

EXHIBIT A

**IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF TENNESSEE**

AMBER SHERMAN, RACHAEL SPRIGGS,
KERMIT MOORE, BLACK CLERGY
COLLABORATIVE OF MEMPHIS, MEMPHIS
A. PHILIP RANDOLPH INSTITUTE, EQUITY
ALLIANCE,

Plaintiffs,

v.

26-cv-616

TRE HARGETT, in his official capacity as
Secretary of State of Tennessee, MARK GOINS,
in his official capacity as Coordinator of Elections
for Tennessee, STATE ELECTION
COMMISSION, and DONNA BARRETT, JUDY
BLACKBURN, JIMMY ELDRIDGE, MIKE
MCDONALD, SECONDRA MEADOWS,
VANECIA BELSER KIMBROW, and KENT
YOUNCE, in their official capacities as members
of the State Election Commission,

Defendants.

REPLY EXPERT REPORT OF DR. JONATHAN R. CERVAS

1. I submitted an expert report in this case on May 12, 2026 (“Cervas Report”) and an addendum and correction to that report on May 18, 2026 (“Cervas Addendum”).

2. In response to my initial submissions, the Defendants in this case submitted the Expert Report of Michael Barber, Ph.D (“Barber Report”). I have been asked to review and to respond to the Barber Report.

3. I am compensated at a rate of \$450 per hour. My compensation does not depend on the content of my opinions or the outcome of this matter.

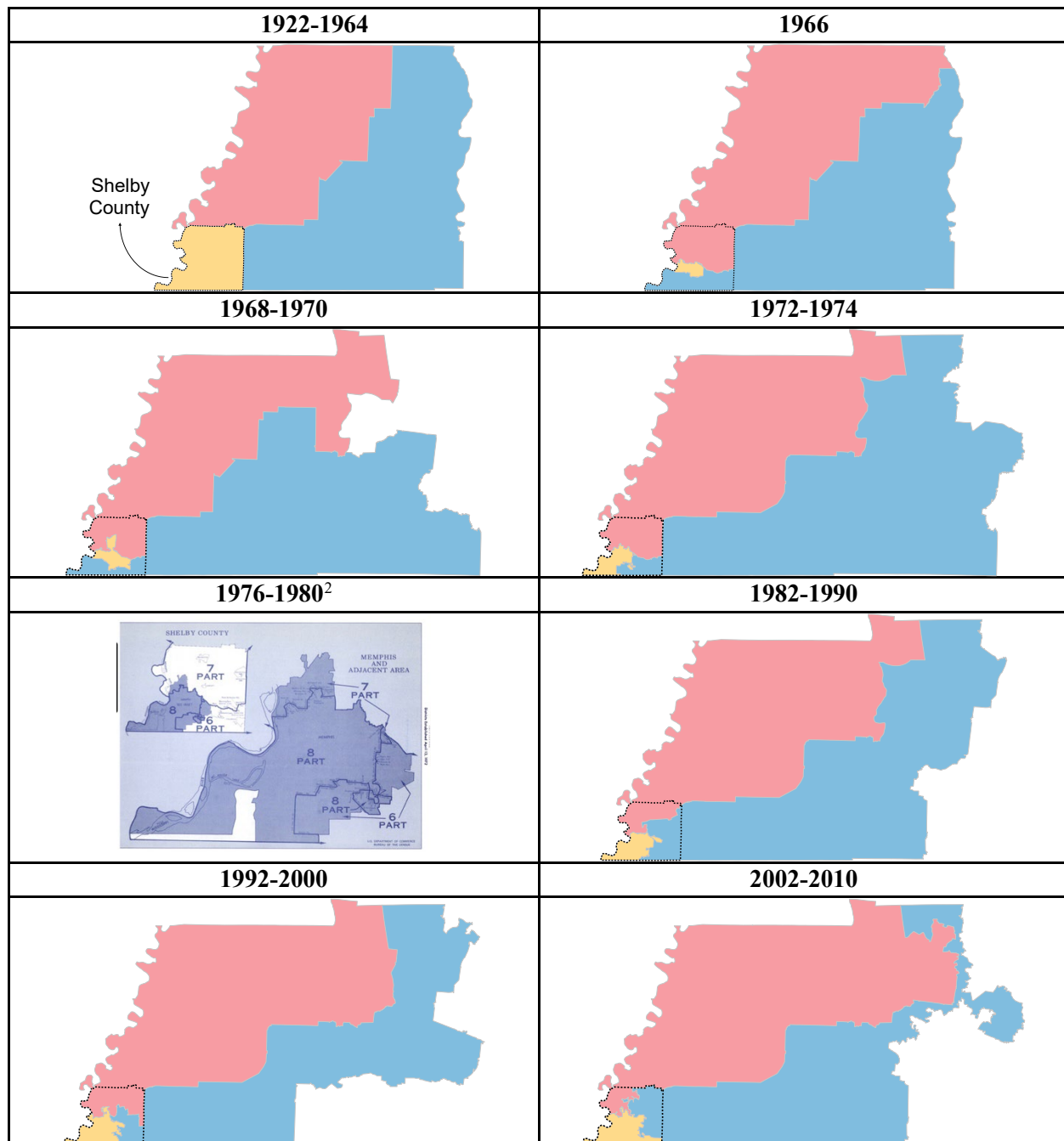
4. The Barber Report does not dispute my conclusion that it is essentially impossible to draw a congressional map for the State of Tennessee that adheres to traditional race-neutral principles and does not include at least one district in which Black voters have an opportunity to elect their candidate of choice. Cervas Addendum ¶ 11. Dr. Barber generated his own set of statewide race- and party-neutral simulations and his simulations support my conclusion.

