STATE OF NORTH CAROLINA

COUNTY OF WAKE

IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
NO. 18-CVS-014001

COMMON CAUSE, et al.,

Plaintiffs,

v.

Representative DAVID R. LEWIS, in his official capacity as Senior Chairman of the House Select Committee on Redistricting, et al.,

Defendants.

MOTION FOR LEAVE TO FILE *AMICI CURIAE* BRIEF BY SAMUEL S.-H. WANG AND THE PRINCETON GERRYMANDERING PROJECT

Samuel S.-H. Wang, Ph. D. and the Princeton Gerrymandering Project respectfully move this Court for leave to file the *amici curiae* brief attached hereto at Exhibit A, on behalf of Professor Samuel S.-H. Wang, Director of the Princeton Gerrymandering Project and the Princeton Gerrymandering Project.

In support of this Motion, Professor Wang and the Princeton Gerrymandering Project show the Court as follows:

1. The Princeton Gerrymandering Project is a redistricting policy and research group housed at the Center for Information Technology Policy at Princeton University and dedicated to bridging the gaps between math, law and technology. Its director is Professor Samuel S.-H. Wang, a professor at Princeton University.

2. The Princeton Gerrymandering Project seeks permission to participate as *amici curiae* solely to provide information to the Court in the form of the attached brief from Professor Wang concerning issues before the Court.

3. Professor Wang has participated in the filing of *amicus* briefs before the United States Supreme Court on issues related to gerrymandering and has also authored a number of law review articles on the subject of partisan gerrymandering.

4. As such, he brings a unique and valuable point of view to the Court, especially on the subject of his letter, namely, public access to data.

WHEREFORE, the Professor Wang and the Princeton Gerrymandering Project respectfully request that this Court:

a. Grant them leave to submit the attached *amici curiae* matter attached as Exhibit A; and

b. Grant such other and further relief as the Court deems just and proper.

This the 27th day of September, 2019.

WOMBLE BOND DICKINSON (US) LLP

Pressly M. Millen
N.C. State Bar No. 16178
555 Fayetteville Street, Suite 1100
Raleigh, North Carolina 27601
Telephone: (919) 755-2100
Facsimile: (919) 755-2150
Email: Press.Millen@wbd-us.com

Attorneys for Amici *Professor Samuel S.-H Wang and the Princeton Gerrymandering Project*

EXHIBIT A

STATE OF NORTH CAROLINA

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BRIEF OF SAMUEL S.-H. WANG, PH.D.
AS *AMICUS CURIAE*

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INTRODUCTION

In September, in response to this Court's ruling, the North Carolina General Assembly prepared a remedial plan (the "Remedial Maps") to replace the House and Senate legislative maps, which were last modified in 2017 ("2017 Maps"). However, the process by which those maps were prepared using a process that deviates from this Court's instructions. This brief presents analysis demonstrating that because of that process, the resulting maps fail to remove completely the partisan skew of the 2017 Maps.

It is true that the Remedial Maps succeeded in complying with the Court's order in regard to compactness. *Common Cause v. Lewis*, 18-CVS-014001, 354-55 (Wake Cty. Sup. Ct. Sept. 3, 2019)(requiring that the "mapmakers . . . make reasonable efforts to . . . improve the compactness of the districts"). However, the General Assembly did so without fully complying with another part of the Court's order, specifying that lines be drawn in full public view. *Id.* at 356 (requiring that the maps be drawn "in full public view"). Instead, it chose as its starting point a group of maps drawn according to the computer algorithms of expert witness Dr. Jowei Chen. This unusual method of compliance led to an important consequence: a failure to eliminate partisan skew.

Dr. Chen's maps were created not for the purpose of holding actual elections, but to provide a baseline to ascertain whether the biases in the 2017 Maps could be explained by neutral principles of compactness and preserving county and city boundaries. Answering this question required a means of establishing the full range of what such principles would create. This range can be identified by computer simulation, and creates what statisticians call a "null hypothesis" for testing whether a particular observation (in this case, a set of election results using the 2017 Maps) could have arisen by chance.

The General Assembly has repurposed these maps for a new application – drawing maps for use in actual elections. This has led to two major problems. The first problem is one of "algorithmic bias." Writing a computer program to generate random plans, as Dr. Chen did, requires giving the computer instructions on how and where to draw lines - and such instructions can carry hidden biases. "Algorithmic bias" is well-known in other domains besides redistricting, and can lead to unintended bias by social group, ethnicity, or gender without any intention on the part of the designer of the algorithm. In the current situation, Dr. Chen's maps tend to favor Republican candidates on average. *See* Pls.' Ex. 10. By choosing those maps as a starting point, legislators have started with a stacked deck that favors the Republican Party.

A second problem arises from the fact that real-world redistricting is anything but random. Lines are drawn with some goal in mind. That goal can include the preservation of communities of interest – and it can also include the creation of advantage for an individual candidate or even a whole political party. Even after establishing a random starting point, the Legislature could have made sure that the influence of partisanship was minimized by amending the Remedial Maps to respect local interests and build competitive districts. However, amendments were done with little or no public input.[1]

This brief analyzes the consequences of the Legislature's chosen procedure. Both the initial plans compiled from Dr. Chen's simulations (the "Basemaps") and the final Remedial Maps still contain substantial overall partisan skew. In addition, the districts in both the Basemaps and the Remedial Maps appear not to be more competitive than the 2017 Maps, as would be expected for an effective remedy.

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[1] See Will Doran, NC lawmakers are almost finished with new political maps. Here's a chance to comment., The News & Observer (Sept. 13, 2019, 2:17 PM), https://www.newsobserver.com/news/politics-government/article235062762.html.

