volition or intent as awareness of consequences" in that it requires an action be taken "at least in part 'because of,' not merely 'in spite of,' its adverse effects upon an identifiable group." *Personnel Adm'r of Mass. v. Feeney*, 442 U.S. 256, 279 (1979). But that "is not to say that the inevitability or foreseeability of consequences of a neutral rule has no bearing upon the existence of discriminatory intent." *Id.* at 279 n.25.

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[260] PX-3 at 90-103 (Chen Report); 10.23 Tr. at 88:23-89:6 (Chen) ("[W]hen you apply Utah's natural political geography, combined with strict adherence to the Prop 4 redistricting criteria, [you] end up with, as I found in over 99 percent of my simulated plans, a three-one plan").

[261] PX-2 at 10-11 (Oskooii Report).

"Certainly, when the adverse consequences of a law upon an identifiable group are . . . inevitable . . . a strong inference that the adverse effects were desired can reasonably be drawn." *Id.* Likewise, direct evidence of intent is not needed for a court to find unlawful purpose. As the New York Court of Appeals explained in addressing New York's prohibition on intentional partisan gerrymandering, unlawful partisan intent "could be demonstrated directly or circumstantially through proof of a partisan process excluding participation by the minority party and evidence of discriminatory results (*i.e.*, lines that impactfully and unduly favor or disfavor a political party . . .)." *Harkenrider*, 197 N.E.3d at 452.

In redistricting cases, comparison of a challenged map to computer-simulated redistricting plans provides probative evidence of unlawful partisan intent. *See, e.g.*, *League of Women Voters of Ohio v. Ohio Redistricting Comm'n*, 192 N.E.3d 379, 412 (Ohio 2022) ("The fact that the adopted plan is an outlier among 5,000 simulated plans is strong evidence that the plan's result was by design."); *City of Greensboro v. Guilford Cnty. Bd. of Elections*, 251 F. Supp. 3d 935, 943 (M.D.N.C. 2017) ("[C]redible evidence based on computer simulations by Dr. Jowei Chen establishes that it is highly unlikely for a Greensboro redistricting process to result in four Republican-leaning districts absent an intentional effort to draw lines giving Republicans an advantage."); *Allen v. Milligan*, 599 U.S. 1, 44 (2023) (Kavanaugh, J., concurring) ("[C]omputer simulations might help detect the presence or absence of *intentional* discrimination." (emphasis in original)).

Even a single alternative map (whether computer simulated or not) can provide strong evidence to defeat a defendants' proffered justification for a challenged map. The U.S. Supreme Court has held that plaintiffs can meet their burden to prove unlawful intent in redistricting by proffering an alternative map that satisfies the purported objective of the challenged map without the challenged map's discriminatory effects. In *Cooper v. Harris*, the Supreme Court characterized an alternative map of this sort as "key evidence" and a "highly persuasive" way to disprove a purported justification for a map. 581 U.S. 285, 317-18 (2017) (emphasis in original). In *Cooper*, the claim was racial gerrymandering, and the state defended itself by contending that it was in fact motivated by partisan concerns. But as the *Cooper* Court noted, this is a familiar evidentiary tool not limited to one set of claims or justifications. And the U.S. Supreme Court recently punctuated the value of alternative map evidence, noting that it alone can "carry the day" for plaintiffs and, if produced, will "undermine[] the [government's] defense that the districting lines were 'based on a permissible, rather than a prohibited, ground.'" *Alexander v. S.C. State Conf. of the NAACP*, 602 U.S. 1, 35-36 (2024).

Here, Map C exhibits unlawful partisan purpose for at least four reasons.

First, as Dr. Chen's analysis shows, the map is an extreme outlier compared to 10,000 computer-simulated maps drawn using Prop 4's neutral criteria. Of those 10,000 maps, over 99.94% resulted in three Republican districts and one Democratic district. Otherwise stated, the odds that the partisan skew in Map C was created using only neutral criteria is extremely unlikely, less than 1 in 1,000. Furthermore, as Dr. Chen reports, Map C has an unusually low standard deviation among the districts—meaning they are all more evenly Republican and Democratic than would be expected from a map drawn solely to follow neutral criteria and the state's political geography. This unnatural result indicates excessive cracking of Democratic voters concentrated in Salt Lake County and is unlikely to occur unintentionally. As Dr. Chen opines, given the computer-simulated mapping results, Map C's partisan skew in favor of Republicans is not the

product of adherence to Prop 4's neutral redistricting criteria or Utah's political geography. *See supra*, Findings, Section VIII.