5. The Cervas Report stated that no congressional redistricting plan had ever divided Shelby County into more than two districts. Cervas Report ¶¶ 4, 23. Dr. Barber contends this is incorrect. Barber Report 27-28. Having previously served as an expert witness in Tennessee state court redistricting litigation, my opinion here was based on the Tennessee courts' definition of a county split, that is, a county is split when a portion of that county is combined with territory from another county to form a district.¹ Under that definition, a district contained entirely within Shelby County does not constitute a split of Shelby County. **Figure 1** below shows each districting plan dating back to 1922 for every district wholly or partially within Shelby County. Viewed through this lens, throughout all of Tennessee's congressional redistricting history, until 2026, no more than two districts ever extended beyond Shelby County's boundaries. Whether one applies Dr. Barber's understanding of county splits or the definition used by the Tennessee

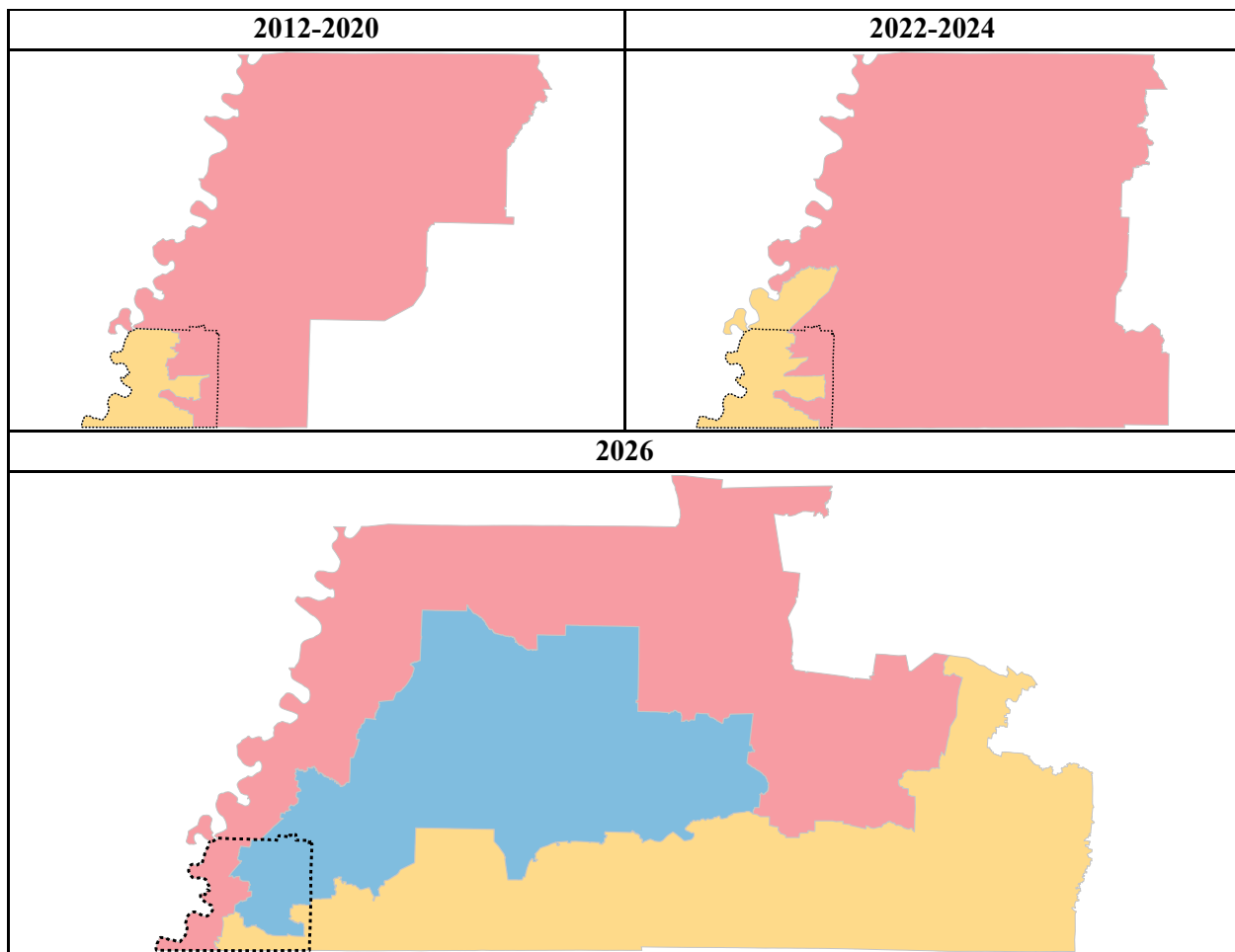
¹ *State ex rel. Lockert v. Crowell*, 656 S.W2d 836, 843 (Tenn. 1983) (stating "[t]he result is that on the record before us we find no justification for detaching any segment of Shelby County to achieve a more perfect compliance with one person, one vote requirements. However, we will not foreclose the possibility that detachment of a single part of Shelby County might be justified by either (1) the necessity to reduce a variance in an adjoining district or (2) to prevent the dilution of minority voting strength.")