ARGUMENT

I. SO-CALLED "RANDOMIZED" MAPS CONTAIN ALGORITHMIC BIAS AND DO NOT TAKE INTO ACCOUNT COMMUNITIES OF INTEREST

A risk of bias is inherent to any computer-created data set. Seemingly neutral rules can lead to consequences that are not explicitly encoded into those rules.[2] In a redistricting context, this could mean the difference between a fair map and a gerrymander. The randomized maps generated by Dr. Chen's computer programs gave precedence to compact shapes and keeping counties and cities whole. When applied blindly, such priorities lead on average to maps that tend to favor Republican voters over Democratic voters. *See* Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 8 Q.J. Pol. Sci. 239, 264 (2013)("[I]n . . . urbanized states, voters are arranged in geographic space in such a way that traditional districting principles of contiguity and compactness will generate substantial electoral bias in favor of the Republican Party"). Such priorities have a clear role in building cohesive districts. But blind application of the rules disregards other priorities such as representation of neighborhoods and communities.

Accommodating neighborhoods within cities or other communities of interest could have been done by identifying them in the computer program. However, this priority was not among Dr. Chen's goals. Such accommodation could also have been achieved by legislators drawing lines themselves as they were instructed to do by the Court. It is important to note that "[d]rawing districts at random identifies a vast range of possibilities, but does not identify the desirability of a specific outcome." *See* Samuel S.-H. Wang, *Three Tests for Practical Evaluation of Partisan Gerrymandering*, 68 Stan. L. Rev. 1263, 1280 (2016). In other words, the

[2] Nanette Byrnes, Why We Should Expect Algorithms to Be Biased, MIT Tech. Rev. (June 24, 2016), https://www.technologyreview.com/s/601775/why-we-should-expect-algorithms-to-be-biased/ ("Algorithm and data-driven products will always reflect the design choices of the humans who built them").

path chosen by the Legislature to remedy the partisan map failed to comply with either the letter of the Court's order (to draw lines in public) or its intention (to follow a process that does not discriminate between the two parties). *Common Cause v. Lewis*, 18-CVS-014001, 354-56 (Wake Cty. Sup. Ct. Sept. 3, 2019).

A. THE EXPERT WITNESS'S ALGORITHM FOR RANDOMIZATION CREATES MAPS THAT FAVOR THE REPUBLICAN PARTY ON AVERAGE AND FAILS TO ADDRESS THE PARTISAN BIAS OF THE 2017 MAPS

Real-life districting consists of many choices that are not easy to automate. Samuel S.-H. Wang, *Three Tests for Practical Evaluation of Partisan Gerrymandering*, 68 Stan. L. Rev. 1263, 1280 (2016)("[C]onsideration of districting procedures leads to a proliferation of choices and value judgments"). When an algorithm ranks criteria such as compactness and municipality splits above representation of communities, partisan skew can result.[3] In the case of Dr. Chen's maps, this bias arises from the fact that urban areas vote Democratic at rates much higher than rural areas vote Republican, preventing the algorithm's equal treatment of the parties.[4]

After deciding to use Dr. Chen's maps, both Committees decided to participate in some theatrics of transparency by bringing in a North Carolina State Lottery machine.[5] To the average spectator, this machine implies a certain amount of fairness. But even a marked deck of cards looks fair to the unknowing eye. Here, the balls in the lottery machine had an overall bias. Thus, the selection of five Chen maps per county grouping introduced partisan skew while maintaining the appearance of randomness. Republican members of the Committee had access to partisan

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[3] Sam Wang, *Suggestions for a fair redistricting process (contains no partisan data)*, Princeton Election Consortium (Sept. 16, 2019, 9:41 AM), http://election.princeton.edu/2019/09/16/analysis-of-the-north-carolina-redistricting-process-contains-no-partisan-data/.

[4] *Id.*

[5] Miles Parks, *A Surprise Vote, Thrown Phone And Partisan 'Mistrust' Roil N.C. As Maps Are Redrawn*, NPR (Sept. 16, 2019, 5:19 AM), https://www.npr.org/2019/09/16/760177030/a-surprise-vote-thrown-phone-and-partisan-mistrust-roil-n-c-as-maps-are-redrawn.

analysis of all of Dr. Chen's maps, and their average performance was available as an exhibit in the trial. Pls.' Ex. 10; *see also* Pls.' Ex. 1 at 26-42. Legislators therefore knew that on average, Dr. Chen's maps would likely work to one side's partisan advantage.

B. INSUFFICIENT OPPORTUNITY FOR PUBLIC COMMENT LED TO A FAILURE TO ACCOUNT FOR COMMUNITIES OF INTEREST.

Information about neighborhoods and other communities of interest can come from a variety of sources, including the public.[6] Such information can also come from a legislator who represents a particular area. However, serving community interests can come into conflict with a legislator's self-interest.

The House Committee publicly endorsed the concept of respecting communities of interest.[7] However, the drawing of lines was done by the representatives themselves at the redistricting terminals, some of which had no microphone to broadcast the discussions. Additionally, the House only gave 30 minutes' notice before its hearing for public comment, severely curtailing the public's ability to provide meaningful commentary.[8] Therefore, the House's drawing of lines to respect communities of interest was performed outside of the public view and without public input.

C. TO MAINTAIN THE DISTINCT INTERESTS OF THE CITY OF HIGH POINT AND OF RANDOLPH COUNTY, THE COURT MAY CONSIDER UNLOCKING SENATE DISTRICTS 24, 26, AND 27.

An example of community interests can be seen in the Guilford-Alamance-Randolph county cluster. In the Remedial Maps, the City of High Point is split between Senate Districts 26

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[6] *See* Woodrow Wilson School of Public and International Affairs, *A Commissioner's Guide to Redistricting in Michigan* 31 (Feb. 2019), http://gerrymander.princeton.edu/assets/docs/Princeton_MI_report.pdf #page=34.