Second, Map C fails S.B. 1011's RMD test, which the Court need not consider due to S.B. 1011's likely unconstitutionality but will nevertheless consider as additional probative evidence. Under S.B. 1011, the RMD (ranked marginal deviation) is a measure of how similar a map's district vote shares are to the average ensemble map's district vote shares. A proposed map fails the RMD test if it exceeds that of 95% of an ensemble consisting of at least 4,000 maps drawn to comply with the state's "legal and geometric criteria." Utah Code § 20A-19-103(1)(a), (f). The RMD test "indicates whether a proposed redistricting plan shows a partisan intent." *Id.* § 20A-19-103(1)(a)(ii). As the Court notes above, Map C decisively fails the RMD test, registering an RMD greater than 99.99% of Dr. Chen's ensembles. Map C is an extreme statistical outlier not only under Dr. Chen's ensembles, but also Dr. Trende's ensembles when subsetted for simulated maps that "plausibly comply" with Prop 4's neutral criteria. *See supra*, Findings, Section VIII.

Third, Map C's far-and-away outlier status is sufficient to conclude that it was drawn to favor Republicans, *see, e.g.*, *City of Greensboro*, 251 F. Supp. 3d at 943 (finding intent based upon outlier analysis compared to computer-simulated maps), but other facts surrounding its creation, assessment, and adoption confirm its partisan intent, *see Detzner*, 172 So. 3d at 388. As the Court discusses in detail above, *see supra*, Conclusions, Section II.A, Dr. Trende drew Map C starting from the 2021 map on a tool that displays partisan data, including for each precinct considered—which Dr. Trende declined to hide or turn off. Map C was also presented to the Legislature alongside at least one other map drawn by Dr. Trende that split Salt Lake County along an east-west axis, which would avoid cracking Democratic voters concentrated in the north of the County. But Map C was made public and voted on, while that other map was not. *See supra*, Findings, Section VII.A.

Fourth, the Legislature relied on Dr. Trende's analysis of Map C for assurance that it was not drawn with partisan intent. But, as Dr. Chen credibly explains, Dr. Trende's ensemble analysis, which he used to assess Map C's partisan intent, was "deeply flawed" and was itself infected with partisan bias from start to finish.[262] Every simulated plan Dr. Trende generated to assess whether Map C is a partisan outlier failed to comply with Prop 4's neutral redistricting criteria. This alone made it impossible to conclude that Map C's partisan outcome could have resulted from following those criteria and not partisan motivations. Further, these violations of neutral criteria—which Dr. Trende built into his map-drawing algorithm—caused maps in his ensemble to skew significantly pro-Republican. *See supra*, Findings, Section V. Dr. Trende's algorithm from its inception thus "caused him to conduct his partisan analysis using simulated plans that exhibit unnatural pro-Republican bias."[263] Rather than correct this error, Dr. Trende compounded it by then "culling" his ensembles to remove from consideration all simulations he identified as failing the partisan bias test. The effect was to disqualify an extraordinary number of maps from his ensembles, and consistent with the understood pro-Republican effect of applying partisan bias in a state like Utah, the maps removed from Dr. Trende's ensembles were largely those that included one Democratic-leaning district. *See supra*, Findings, Section VI.B. It was the culled set of mostly pro-Republican

[262] PX-3 at 4 (Chen Report).
[263] PX-3 at 41 (Chen Report).

4-0 maps that Dr. Trende used as his baseline to assure the Legislature that no partisan intent was involved in Map C.[264] *See supra*, Findings, Section VII.B.