courts, the 2026 Plan is the first to divide Shelby County among three districts that each also include territory outside the county, a configuration with no historical precedent.

Figure 1: Three Shelby County Area districts Shown with Shelby County Boundaries



² The digital shapefile is incomplete for this congress. This image was provided to me by Kenneth Martis through personal communication.



6. Dr. Barber incorrectly states that the 2012–2020 and 2022–2024 congressional plans are the first ever to “not include a district entirely within Shelby County.” Barber Report 27. The 2012-2020 Plan includes one district wholly within Shelby County and one that extends out into western Tennessee. The 2022-2024 plan largely resembles this plan, with a portion of Tipton County added. District 9 in the 2022 Plan is still centered on Shelby County, which is home to 96% of the district population.

7. Population growth in the state between 2010 and 2020 necessitated adding population to the Memphis area district. Shelby County grew by just 2,100 persons.³ Most of the growth occurred in middle Tennessee.⁴ Therefore districts had to move in that physical direction, including adding parts to District 9. District 9 in the 2012 Plan had a population of 705,139. District 9 in the 2022 Plan had a population of 767,871. This is a difference of 62,732. The Tipton County part of District 9 is 30,594 people, accounting for nearly half of the population increase between decades. Most importantly, none of the previous plans, including the 2012 and 2022 Plan, gratuitously divided the Black community in Shelby County in the manner 2026 Plan does.