[7] Sen. Comm. on Redistricting & Elections, *2019 Senate Redistricting - 9/17/2019*, YouTube (Sept. 17, 2019), https://youtu.be/q1rFk7iEuhk?t=11428 (beginning at minute mark 3:10:28).

[8] Will Doran, *NC lawmakers are almost finished with new political maps. Here's a chance to comment.*, The News & Observer (Sept. 13, 2019 2:17 PM), https://www.newsobserver.com/news/politics-government/article235062762.html.

and 27. I suggest that the Court may unfreeze these districts to repair the split. Additional unfreezing of District 24 would allow compliance with equal population requirements.

In making this recommendation, I note that parts of these districts were drawn by a Special Master in *Covington v. North Carolina.* Order, *Covington v. North Carolina,* No. 1:15-CV-399, Doc. No. 206 (M.D. N.C. Nov. 1, 2017); *see also* Order, *Common Cause v. Lewis*, No. 18-CVS-014001 (Wake County Sept. 13, 2019). Because parts of these districts could not be redrawn, High Point could not be properly brought together as one whole city. It also could not be paired with other more like-minded communities in Guilford County to replace its current pairing with Randolph County. Members of the High Point community spoke out in the Joint Committee's public comment about the fact that their city was split between two districts. Senator Dan Blue stated that the reason for this was this Court's order, which froze these districts into place.[9]

Reconnecting High Point with other parts of Guilford County would result in a district that is consonant with the communities contained within it. *See* Fig. 1. Doing so would also increase Democratic voteshare in District 24 (from 44.7% to 46.2%) and District 27 (from 51.3% to 53.2%) but decrease Democratic voteshare in District 26 (from 31.9% to 29.2%).[10] Most importantly, voters in High Point would be able to speak in full voice together rather than being cracked in two. Similarly, residents of Randolph County would have distinct representation as a community.

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[9] Travis Fain, Senate, House approve each other's voting district maps, WRAL (Sept. 16, 2019), https://www.wral.com/senate-house-approve-each-other-s-voting-district-maps/18639174/.

[10] *Compare North Carolina State Senate plan uploaded on 9/25/2019*, PlanScore, https://planscore.org/plan.html?20190925T141634.592311832Z [hereinafter "Princeton Gerrymandering Project Map"], *with North Carolina State Senate plan uploaded on 9/15/2019*, PlanScore, https://planscore.org/plan.html?20190915T102225.817993516Z [hereinafter "Senate Remedial Map"].

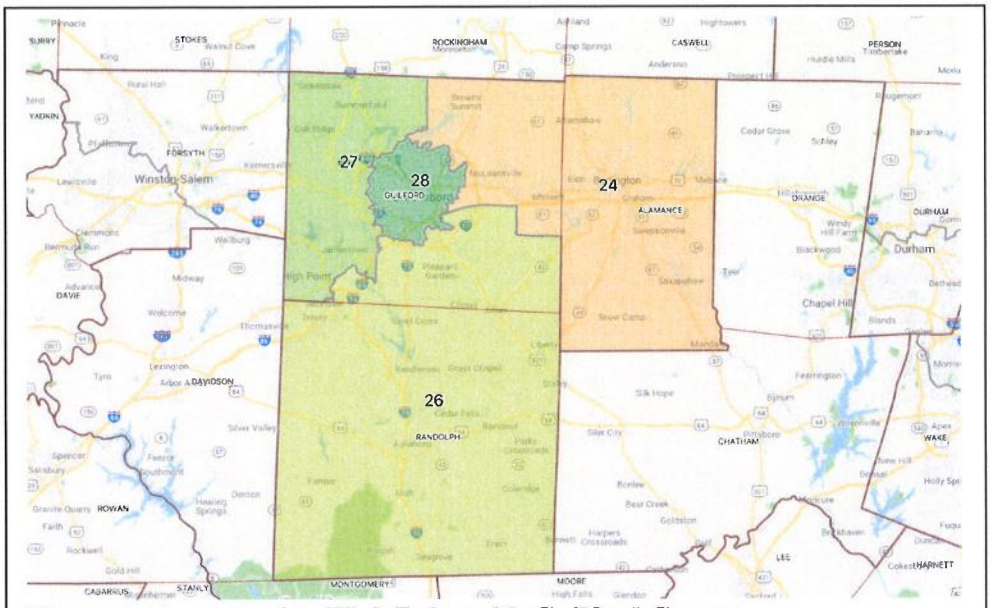


Figure 1. Reconnecting High Point with Guilford County.

II. BOTH HOUSE AND SENATE REMEDIAL MAPS ARE UNCOMPETITIVE AND RETAIN CONSIDERABLE PARTISAN SKEW

Both the House and Senate's Remedial Maps retain considerable amounts of partisanship, as can be seen through the use of widely-used metrics of partisan skew. Using estimates of partisan tendency and statewide partisan metrics from PlanScore.org, I find that the House Remedial Map has retained at least one-half to two-thirds of the partisan skew of the struck-down 2017 Map. The Senate Remedial Map has retained one-third to one-half of the partisan skew of that chamber's 2017 Map.

