IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

ALPHA PHI ALPHA FRATERNITY INC., et al., *Plaintiffs,* v. BRAD RAFFENSPERGER, in his official capacity as Secretary of State of Georgia, *Defendant.*	) No. 1:21-CV-05337-SCJ
COAKLEY PENDERGRASS et al., *Plaintiffs,* v. BRAD RAFFENSPERGER et al., *Defendants*.	) No. 1:21-CV-05339-SCJ
ANNIE LOIS GRANT et al., *Plaintiffs,* v. BRAD RAFFENSPERGER et al., *Defendants.*	) No. 1:22-CV-00122-SCJ

AMICI CURIAE BRIEF OF THE GEORGIA STATE CONFERENCE OF THE NAACP, THE GEORGIA COALITION FOR THE PEOPLE'S AGENDA, INC., GALEO LATINO COMMUNITY DEVELOPMENT FUND INC., COMMON CAUSE, LEAGUE OF WOMEN VOTERS OF GEORGIA, JASMINE BOWLES, DR. CHERYL GRAVES, DR. URSULA THOMAS, DR. H. BENJAMIN WILLIAMS, AND BRIANNE PERKINS IN OPPOSITION TO DEFENDANTS' PROPOSED REMEDIAL MAPS

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STATEMENT OF AMICI CURIAE

Amici Curiae, the Georgia State Conference of the NAACP, the Georgia Coalition for the People's Agenda, Inc., and GALEO Latino Community Development Fund, Inc. (collectively, the "NAACP Plaintiffs"); and Common Cause, the League of Women Voters of Georgia, Jasmine Bowles, Dr. Cheryl Graves, Dr. Ursula Thomas, Dr. H. Benjamin Williams, and Brianne Perkins (collectively, the "Common Cause Plaintiffs") are plaintiffs in consolidated lawsuits challenging the legality and constitutionality of Georgia's Congressional, Senate, and House legislative maps. *See Georgia State Conference of the NAACP et al. v. State of Georgia*, 1:21-CV-5338-ELB-SCJ-SDG); *Common Cause, et al. v. Brad Raffensperger*, (1:21-CV-00090-SCJ-SDG-ELB) (collectively, the "GA NAACP and Common Cause cases"). Trial in those cases were stayed pending the appeal of this Court's October 26, 2023 Order entered in *Alpha Phi Alpha v. Raffensperger*, No. 21-05337; *Pendergrass v. Raffensperger*, No. 21-05339; and *Grant v. Raffensperger*, No. 22-00122 (N.D. Ga. Oct. 26, 2023), which enjoined use of Georgia's 2021 Congressional, State Senate, and State House of Representatives redistricting plans. The *GA NAACP* and *Common Cause* cases include overlapping claims with the instant matter, causing the GA NAACP Plaintiffs and the Common Cause Plaintiffs to share a vested interest in the remediation related to those claims, which are intertwined.

Additionally, the organizational plaintiffs are civil rights organizations committed to protecting the right to vote and eliminating discrimination and inequality in any form.

The Georgia State Conference of the NAACP ("GA NAACP") is a unit of the National NAACP, and is the oldest and one of the largest, most significant organizations promoting and protecting the civil rights of African Americans and other racial and ethnic minorities in Georgia. The GA NAACP is a non-partisan, interracial, nonprofit membership organization with a mission to eliminate racial discrimination through democratic processes and ensure the equal political, educational, social, and economic rights of all persons, in particular African Americans. Protecting and promoting the voting rights of Black voters, other voters of color, and underserved communities is essential to this mission. The GA NAACP has approximately 10,000 members across approximately 180 local units, residing in at least 120 counties in Georgia, including in areas affected by these remedial plans.

GALEO Latino Community Development Fund, Inc. ("GALEO") was founded in 2004 and works to increase civic engagement and leadership development of the Latinx community across Georgia. Protecting and promoting the voting rights of Georgia's Latinx U.S. citizens is essential to this mission.

GALEO has over 230 members in Georgia, in over 35 counties and 70 cities, including in areas affected by the proposed remedial maps.

The Georgia Coalition for the People's Agenda ("GCPA") was founded in 1998 by Reverend Joseph Lowery, and is an umbrella organization of human rights, civil rights, labor, women's, youth, and peace and justice groups which advocate for, among other things, voting rights protection and elimination of barriers to the ballot box for all Georgians. GCPA is a coalition of more than 30 organizations, which collectively have more than 5,000 individual members across the state of Georgia in various cities and counties, including in areas impacted by the proposed remedial maps.

Common Cause is a nonprofit corporation and nonpartisan democracy group dedicated to fair elections and making government at all levels more representative, open, and responsive to the interests of all people. Founded in 1970 with offices in Atlanta, Georgia, Common Cause has more than 26,000 members across Georgia, including in the areas affected by the remedial maps before the court. Unfair and discriminatory redistricting directly frustrates and impedes Common Cause's core mission of making government more responsive to the interests of communities by diminishing the voices of the voters Common Cause works to engage. As a result, Common Cause has an interest in ensuring that Black Georgians do not have their voting strength diluted in Georgia's redistricting plans.

League of Women Voters of Georgia (the "League") is a nonpartisan, nonprofit, grassroots organization committed to empowering voters and defending democracy in Georgia since 1920, especially for those who have been left out of the democratic process. With 11 local Leagues around the state, the League has approximately 550 members in Georgia, including in the areas affected by the remedial maps before the court. As part of its mission, the League—including local Leagues—advocates for fair and nondiscriminatory maps, which necessarily include effective representation of racial and linguistic minorities. Unfair and discriminatory redistricting directly frustrates and impedes the League's core mission of protecting the rights of voters the League works to engage, including Black voters and residents. As a result, the League has an interest in ensuring that Black Georgians do not have their voting strength diluted in Georgia's redistricting plans.

Jasmine Bowles, Cheryl Graves, Dr. Ursula Thomas, Dr. H. Benjamin Williams, and Brianne Perkins are Black registered voters who reside in the Metro Atlanta area. They have an interest in ensuring that their voting strength and the voting strength of other Black voters is not diluted in Georgia's redistricting plans.

ARGUMENT

I. The Court Should Reject the State's Remedial Maps and Appoint a Special Master.

The new maps should be rejected because the State unequivocally disobeyed this Court's prohibition that it not "eliminat[e] minority opportunity districts" in

remedying the Section 2 violations. Grasping precisely what the State did in response to the Court's order takes some doing, however, because the State has engaged in a "shell game," moving around and renumbering, reordering, and reorganizing the districts to make it appear that the proposed remedial maps comply with the Court's Order, when in fact they do not. To aid the Court in piercing through this maze, Amici have prepared a computer-enabled "cross-walk" to match the old voting districts to the new proposed voting districts. *See* December 12, 2023 Declaration of Dr. Moon Duchin ("Duchin Decl."), attached hereto as Exhibit B, at 2-3 (renumbering). Employing the "cross-walk" not only clarifies what the State actually did, it also helps to reveal that the State failed to make the changes ordered by the Court.

On October 26, 2023, this Court issued an Opinion and Memorandum of Decision (the "Court Order") holding Georgia's Congressional, Senate, and House maps violated Section 2 of the Voting Rights Act and ordering the General Assembly to draw new maps that included:

> [A]n additional majority-Black congressional district in west-metro Atlanta; two additional majority-Black Senate districts in south-metro Atlanta; two additional majority-Black House districts in south-metro Atlanta, one additional majority-Black House district in west-metro Atlanta, and two additional majority-Black House districts in and around Macon-Bibb.

Alpha Phi Alpha Fraternity Inc. v. Raffensperger, No. 21-05337, 2023 WL 7037537, at *143 (N.D. Ga. Oct. 26, 2023). The Court also unequivocally ordered that the

"State cannot remedy the Section 2 violations described herein by *eliminating minority opportunity districts* elsewhere in the plans." *Id*. (emphasis added).

The term "minority opportunity districts"—distinct from the term "majority-Black district or majority-Black opportunity district"—is a redistricting term of art "meaning [] district[s] in which [minorities] have a realistic opportunity to elect a candidate of choice." *See Wright v. Sumter Cnty. Bd. of Elections & Registration*, 2020 WL 499615, at *5 (M.D. Ga. Jan. 29, 2020), *amended on reconsideration on other grounds*, 2020 WL 11772601 (M.D. Ga. Apr. 8, 2020), and *aff'd*, 979 F.3d 1282 (11th Cir. 2020). Thus, the Court "retain[ed] jurisdiction to determine whether the remedial plans adopted by the General Assembly remedy the Section 2 violations by incorporating *additional legislative districts* in which Black voters have a *demonstrable opportunity to elect* their candidates of choice." *Alpha Phi Alpha Fraternity Inc.*, 2023 WL 7037537, at *143 (emphasis added). But the State did exactly what the Court ordered it not to do.

The Court's clear warning that the State may not remedy the Section 2 violations by approving plans that "eliminate minority opportunity districts elsewhere in the plans" accords with Voting Rights Act precedent. "A judicial remedy fashioned under section 2 must. . . enhance the ability of the plaintiffs to elect their candidates of choice. Any remedy that has the effect of eliminating this essential element of choice is invalid, for it contravenes the spirit and purpose of the

Act." *White v. State of Ala.*, 74 F.3d 1058, 1069–70 (11th Cir. 1996). And courts may not approve remedial plans that "only partially remed[y]" the Section 2 violation. *Singleton v. Allen*, No. 21-1291, 2023 WL 5691156, at *50 (N.D. Ala. Sept. 5, 2023), *appeal dismissed sub nom. Milligan v. Co-Chairs of Alabama Permanent Legislative Comm. on Reapportionment*, No. 23-12922, 2023 WL 6568350 (11th Cir. Oct. 3, 2023).

The Court's clear warning was—unfortunately—prescient. Instead of drawing *additional* Black opportunity districts to remedy the Section 2 violations, the State destroyed districts in which Black voters had the opportunity to elect candidates of choice. The net result is *fewer* opportunities for Black voters to elect candidates of choice in the Congressional and House plan. Specifically, while the enjoined Congressional map had five effective[1] Black opportunity districts, the State's new proposed Congressional map has *only four*. Duchin Decl. at 4. Similarly, while the enjoined House map had sixty-nine Black opportunity districts effective for Black voters, the State's new proposed House plan has *only sixty-eight*. *Id.* at 5. Further, the enjoined Senate map had *nineteen* Black opportunity districts, and the State's new proposed Senate plan *only has twenty*—thus the proposed plan

[1] According to Plaintiffs' expert Dr. Moon Duchin, a district is effective for Black voters if Black voters would have elected candidates of choice in three out of four select primary elections and five out of eight select general elections. Duchin Decl. at 4. In this brief, a district is deemed an "effective" opportunity district for Black voters if it meets these criteria.

has only one additional opportunity district when compared to the enjoined plan, not two additional opportunity districts as ordered by this Court. *Id.* at 4. The proposed maps therefore do not comply with this Court's command that the State add one additional Black opportunity Congressional district, two additional Black opportunity Senate districts, and five additional Black opportunity House districts.

The State essentially treated the Court's order as a game of Whack-A-Mole—appearing to make changes to comply with the Order in one section of the state while simultaneously undermining voting rights in other sections of the state, and helping mask the multitude of changes that violate the Order by renumbering the districts. The Court should not tolerate the State's gamesmanship. It should reject the proposed remedial plans and appoint a special master to draw new plans, following a period of public hearings and comment.

A. The state unnecessarily engaged in widespread district renumbering.

One notable feature of the State's proposed plans is that the State engaged in widespread district renumbering without any geographic justification. *See* Duchin Decl. at 2-3. This renumbering highlights the State's "shell game," as its only logical purpose is to create confusion in an attempt to hide the State's failure to comply with the Court Order.

In the Congressional plan, the State changed the district numbering of three districts instead of using the district number that would have best geographically matched districts in the enjoined plan—proposed Congressional District 7 (not effective for Black voters) best aligns with enjoined Congressional District 6 (not effective for Black voters), proposed Congressional District 13 (effective for Black voters) best aligns with enjoined Congressional District 7 (effective for Black voters), and proposed Congressional District 6 (effective for Black voters) best aligns with enjoined Congressional District 13 (effective for Black voters). *Id*. at 2, Table 1. This merry-go-round allows the State to claim that proposed Congressional District 6 is an additional Black opportunity district, when in reality it simply replaces enjoined Congressional District 13 (already effective for Black voters) in disguise. *Id*., Figure 1. These three proposed districts—just like their most geographically equivalent districts in the enjoined plan—comprise two effective Black opportunity districts. *See id.* at 4. No additional Black opportunity district was created as ordered.