8. Dr. Barber appears to take support for his opinion that the 2026 Plan's three-way split of Shelby County is better explained by partisanship than race from a set of conditional simulations that holds fixed the precise lines of districts from the 2026 Plan outside of Shelby County (see **Figure 2**) and then instructs the algorithm to draw 100,000 maps to see if the sims reach the same outcome of the state. Barber Report 20-22. But Barber's conditional simulation is methodologically circular. The non-Shelby portions of enacted Districts 5, 8, and 9 guarantee that the Black voters in Shelby County will be cracked. A legislature can claim to be race blind in this way while creating objectives that allow them to engage in race sorting. The conditional simulation doesn't show that race is irrelevant; it is precisely what racial proxy gerrymandering looks like.

³ See "County Growth Table", indexed on the Tennessee House Redistricting Committee website, <https://capitol.tn.gov/house/archives/112ga/committees/Redistricting.aspx>.

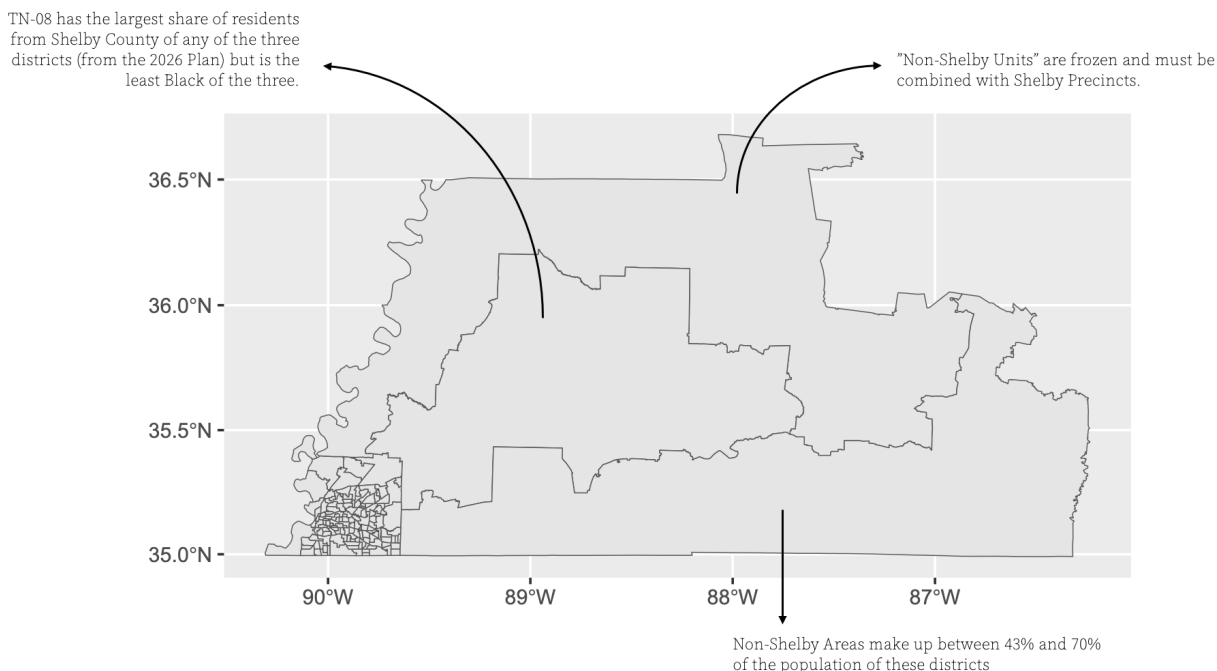
⁴ The state grew by more than 500,000 residents. See "Select Committee Presentation September 2021", indexed on the Tennessee House Redistricting Committee website, <https://capitol.tn.gov/house/archives/112ga/committees/Redistricting.aspx>.

9. There are several technical problems with Dr. Barber's conditional simulation. After running the redistricting simulation software, a warning appears: "Watch out for low effective samples, very low acceptance rates (less than 1%), large std. devs. of the log weights (more than 3 or so), and low numbers of unique plans. R-hat values for summary statistics should be between 1 and 1.05."⁵ The acceptance rate of the second split (that creates the third of three districts) is 0.1%. Dr. Barber's exercise here also suffers from a massive volume of redundant maps. Dr. Barber claims that he "increase[s] the number of maps from 10,000 to 100,000 to allow for more variation and exploration of possible alternatives" (Barber Report 21, fn.5), but given the partisanship naturally baked into his exercise and the constraint of drawing districts with equal population, the total number of truly unique maps is tiny and each will necessarily hew closely to the demographics of the 2026 Plan. Fifty-one percent of all districts are *identical* and many of the additional simulations will feature districts with just minor variations.⁶ There are only 146 precincts in Shelby County, so there are only so many ways to construct three contiguous districts connected to large units outside the county. The simulations are reverse-engineered to achieve Dr. Barber's desired outcome and the unnecessarily large numbers of iterations creates a false appearance of statistical rigor.