Expected win margins were computed using PlanScore, a public resource created by political scientists and election law scholars for the purpose of partisan evaluation of plans.[11] PlanScore estimates the likely partisanship of a North Carolina legislative district by averaging the outcome of the 2016 Presidential race and the 2018 state race (House or Senate, depending on the type of district). By summing estimated Democratic and Republican vote totals across voter tabulation districts (VTDs), PlanScore calculates the likely partisanship of a hypothetical

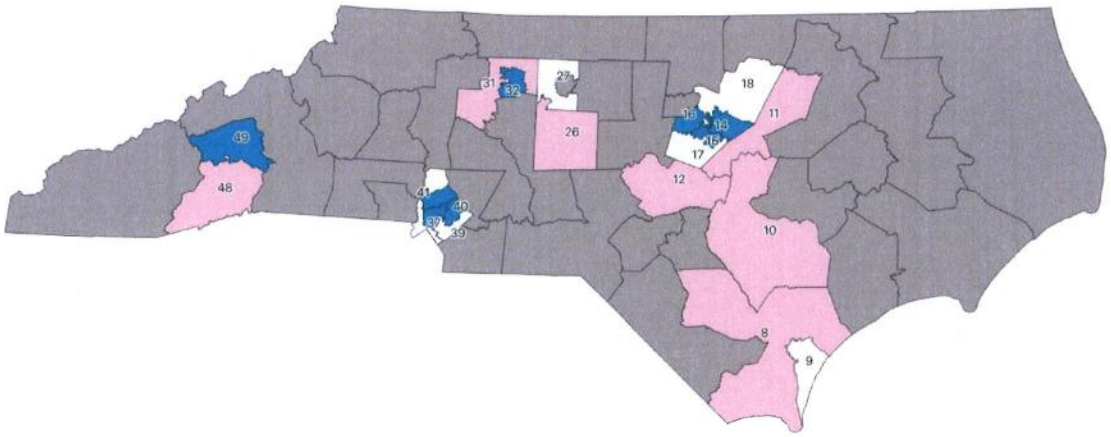
[11] *What Is PlanScore?*, PlanScore.org, https://planscore.org/about/ (last visited Sept. 26, 2019).

district. By averaging out the swings that may occur naturally from one election to the next, the resulting estimate allows a direct comparison of the 2017 map with the Remedial Maps. Using the PlanScore calculations and competitiveness ranges from Michael Bitzer,[12] the following figures show the change in competitiveness in the Senate and House between the 2017 Maps and the Remedial Maps. *See* Figs. 2-3.

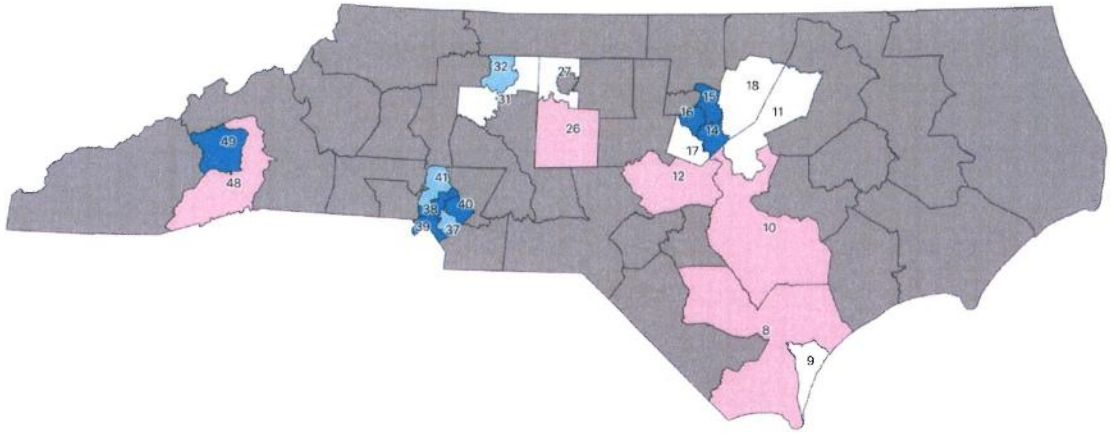
[12] Michael Bitzer, The NC Legislature Couldn't Use Political Data, But The Rest of Us Can: Analysis of the Proposed NC Maps, Old North State Politics (Sept. 18, 2019), https://www.oldnorthstatepolitics.com/2019/09/nc-2019-proposed-legislative-maps-analysis.html#more.

Estimated partisan performance of Senate districts

2017 Map



Remedial Map passed by General Assembly



0 - 30% Predicted Democratic Voteshare
30 - 45% Predicted Democratic Voteshare
45 - 55% Predicted Democratic Voteshare
55 - 60% Predicted Democratic Voteshare
60- 100% Predicted Democratic Voteshare

Figure 2: Estimated performance of Senate Remedial Map compared with 2017 Map.