The State also engaged in misdirection by renumbering of districts in the proposed Senate and House maps, as demonstrated below:

SD	State numbers 2023	38	42	6	28	35	44	17				
	Best match to 2021	6	17	28	35	38	42	44				
HD	State numbers 2023	61	64	40	82	74	101	84	115	116	91	92
	Best match to 2021	40	61	64	74	78	81	82	84	91	92	93
HD	State numbers 2023	107	93	106	117	78	81	149	135	134	133	
	Best match to 2021	101	106	107	115	116	117	133	134	135	149	

See id. at 2-3, Tables 2 and 3.

Notably, in the proposed Senate plan, several of these districts—Senate Districts 17, 28, 35, and 44—are among the districts that comprise the Section 2 vote dilution area identified in the Court Order, making it more difficult to evaluate compliance. *Id*. at 2-3. And in the proposed House plan, seven districts—House Districts 40, 81, 82, 101, 133, 134, and 149—are completely disjointed from their prior geographic position. *Id*. at 3. For the Court's convenience, "cross-walks" decoding the district renumbering in the proposed remedial plans is included with Dr. Duchin's declaration. *Id*. at 2-3.

B. The State's proposed remedial plans eliminate existing Black opportunity districts.

The State eliminated effective opportunity districts for Black voters in each of the proposed plans despite being ordered not to do so by this Court. As a result, the remedial plans do not "enhance the ability of [Black voters] to elect their candidates of choice," *White*, 74 F.3d at 1069–70. Indeed, the proposed Congressional and House plans each contain one ***fewer*** Black opportunity district that is effective for Black voters, and the proposed Senate plan contains only one additional effective district for Black voters—instead of the two the Court instructed the State to draw.

Proposed Congressional Plan. The enjoined Congressional plan contained five effective opportunity districts for Black voters: enjoined Congressional Districts 2, 4, 5, 7, and 13. *Id*. at 4. The proposed Congressional Plan only has four districts

effective for Black voters: enjoined Congressional Districts 2, 4, 6, and 13. *Id.* Congressional District 5 in the proposed plan remains a firmly Democrat-leaning district, but the proposed remedial plan *weakens* its electoral alignment for Black voters in primaries. Thus, it will be more difficult for Black-preferred candidates to secure a primary nomination, making this district no longer effective for Black voters. *Id.* The State has thus failed to add an *additional* Black opportunity district, as the Court Order required, instead proposing a map that includes one *fewer*, effective Black opportunity district.

Proposed Senate Plan. The enjoined Senate plan contained nineteen districts that were effective opportunity districts for Black voters. *Id.* at 4. The proposed Senate plan contains twenty effective opportunity districts for Black voters—an increase of one. *Id.* The only district that was not performing in the enjoined plan but is performing in the proposed plan is Senate District 38 (Senate District 6 in the enjoined plan). *Id.* And that district was already a "swing" district that had narrowly elected the candidate of choice of Black voters—Jason Esteves—in 2022. *Id.* Thus, the State has not drawn *two* additional, effective Black opportunity districts in the proposed remedial plan, as the Court Order required.

Proposed House Plan. The enjoined House plan contained sixty-nine districts effective for Black voters. *Id.* at 5. The proposed House plan contains only sixty-eight districts effective for Black voters, a decrease of one. *Id.* Two districts

that were not previously performing for Black voters—House District 149 (best aligned with House District 133 in the enjoined plan) and House District 145 are now effective for Black voters in the proposed plan. *Id*. However, three districts—House Districts 86, 105, and 108—were previously effective in the enjoined plan, but are no longer effective. *Id*. Thus, instead of creating *five additional* Black opportunity districts, the proposed map includes one *fewer* Black opportunity district. *Id*.

II. The NAACP Plaintiffs Have Pending Claims Not Addressed by the Court Order or the Remedial Maps.

The NAACP Plaintiffs have pending statutory and constitutional challenges to Georgia's Congressional, Senate, and House maps that remain unchanged by the proposed remedial plans. *See e.g.*, *Georgia State Conference of the NAACP et al. v. State of Georgia*, 1:21-CV-5338-ELB-SCJ-SDG). These challenges include claims that: 1) Section 2 of the Voting Rights Act requires drawing an additional majority-Black Senate district in and around Gwinnett and an additional majority-Black Senate district in and around the East Black Belt; 2) Section 2 of the Voting Rights Act requires drawing an additional majority-Black house district in Southwest Atlanta and an additional majority-Black and Hispanic district in Southeast Georgia; and 3) Certain districts, including Senate Districts 1, 2, 4, 17 (now numbered as Senate District 42), and 26; and House Districts 44, 48, 49, 52, and 104 are racially gerrymandered and the product of intentional discrimination. *See* Joint Proposed

Pretrial Order, No. 21-53338, ECF No. 194, at 17-18, 20-22. The NAACP Plaintiffs reserve their rights to continue to press these claims if the 2021 enacted maps are reinstated or to press new claims by way of amendment of their complaint or by the filing of a new complaint if either the State's remedial maps are adopted by the Court or if the remedial maps adopted by the Court do not satisfy the vote dilution or racial gerrymandering identified by the NAACP Plaintiffs' allegations.[2]

CONCLUSION

For the foregoing reasons, Amici urge the Court to reject the proposed remedial plans and to appoint a special master to draw new plans and accept public comment.

Dated: December 12, 2023

Respectfully submitted,

By: /s/ Kurt Kastorf
Georgia Bar No. 315315

KASTORF LAW LLP
1387 Iverson St., Suite 100
Atlanta, GA 30307
(404) 900-0030
kurt@kastorflaw.com

Jon Greenbaum*
Ezra D. Rosenberg*
Julie M. Houk*

[2] The Common Cause Plaintiffs likewise reserve their rights to continue to press their claims, amend them, or press new claims based on the maps that are approved during these remedial proceedings.

David Rollins-Boyd*
Alexander S. Davis*
jgreenbaum@lawyerscommittee.org
erosenberg@lawyerscommittee.org
jhouk@lawyerscommittee.org
drollins-boyd@lawyerscommittee.org
adavis@lawyerscommittee.org

LAWYERS' COMMITTEE FOR CIVIL RIGHTS UNDER LAW
1500 K Street NW, Suite 900
Washington, D.C. 20005
Telephone: (202) 662-8600
Facsimile: (202) 783-0857
Counsel for NAACP Plaintiffs

Keith Harrison*
Toni Michelle Jackson*
Astor H.L. Heaven*
kharrison@crowell.com
tjackson@crowell.com
aheaven@crowell.com

CROWELL & MORING LLP
1001 Pennsylvania Avenue NW
Washington, D.C. 20004
Telephone: (202) 624-2500
Counsel for NAACP Plaintiffs

By: /S/ Jack Genberg
Bradley E. Heard (Ga. Bar 342209)
Jack Genberg (Ga. Bar 144076)
Courtney O'Donnell (Ga. Bar 164720)

SOUTHERN POVERTY LAW CENTER
150 E Ponce de Leon Ave, Suite 340
Decatur, GA 30030
Telephone: (404) 521-6700

Facsimile: (404) 221-5857
bradley.heard@splcenter.org
jack.genberg@splcenter.org
courtney.odonnell@splcenter.org
Counsel for Common Cause Plaintiffs

Cassandra Nicole Love-Olivo*
Nathan Jamieson*

DECHERT LLP
633 West 5th Street, Suite 4900
Los Angeles, CA 90071-2032
Telephone: (213) 808-5700
Facsimile: (213) 808-5760
cassandra.love@dechert.com
nathan.jamieson@dechert.com
Counsel for Common Cause Plaintiffs

Neil Steiner*

DECHERT LLP
Three Bryant Park,
1095 Avenue of the Americas
New York, NY 10036-6797
Telephone: (212) 698-3500
Facsimile: (212) 698-3599
neil.steiner@dechert.com
Counsel for Common Cause Plaintiffs

*Admitted *Pro Hac Vice*

Declaration of Dr. Moon Duchin

Professor of Mathematics, Tufts University
Senior Fellow, Tisch College of Civic Life

December 12, 2023

1 Background and qualifications

I am a Professor of Mathematics and a Senior Fellow in the Jonathan M. Tisch College of Civic Life at Tufts University. At Tisch College, I am the director and principal investigator of an interdisciplinary research group called the MGGG Redistricting Lab, focused on geometric and computational aspects of redistricting. My areas of research and teaching include the structure of census data, the design and implementation of randomized algorithms for generating districting plans, and the analysis of redistricting more broadly.

I have previously submitted reports and/or provided testimony by deposition, a hearing, or at trial in North Carolina, Pennsylvania, Wisconsin, Alabama, South Carolina, Texas, and in a different lawsuit in Georgia.[1]

2 Summary

In December 2023, the Georgia General Assembly passed three proposed remedial maps—for Congress, state Senate, and state House. These were adopted in response to the October 26 Court Order finding that the 2021 redistricting plans violated Section 2 of the Voting Rights Act and requiring the state to create several additional districts that provided an effective opportunity for Black voters to elect candidates of choice: one in Congress, two in the state Senate, and five in the state House.

The timeline for responding to these new maps is too short for a detailed study of racial gerrymandering, so I am not able to provide a comprehensive analysis.[2] But in this short declaration, I can establish two simple facts.

First, the state has chosen numbering for its new plans that departs from the previous plan, with no justification in geography. The numbering creates an intense challenge for those analyzing the plan, because it invites comparisons between districts that do not correspond in geographic or demographic terms. In this report I provide a **crosswalk** from the state's new numbers to the best geographical match in the previous map (Tables 1–3).

Second, I provide an **effectiveness analysis** based on standard and accepted methodology, showing that the state did not create the required number of additional districts in any of the three proposed remedial maps. The net change was −1 in the Congressional map, +1 in the Senate map, and −1 in the House map, falling short of the court order in each case, and indeed actually *reducing* the number of effective districts in two out of three maps.

[1] *NC League of Conservation Voters, et al. v. Hall, et al.* No. 21-cvs-500085 (Wake Cnty. Sup. Ct. 2021); *Carter v. Chapman*, No. 7 MM 2022, 2022 WL 702894 (Pa. Mar. 9, 2022); *Johnson v. Wis. Elections Comm'n*, No. 2021AP1450-OA, 2022 WL 621082 (Wis. Mar. 3, 2022); *Milligan, et al. v. Merrill, et al.*, Case No. 2:21-cv-01530-AMM and *Thomas, et al. v. Merrill, et al.*, Case No. 2:21-cv-01531-AMM (N.D. Ala. 2021); *SC NAACP et al. v. Alexander, et al.*, Case No. 3-21-cv-03302-MBS-TJH-RMG (D.S.C.) (three-judge ct.); *TX NAACP et al. v. Abbott*, Case No. 1:21-CV-00943-RP-JES-JVB; *Georgia State Conference of the NAACP et al. v. State of Georgia*, 1:21-CV-5338-ELB-SCJ-SDG (N.D. Ga. 2021).

[2] I have included data products with this report for the court's use, including an analysis of county splits and precinct splits, showing whether race/ethnicity or partisan data has a larger differential across the pieces in each split.

3 District numbering in the 2023 plans

3.1 Congressional

CD	State numbers 2023	7	13	6
	Best match to 2021	6	7	13

Table 1: Numbering in the state's newly enacted Congressional plan shows that three districts had their numbers permuted, rather than applying the best geographical match to previous districts. Compare Figure 1.