⁵ Redist 4.3.2., *Diagnostic information on sampled plans* (last visited June 1, 2026), https://alarm-redist.org/redist/reference/summary.redist_plans.html.

⁶ I calculated this by analyzing the number of districts that have the same total population (which range from 762,748 to 770,412), Black voting-age population composition, and various partisan outcomes across several years. It would be extraordinarily unlikely for a district to have identical numbers on all these different data unless they were exactly the same districts.

Figure 2: Dr. Barber's Conditional Simulation



Note: Dr. Barber's conditional simulation sets the non-Shelby portions of TN-05, TN-08, and TN-09 as they exist in the 2026 Plan. It then redistributes the Shelby County precincts. But this essentially guarantees outcomes similar to the 2026 Plan because there are only so many ways to add exactly the correct number of additional residents for each of the three districts while creating contiguous districts.

10. But Dr. Barber's conditional simulations are illuminating in one respect: They highlight that racial sorting in the 2026 Plan happens both within and outside Shelby County. The three districts that intersect in Shelby County collectively have a large Black population. Among these districts' population of 2.3 million are nearly 700,000 Black residents (just shy of the population of an entire district). And while most of these residents are in Shelby County, almost 200,000 live outside Shelby County. These Black residents are also sorted among the three districts, but not evenly. District 8, which has the most population outside of Shelby County of the three districts, has the highest rate of Black residents in its non-Shelby section. But, TN-08 has the lowest share of Black residents among the three districts when the Shelby County segment is included. Had the legislature united the Black residents outside of Shelby

County, either with each other, or collectively with those in Shelby County, they would have been able to achieve political power. But instead they find themselves sorted among the three districts.

11. I examined each of the districts in Dr. Barber's conditional simulation that includes the same non-Shelby portion of TN-08 as the enacted 2026 Plan. Recall that the enacted 2026 Plan has a Black Voting Age Population ("BVAP") of 26.6%. By contrast, among Dr. Barber's 100,000 simulated districts containing that identical non-Shelby population, the BVAP ranges from 25.1% to 47.4%, with an average of 36.4%. Only 75 out of 100,000 simulated districts have a BVAP as low as the enacted district. In other words, the enacted district falls at approximately the 0.075th percentile of the simulated distribution, making it an extreme statistical outlier rather than a typical or random outcome.

12. Dr. Barber contends that "[the] parallel treatment [of Davidson and Shelby Counties] is consistent with a partisan explanation for the plan's structure." Barber Report 25. But all this parallel treatment does is demonstrate that partisan gerrymandering and racial gerrymandering take similar forms – cracking concentrated communities to disperse their electoral effectiveness.

13. Moreover, Dr. Barber's observation raises an important distinction between the Tennessee Legislature's treatment of Shelby County and Davidson County. The Tennessee Legislature engaged in the partisan gerrymandering of Davidson County in the 2022 Plan, but did not do the same to Shelby County.

14. As I show in my opening report and which Dr. Barber's work confirms, at least one district in which Black voters have an opportunity to elect candidates of choice would be virtually ensured in any race or party-neutral districting scheme. His argument essentially is:

because a partisan explanation is consistent with the data, racial motivation is not established. But this confuses sufficiency with exclusivity. A mapmaker can use partisanship as a proxy for race and still be found to have engaged in racial sorting. The context in which the 2026 Plan was enacted provides indicia that race played at least some role here.

15. Tennessee statutes governing congressional redistricting criteria do not appear to have a provision prohibiting partisan gerrymandering, and the criteria for congressional redistricting has not changed between the adoption of the 2022 Plan and the 2026 Plan. Contemporaneous reporting about the redistricting process in 2021-2022 suggested,⁷ and Dr. Barber confirms, that the 2022 Plan engaged in partisan gerrymandering by dividing Davidson County to eliminate a Democratic leaning district.⁸ Importantly though, the 2022 Plan did not engage in the same partisan tactics in the Shelby County area, where the Black population is naturally numerous and compact enough to form a majority in a single Congressional district.