The Legislature, for its part, endorsed Dr. Trende's biased analysis by *requiring* its use in S.B. 1011 for evaluating undue partisan favoritism to the exclusion of other more appropriate metrics. *See Personnel Adm'r of Mass. v. Feeney*, 442 U.S. 256, 279 n.25 (1979) ("Certainly, when the adverse consequences of a law upon an identifiable group are . . . inevitable . . . a strong inference that the adverse effects were desired can reasonably be drawn."). When put in the context of the Legislature's recent efforts to preclude non-Republican representation in the state's congressional delegation,[265] these facts indicate strong circumstantial evidence of partisan intent.

The Court concludes that Map C purposefully favors the Republican Party and disfavors the Democratic Party.

C. Map C violates Prop 4's requirement to minimize the division of municipalities and counties across multiple districts.

The Court finds that Map C fails to minimize the division of municipalities and counties as Prop 4 requires. Maps in Utah "shall abide by" the redistricting standards in Prop 4 "to the greatest extent practicable" and in the priority order delineated in the statute. Utah Code § 20A-19-103(3). Preceded only by adherence to the federal constitution (including population equality), Prop 4's second priority-ordered requirement is that maps must be drawn to "minimiz[e] the division of municipalities and counties across multiple districts, giving first priority to minimizing the division of municipalities and second priority to minimizing the division of counties." *Id.* at § 20A-19-103(3)(b).

To "minimize" means to "reduce or keep to a minimum," and "reduce" in turn means "to diminish in size, amount, extent, or number." *Minimize, Reduce*, Merriam-Webster. Furthermore, "multiple" means "consisting of, including, or involving more than one." *Multiple*, Merriam-Webster. Prop 4's plain language thus requires that maps be drawn to reduce both the extent and number of municipalities and counties divided across more than one district. In other words, the requirement necessitates minimizing both the extent that any one municipality or county is divided and the total number of municipalities and counties that are divided. *Cf. Hall v. Moreno*, 2012 CO 14, ¶ 47, 270 P.3d 961, 971 (discussing practical benefits to reducing division of communities of interest "across multiple districts").

This requirement to minimize division of municipalities and counties, and in that order, is mandatory. It is preceded by the imperative "shall," and its plain language prescribes first minimizing the division of municipalities, and second that of counties. *See Pugh v. Draper City*, 2005 UT 12, ¶ 13, 114 P.3d 546, 549; *see also LWVUT I*, 2024 UT 21, ¶ 87 (discussing Prop 4's "mandatory neutral redistricting criteria"). While Prop 4 specifies that its requirements be met "to the greatest extent practicable," Utah Code § 20A-19-103(3), that phrase provides flexibility in the manner in which maps may comply with the requirements but does not excuse non-compliance.

To give meaning to the phrase "to the greatest extent practicable," the Court looks to analogous language interpretated by other courts. The Georgia Supreme Court analyzed the phrase "to the greatest extent practicable," finding that for something to be "practicable" means that it

[264] PX-12 (Trende Map Analyses).
[265] PX-1C at 2-7 (10.16 Warshaw Report) (recounting historical context of congressional redistricting in Utah).

reasonably can be done. *See City of Marietta v. Summerour*, 807 S.E.2d 324, 334 (Ga. 2017). In *City of Marietta*, a Georgia statute provided a list of policies and practices that the city must follow "to the greatest extent practicable" when exercising its eminent domain power. *Id.* The city argued that "to the greatest extent practicable" indicated that the policies were "effectively nothing more than suggestions" from which it could depart "whenever it conclude[d] that another course would be better." *Id.* at 330. The court rejected this reading, holding that something is practicable if it is "capable of being accomplished," "feasible in a particular situation," or "able to be effected, accomplished, or done." *Id.* at 334 (citing dictionaries). As the *City of Marietta* court explained, "'to the greatest extent practicable' is not to say that [one] must comply with it only 'if [one] feels like complying' or 'if [one] thinks it a good idea." *Id.* at 330 (citing *Brown v. Bd. of Ed.*, 349 U.S. 294, 300 (1955)). Rather, the phrase communicates some degree of flexibility in complying with mandatory requirements. *Id.* at 331. The Georgia Supreme Court's reading accords with other courts' interpretations of the same and similar phrases. *See, e.g.*, *City of Columbia v. Costle*, 710 F.2d 1009, 1013 (4th Cir. 1983) (concluding that "to the greatest extent practicable" requires compliance "to the fullest extent . . . capable"); *see also Maryland Dep't of Env't v. Anacostia Riverkeeper*, 134 A.3d 892, 917-18 (Md. Ct. App. 2016) ("maximum extent practicable" required regulated party to continue until "all reasonable opportunities" were "exhausted").