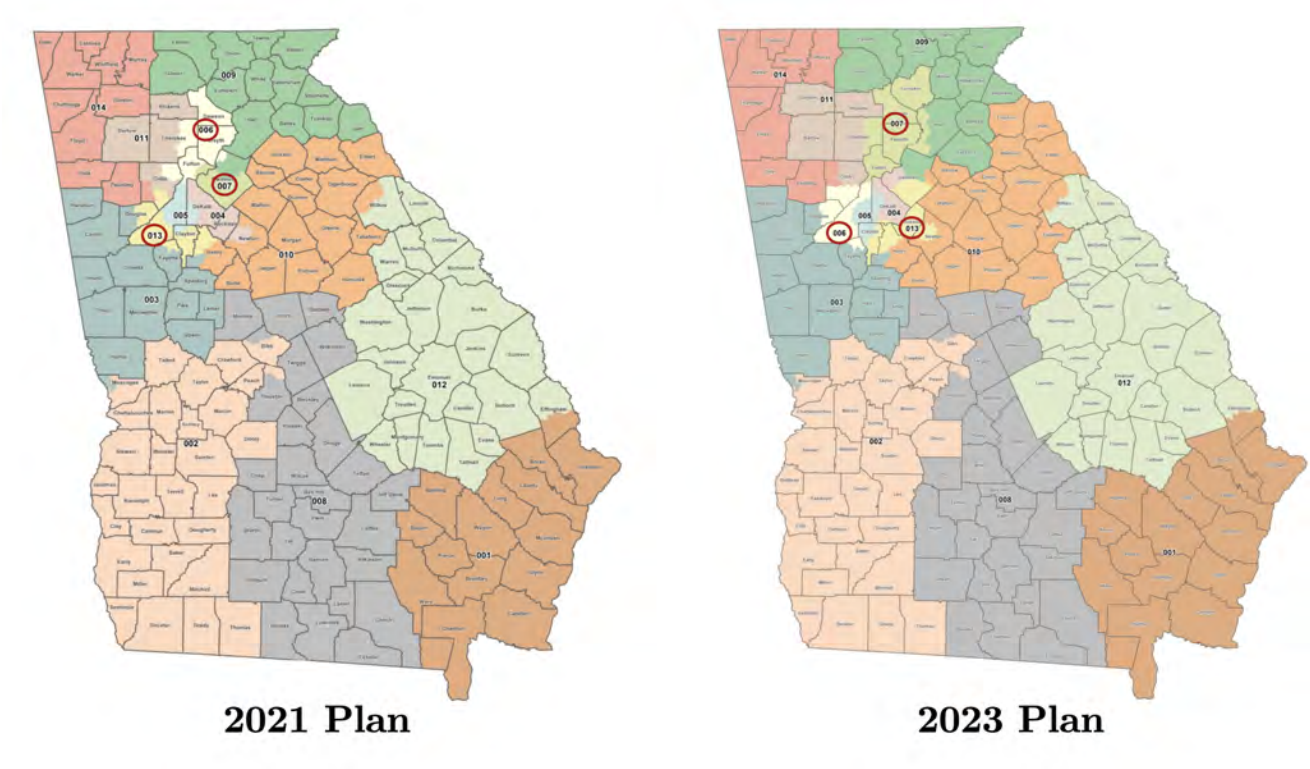

Figure 1: Congressional district numbering swaps are visible in the state's published District Packets (https://www.legis.ga.gov/joint-office/reapportionment). The numbering creates the impression that CD 6 has been made a majority-Black district. Instead, the name "CD 6" has now been attached to what was formerly CD 13, which was already a majority-Black district.

3.2 State Senate

SD	State numbers 2023	38	42	6	28	35	44	17
	Best match to 2021	6	17	28	35	38	42	44

Table 2: Numbering in the state's newly enacted Senate plan showing seven districts that were given labels mismatched to their location.

Two Senate districts moved to locations completely disjoint from their previous positions: the ones in the enacted map numbered SD 6 and SD 42.

The Court Order of October 26, 2023 required that the state re-draw the Senate plan to create two additional opportunity-to-elect districts for Black voters in a particular area in which vote dilution had been identified. That area comprises 10, 16, 17, 25, 28, 30, 34, 35, 43, and 44, as they were numbered in the 2021 enacted plan. Note that several districts from this area (17, 28, 35, 44) are among the ones listed in Table 2, which means that the renumbering materially impacts the ability to track whether the new plan complies with the court order.

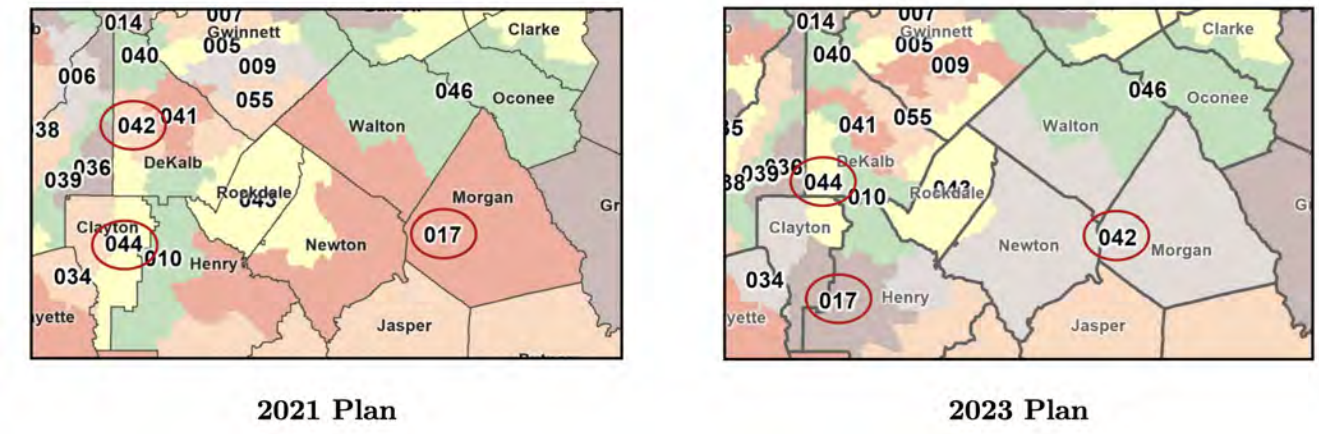

Figure 2: Senate district numbering swaps are visible in these insets drawn from the state's published District Packets (https://www.legis.ga.gov/joint-office/reapportionment). So while the state's numbers report that SD 17 has been raised from 32.01% BVAP to 63.61%, this is an artifact of the renumbering that makes it difficult to track the changes. The new SD 42 has 32.56%, a close match to previous SD 17.

As a final remark on the mismatch of new numbers to old, it is also notable that the geographical extension of the new ten districts overlaps only partially with the previous locations. In particular, instead of remedying the vote dilution in that area of the state, the new majority-Black districts are made possible by bringing in Black voters from outside the designated region.

3.3 State House

HD	State numbers 2023	61	64	40	82	74	101	84	115	116	91	92
	Best match to 2021	40	61	64	74	78	81	82	84	91	92	93

HD	State numbers 2023	107	93	106	117	78	81	149	135	134	133
	Best match to 2021	101	106	107	115	116	117	133	134	135	149

Table 3: The impact of renumbering in the 2023 House plan is extensive, with 21 districts not assigned the number that gives the best geographic match to the 2021 plan.

Seven House districts moved to locations completely disjoint from their earlier positions: HD 40, 81, 82, 101, 133, 134, 149. In fact, the district previously called HD 149 has not changed by a single person—the exact grouping of 58,893 people has been kept together as a district—but that district has been renumbered as 133.

4 Net effects of new maps

To explain the net effects on the opportunity of Black voters to elect their candidates of choice in Georgia, I will use a simple but well-established method to label districts as *effective* or not.

Both in litigation and in peer-reviewed scholarship, the principal method to study the likely properties of new districts is to use past elections as a test.[3] In Georgia, I selected eight general elections and four primary elections as being especially probative for an effectiveness analysis. I consider a district to be *effective* if it would have elected the Black voters' candidate of choice in at least three out of four primaries and at least five out of eight general elections. More discussion of this effectiveness standard can be found in Appendix A.

4.1 Congress

The 2021 enacted plan had **five** districts that earn the label of effective (CD 2, 4, 5, 7, and 13). The 2023 replacement plan only has **four**, which means the net change is −1.

CD 2 did not change at all. Changes to CD 4 are significant, but the geographical location remains similar, and the newly configured district is still effective. The best matches to 2021 districts 7 and 13, now renumbered 13 and 6, are still effective.

However, CD 5, currently represented by Nikema Williams, has been weakened in its electoral alignment with the preferences of Black voters, falling below the threshold for an effective district. Though it remains solidly Democratic, it is now aligned with the preferences of Black voters in only *two* out of four primary elections; the previous configuration was aligned in three out of four. This means that this district maintains its partisanship but it has become measurably harder for a Black-preferred candidate to secure the Democratic nomination. The other changes push demographic numbers around, but are electorally insignificant.

4.2 State Senate

Statewide, the 2021 enacted plan had **19** out of 56 districts that were labeled effective as Black opportunity-to-elect districts. The court ordered the creation of two additional districts. However, the new plan has **20** effective districts, for a net addition of +1 rather than the two that were required.

The label of effective described here maps very successfully onto actual performance in subsequent Congressional elections: 18 out of 19 Senate districts marked effective in the 2021 plan turned out to elect people of color in 2022, and only 1 out of 37 districts without the effective label performed in this sense. The only overperforming district was SD 6 from the 2021 map—it was performing for Black voters already, despite having a majority of White voters (about 58% of adults) and not earning the label of effective. A strong Afro-Latino candidate named Jason Esteves won in 2022 despite the less favorable district configuration. That this district is now re-drawn to be more favorable—now called SD 38, it has become majority-Black and now elects preferred candidates in all four probative primaries and all eight probative general elections. This accounts for the net increase of one labeled "effective" district, but does not improve on the expected performance of the map, since the district was already performing.

[3] This is sometimes called a "reconstituted" election analysis.

4.3 State House

The massive renumbering scheme in the House plan makes analysis of the new plan much more difficult, but the effectiveness numbers are unmistakable. Though the court ordered the creation of five additional opportunity-to-elect districts, the net change in effective districts is actually negative. Where the previous plan had **69** effective districts, and the state was instructed to add five opportunity districts, the new plan actually reduces the effective district count with a −1 change, to **68**.

Two districts shift in a positive direction. What used to be HD 133 is now called HD 149 and has become effective; this is a genuine plus-one, both becoming majority-Black and electorally effective for Black preferences. HD 145 retained its label and became effective; this is also a genuine pickup, becoming majority-Black as well as newly effective.

By contrast, HD 86, 105, 108 were effective, but now are not. HD 86 is still Democratic but is now more likely to elect White-preferred candidates. (It used to align with Black voters' preferences in three of four primaries; that number has dropped to just one out of four.) HD 105 was turned from Democratic- to Republican-favoring, while retaining its status as a diverse district without a single-race majority. It is the clearest example of a performing coalition district that was essentially dismantled in the re-draw. HD 108 is a second performing coalition district that was notably weakened in partisan terms and no longer meets the standard of an effective district. The incumbent, Jasmine Clark, is a PhD microbiologist and an active member of the Georgia Legislative Black Caucus. The district now elects the Black candidate of choice in only four out of eight general elections from the probative dataset, down from six before the re-draw.

A Defining an effective district

To keep this declaration self-contained, I am including a recap of the definition of effectiveness from my report in *NAACP v. Georgia*.

A.1 Identifying probative elections

In the voting rights sphere, it is well understood that certain past elections are more probative—that is, provide better and clearer evidence of polarization patterns and preferences—than others. Elections are more suitable for an effectiveness analysis when they are more recent, when they have a viable minority candidate on the ballot, and when we can make confident statistical inferences about each group's preference. They are less suitable when they are blowouts (or, of course, uncontested).

I have selected the following eight general elections and four Democratic primary elections (Tables 4) as especially probative for analyzing effective electoral opportunity for Black voters in Georgia. All are recent statewide elections (held since 2018), most have a Black candidate on the ballot, and most are quite close on a statewide basis.[4]

Year	Contest	R Candidate	D Candidate	D share
2016	President	Trump-Pence	Clinton-Kaine	.4734
2018	Governor	Brian Kemp	Stacey Abrams (B)	.4930
2018	Super. Pub. Instruc.	Richard Woods	Otha Thornton (B)	.4697
2020	President	Trump-Pence	Biden-Harris (B)	.5013
2020	Public Serv. Commiss.	Lauren McDonald	Daniel Blackman (B)	.4848
2021	Senate Runoff	David Perdue	Jon Ossoff	.5061
2021	Senate Runoff Special	Kelly Loeffler	Raphael Warnock (B)	.5104
2022	Governor	Brian Kemp	Stacey Abrams (B)	.4620

Year	Contest	BH-Preferred Candidate	D share (outcome)
2018	Lt. Governor	Triana Arnold James (B)	.4475 (L)
2018	Super. Primary	Otha Thornton (B)	.4387 (1st of 3)
2018	Super. Runoff	Otha Thornton (B)	.5914 (W)
2018	Insurance Commiss.	Janice Laws Robinson (B)	.6286 (W)

Table 4: Eight general elections and four primaries and primary runoffs are chosen for the score of effectiveness.

A.2 Electoral alignment as a measure of district effectiveness

Using the four primary and eight general elections listed here, I will deem a district to be *effective* if it is electorally aligned with the preferences of Black and Latino voters in at least three out of four primaries and at least five out of eight general elections. This standard ascertains that minority-preferred candidates can be both nominated and elected from the district, and it distinguishes minority preferences from (related, but distinct) Democratic party preferences. This same core idea of measuring district effectiveness—keyed to electoral history, not to demographics of the district—appears frequently in the peer-reviewed literature, for instance in a recent piece in the *Election Law Journal* for which I was a co-author.[5]

[4] Even Robinson's primary election, which was won with nearly 63% of the statewide vote, shows substantial district-level variation. By contrast, in the Democratic primary for Governor in 2018, Abrams won with 76.4% and with little regional variation, making it a less informative contest, which explains why it is not included.

[5] Amariah Becker, Moon Duchin, Dara Gold, and Sam Hirsch, *Computational Redistricting and the Voting Rights Act*. **Election Law Journal**, Volume 20, Number 4 (2021), 407–441.