16. There is no new Census data that the legislature relied upon when drawing the 2026 Plan. The Tennessee legislature appears to have drawn the 2026 plan using the same 2020 Census data that they used to draw the 2022 plan.

17. Nor was there any meaningful change in the partisan composition of the State of Tennessee. The correlation between partisanship at the precinct level in the 2020 and 2024 Presidential elections is 0.992.

⁷ For example, see Andrew Witherspoon and Sam Levine, “A masterclass in election-rigging: how Republicans ‘dismembered’ a Democratic stronghold”, The Guardian. January 26, 2022. <https://www.theguardian.com/us-news/ng-interactive/2022/jan/25/nashville-tennessee-gerrymandering-congress-republicans>.

⁸ See Barber Report at 4. The 2022 Plan and the 2026 Plan both have three partial districts in Davidson County that Dr. Barber describes as “a partisan strategy aimed at dividing Democratic voters where they are most geographically concentrated.”

18. Changes in the racial demographics of Shelby County indicate that both the white and Black populations are declining. However, the Black population has a larger baseline population than the white population and is declining at a slower rate, resulting in a smaller numerical decrease than that of the white population. As a result, the Black-to-white population ratio was smaller when the 2022 Plan was enacted than when the 2026 Plan was enacted.⁹

19. The only changed circumstance that appears to have precipitated the fragmentation of southwest Tennessee's Black population into three districts occurred just over a week before the 2026 Plan was adopted when the US Supreme Court updated its framework for challenging racial vote dilution under the federal Voting Rights Act. (*Callais v. Louisiana*, April 26, 2026).

20. I have experience drawing maps in various contexts, including as a consultant to courts and states, and for being responsible for providing courts remedies for violations of the 14th Amendment. The 2026 Plan is a racial outlier insofar as the Black population of the most heavily Black district is so far below any neutrally drawn redistricting plan. This is particularly evident in the way Dr. Barber's conditional simulations reveal the gratuitous separation of Black voters in Shelby County from Black voters in the region immediately outside Shelby County. The 2026 Plan's treatment of Shelby County disregards the traditional good government principles of drawing compact districts and avoiding unnecessary county splits in favor of dismantling a naturally occurring Black opportunity district.¹⁰ To do so, the 2026 Plan deviates

⁹ CVAP data from 2020 and 2024, taken from Dave's Redistricting App. The Black population in Shelby County has declined by 9,899 (-2.7%), while the white population has retracted by 22,912 (-8.5%).

¹⁰ The 2026 Plan increases the deviation from these traditional good government principles as compared to the 2022 Plan. The 2026 Plan reduces the average compactness of the three southwestern Tennessee districts on two widely used measures of compactness: Reock (-0.22) and Polsby-Popper (-0.08). And according to Dave's Redistricting App, the 2022 Plan split 10

from literal centuries of historical practice in Tennessee redistricting. And the way the 2026 Plan fragments one of the largest and most compact Black populations in the United States into ill-compact districts is consistent with my experience reviewing other maps for racial gerrymandering. Individually, each of these redistricting anomalies in the 2026 Plan would raise concerns for me about whether racial discrimination infected the mapmaking. Taken together, I find it hard to avoid the conclusion that racial discrimination did infect the map.

* * *

I reserve the right to modify, update, or supplement my opinions in light of additional facts, testimony and/or materials that may become available.

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

Executed on June 2, 2026
Morgantown, West Virginia



Dr. Jonathan Cervas

counties a total of 11 times. The 2026 Plan splits 12 counties a total of 14 times. In the counties that have new splits in the 2026 Plan, the average BVAP weighted by population is 34.5% (16.4% if Shelby County is not included), but the in counties where a split was removed, the BVAP was 6.2%. For a list of criteria sometimes considered traditional, see the National Conference of State Legislatures “Redistricting Criteria”, <https://www.ncsl.org/elections-and-campaigns/redistricting-criteria>.