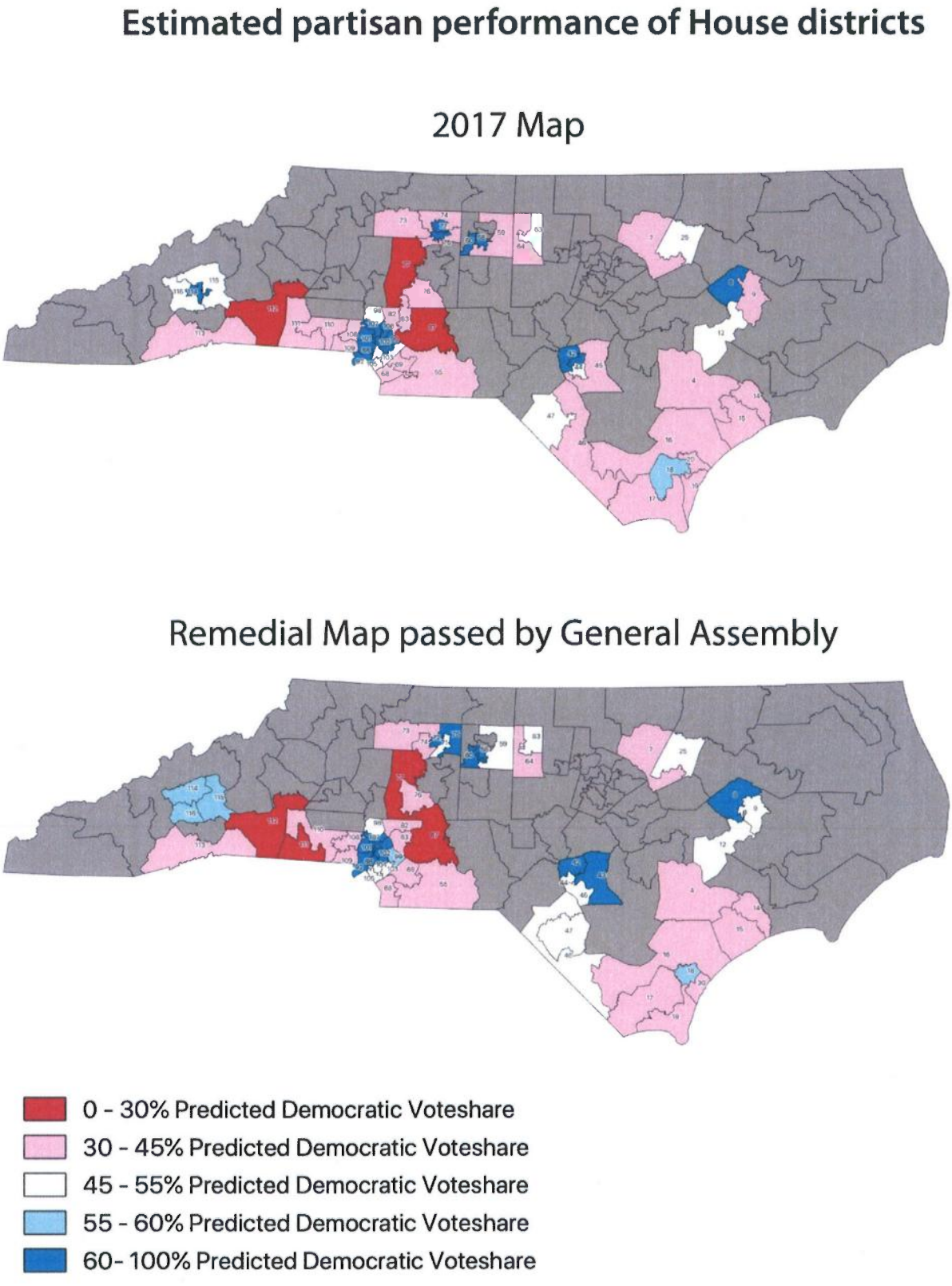


Figure 3: Estimated performance of House Remedial Map compared with 2017 Map.

A. THE HOUSE REMEDIAL MAP RETAINS ONE-HALF TO TWO-THIRDS OF THE PARTISANSHIP OF THE 2017 MAP.

After choosing to use Dr. Chen's maps as a baseline, the House Committee then relied on the North Carolina State Lottery's lottery machine to randomly one of Dr. Chen's 1,000 maps per county cluster. In doing so, they chose one map out of the top five, which were ranked according to Dr. Chen's formula for compactness which took into account compactness scores and splits in municipalities and VTDs. By repeatedly picking maps for the county clusters, the House then had its base map for the challenged districts. The House's baseline relied upon Dr. Chen's Set 1 maps, which did not consider incumbency, *see* Pls.' Ex. 1 at 4-5, which were then modified by Committee members to protect incumbents from running against one another.

North Carolina House Redistricting (September 2019)				
	2017 Map	**Basemap**	**Remedial**	**Hypothetical equal treatment**
Efficiency Gap	8.7%	4.7%	4.8%	0
Partisan Bias	6.8%	3.1%	3.2%	0
Mean-Median Difference	4.7%	3.3%	3.4%	0
Total D Seats (50-50 vote)	**47**	**53**	**52**	**60**
Total R Seats (50-50 vote)	**73**	**67**	**68**	**60**

Table 1. PlanScore evaluation of House maps.

The House's 2017 Map scored high on three metrics of partisan skew.[13] Because this map was an outlier, any redrawing would be likely to reduce the party advantage. Indeed, both the House Basemap and House Remedial Map do improve the partisan skew. *See* Tbl. 1. However, those same three metrics show that the Remedial Map still contains one-half to two-thirds of the

[13] *See North Carolina State House plan uploaded on 9/19/2019*, PlanScore, https://planscore.org/plan.html?20190919T182932.764452489Z [hereinafter "House 2017 Map"].

partisanship of the 2017 Map.[14] Additionally, in a hypothetical scenario where the North Carolina vote-share is split equally between the parties, I found that Republicans would be favored to win 68 seats to the Democrats' 52 seats, an increase of three seats from the Republicans' current 65 seats.[15]

The partisan skew of the House Remedial Map, which results from a mixture of geographic structure and legislative inaction, could have been prevented. For example, the Pennsylvania Congressional map struck down in 2018 had a gerrymandered delegation of thirteen Republicans and five Democrats, *see generally League of Women Voters v. Commonwealth*, 178 A.3d 737 (Pa. 2018), even though Pennsylvania's vote share is typically split equally between the parties.[16] After the Pennsylvania map was redrawn, the resulting Congressional delegation had nine Republicans and nine Democrats, and the map's district boundaries were more compact and split fewer municipalities.[17] A similarly drawn map in North Carolina has the potential to reduce partisan skew while still maintaining compactness and minimizing municipality and VTD splits.

1. THE HOUSE REMEDIAL MAPS INCREASE ELECTORAL COMPETITION IN FOUR OUT OF FOURTEEN COUNTY CLUSTERS.

Increases in electoral competition can be quantified either by the creation of one or more Democratic-leaning districts, or by decreasing the estimated expected win margin for either

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[14] *See North Carolina State House plan uploaded on 9/19/2019*, PlanScore, https://planscore.org/plan.html?20190919T190739.359610261Z [hereinafter "House Basemap"]; *See North Carolina State House plan uploaded on 9/19/2019*, https://planscore.org/plan.html?20190919T182618.814896154Z [hereinafter "House Remedial Map"].