B Overall maps of boundary changes

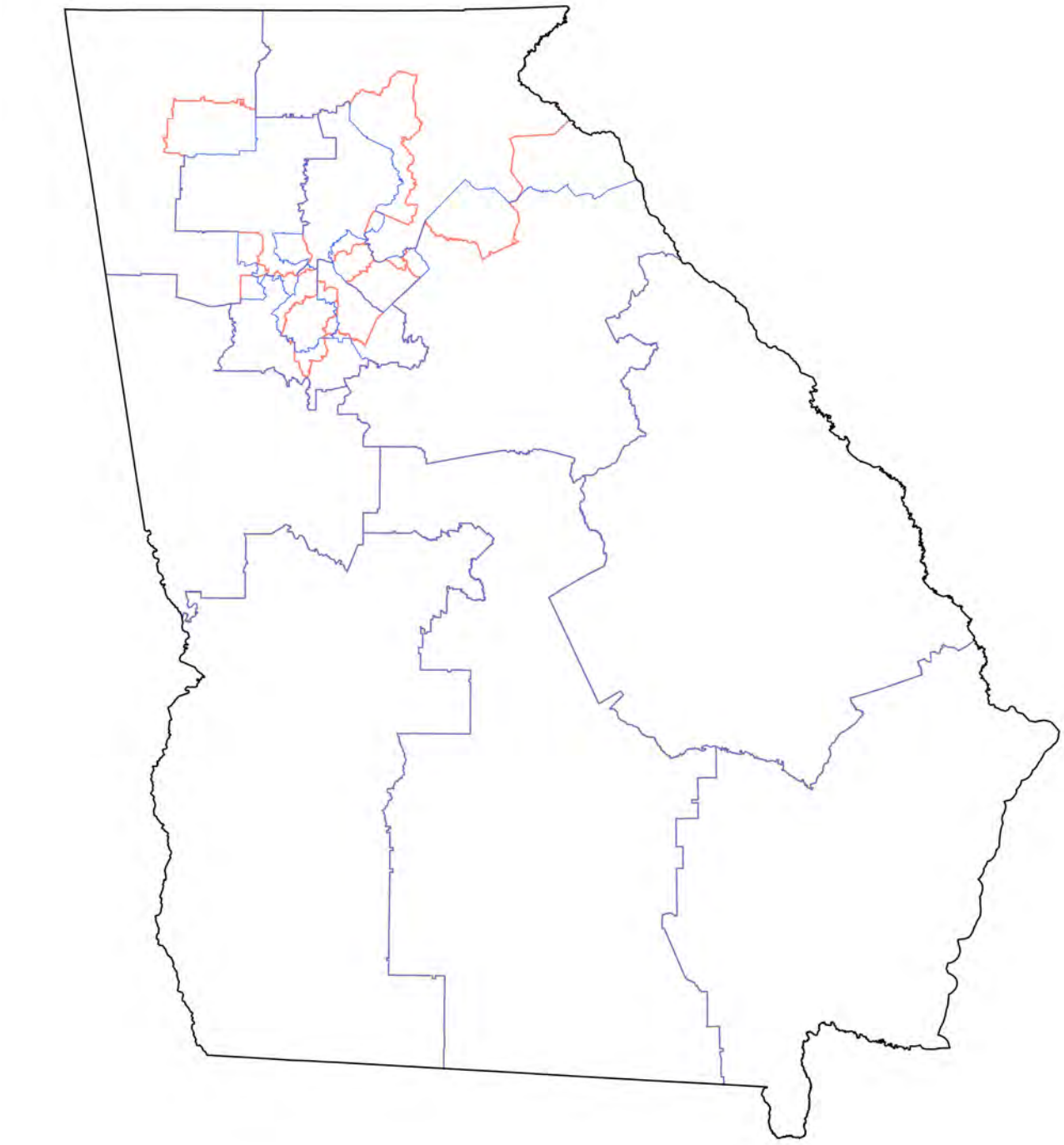

Figure 3: Changes to Congressional districts. The 2021 map has boundaries shown in blue; the 2023 boundaries are shown in red.

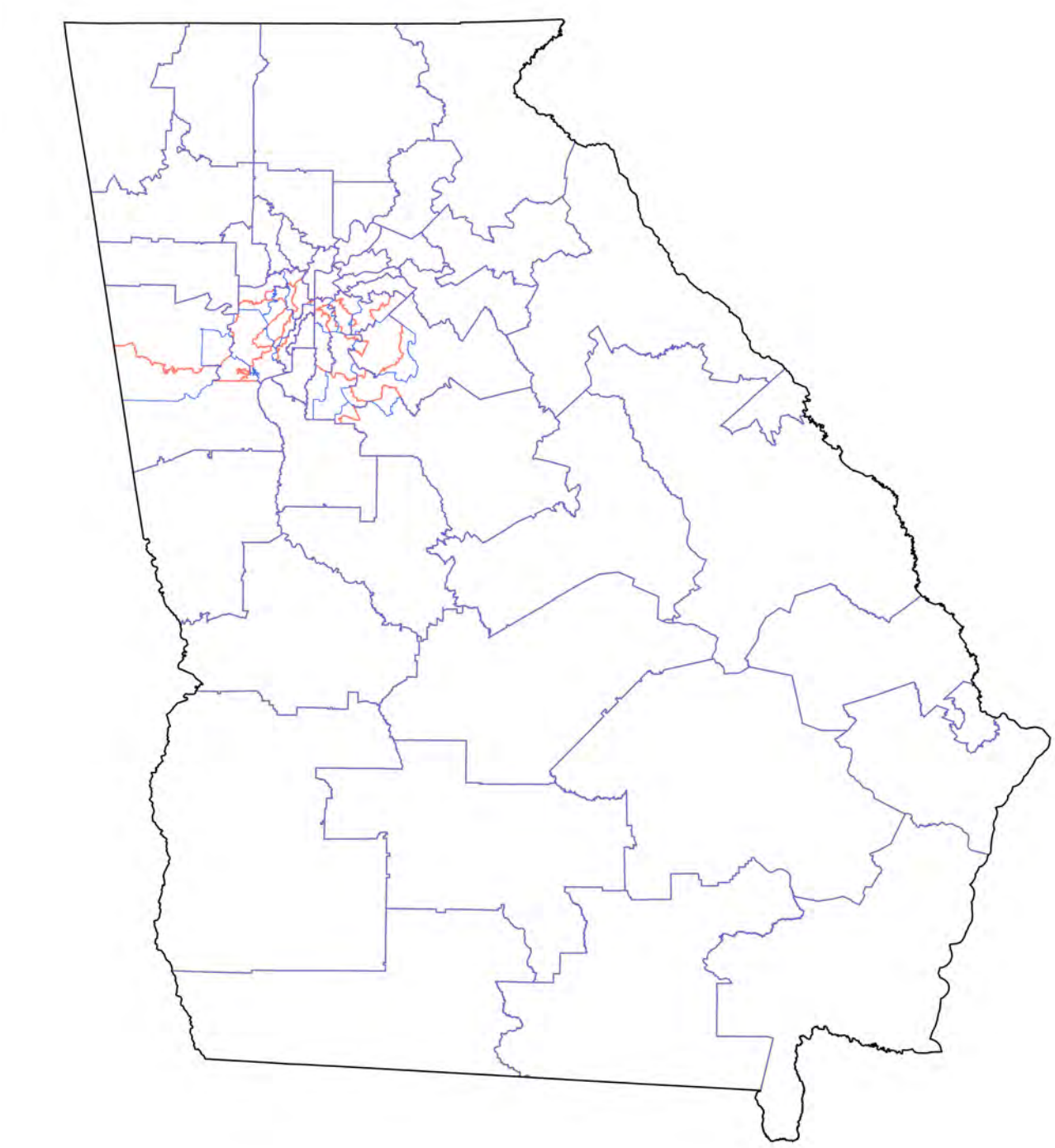

Figure 4: Changes to state Senate districts. The 2021 map has boundaries shown in blue; the 2023 boundaries are shown in red.

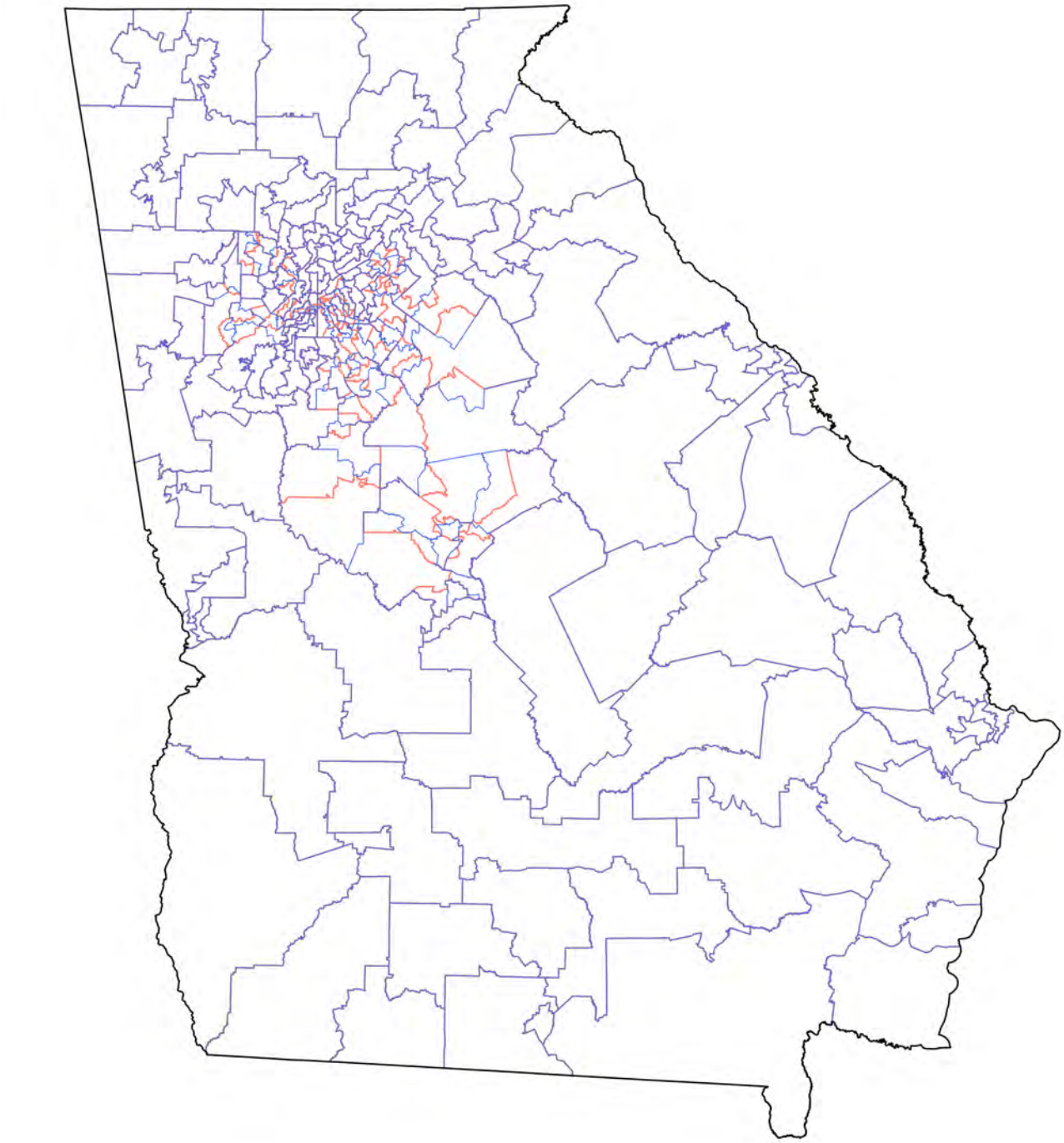

Figure 5: Changes to state House districts. The 2021 map has boundaries shown in blue; the 2023 boundaries are shown in red.

I reserve the right to continue to supplement my report in light of additional facts, testimony and/or materials that may come to light. Pursuant to 28 U.S.C. 1746, I declare under penalty of perjury of the laws of the United States that the foregoing is true and correct according to the best of my knowledge, information, and belief.

Executed this 12th day of December, 2023.

