

# Attachment 4

# Expert Report of Michael Barber, PhD

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Enacted Map. To measure the partisan lean of the 2023 Enacted Congressional map, I calculate the partisan lean of each district using the same set of statewide elections that were mentioned in the previous section of this report. This measure captures the overall partisan tendency of each district by averaging the outcome of multiple elections and reduces the impact of any particular candidate, issue, or favorable/unfavorable election cycle. Figure 4 shows the partisan lean of each of the 14 districts in the 2023 Congressional Map. The dot shows the average partisanship of each district and the horizontal lines show the range of outcomes in each district from the 19 different elections that compose the average. Larger numbers indicate more Republican-leaning districts. As can be seen in the figure, the map creates 10 safely Republican-leaning districts, three safely Democratic-leaning districts, and one district that is Democratic-leaning, but closer to a toss up.<sup>4</sup> Districts are ordered from most Democratic-leaning at the top to most Republican-leaning at the bottom.

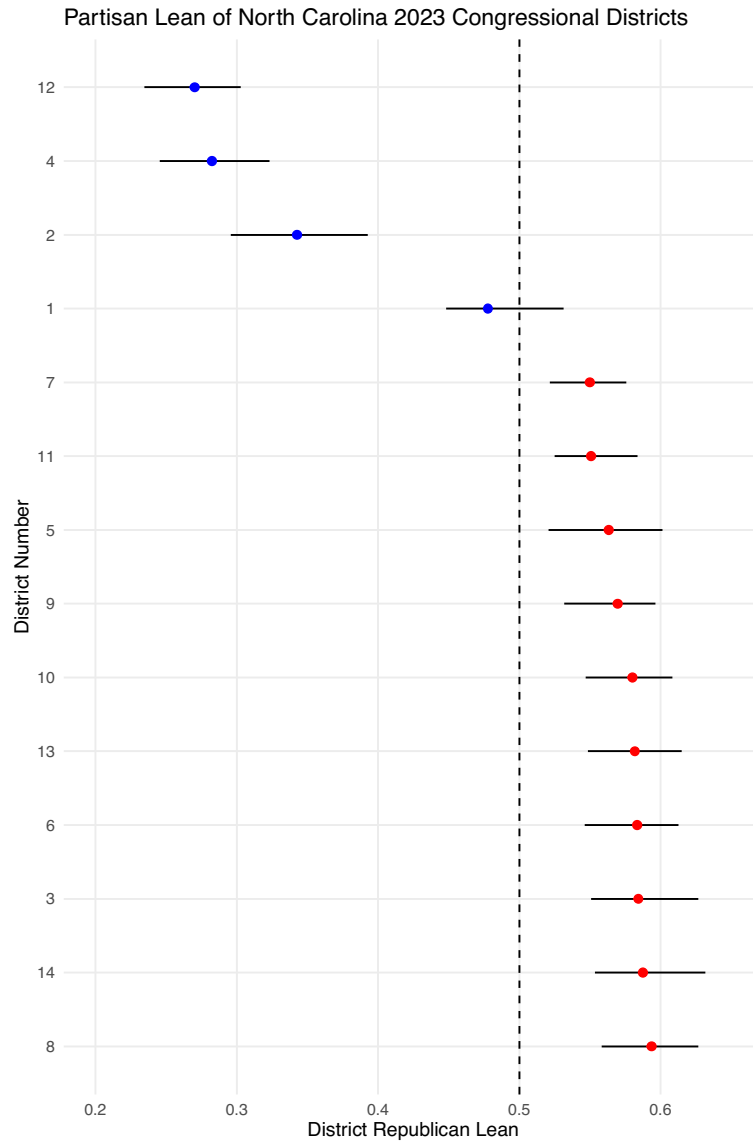
The 2023 Enacted Map diverges significantly from the 2022 Map that was drawn by a court-appointed Special Master. The 2022 Special Master Map was pretty evenly divided between Republican and Democratic-leaning districts. Using the same election data to create partisan indices, the 2022 Map contained five safely Democratic districts, five safely Republican districts and four districts with a partisan index that would make them somewhat of a toss-up (two Democratic leaning and two Republican leaning). And the November 2022 congressional elections largely confirmed this. The current (as of summer 2024) congressional delegation from North Carolina has seven Democrats and seven Republicans, elected under the 2022 Special Master Map.

On the other hand, the 2023 Enacted Map more closely resembles the 2021 Enacted Map that was struck down by a court as a partisan gerrymander (giving rise to the 2022 court-appointed Special Master Map). While the 2021 Map was never used in an election, we can still calculate the partisan lean of the districts. The 2021 Map contained three safely Democratic seats, eight safely Republican seats and three toss-up seats (one Democratic

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<sup>4</sup>Throughout the report, I refer to a safe district as one with a partisan index of 0.55 or greater (or 0.45 or smaller).