[15] Sam Wang, North Carolina's new House plan still has at least half the partisan skew of the gerrymandered map, Princeton Election Consortium (Sept. 14, 2019), http://election.princeton.edu/2019/09/14/north-carolinas-new-house-plan-contains-over-half-as-much-partisanship-as-the-original-gerrymander/.

[16] Nate Cohn et al., *The New Pennsylvania Congressional Map, District by District*, N.Y. Times (Feb. 19, 2018), https://www.nytimes.com/interactive/2018/02/19/upshot/pennsylvania-new-house-districts-gerrymandering.html.

[17] *Id.*

party. In the House Remedial Map, four county clusters show improvements in electoral competition compared with the 2017 Map: Buncombe, Cumberland, Lenoir-Pitt, and Mecklenburg. *See* Tbl. 2. In these clusters, the average estimated Democratic winning vote share or the average estimated Republican winning vote share decreased by at least five percentage points, as measured by PlanScore estimates. *See id.*

Eight county clusters showed little change in electoral competition: Alamance, Anson-Union, Brunswick-New Hanover, Cabarrus-Davie-Montgomery-Richmond-Rowan-Stanly, Cleveland-Gaston, Duplin-Onslow, Forsyth-Yadkin, Franklin-Nash, and Guilford. In all of these clusters, the average winning vote share changed by less than four percentage points. *See id.* In each cluster, the number of districts favoring Democrats or Republicans did not change. In terms of partisan skew, the Remedial Map in these clusters presented no improvement over the 2017 Map.

In one county cluster, Columbus-Pender-Robeson, the Remedial Map became more favorable to Republicans: the 2017 Map had one Democratic-leaning and two Republican-leaning House districts, whereas in the Remedial Map all three districts are Republican-leaning. *See id.* In one county cluster, Cumberland, the Remedial Map became more favorable to Republicans but also became more competitive. The 2017 Map had three Democratic-leaning and two Republican-leaning House districts, whereas the Remedial Map has two Democratic-leaning and two Republican-leaning House districts. In those Republican-leaning districts, the estimated winning vote share decreased by 7.6 percentage points. *See id.*

Cluster	Estimated average D win		Estimated average R win			2017 Map		Remedial plan		
	2017 Map	Remedial Map	2017 Map	Remedial Map		D-favoring Districts (>50% D)	R-favoring Districts (>50% R)	D-favoring Districts (>50% D)	R-favoring Districts (>50% R)	Total Districts in Cluster
Alamance			55.6%	55.4%		0	2	0	2	2
Anson-Union			61.8%	61.6%		0	3	0	3	3
Brunswick-New Hanover	57.7%	56.5%	60.3%	60.4%		1	3	1	3	4
Buncombe	73.7%	57.0%	52.9%			2	1	3	0	3
Cabarrus-Davie-Montgomery-Richmond-Rowan-Stanly			64.5%	64.6%		0	5	0	5	5
Cleveland-Gaston			63.8%	63.8%		0	4	0	4	4
Columbus-Pender-Robeson	53.3%		61.6%	57.0%		1	2	0	3	3
Cumberland	64.7%	67.2%	58.5%	50.9%		3	1	2	2	4
Duplin-Onslow			64.6%	64.6%		0	3	0	3	3
Forsyth-Yadkin	73.0%	70.5%	60.1%	60.4%		2	3	2	3	5
Franklin-Nash	53.8%	53.1%	57.8%	57.5%		1	1	1	1	2
Guilford	70.1%	67.3%	58.9%	54.4%		2	1	2	1	3
Lenoir-Pitt	65.5%	55.8%	54.0%	52.8%		1	2	2	1	3
Mecklenburg	71.0%	66.3%	52.9%	54.2%		8	4	11	1	12
					Total	21	35	24	32	56

shading:	improvement	retrogression

Table 2. House competitiveness of districts, by county cluster.

B. THE REMEDIAL SENATE MAP RETAINS ONE-THIRD TO ONE-HALF OF THE PARTISANSHIP OF THE 2017 MAP AND CONTAINS ELEMENTS OF A BIPARTISAN GERRYMANDER

1. THE SENATE REMEDIAL MAP RETAINS ONE-THIRD TO ONE-HALF OF THE PARTISANSHIP OF THE 2017 MAP

In drawing its Remedial Map, the Senate relied on Dr. Chen's Set 2 maps, which considered incumbency as a factor (albeit old 2011 incumbents). *See* Pls.' Ex. 1 at 4-5. Choosing Set 2 thus allowed the Senate to make fewer changes to their chosen maps to reduce pairing of incumbents.

Like the 2017 House Map, the 2017 Senate Map had high measures of partisan skew.[18] The Senate's starting Basemap and its final Remedial Map retain between one-third and one-half

[18] *See North Carolina State Senate plan uploaded on 9/11/2019*, PlanScore, https://planscore.org/plan.html?20190911T155746.384854714Z [hereinafter "Senate 2017 Map"].

of the partisanship that existed in the original 2017 Maps.[19] Using a hypothetical 50-50 vote-share scenario, the Republicans would be favored in 27 districts to the Democrats' 23 districts, a two-seat decrease from the current split of 29 Republicans, 21 Democrats. *See* Tbl. 3. Thus, by even the simplest measure of partisan skew, seats won, the Remedial Map gets only halfway to a 25-seat to 25-seat split. *See id.*

North Carolina Senate Redistricting (September 2019)				
	2017 Map	**Basemap**	**Remedial**	**Hypothetical equal treatment**
Efficiency Gap	11.2%	3.9%	3.1%	0
Partisan Bias	5.8%	2.6%	2.4%	0
Mean-Median Difference	4.0%	2.7%	2.7%	0
Total D Seats (50-50 vote)	**22**	**23**	**23**	**25**
Total R Seats (50-50 vote)	**28**	**27**	**27**	**25**

Table 3. PlanScore evaluation of Senate maps.