Dr. Moon Duchin

Congress

	District	Clinton16	Abrams18	Thornton18	Biden20	Blackman20	Ossoff21	Warnock21	Abrams22	James18P	Thornton18P	Thornton18RO	Robinson18P	NumCOCPrim	NumCOCGene	Effective?	
State	Match	0.473388274	0.492966424	0.469746905	0.501266674	0.484807387	0.506108377	0.510380319	0.462047864	0.447544559	0.438661194	0.591370387	0.628587169				
1	1	0.41490643	0.424509318	0.410488169	0.432172486	0.419264182	0.43794081	0.438624967	0.394954771	0.499234903	0.499702788	0.715041898	0.696664871	3	0	0	
2	2	0.54633626	0.550796059	0.535355461	0.55235373	0.544459736	0.561059548	0.562433866	0.518759972	0.551535109	0.472009484	0.637887049	0.742951982	4	8	1	
3	3	0.316845516	0.328676992	0.311855255	0.347563512	0.331240314	0.352399341	0.356424547	0.313037462	0.417749085	0.418493716	0.538849312	0.617839693	3	0	0	
4	4	0.784582716	0.799701022	0.769584947	0.791941793	0.781497791	0.795238823	0.800614952	0.76275068	0.475190016	0.45081048	0.581765912	0.625006886	3	8	1	
5	5	0.869020955	0.88018533	0.833976449	0.868119517	0.849901193	0.863595923	0.870090599	0.851421126	0.365282653	0.401135087	0.528552331	0.502594674	2	8	0	
7	6	0.342400868	0.367537443	0.331102343	0.40263858	0.3647001	0.386782053	0.394607418	0.336385489	0.287481947	0.340738036	0.470634172	0.485085356	0	0	0	
13	7	0.650840027	0.693755387	0.67183437	0.704917379	0.701735512	0.724068422	0.727573024	0.700085709	0.531333461	0.486207673	0.641533989	0.694206404	4	8	1	
8	8	0.343036616	0.342732037	0.328012988	0.360421702	0.347288097	0.364794564	0.36643621	0.318461189	0.486090206	0.440307325	0.627325661	0.694033871	3	0	0	
9	9	0.289349399	0.310460269	0.293829313	0.336534429	0.318299054	0.338409727	0.34292408	0.281947683	0.366222593	0.392786447	0.56183663	0.575149107	3	0	0	
10	10	0.360027034	0.374967125	0.361585733	0.392259679	0.376628863	0.397627767	0.401212271	0.3593355	0.416132818	0.434097335	0.648645118	0.59236221	3	0	0	
11	11	0.336033592	0.363011864	0.334676677	0.388483728	0.360354019	0.381026195	0.388388825	0.33516469	0.295868324	0.370577697	0.462065828	0.499895621	0	0	0	
12	12	0.432372579	0.431851279	0.41738314	0.448657676	0.433084389	0.451113646	0.452567074	0.402285004	0.492772153	0.419559836	0.646177768	0.762552719	3	0	0	
6	13	0.718942437	0.743549445	0.708646693	0.750153613	0.729993678	0.743751208	0.750790676	0.723098946	0.497329892	0.493165395	0.645313012	0.65231455	3	8	1	
14	14	0.267851688	0.288993209	0.276843843	0.309743723	0.295978117	0.315919551	0.318712875	0.274077672	0.381279122	0.378271715	0.489275693	0.58876325	2	0	0	
																4	

Senate

State	District Match	Clinton16	Abrams18	Thornton18	Biden20	Blackman20	Ossoff21	Warnock21	Abrams22	James18P	Thornton18P	Thornton18RO	Robinson18P	NumCOCPrima	NumCOCGene	Effective?
		0.473388274	0.492966424	0.469746905	0.501266674	0.484807387	0.506108377	0.510380319	0.462047864	0.447544559	0.438661194	0.591370387	0.628587169			
1	1	0.397656842	0.416462196	0.396250058	0.433881511	0.409893473	0.431119931	0.433099014	0.385785664	0.443252003	0.495691354	0.713872083	0.675209267	3	0	0
2	2	0.727763046	0.744670773	0.724826901	0.730422618	0.722089295	0.741980505	0.74342658	0.71469271	0.5567776	0.537440579	0.76154341	0.724487595	4	8	1
3	3	0.322948638	0.328530274	0.316317984	0.339865889	0.327306164	0.338240721	0.337891668	0.29631488	0.458430767	0.456582855	0.616576636	0.664683584	3	0	0
4	4	0.311684437	0.313172797	0.298786565	0.334206791	0.318114973	0.337733447	0.337867831	0.291067433	0.462347945	0.417040919	0.642149666	0.679982588	3	0	0
5	5	0.748620203	0.776747576	0.750276816	0.734733983	0.739530571	0.769846296	0.772726768	0.703407307	0.493585851	0.460396761	0.626972071	0.632879757	3	8	1
38	6	0.770342153	0.775004489	0.731730429	0.785145143	0.753958261	0.761161801	0.770810773	0.743784955	0.479196443	0.474510674	0.651566404	0.654215481	3	8	1
7	7	0.521158505	0.562144334	0.524973897	0.585472627	0.561839387	0.584837375	0.590894256	0.530825222	0.393755382	0.432716186	0.582196574	0.570882221	3	8	1
8	8	0.333861632	0.336173199	0.325348681	0.352041388	0.340680234	0.350653954	0.35074256	0.300893828	0.527880435	0.422300733	0.614608909	0.718206551	4	0	0
9	9	0.527746882	0.57227682	0.542557472	0.603534631	0.587329326	0.615802111	0.621490898	0.570215803	0.453820218	0.448561976	0.613874083	0.623237363	3	8	1
10	10	0.838930793	0.860803521	0.834319185	0.853074419	0.850358127	0.863541901	0.867322432	0.85096566	0.476331134	0.457875357	0.626262209	0.625047374	3	8	1
11	11	0.34835592	0.335981602	0.32361354	0.352640589	0.341816795	0.351222073	0.351062899	0.303884958	0.528816199	0.421896932	0.547802198	0.709845599	4	0	0
12	12	0.580485626	0.577101919	0.561840927	0.581609029	0.574551684	0.589411809	0.590262253	0.544842081	0.579918244	0.477058094	0.641213907	0.763379962	4	8	1
13	13	0.283558192	0.279078315	0.262250293	0.296374522	0.282069339	0.302265372	0.303606087	0.258128744	0.517859787	0.43540719	0.614506784	0.69559205	4	0	0
14	14	0.542058433	0.562413761	0.507707193	0.601154637	0.552764258	0.566559571	0.576250028	0.53144386	0.30383806	0.370349989	0.469827586	0.457045768	0	8	0
15	15	0.664965964	0.671406841	0.654364323	0.66800349	0.662096815	0.680131671	0.682165733	0.646145965	0.598603875	0.450189444	0.584984714	0.733803209	4	8	1
16	16	0.319918218	0.333247581	0.312572543	0.358643894	0.337149535	0.356820571	0.361496315	0.322497143	0.406667691	0.396526538	0.507908612	0.606501698	3	0	0
42	17	0.351497623	0.381867226	0.368081703	0.406810309	0.396357233	0.419303781	0.422335451	0.39939181	0.471564772	0.454947264	0.641386872	0.674541874	3	0	0
18	18	0.365571027	0.374317477	0.360818184	0.389313837	0.376635747	0.396508346	0.398963335	0.355940936	0.463958658	0.489104968	0.668172873	0.693176878	3	0	0
19	19	0.245786066	0.23449611	0.231432315	0.251618071	0.245934184	0.256753266	0.257350991	0.210910027	0.505406914	0.399668854	0.65745646	0.721363839	4	0	0
20	20	0.325093587	0.323788777	0.312244678	0.343664949	0.331101248	0.349898721	0.352253856	0.309414802	0.492677592	0.492146519	0.691449291	0.70500136	3	0	0
21	21	0.286531967	0.304093667	0.272116911	0.336905461	0.300850615	0.32349903	0.331579724	0.277250649	0.29628253	0.343523929	0.512380687	0.515726717	2	0	0
22	22	0.691134906	0.707978632	0.688358466	0.712253257	0.701294838	0.716791822	0.718869821	0.685482474	0.516625334	0.437677459	0.683349161	0.822714007	4	8	1
23	23	0.406909414	0.407829839	0.396201932	0.425368332	0.412508803	0.430702412	0.432163145	0.386389232	0.496846335	0.424914067	0.600841701	0.745644349	3	0	0
24	24	0.301034457	0.298982126	0.290691966	0.327364466	0.303368848	0.32403547	0.324933055	0.274008037	0.412968724	0.446258503	0.70775463	0.669346562	3	0	0
25	25	0.357381017	0.364705185	0.351484158	0.378777559	0.366818234	0.390518444	0.393369428	0.353376542	0.455487701	0.419065952	0.679745005	0.694159464	3	0	0
26	26	0.641005492	0.647911677	0.63256209	0.643425602	0.639874815	0.655968029	0.658475927	0.615661943	0.477361857	0.44390107	0.641215067	0.731163743	3	8	1
27	27	0.230645174	0.261223028	0.235950993	0.307605426	0.276774814	0.29746556	0.303933227	0.25110591	0.249626592	0.316157929	0.410637538	0.490427618	0	0	0
6	28	0.266332564	0.273152885	0.255598986	0.294133086	0.274685109	0.29392537	0.298758302	0.254594592	0.369032132	0.387635691	0.441005778	0.596014214	1	0	0
29	29	0.350069362	0.35490641	0.337830717	0.374860014	0.356860303	0.37733267	0.379819529	0.337209014	0.468800399	0.436422112	0.542916249	0.663854051	3	0	0
30	30	0.319591503	0.338728802	0.326984144	0.352233521	0.345330387	0.369195525	0.372838947	0.328497836	0.426925117	0.435626856	0.537046336	0.605514566	3	0	0
31	31	0.276774826	0.310139739	0.302862795	0.332840526	0.324375716	0.345879227	0.348963119	0.313161521	0.42401181	0.446012984	0.519129919	0.623744275	3	0	0
32	32	0.363413884	0.406076288	0.374415003	0.435465814	0.408160605	0.428661906	0.436347822	0.383641981	0.319412211	0.395165638	0.522185242	0.522950922	3	0	0
33	33	0.609104687	0.640552987	0.60783602	0.653419429	0.633097837	0.646063659	0.652350062	0.606748147	0.421644142	0.46683925	0.520386756	0.587102787	3	8	1
34	34	0.820089707	0.847209987	0.830401292	0.827087817	0.833130241	0.849842366	0.851787376	0.827991473	0.544206154	0.491229624	0.609594096	0.721371709	4	8	1
28	35	0.694085489	0.737645844	0.713788348	0.746384656	0.742289079	0.760052333	0.764748329	0.740357786	0.563476363	0.532919006	0.707689413	0.696286925	4	8	1
36	36	0.906907904	0.916383242	0.868612266	0.896199824	0.877128473	0.892502906	0.899594772	0.884564356	0.369450947	0.41335009	0.548268353	0.505023424	3	8	1
37	37	0.374233068	0.412009028	0.383790054	0.445343011	0.417680711	0.43868215	0.446203912	0.400183003	0.38444957	0.449537851	0.560905939	0.579599587	3	0	0
35	38	0.775458443	0.797779608	0.763664321	0.788950337	0.76937444	0.785933851	0.792421413	0.763623737	0.503538083	0.504013486	0.688989241	0.668990071	4	8	1
39	39	0.861983025	0.869965073	0.822637016	0.859487187	0.835465553	0.849292397	0.857151545	0.832824123	0.42370025	0.432763522	0.602334446	0.596440754	3	8	1
40	40	0.598008484	0.615156328	0.559162076	0.648280462	0.599691472	0.614079698	0.625523411	0.580811776	0.268194607	0.332662798	0.424142885	0.409912361	0	8	0
41	41	0.843688522	0.856153779	0.822503698	0.84775341	0.838047286	0.848765716	0.85418011	0.825599606	0.432904848	0.427187423	0.546355819	0.580274206	3	8	1
44	42	0.899811359	0.90970031	0.867746938	0.899055293	0.885984542	0.898643151	0.903604839	0.886982159	0.359213106	0.382794449	0.509125822	0.465680095	1	8	0
43	43	0.683546683	0.731315755	0.71361257	0.748643664	0.748636282	0.767381238	0.769563302	0.752507349	0.565630159	0.509544241	0.694222124	0.716151008	4	8	1
17	44	0.689257486	0.735767469	0.717127081	0.744403137	0.747192946	0.767306381	0.769969531	0.754958199	0.558714744	0.496664224	0.634629976	0.722995037	4	8	1
45	45	0.33670815	0.377455458	0.352473644	0.413922594	0.393215268	0.41696996	0.42291309	0.377282141	0.417954262	0.438671393	0.60421092	0.603098633	3	0	0
46	46	0.375146407	0.388881563	0.366568651	0.40776159	0.381643299	0.403367171	0.408827905	0.355458951	0.348538116	0.394607793	0.539021805	0.495802311	1	0	0
47	47	0.395884205	0.405243665	0.390433629	0.407172744	0.391182976	0.41555903	0.419863747	0.366819036	0.393574581	0.441924028	0.631734384	0.537769461	3	0	0
48	48	0.400997769	0.43634328	0.392011994	0.48358662	0.441092428	0.468496371	0.476190476	0.413079168	0.319309169	0.348802466	0.499995158	0.514376966	1	0	0
49	49	0.233521048	0.252969716	0.234980477	0.27631997	0.252314951	0.271828738	0.277271519	0.221135981	0.288779862	0.340227428	0.409931948	0.526904413	1	0	0
50	50	0.171579454	0.16724043	0.162604274	0.185527893	0.17095967	0.186739224	0.189770662	0.144341809	0.280969728	0.321968408	0.472644995	0.549663405	1	0	0
51	51	0.156817373	0.155800482	0.150268798	0.175122587	0.161709995	0.175937805	0.17901156	0.142040545	0.208610621	0.266731025	0.333897842	0.443707183	0	0	0
52	52	0.244967297	0.254976389	0.243727984	0.265854388	0.251919896	0.272325739	0.27665719	0.224125096	0.329870804	0.327136021	0.470374617	0.579184596	1	0	0