Applying these principles to redistricting in Utah, Prop 4 requires that, to the fullest extent feasible, a map should reduce the total number of municipalities and counties that are divided and the extent that any one municipality or county is divided, first prioritizing municipalities and then counties.

Map C does not do this. Plaintiffs' maps—and the ease with which they were produced—demonstrates that reducing the number of municipal and county divisions in Map C is "capable of being accomplished," "feasible in a particular situation," and "able to be effected, accomplished, or done." Map C divides three municipalities into 11 pieces.[266] In Map C, North Salt Lake is split into two pieces across two districts, Millcreek is split into six pieces across two districts, and Pleasant Grove is split into three pieces across two districts. In Plaintiffs' Map 1, only Midvale is split, and into two pieces across two districts. In Plaintiffs' Map 2, only Pleasant Grove is split, and into two pieces across two districts.[267] Given that both of Plaintiffs' maps easily divide only one municipality one time—and that Map 2 does so while maintaining a high degree of fidelity to Map C—the Court finds that Map C fails to minimize the division of municipalities to the greatest extent practicable.

The Court also finds that Map C violates Prop 4's requirement to minimize county divisions. Though Map C divides the same number of counties as Maps 1 and 2 (three counties total), Map C includes an additional division of Utah County that could have been resolved with minimal, practicable adjustments.[268] As Dr. Chen explained, having more than three county divisions is never necessary in Utah to achieve population equality in the congressional map, and in the 10,000 equally populated and legally compliant maps in his ensemble, no map ever had more than three county splits.[269] This demonstrates that it is "practicable" to create a compliant

[266] PX-2 at 16 (Oskooii Report).
[267] PX-2 at 16 (Oskooii Report).
[268] PX-2 at 9-10 (Oskooii Report); 10.23 Tr. at 238:2-18 (Oskooii).
[269] PX-3 at 93, Figure 6.3 (Chen Report); 10.23 Tr. at 41:10-42:12 (Chen).

map with only three county divisions. Thus, Map C's division of Utah County across three districts, resulting in four county divisions total, makes Map C a significant outlier, and violates Prop 4.

III. The Court has the unwelcome obligation to order the use of a lawful congressional map.

As the Court previously noted, "[u]pon issuance of a permanent injunction under [Utah Code Ann. § 20A-19-301(2)], the Legislature may enact a new or alternative redistricting plan that abides by and conforms to the redistricting standards, procedures, and requirements of" Prop 4. Utah Code § 20A-19-301(8). For the reasons explained above, the Legislature has failed to do so. For that reason, Defendants are permanently **ENJOINED** from implementation or use of S.B. 1012 (Map C).

The Lieutenant Governor has advised the Court that a map must be in place by November 10, 2025, to avoid interfering with the 2026 election calendar. That date is now upon us, and the Legislature has failed to discharge its obligation under Article IX of the Utah Constitution and Prop 4 to enact a lawful congressional map. The Court is thus "left with the unwelcome obligation" of ensuring that a lawful congressional map is in effect for Utah's elections. *Connor v. Finch*, 431 U.S. 407, 415 (1977).

Legislative Defendants have questioned whether the Court has the authority to impose a map in the absence of one lawfully enacted by the Legislature, noting that Prop 4 envisions the Legislature having the option of enacting a map in the event its chosen map is enjoined. But that provision does not foreclose a court-imposed map to ensure the state's elections can proceed under a lawful map in the absence of a compliant map enacted by the Legislature.

First, Prop 4 provides that redistricting may occur upon the issuance of a permanent injunction or to conform with the final decision of a court. Utah Code § 20A-19-102(3) & (4). It does so without limiting that function to the Legislature.