2. THE SENATE REMEDIAL MAP HAS ELEMENTS OF A BIPARTISAN GERRYMANDER

The Table below shows the average expected margin of victory in the seven clusters identified by the Court as requiring a remedial map. *See* Tbl. 4. Competitiveness in each of these clusters can be evaluated individually as the average expected margins of victory, irrespective of party. If the Remedial Map has districts with reduced expected margins of victory, this would mean that races were made more competitive. If the expected margins of victory are not

[19] *See North Carolina State Senate plan uploaded on 9/19/2019*, PlanScore, https://planscore.org/plan.html?20190919T191727.975411748Z [hereinafter "Senate Basemap"]; *Senate Remedial Map*, PlanScore, https://planscore.org/plan.html?20190915T102225.817993516Z; *see also* Sam Wang, *The North Carolina Senate remedial map shows reduced bias but is weak for minority representation*, Princeton Election Consortium (Sept. 15, 2019, 11:45 AM), http://election.princeton.edu/2019/09/15/the-north-carolina-senate-remedial-map-shows-reduced-bias-but-may-have-a-voting-rights-act-compliance-issue/.

decreased, this would mean that the remedial districting process failed to create increased competition.

The table compares the 2017 Map with the Remedial Map. For historical context, the table makes four other comparisons: (a) court-ordered redistricting leading to the North Carolina 2017 Map in a previous case, Order, *Covington v. North Carolina*, No. 1:15CV399, Doc. No. 242 at 92 (M.D. N.C. Jan. 21, 2018); (b) the court-ordered redistricting of Pennsylvania Congressional districts, Order, *League of Women Voters v. Commonwealth*, No. 159-MM-2017 at 6-9 (Pa. Feb. 19, 2018); (c) the court-ordered redistricting of Florida Congressional and state Senate districts, Order, *League of Women Voters of Fla. v. Detzner*, No. SC14-1905 at 83-84 (Fla. Dec. 2, 2015); *see also* Final J. Adopting Remedial Senate Plan, *League of Women Voters of Fla. v. Detzner*, No. 2012-ca-2842 at 2 (Fla. Dec. 30, 2015); and (d) the court-ordered redistricting of Virginia House of Delegates districts, Memo. Op., *Bethune-Hill v. Va. State Bd. of Elections*, 3:14cv852, Doc. No. 361 at 3 (E.D. Va. Feb. 14, 2019).

In the past cases, winning vote shares were decreased by the redrawing of the map by an average of 9 to 16 percentage points. *See id.* In contrast, the Remedial Maps submitted by the General Assembly would lead to an estimated reduction of winning vote share of only 2.3 percentage points in the Senate and 2.8 percentage points in the House. *See id.*

	All winning vote shares			Democratic wins			Republican wins		
Redistricting case	**Before**	**After**	**change**	**Before**	**After**	**change**	**Before**	**After**	**change**
North Carolina state Senate (proposed Remedial Map)*	**62.6%**	**60.3%**	**-2.3%**	**66.8%**	**61.6%**	**-5.3%**	**58.4%**	**59.0%**	**0.7%**
North Carolina state House (proposed Remedial Map)*	**64.5%**	**61.7%**	**-2.8%**	**68.6%**	**63.8%**	**-4.8%**	**60.4%**	**60.0%**	**-0.4%**
North Carolina state Senate (2017)	72.8%	63.8%	-9.0%	71.6%	66.0%	-5.6%	74.0%	61.6%	-12.4%
North Carolina state House (2017)	81.0%	65.4%	-15.6%	86.9%	68.6%	-18.3%	77.3%	60.4%	-16.9%
Florida Congressional (2015)	73.4%	63.9%	-9.6%	72.3%	64.9%	-7.5%	74.6%	62.9%	-11.7%
Pennsylvania Congresional (2018)	73.9%	64.5%	-9.3%	80.1%	69.6%	-10.6%	67.7%	59.5%	-8.1%
Virginia House of Delegates (2018)	76.0%	64.6%	-11.3%	82.2%	65.7%	-16.5%	69.7%	63.5%	-6.2%

* based on PlanScore predictions. Remedial districts only

Table 4. Changes in competitiveness in the Remedial Maps, compared with increases in competitiveness in past redistricting cases.

3. THE SENATE REMEDIAL MAPS INCREASE ELECTORAL COMPETITION IN FOUR OUT OF SEVEN COUNTY CLUSTERS.

In the Senate Remedial Map, four county clusters in the Senate Remedial Map show improvements in electoral competition compared with the 2017 map: Alamance-Guilford-Randolph, Davie-Forsyth, Franklin-Wade, and Mecklenburg. In all but Davie-Forsyth cluster, the number of districts favoring Democrats increased. Meanwhile, three clusters are unchanged in electoral competition or the number of Democrat/Republican-favoring districts: Bladen-Brunswick-New Hanover-Pender, Buncombe-Henderson-Transylvania, and Duplin-Harnett-Johnston-Lee-Nash-Sampson. In terms of partisan skew, the Remedial Map in these clusters presented no improvement over the 2017 Map.