53	53	0.183712246	0.185819315	0.182573062	0.201201489	0.191643036	0.205370621	0.204523397	0.16275259	0.350880802	0.238477277	0.349786023	0.572850668	1	0	0
54	54	0.219292247	0.216750235	0.209750704	0.234555364	0.224688192	0.237111339	0.23737016	0.174488292	0.370259051	0.267940943	0.398172443	0.520751901	1	0	0
55	55	0.753260885	0.778008946	0.755252179	0.782923214	0.778571087	0.793223984	0.79738548	0.766932289	0.507325498	0.477508361	0.629033073	0.646391223	4	8	1
56	56	0.363928871	0.394412174	0.350326247	0.437347927	0.389409268	0.410829976	0.421008154	0.373754223	0.227296172	0.327667829	0.42825929	0.443238104	0	0	0
																20

House

State	District Matched	Clinton16	Abrams18	Thornton18	Biden20	Blackman20	Ossoff21	Warnock21	Abrams22	James18P	Thornton18P	Thornton18RO	Robinson18P	NumCOCPrima	NumCOCGene	Effective?
		0.473388274	0.492966424	0.469746905	0.501266674	0.484807387	0.506108377	0.510380319	0.462047864	0.447544559	0.438661194	0.591370387	0.628587169			
1	1	0.193335405	0.196431157	0.193808519	0.210421288	0.200901512	0.215978935	0.214622842	0.173592641	0.346810616	0.27732596	0.402929398	0.580637817	1	0	0
2	2	0.169562976	0.166999475	0.163546913	0.190058152	0.176762907	0.189483783	0.187649028	0.142458933	0.355779922	0.265017959	0.366987682	0.547632048	1	0	0
3	3	0.190797463	0.201827612	0.19429166	0.222094609	0.209943693	0.223270178	0.22219441	0.181564515	0.329397875	0.29368932	0.394495413	0.533007335	1	0	0
4	4	0.358907205	0.363309425	0.34399393	0.383528859	0.367179718	0.380571518	0.380818981	0.290584388	0.360131164	0.272102273	0.518684909	0.522859676	2	0	0
5	5	0.171612162	0.173299665	0.1685	0.185540705	0.178540437	0.192596108	0.195016611	0.148222878	0.382440476	0.2760181	0.407643312	0.526555387	1	0	0
6	6	0.156356875	0.145715216	0.148136091	0.164133668	0.158585394	0.167896291	0.167119295	0.117663424	0.366804952	0.249647442	0.320562448	0.543028853	1	0	0
7	7	0.166093616	0.162931821	0.157476523	0.180721442	0.168681672	0.181512826	0.185000988	0.14692359	0.215668203	0.257228315	0.335195531	0.417322835	0	0	0
8	8	0.165914425	0.159962963	0.157593445	0.181864594	0.170109612	0.181513231	0.184001989	0.142172879	0.202205882	0.264404104	0.359504132	0.471698113	0	0	0
9	9	0.1472749	0.15231347	0.14568916	0.1694994	0.1521623	0.170462647	0.173248995	0.139056222	0.183179246	0.270094467	0.334513241	0.449588065	0	0	0
10	10	0.167184445	0.167527905	0.158764862	0.185947912	0.168840008	0.186405704	0.191326306	0.148514775	0.225151758	0.31625431	0.447199535	0.50306053	1	0	0
11	11	0.146058458	0.155037883	0.144586094	0.1867689	0.169361788	0.186321961	0.191171702	0.155163879	0.266195459	0.296091566	0.340094057	0.456842233	0	0	0
12	12	0.197827925	0.18950859	0.188662815	0.194489873	0.19063888	0.206945862	0.208323802	0.160741275	0.367056497	0.169157694	0.311704597	0.622716846	1	0	0
13	13	0.329778155	0.343704201	0.321489126	0.353688977	0.331021905	0.357071642	0.362928068	0.30148728	0.317900657	0.326022318	0.463045505	0.566993809	1	0	0
14	14	0.170799447	0.176788966	0.170325166	0.191573663	0.180857367	0.194126304	0.198392873	0.16037025	0.325608327	0.331665256	0.503995974	0.521823078	2	0	0
15	15	0.254197444	0.274913899	0.263438017	0.28627015	0.274888764	0.294867158	0.299268258	0.241738525	0.32928436	0.351842235	0.444460716	0.581101598	2	0	0
16	16	0.201574627	0.20830024	0.20469315	0.223706223	0.215172124	0.230541257	0.233228821	0.194126292	0.355810326	0.373049734	0.523952647	0.608649066	3	0	0
17	17	0.278367941	0.326419903	0.317016002	0.358007095	0.349847363	0.374667918	0.377996359	0.341071371	0.40200607	0.436290985	0.49906062	0.614513916	2	0	0
18	18	0.159768597	0.147912431	0.144070794	0.159786835	0.156258218	0.16527077	0.167825721	0.131366867	0.310335386	0.309074122	0.504682473	0.551144681	2	0	0
19	19	0.341079652	0.387325675	0.371536669	0.414714667	0.397597854	0.421870818	0.425660143	0.397603822	0.466500823	0.48965197	0.573805345	0.631619065	3	0	0
20	20	0.26075213	0.297510901	0.26956216	0.334853541	0.30550493	0.326064956	0.333231945	0.281512089	0.283422509	0.378486367	0.38553371	0.52745748	1	0	0
21	21	0.209588607	0.239782416	0.214762938	0.277206136	0.245476977	0.26573355	0.272010227	0.230438548	0.288318169	0.332590439	0.338413058	0.519436392	1	0	0
22	22	0.34977693	0.400441896	0.376022703	0.416266755	0.396668856	0.420583492	0.426369257	0.375634335	0.352920965	0.412906739	0.512934845	0.563457139	3	0	0
23	23	0.201650552	0.220974695	0.203885786	0.256253564	0.233980471	0.253473101	0.259099432	0.212936363	0.288947332	0.320391087	0.362073044	0.570910426	1	0	0
24	24	0.290074649	0.33244101	0.29882174	0.372728247	0.33857272	0.362245518	0.367840156	0.298927974	0.276708573	0.354138474	0.419357397	0.525912663	1	0	0
25	25	0.354128542	0.388223066	0.344765626	0.440929079	0.39617647	0.422360799	0.429847227	0.365523717	0.276435182	0.292769342	0.460326095	0.4944791	0	0	0
26	26	0.242231166	0.270883131	0.24351472	0.323509966	0.28956331	0.311331322	0.318939305	0.270998351	0.239849031	0.298637383	0.420948075	0.473482725	0	0	0
27	27	0.156426406	0.16326091	0.149645857	0.188400088	0.166663373	0.184143765	0.189274807	0.145158285	0.232721236	0.304430303	0.251699094	0.514839124	1	0	0
28	28	0.176695592	0.198528169	0.181471442	0.235652009	0.211008457	0.227273324	0.232935924	0.189334033	0.249236407	0.322033163	0.37584715	0.468273114	0	0	0
29	29	0.392039748	0.424011577	0.399008825	0.42387923	0.401493405	0.425509492	0.430692966	0.355705335	0.335187749	0.379530601	0.54418675	0.56095961	2	0	0
30	30	0.225213724	0.250148004	0.233122828	0.284052498	0.260307377	0.278494824	0.28377744	0.229965979	0.307721678	0.35298939	0.452520504	0.495815811	0	0	0
31	31	0.200374593	0.212570583	0.202855039	0.240939129	0.222577124	0.244181771	0.248795871	0.192537943	0.308663056	0.339985416	0.483748371	0.596260561	1	0	0
32	32	0.159197652	0.154557669	0.152918468	0.170183497	0.156395122	0.173059398	0.175030578	0.134537202	0.34460273	0.319548172	0.519247242	0.632957273	2	0	0
33	33	0.19906635	0.174256339	0.176531893	0.194835603	0.179869635	0.195877004	0.195251555	0.148551758	0.339478057	0.424441605	0.656454108	0.579373172	3	0	0
34	34	0.363722241	0.397067359	0.36444471	0.44011152	0.404965172	0.425642049	0.436075045	0.391380757	0.380363516	0.460461251	0.542639745	0.589300732	3	0	0
35	35	0.541405214	0.595645548	0.564302726	0.606697085	0.590509393	0.613905775	0.619685451	0.569329094	0.390872612	0.44374621	0.607866013	0.567733784	3	8	1
36	36	0.321327714	0.356505072	0.332098384	0.394998934	0.367938335	0.386900352	0.393388919	0.348027697	0.356748398	0.431976299	0.577300624	0.558255813	3	0	0
37	37	0.549293505	0.58092481	0.538123181	0.599408759	0.56769805	0.580256076	0.590787884	0.531752922	0.355731597	0.44415253	0.562134643	0.544684909	3	8	1
38	38	0.676545481	0.722908289	0.70528789	0.724291581	0.725319256	0.745348717	0.7472608	0.71740506	0.536732625	0.51676018	0.673015545	0.690251856	4	8	1
39	39	0.761353244	0.793022659	0.768206075	0.787574405	0.784626313	0.799128507	0.804852761	0.770311475	0.53562488	0.534539141	0.710600918	0.679637707	4	8	1
61	40	0.757227019	0.785599856	0.751056096	0.788982783	0.763866549	0.779000465	0.786601071	0.762698417	0.508375194	0.528774652	0.722865635	0.679239429	4	8	1
41	41	0.688721238	0.71985314	0.695075412	0.710506988	0.710603486	0.725555052	0.729564414	0.685604467	0.516420383	0.53174617	0.649162425	0.638445349	4	8	1
42	42	0.646531421	0.687788213	0.647060205	0.689292498	0.657035146	0.676958194	0.685458856	0.639533965	0.423710337	0.472129092	0.56781124	0.560911618	3	8	1
43	43	0.603439544	0.626197218	0.587792341	0.637601308	0.606332373	0.616481426	0.624685034	0.579128635	0.355964252	0.427433436	0.529450614	0.521991175	3	8	1
44	44	0.382029316	0.423645017	0.390706308	0.459788243	0.430481443	0.453648478	0.461262987	0.409649561	0.305206392	0.386899622	0.533740647	0.51945769	2	0	0
45	45	0.403928457	0.420322336	0.363687372	0.479192166	0.413365647	0.435390563	0.4476899	0.399728741	0.173228346	0.302139891	0.375205931	0.367587706	0	0	0
46	46	0.377350441	0.409783383	0.368193565	0.449474063	0.403889917	0.425419953	0.435127916	0.389466021	0.238165091	0.341063795	0.451500843	0.444006633	0	0	0
47	47	0.386830168	0.404828666	0.359455377	0.44397516	0.396320306	0.417102232	0.427649332	0.368826438	0.315940252	0.354153612	0.533865938	0.505349109	2	0	0
48	48	0.438148409	0.462542945	0.411991234	0.514732189	0.462375823	0.477851204	0.488549159	0.434446244	0.294738668	0.358175926	0.474267721	0.467867098	0	1	0
49	49	0.409183891	0.433033863	0.380608631	0.480089798	0.424643667	0.441988358	0.453840714	0.402921599	0.267515406	0.334326607	0.48874905	0.486314305	0	0	0