Second, the Court is not remedying only a violation of Prop 4 at this point. With both Map C and the 2021 map now enjoined, the 2011 map is necessarily revived as the legally operative map and, without further action by the Court, would by operation of law govern the forthcoming 2026 election. *See Bd. of Educ. of Ogden City v. Hunter*, 159 P. 1019, 1024 (Utah 2016); *State ex rel. Shields v. Barker*, 167 P. 262, 265 (Utah 1917); *In re J.P.*, 648 P.2d 1364, 1378 n.14 (Utah 1982); *Egbert v. Nissan Motor Co., Ltd.*, 2010 UT 8, ¶ 12, 228 P.3d 737; *LWVUT I*, 2024 UT 21, ¶ 222. Legislative Defendants' contention that the 2011 map is not revived by an injunction against H.B. 2004, which repealed the 2011 map in 2021, is foreclosed by precedent and is also beside the point—if not the 2011 map, then there is currently *no* congressional map.

But it is undisputed that the 2011 map is unconstitutionally malapportioned under both the federal and Utah constitutions. It is likewise indisputable that the *absence* of a lawful congressional map is likewise unsustainable. *See* 2 U.S.C. § 2c (requiring states to create single-member congressional districts). Even if Legislative Defendants were correct that Prop 4 does not authorize a court-imposed map (they are not), no one disputes that state courts are empowered—and in fact have the "unwelcome obligation"—to remedy an unconstitutionally malapportioned map, or the absence of such a map. The U.S. Supreme Court and federal and state courts across the country have recognized as much for decades. *See Scott v. Germano*, 381 U.S. 407, 409 (1965) ("The power of the judiciary of a State to require valid reapportionment or to formulate a valid

redistricting plan has not only been recognized by this Court but appropriate action by the States in such cases has been specifically encouraged."); *Growe v. Emison*, 507 U.S. 25 (1993) (same); *see also Wattson v. Simon*, 970 N.W.2d 56 (Minn. 2022); *Johnson v. Wis. Elections Comm'n*, 967 N.W.2d 469 (Wis. 2021); *Alexander v. Taylor*, 51 P.3d 1204, 1208 (Okla. 2002); *Clarke v. Wis. Elections Comm'n*, 998 N.W.2d 370, 396 (Wis. 2023); *Norelli v. Sec. of State*, 292 A.3d 458, 462-64 (N.H. 2022). The Legislature was given an opportunity to adopt a compliant map, but having failed to do so, the Court must now step in. *See Maryland Comm. for Fair Representation v. Tawes*, 377 U.S. 656, 676 (1964) (finding that Maryland's state legislative maps violated the U.S. Constitution and allowing the Legislature the opportunity to redraw the maps, but noting that the Court should take action if the legislature fails to enact a legally valid map, and that "under no circumstances should the [upcoming] election . . . be permitted to be conducted pursuant to the existing or any other unconstitutional plan").

In addition to the decades of consistent U.S. Supreme Court precedent, federal court precedent, and other state courts' precedent, there is the Utah Constitution, which expressly provides that every person "shall have remedy by due course of law" for "an injury done to the person." Utah Const. art. I, § 11. As the Oklahoma Supreme Court held with respect to its constitution's similar provision, it provides the textual constitutional authority for a state court to order a lawful redistricting map into place in the absence of lawful legislative action doing so. *See Alexander*, 51 P.3d at 1208-10. So too does it here.

The Court does not welcome this task, but the Legislature's failure to comply with Prop 4's requirements, and thus to lawfully discharge its obligation under Article IX of the Utah Constitution, leaves the Court no choice but to exercise its obligation to ensure that Utahns cast ballots under a congressional map that is equally apportioned under both federal and state constitutional requirements and that otherwise complies with Utah's law on redistricting, in particular Prop 4.

IV. The Court orders implementation of Plaintiffs' Map [1 or 2].

[Option 1: Plaintiffs' Map 1]

The Court orders implementation of Plaintiffs' Map 1. As explained in the Court's Findings of Fact, Plaintiffs' Map 1 abides by Prop 4's neutral redistricting criteria to the greatest extent practicable. Among other features, it is equally populated, divides only 1 municipality into just 2 pieces, has the fewest necessary county divisions (3), and has geographically compact districts. It complies with the other neutral criteria as well.