	Estimated average D win		Estimated average R win	
Cluster	2017 Map	Remedial Map	2017 Map	Remedial Map
Alamance-Guilford-Randolph		51.3%	57.7%	68.1%
Bladen-Brunswick-New Hanover-Pender			56.6%	56.5%
Buncombe-Henderson-Transylvania	60.2%	60.9%	59.5%	59.8%
Davie-Forsyth	71.4%	59.0%	62.5%	54.1%
Duplin-Harnett-Johnston-Lee-Nash-Sampson			59.1%	59.1%
Franklin-Wade	68.3%	60.4%	51.5%	
Mecklenburg	70.7%	65.5%	51.0%	

	2017 Map		Remedial plan		
	D-favoring Districts (>50% D)	R-favoring Districts (>50% R)	D-favoring Districts (>50% D)	R-favoring Districts (>50% R)	Total Districts in Cluster
	0	2	1	1	2
	0	2	0	2	2
	1	1	1	1	2
	1	1	1	1	2
	0	3	0	3	3
	3	2	5	0	5
	4	1	5	0	5
Total	9	12	13	8	21

shading: improvement retrogression

Table 5. House competitiveness of districts, by county cluster.

CONCLUSION

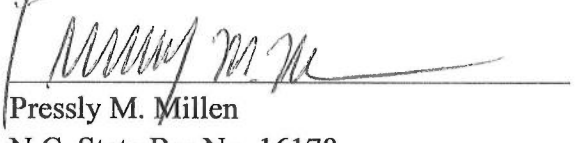
The remedial linedrawing process followed by the Legislature included multiple potential violations of this Court's order regarding process and transparency. Equally important, an ostensibly random algorithm failed to remedy the partisanship of the 2017 Maps. The reason for this is that random maps generated by a computer program will contain implicit value judgments coded within that algorithm. Such algorithmic bias was created by Dr. Chen's emphasis on compactness and municipality splits and lack of emphasis of communities of interest. This bias was left in place by the legislative committees, which allowed little opportunity for public input. Taken together, algorithmic bias and lack of public input have led to Remedial Maps which still contain substantial amounts of partisan skew.

The House's Remedial Map still retains one-half to two-thirds of its original pro-Republican bias skew, while the Senate Remedial Map still retains one-third to one-half of its original skew. While the Senate's Remedial Map goes farther in reducing partisan skew, it fails to increase competition, suggesting that it remains a bipartisan gerrymander.

The Court's opinion of September 3rd gave hope that partisan gerrymandering might at last be constrained in the Old North State. *Amicus* proposes that in its evaluation of the Remedial Maps, it should give the Special Master latitude to partially or completely modify the Remedial Maps to generate a map that gives supporters of both major political parties an equitable opportunity to elect legislators that reflect their preferences.

This the 27th day of September, 2019.

WOMBLE BOND DICKINSON (US) LLP



Pressly M. Millen
N.C. State Bar No. 16178

555 Fayetteville Street, Suite 1100
Raleigh, North Carolina 27601
Telephone: (919) 755-2100
Facsimile: (919) 755-2150
Email: Press.Millen@wbd-us.com

Attorneys for Amici *Professor Samuel S.-H Wang and the Princeton Gerrymandering Project*

CERTIFICATE OF SERVICE

I certify that today, I caused the foregoing Motion for Leave to File *Amici Curiae* Brief and the attached letter to be served on all counsel by email and U.S. mail, addressed to:

Edwin M. Speas, Jr.
Caroline P. Mackie
POYNER SPRUILL LLP
301 Fayetteville St., Suite 1900
Raleigh, NC 27601
espeas@poynerspruill.com
cmackie@poynerspruill.com

Marc E. Elias
Aria C. Branch
PERKINS Corn LLP
700 13th Street NW
Washington, DC 20005-3960
melias@perkinscoie .com
abranch@perkinscoie.com

Abha Khanna
1201 Third Avenue, Suite 4900
Seattle, WA 98101-3099
akhanna@perkinscoie.com

Counsel for the Plaintiffs

R. Stanton Jones
David P. Gersch
Elisabeth S. Theodore
Daniel F. Jacobson
William C. Perdue
ARNOLD & PORTER KAYE SCHOLER LLP
601 Massachusetts Avenue NW
Washington, DC 20001-3743
stanton.jones@arnoldporter.com
david.gersch@arnoldporter.com
elisabeth.theodore@arnoldporter.com
daniel.jacobson@arnoldporter.com
william.perdue@arnoldporter.com

Phillip J. Strach
Michael McKnight
Alyssa Riggins
OGLETREE, DEAKINS, NASH, SMOAK & STEWART, P.C.
4208 Six Forks Rd., Suite 1100
Raleigh, NC 27609
phillip.strach@ogletree.com
michael.mcknight@ogletree.com
alyssa.riggins@ogletree.com

E. Mark Braden
Richard B. Raile
Trevor M. Stanley
BAKER & HOSTETLER, LLP
Washington Square, Suite 1100
1050 Connecticut Ave., N.W.
Washington, DC 20036-5403
rraile@bakerlaw.com
mbraden@bakerlaw.com
tstanley@bakerlaw.com

Counsel for the Legislative Defendants

John E. Branch III

Amar Majmundar

Nathaniel J. Pencook
Andrew Brown
SHANAHAN LAW GROUP, PLLC
128 E. Hargett Street, Suite 300
Raleigh, NC 27601
jbranch@shanahanlawgroup.com
npencook@shanahanlawgroup.com
abrown@shanahanlawgroup.com

Counsel for the Defendants-Intervenors

Stephanie A. Brennan
Paul M. Cox
N.C. Department of Justice
P.O. Box 629
114 W. Edenton St.
Raleigh, NC 27602
amajmundar@ncdoj.gov
sbrennan@ncdoj.gov
pcox@ncdoj.gov

Counsel for the State Board of Elections and its members

This the 27th day of September, 2019.

Pressly M. Millen