50	50	0.518541988	0.555821193	0.502607794	0.593893814	0.552092051	0.578411664	0.586133501	0.515369082	0.326723735	0.376665505	0.500438465	0.515074755	2	8	0
51	51	0.55089998	0.572806966	0.527443206	0.608223714	0.568278616	0.58113775	0.589898753	0.540678201	0.339433644	0.385231188	0.4881505	0.473732047	0	8	0
52	52	0.575881684	0.59378152	0.529129449	0.636095183	0.580062396	0.595655195	0.608107119	0.569699037	0.267906126	0.33866032	0.432828283	0.405326405	0	8	0
53	53	0.497160021	0.499199719	0.428130532	0.547807974	0.474514124	0.484323737	0.499789912	0.45476486	0.227296018	0.304827031	0.434190053	0.391010307	0	1	0
54	54	0.553977031	0.564145438	0.494649989	0.610386422	0.545541658	0.555540902	0.567288063	0.544259468	0.255010748	0.34435606	0.452385741	0.408052362	0	7	0
55	55	0.814549412	0.811443727	0.755566629	0.809383799	0.766887276	0.783150266	0.794601371	0.764357621	0.419092953	0.45807184	0.658947012	0.627458117	3	8	1
56	56	0.920567528	0.937233365	0.901097687	0.910374171	0.898516562	0.916032196	0.92195985	0.898580354	0.474005865	0.48731918	0.68755526	0.664889722	3	8	1
57	57	0.79567823	0.803466141	0.718227679	0.810250395	0.755961475	0.773721219	0.785720639	0.763712781	0.215087473	0.307691793	0.386297353	0.301043323	0	8	0
58	58	0.924430156	0.935173382	0.890261594	0.909709403	0.893134804	0.909075066	0.915792547	0.899733566	0.410784994	0.430977877	0.609180902	0.563269855	3	8	1
59	59	0.950304617	0.960289836	0.929107355	0.93370604	0.929215684	0.942519516	0.946572913	0.93072788	0.468347436	0.463219081	0.653141624	0.638250458	3	8	1
60	60	0.73396715	0.730087979	0.676836957	0.746813182	0.707001841	0.715814082	0.72751667	0.694093686	0.425560648	0.420894808	0.613833458	0.620419535	3	8	1
64	61	0.57796075	0.631442042	0.607520085	0.658853132	0.653639741	0.6821135	0.685481556	0.669110791	0.580723542	0.525516055	0.673704415	0.703358736	4	8	1
62	62	0.935399792	0.943378664	0.912713836	0.925448094	0.922263668	0.934147795	0.938224355	0.918840164	0.455852205	0.46159196	0.62974292	0.620008924	3	8	1
63	63	0.919679506	0.927949649	0.896712267	0.908451513	0.907112718	0.918242832	0.924279606	0.901689708	0.422722685	0.439639324	0.571169346	0.600229334	3	8	1
40	64	0.31284745	0.350069529	0.338603119	0.383670099	0.375277919	0.401530752	0.40485486	0.38251903	0.475966214	0.474624614	0.477522667	0.651870347	2	0	0
65	65	0.748020114	0.77360744	0.757880334	0.762025684	0.761532993	0.77411447	0.777337702	0.750742504	0.59490062	0.543868902	0.723110744	0.728195949	4	8	1
66	66	0.63815534	0.686397549	0.667064974	0.702634385	0.701943667	0.722319322	0.726339247	0.695610019	0.572458791	0.512727273	0.655826558	0.708869814	4	8	1
67	67	0.628927128	0.663334311	0.647320539	0.661694089	0.655971387	0.676984396	0.679753524	0.648818623	0.578281487	0.522467726	0.726116428	0.727463957	4	8	1
68	68	0.599050834	0.630510888	0.606717201	0.650223328	0.63949854	0.646794827	0.6521016	0.621549153	0.514156988	0.510428155	0.643911132	0.689798393	4	8	1
69	69	0.703366606	0.738840798	0.719027725	0.740912054	0.735015365	0.754992421	0.758597971	0.738006254	0.519584469	0.516551473	0.683121019	0.707859175	4	8	1
70	70	0.37581419	0.387764394	0.366345634	0.383004127	0.365539884	0.390444642	0.39526996	0.348372674	0.430811694	0.435115874	0.504565755	0.64313357	3	0	0
71	71	0.304649305	0.320907843	0.310701391	0.328617705	0.319166453	0.346643408	0.351041044	0.304543274	0.344465873	0.412467606	0.556026486	0.5555714	3	0	0
72	72	0.298187775	0.286641579	0.270311752	0.285846177	0.271342558	0.287344106	0.292835807	0.234981326	0.318120623	0.359833756	0.404040147	0.502973699	1	0	0
73	73	0.281380627	0.301175487	0.276364894	0.36116553	0.330631982	0.350856132	0.357192426	0.312461421	0.341182871	0.384427185	0.465866265	0.578967632	2	0	0
82	74	0.332616905	0.345715985	0.326033538	0.368329701	0.349264289	0.369683658	0.37329737	0.345391529	0.44150594	0.404357399	0.515802654	0.610174976	3	0	0
75	75	0.866661225	0.890557584	0.873944986	0.864383402	0.875546219	0.892923887	0.895188642	0.873300979	0.566686068	0.473171713	0.543890231	0.72731036	4	8	1
76	76	0.863146273	0.879585003	0.863889298	0.849946949	0.860665553	0.880784719	0.881135942	0.860975461	0.572555661	0.453179503	0.577367613	0.74832865	4	8	1
77	77	0.90744908	0.923558106	0.90831879	0.894447127	0.907077419	0.92208197	0.922505584	0.903704668	0.537164963	0.483376698	0.625899281	0.73763502	4	8	1
74	78	0.70933115	0.750793937	0.734908402	0.754827376	0.759799234	0.783138752	0.784808552	0.766889276	0.577212063	0.504745715	0.618294529	0.725167771	4	8	1
79	79	0.897255499	0.912328589	0.897957839	0.88058336	0.889702569	0.905600669	0.907637232	0.883101852	0.556053812	0.455418909	0.571261682	0.724006116	4	8	1
80	80	0.560759676	0.577654845	0.51974405	0.616160667	0.567684475	0.582653225	0.595374583	0.547298733	0.250676988	0.30751557	0.390392486	0.4082822	0	8	0
101	81	0.699066745	0.715863329	0.657087994	0.739555382	0.69916515	0.707676581	0.717763387	0.692887622	0.220949981	0.318350902	0.373985847	0.324954864	0	8	0
84	82	0.913757723	0.92042608	0.879755691	0.911679331	0.898731703	0.90931623	0.913976451	0.896204216	0.336676153	0.382926473	0.511034799	0.445368033	1	8	0
83	83	0.612428817	0.63285881	0.566402758	0.658550526	0.597911978	0.617841872	0.630168213	0.595114607	0.249871737	0.332816337	0.432233111	0.425751131	0	8	0
115	84	0.796729788	0.825396825	0.807855405	0.821648724	0.823742983	0.840013714	0.84283177	0.830634668	0.554020546	0.513116996	0.690202518	0.722636664	4	8	1
85	85	0.869916038	0.881095805	0.84422508	0.867107134	0.861616332	0.873462428	0.878355416	0.85431105	0.381669703	0.409144241	0.529523653	0.514537315	3	8	1
86	86	0.833076163	0.850611384	0.811439281	0.84178524	0.831990496	0.845292841	0.850424604	0.817013102	0.373172287	0.395971926	0.499212102	0.5139407	1	8	0
87	87	0.784703285	0.79929681	0.768192452	0.800608747	0.793607104	0.806810584	0.81180688	0.774615911	0.413463419	0.418386313	0.513997333	0.56667687	3	8	1
88	88	0.809411693	0.826476407	0.803888015	0.818432367	0.817943157	0.830225818	0.834857444	0.802449547	0.478251288	0.461275585	0.605549562	0.621077068	3	8	1
89	89	0.928408991	0.932926427	0.89274786	0.924830401	0.909624149	0.918985103	0.924581748	0.908503766	0.352003541	0.390535993	0.541871384	0.46611494	1	8	0
90	90	0.918239476	0.927505429	0.877317047	0.919941526	0.901961861	0.911215167	0.917979549	0.903556041	0.342018234	0.373819437	0.534911304	0.439918958	1	8	0
116	91	0.794678347	0.824743651	0.807195385	0.819834253	0.823439318	0.841362162	0.843729472	0.825797174	0.559886249	0.488700555	0.675244872	0.721957693	4	8	1
91	92	0.747162284	0.785610679	0.770400117	0.795980602	0.797175196	0.810558802	0.813309812	0.803199308	0.584197595	0.504376319	0.692891423	0.711326798	4	8	1
92	93	0.723694045	0.76221012	0.74126417	0.776945206	0.778296735	0.797361018	0.799136192	0.783071375	0.566590855	0.516965212	0.675665019	0.723463316	4	8	1
94	94	0.723749	0.75386787	0.731539398	0.759514472	0.7530403	0.77062369	0.775103197	0.743649954	0.520226629	0.485117197	0.670542429	0.672300607	4	8	1
95	95	0.785166688	0.82153466	0.802343273	0.818105116	0.819213328	0.836801358	0.839404133	0.809355126	0.57348496	0.509106328	0.702050821	0.709057156	4	8	1
96	96	0.651266482	0.683080214	0.65153079	0.668715863	0.661968287	0.683627099	0.687444194	0.624692401	0.440740489	0.453262115	0.604757889	0.576209251	3	8	1
97	97	0.603343872	0.632324262	0.595636506	0.639670253	0.621131883	0.637556719	0.644655676	0.58537403	0.38512196	0.425986165	0.56364352	0.543954448	3	8	1
98	98	0.775992532	0.794922704	0.76687242	0.746467283	0.754318024	0.782479967	0.783845732	0.717403688	0.463754031	0.451567221	0.647503885	0.582933202	3	8	1
99	99	0.446519868	0.486109113	0.446559608	0.527781494	0.493392888	0.520491681	0.527725433	0.467114866	0.382734175	0.446634094	0.599299327	0.563728498	3	3	0
100	100	0.313356593	0.348539964	0.317463648	0.398793192	0.365202133	0.391207969	0.397133525	0.339228121	0.326800232	0.335586873	0.494654723	0.548898069	1	0	0