As likewise explained in the Court's Findings of Fact, Plaintiffs' Map 1 has neither the purpose nor effect of unduly favoring or disfavoring a political party. It was configured by a reliable computer algorithm programmed to closely adhere to Prop 4's neutral redistricting criteria without any partisan data. It falls comfortably in the distribution of expected partisan outcomes under that ensemble of Prop 4 compliant maps. Likewise, under relevant metrics like the efficiency gap, as well as LRVS, SDVS, and RMD test (using Dr. Chen's ensemble), it fares well, showing no sign of partisan favoritism. It does not guarantee one-party control of the congressional delegation, but rather accords with Utah's political geography and electoral conditions.

The Court **ORDERS** its implementation for Utah's congressional elections.

[Option 2: Plaintiffs' Map 2]

The Court orders implementation of Plaintiffs' Map 2. As explained in the Court's Findings of Fact, Plaintiffs' Map 2 abides by Prop 4's neutral redistricting criteria to the greatest extent practicable. Among other features, it is equally populated, divides only 1 municipality into just 2 pieces, has the fewest necessary county divisions (3), and has geographically compact districts. It complies with the other neutral criteria as well.

Plaintiffs' Map 2 was offered as a "least change" version of the Legislature's Map C with the goal to remedy violations of Prop 4 identified by Plaintiffs. It retains 84.76% of Utah voters in the same districts to which Map C assigned them. In this respect, Plaintiffs' Map 2 respects to a great degree the policy choices of the Legislature. The Court pauses to note that it has found serious deficiencies in the process by which Map C was adopted—including in particular the consideration of political data in its adoption in violation of Prop 4—and in its purpose and effect of favoring the Republican Party. Nevertheless, the Court finds that Plaintiffs' process in modifying Map C to become Plaintiffs' Map 2 sufficiently resolves these concerns. Plaintiffs' expert Dr. Oskooii credibly and reliably testified that he adjusted Map C using a redistricting program that included no partisan or political data, and he referenced no such information. The map's reconfiguration of districts in Salt Lake County in particular resolved excess municipal and county divisions.

Plaintiffs' Map 2 does not purposefully or unduly favor or disfavor any political party. The changes made in it to Map C ameliorate the Court's concerns regarding Map C's configuration, and Plaintiffs' Map 2 performs well on the relevant metrics like the LRVS, SDVS, and the efficiency gap, showing no sign of partisan favoritism. While Plaintiffs' Map 2 falls short of passage of the RMD test using Dr. Chen's ensemble, the Court has enjoined implementation of S.B. 1011, and that test is no longer controlling. The Court nevertheless has considered Plaintiffs' Map 2's performance on the RMD test, and concludes that it sufficiently improves upon Map C's extreme failure on that metric and is far less an outlier in terms of its pro-Republican favoritism than Map C. It does not guarantee one-party control of the congressional delegation, but rather accords with Utah's political geography and electoral conditions.

Plaintiffs' Map 2 corrects the major deficiencies of the Legislature's Map C while also adhering to its policy choices in configuring Map C—including two districts with near complete overlap with Map C's districts. The Court **ORDERS** its implementation for Utah's congressional elections.

[PROPOSED] CONCLUSION AND ORDER

For the foregoing reasons, the Court orders as follows:

1. The Court preliminarily **ENJOINS** implementation of S.B. 1011;

2. The Court declares that S.B. 1012, Map C, fails to abide by and conform with the requirements of Prop 4 and thus the Court permanently **ENJOINS** its use or implementation by Defendants;

3. The Court declares that the 2011 congressional map, revived by operation of law upon the injunctions against the 2021 map and 2025 Map C, is unconstitutionally malapportioned in violation of the Utah Constitution, and accordingly **GRANTS** Plaintiffs' motion for summary

judgment on Count VIII, and permanently **ENJOINS** the 2011 congressional map's use or implementation by Defendants;

4. The Court **ORDERS** Defendants to implement Plaintiffs' Map **[1/2]** to conduct Utah's congressional elections.

RESPECTFULLY SUBMITTED this 5th day of November 2025.

/s/ David C. Reymann

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