107	101	0.558751311	0.605316181	0.572457102	0.615595578	0.60210877	0.628875712	0.633327521	0.572491261	0.446812456	0.443076962	0.597659587	0.601074812	3	8	1
102	102	0.626579213	0.669106809	0.643179715	0.670914089	0.666117966	0.699388936	0.70254388	0.645517482	0.494198793	0.48080568	0.63632716	0.665190688	3	8	1
103	103	0.359569965	0.403342655	0.377526158	0.433058423	0.407609656	0.430838075	0.437489444	0.380938747	0.398855351	0.40936301	0.585710062	0.590219652	3	0	0
104	104	0.277106127	0.314919705	0.29288448	0.36173845	0.340236222	0.364959608	0.371709435	0.333176568	0.420177155	0.444476858	0.593129657	0.616551259	3	0	0
105	105	0.415037926	0.468591249	0.441045597	0.501565385	0.486982663	0.51043956	0.515756452	0.471056658	0.433976885	0.447155393	0.642076885	0.62666992	3	3	0
93	106	0.723567544	0.760532208	0.742816362	0.765536913	0.764776294	0.780225264	0.782985643	0.758809586	0.568080029	0.504975179	0.707701678	0.702082932	4	8	1
106	107	0.576293702	0.615660654	0.585543828	0.624596279	0.61711475	0.643936304	0.648931425	0.587908085	0.463590904	0.441052347	0.608644186	0.629156036	3	8	1
108	108	0.449588761	0.485008256	0.449833546	0.538552828	0.509601905	0.537118757	0.545064312	0.492446115	0.373122816	0.425493326	0.553229074	0.550349464	3	4	0
109	109	0.801008969	0.826833721	0.805865689	0.768087459	0.776318369	0.813697249	0.816132517	0.746478873	0.501190476	0.464487744	0.595121951	0.64789604	4	8	1
110	110	0.501236	0.573385681	0.552943134	0.61742975	0.607138832	0.634553812	0.638243655	0.616844016	0.536482626	0.483799369	0.680293312	0.6915417	4	8	1
111	111	0.270791766	0.318435768	0.306864251	0.362416368	0.35131485	0.370691982	0.373761735	0.346033367	0.438518968	0.457833512	0.63372497	0.626011416	3	0	0
112	112	0.275127551	0.292728055	0.28340733	0.308674315	0.298744538	0.315820391	0.318495666	0.278518638	0.45130814	0.437833715	0.572016461	0.633460076	3	0	0
113	113	0.672978059	0.717282265	0.704558982	0.716557769	0.720635476	0.745869001	0.748323427	0.727653683	0.557688996	0.499418678	0.67035804	0.724325114	4	8	1
114	114	0.282411726	0.286893514	0.270725544	0.30181554	0.284754365	0.306825221	0.309835401	0.269301123	0.353022377	0.377675187	0.537327717	0.618985481	2	0	0
117	115	0.634492154	0.692871354	0.676529564	0.723779586	0.723176624	0.74567994	0.748727576	0.731725075	0.552803578	0.514773941	0.725428028	0.718617772	4	8	1
78	116	0.670223602	0.719173621	0.699271131	0.722540437	0.725039531	0.740122659	0.742959271	0.729502506	0.546935597	0.493699916	0.607294886	0.721314979	4	8	1
81	117	0.255167215	0.297816801	0.283742941	0.351835049	0.339726473	0.369184417	0.372022976	0.379079071	0.485330681	0.47425897	0.680478821	0.699329551	3	0	0
118	118	0.324420594	0.333832218	0.32623432	0.33722527	0.330979733	0.354921157	0.357722107	0.322499621	0.485564711	0.4220632	0.537540236	0.689778198	3	0	0
119	119	0.23360936	0.245737378	0.233572857	0.272060808	0.257364833	0.279742801	0.28369734	0.242176179	0.365424229	0.39976194	0.478533557	0.557736336	2	0	0
120	120	0.432373303	0.435252958	0.413376361	0.449048827	0.416850455	0.444026764	0.450307131	0.396394585	0.330962173	0.398163403	0.549924878	0.509860232	2	0	0
121	121	0.438313471	0.438178135	0.407733617	0.459818777	0.419399763	0.442517688	0.450332613	0.385219883	0.305629486	0.360992553	0.463406668	0.431841982	0	0	0
122	122	0.782920964	0.798241378	0.768872354	0.787717535	0.771953115	0.795837644	0.80098019	0.765468225	0.446967808	0.48278219	0.731612289	0.533632619	3	8	1
123	123	0.314528127	0.302333237	0.315256357	0.319462228	0.308538967	0.319256059	0.320114166	0.27358224	0.448229494	0.475930972	0.821002387	0.679481241	3	0	0
124	124	0.391102562	0.384129788	0.367482333	0.398036644	0.377178869	0.393638241	0.397704515	0.339500613	0.392878764	0.394544532	0.513355262	0.615794421	2	0	0
125	125	0.31244735	0.338008115	0.325193861	0.374982145	0.354943455	0.378397739	0.379866253	0.342297983	0.497931714	0.448401293	0.55318938	0.729034408	3	0	0
126	126	0.619522818	0.621192128	0.611541322	0.619683874	0.616985644	0.629838373	0.630552046	0.589373699	0.571306234	0.465270348	0.713561889	0.843053766	4	8	1
127	127	0.322473097	0.338884045	0.315848076	0.374876531	0.341453422	0.364943266	0.36703493	0.317425647	0.388495348	0.414591376	0.560127497	0.675889699	3	0	0
128	128	0.510483612	0.498866774	0.485768823	0.502530167	0.495365486	0.509821463	0.512052877	0.454525878	0.483556902	0.357222844	0.681927711	0.729199549	2	4	0
129	129	0.672590252	0.673317113	0.64962387	0.685630121	0.666910903	0.683521419	0.685774302	0.63419695	0.478764997	0.426185165	0.682900477	0.787612877	3	8	1
130	130	0.662745857	0.68131901	0.666482236	0.683851484	0.6796869	0.694697333	0.696074932	0.673006349	0.529105092	0.432216831	0.667598275	0.829987734	4	8	1
131	131	0.293234928	0.321721628	0.299739853	0.367011421	0.335742675	0.363930695	0.364086398	0.323187457	0.456080363	0.456353937	0.607114579	0.698750367	3	0	0
132	132	0.697489191	0.706540315	0.691818058	0.702392984	0.698609654	0.7174983	0.719002418	0.67240363	0.511386065	0.453401939	0.707157597	0.830777391	4	8	1
149	133	0.609517037	0.605813703	0.590598652	0.599689626	0.592853225	0.614188986	0.616437851	0.56213004	0.478449781	0.487655592	0.735343086	0.748356743	3	8	1
135	134	0.252257536	0.251387338	0.241194809	0.261114193	0.251854248	0.265931429	0.268761046	0.231984905	0.408639599	0.31470583	0.451631024	0.617422494	1	0	0
134	135	0.324159407	0.325261444	0.317166616	0.327837222	0.319414598	0.340134431	0.342989986	0.291709666	0.451612903	0.419006479	0.546134663	0.692307692	3	0	0
136	136	0.350853304	0.354939083	0.339460605	0.349929452	0.33721345	0.357106114	0.36018829	0.305557624	0.411949666	0.449763942	0.576981915	0.66394531	3	0	0
137	137	0.580536832	0.588272447	0.569750585	0.589662445	0.583066331	0.59986244	0.601140787	0.565601688	0.583124173	0.449736809	0.621002587	0.719553729	4	8	1
138	138	0.276134197	0.272907498	0.25483058	0.298510823	0.272617328	0.294883492	0.298407465	0.254631792	0.408685306	0.405977584	0.464208243	0.608722741	1	0	0
139	139	0.334341223	0.347320699	0.330780194	0.391490975	0.368880422	0.387196237	0.38898431	0.347450143	0.480097089	0.399892194	0.454494558	0.647308114	2	0	0
140	140	0.751150518	0.769234685	0.751855742	0.747135973	0.741100015	0.765443198	0.769013152	0.74508316	0.601994577	0.442569564	0.527694581	0.729821998	4	8	1
141	141	0.721725602	0.741896633	0.721974699	0.737048822	0.731014457	0.7494043	0.751229594	0.728038962	0.642356642	0.459932807	0.580065691	0.753293937	4	8	1
142	142	0.557939354	0.573777359	0.546421029	0.594036372	0.571742924	0.591787002	0.596041941	0.549976774	0.436161305	0.441260346	0.625045852	0.685798881	3	8	1
143	143	0.604965718	0.618552837	0.601271869	0.615974888	0.610886822	0.629265608	0.631673558	0.600609	0.462760865	0.498804562	0.679385322	0.727381598	3	8	1
144	144	0.295103235	0.289342667	0.277341967	0.299093773	0.282245273	0.302232476	0.304543529	0.259418883	0.426338219	0.403923608	0.593159543	0.653987214	3	0	0
145	145	0.553907094	0.554372389	0.538146387	0.554705437	0.5465782	0.562596237	0.56490423	0.508304406	0.462051467	0.46051661	0.659995294	0.731009061	3	8	1
146	146	0.330638991	0.355758353	0.340173968	0.383965478	0.369330975	0.393004831	0.395281194	0.357004158	0.516594813	0.559425502	0.764876561	0.693019262	4	0	0
147	147	0.379582774	0.419133936	0.405735174	0.446176602	0.434749837	0.458350573	0.460191627	0.421027794	0.511124528	0.557387208	0.706848189	0.694402535	4	0	0
148	148	0.328259236	0.316717013	0.297970165	0.327627786	0.310557303	0.328642986	0.331263609	0.291251319	0.518487841	0.487938464	0.681509862	0.695614765	4	0	0
133	149	0.342298943	0.325637692	0.317595376	0.334837931	0.329217594	0.344144612	0.346870005	0.296366033	0.456989247	0.382376718	0.511023622	0.689378758	2	0	0
150	150	0.559454096	0.549589432	0.533907945	0.545509201	0.538591928	0.554299608	0.556169258	0.510674188	0.542049062	0.512037412	0.73762934	0.750728535	4	8	1
151	151	0.483813755	0.471954911	0.457669257	0.480942439	0.474007987	0.487718117	0.488699276	0.445225919	0.546506729	0.485051121	0.672537566	0.714958977	4	0	0

152	152	0.273846726	0.285477169	0.275815499	0.301698699	0.290883386	0.312260095	0.312861511	0.279275889	0.554240048	0.470126088	0.616416019	0.72919785	4	0	0
153	153	0.672765181	0.679787129	0.65971917	0.68248684	0.674057198	0.688651649	0.689876102	0.659314737	0.606892658	0.480408536	0.639188607	0.799901376	4	8	1
154	154	0.546445735	0.538286675	0.528020566	0.537715335	0.532086239	0.550366692	0.549998445	0.493146431	0.567890067	0.463591738	0.611168191	0.754342785	4	7	1
155	155	0.345691998	0.327929784	0.320616288	0.348937608	0.339050028	0.354074821	0.356132174	0.313014827	0.478991597	0.430993877	0.651741294	0.68448439	3	0	0
156	156	0.294511932	0.282894235	0.2766954	0.297578844	0.288051211	0.301219636	0.303518186	0.248621253	0.528252126	0.436247451	0.662000294	0.735562571	4	0	0
157	157	0.248145685	0.236994524	0.232031631	0.251102464	0.244279443	0.257181943	0.257071669	0.207579766	0.48853211	0.388973966	0.693939394	0.720215219	3	0	0
158	158	0.353142713	0.341227607	0.327101233	0.349207455	0.334163047	0.351157324	0.351795475	0.304709106	0.488864217	0.391422355	0.625270488	0.709841256	2	0	0
159	159	0.300297324	0.292779177	0.279979667	0.304476675	0.292963392	0.310407928	0.310947059	0.265088608	0.459551621	0.394707862	0.605628982	0.696454973	2	0	0
160	160	0.326453291	0.305178295	0.288363933	0.317821408	0.297314769	0.312078346	0.313537641	0.255951283	0.411665258	0.391114983	0.545454545	0.633187773	2	0	0
161	161	0.324559428	0.367911812	0.359455022	0.406808326	0.395780833	0.419962619	0.420056564	0.389734428	0.554283908	0.519472475	0.713534582	0.703587221	4	0	0
162	162	0.650399594	0.686970683	0.674150374	0.672134807	0.66779147	0.689267673	0.690072097	0.657569997	0.604277044	0.56363639	0.787382789	0.751743745	4	8	1
163	163	0.721397566	0.731311264	0.705934126	0.726590145	0.711453097	0.729062226	0.731394186	0.700788472	0.494527148	0.514763393	0.741287834	0.681105196	3	8	1
164	164	0.363497759	0.419020971	0.403421161	0.42855853	0.411323653	0.434729644	0.434662179	0.406207242	0.499511809	0.52896246	0.758471495	0.696327361	3	0	0
165	165	0.789585306	0.789875194	0.768546441	0.780310443	0.773462031	0.785062715	0.786326967	0.753969833	0.568896018	0.535933547	0.76605231	0.738101914	4	8	1
166	166	0.311572215	0.313517299	0.283386915	0.347004837	0.304497184	0.330049735	0.333164208	0.284434901	0.275482894	0.410264041	0.631348954	0.52193143	3	0	0
167	167	0.304458287	0.312500819	0.300391888	0.326780105	0.318924747	0.337682865	0.337909603	0.30075772	0.483960061	0.476491862	0.697969976	0.724117836	3	0	0
168	168	0.60980371	0.635030033	0.624548845	0.622503467	0.621162556	0.645952449	0.647857122	0.602395463	0.550534006	0.542481668	0.783365571	0.788629663	4	8	1
169	169	0.274300114	0.264139699	0.24642646	0.276723639	0.266634471	0.280646159	0.281841915	0.237035575	0.506274842	0.368616631	0.559172735	0.699105011	3	0	0
170	170	0.273340379	0.2609803	0.244078704	0.284566814	0.267604994	0.288125699	0.289457055	0.236223045	0.450963956	0.427226027	0.502040816	0.667808219	3	0	0
171	171	0.392632781	0.381894237	0.371002468	0.395719263	0.390447474	0.395343334	0.395715096	0.346875	0.504876916	0.427166276	0.586419753	0.727358048	4	0	0
172	172	0.273420064	0.256362297	0.246247113	0.273246777	0.261114074	0.276027041	0.276839095	0.227254062	0.55191768	0.413434248	0.587155963	0.654390935	4	0	0
173	173	0.405792616	0.400788374	0.383981892	0.419149497	0.40307399	0.413339576	0.412950987	0.370614349	0.551106428	0.450937155	0.601593625	0.740781508	4	0	0
174	174	0.213691093	0.198412807	0.197744242	0.207631953	0.202579311	0.208521843	0.208067166	0.199440635	0.523771063	0.375237755	0.556597249	0.671581437	3	0	0
175	175	0.353262243	0.35243498	0.339676636	0.35654416	0.344561387	0.354097201	0.354041359	0.309956534	0.539249912	0.39883155	0.525296435	0.735044441	4	0	0
176	176	0.284814371	0.280642473	0.273388823	0.286630462	0.279345328	0.2936341	0.294397263	0.250457524	0.546376829	0.406106676	0.606451462	0.729219158	4	0	0
177	177	0.521123717	0.537519511	0.51689791	0.571826198	0.555267445	0.569703793	0.570053944	0.489173429	0.544818028	0.444975854	0.637047575	0.74068558	4	7	1
178	178	0.158893193	0.144698845	0.145252945	0.158453638	0.152747203	0.16236938	0.161099653	0.127159397	0.462709351	0.404514968	0.69200643	0.693969294	3	0	0
179	179	0.394509904	0.393661972	0.375606499	0.420313155	0.400237883	0.403	0.403871315	0.352351207	0.415138693	0.462121212	0.594455852	0.630976096	3	0	0
180	180	0.321039396	0.337274983	0.326166587	0.342310665	0.328603836	0.343821331	0.342032229	0.295455687	0.460857726	0.458689459	0.625482625	0.653437279	3	0	0