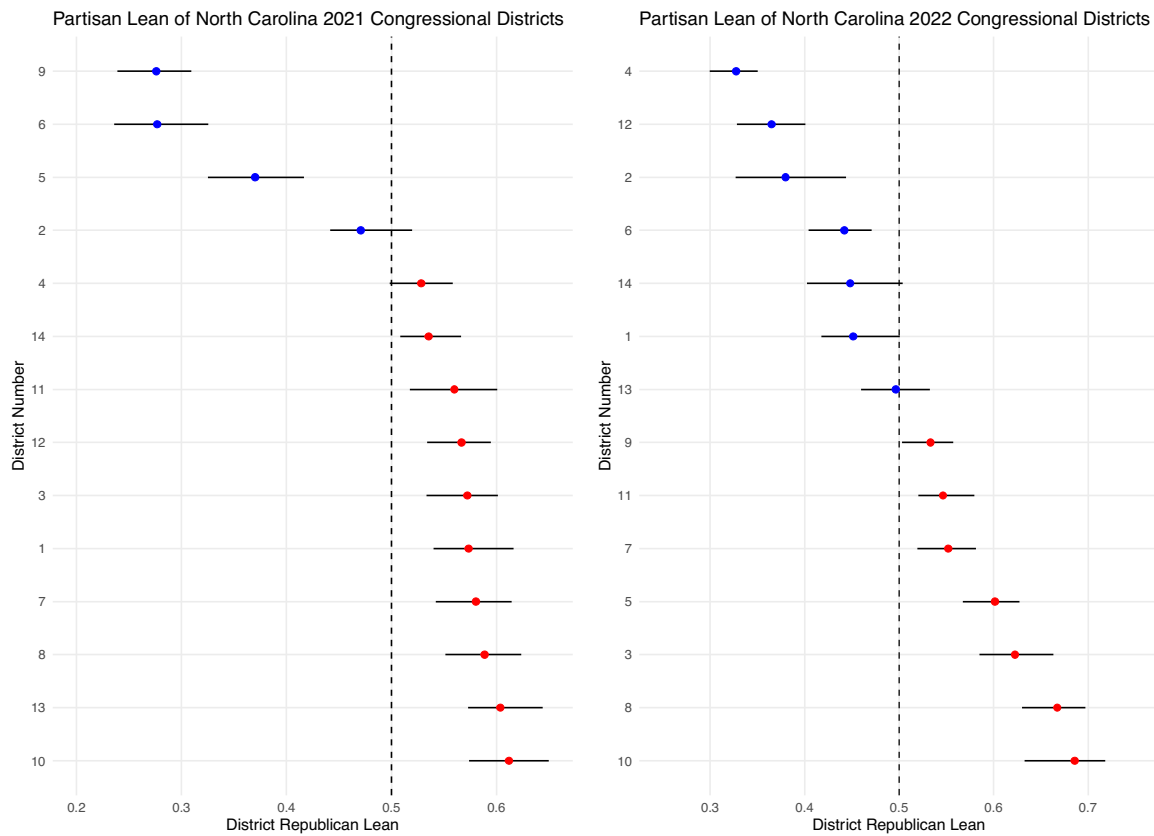
Figure 4: Partisan Lean of Congressional Districts



Note: The horizontal axis shows the Republican partisan lean of the 14 congressional districts in North Carolina. The 2023 Enacted Congressional Map contains 10 Republican-leaning districts, 3 safely Democratic districts and one Democratic-leaning district.

leaning and two Republican leaning). Figure 5 shows the partisan lean of both the 2021 Map (left panel) that was never implemented and the 2022 Special Master Map (right panel). Notably, the 2023 Enacted Congressional Map is even more favorable to Republicans than either of these maps, with ten safely Republican seats.

Figure 5: Partisan Lean of 2021 Congressional Districts (left) and 2022 Congressional Districts (right)



Note: The horizontal axis shows the Republican partisan lean of the 14 congressional districts in North Carolina. The left panel shows the partisan lean of the 2021 Enacted Map. The right panel shows the partisan lean of the 2022 Map that was drawn by a court-appointed Special Master after the 2021 Map was struck down as a partisan gerrymander.

## 4.1 County Envelope Analysis

Dr. Rodden conducts a county “envelope analysis” to determine if race was a significant factor in the drawing of the 2023 Enacted Congressional map.<sup>5</sup> In this analysis he investigates the association between the race of registered voters and their propensity to be included in various congressional districts within the county envelope. The method is called an “envelope” analysis because the study is limited to a consideration of voters that live inside of the counties that are either wholly or partially within a particular district of interest. In this way, the counties form the “envelope” from which the district was drawn. Below I offer several critiques of the particular way in which Dr. Rodden conducts this analysis as well as an overall critique of the analysis itself.

Dr. Rodden uses the state list of registered voters (“voter file”) as the data for his analysis. In his report he articulates the reasons for this choice. However, the use of the voter file presents several problems that make it unsuitable for this type of analysis.

First, the voter file, by definition, only contains those individuals who are registered voters. However, when a map drawer creates a map, they must equalize the population of the entire district, regardless of whether or not a person is registered to vote, or is even eligible to register to vote. Thus, if a map drawer were to use the voter file to decide which people to move into or out of a congressional district, they would be, in essence, creating a map that would immediately be invalid due to significant malapportionment issues. It is much more realistic for a map maker to go about the task of drawing congressional districts by assembling census blocks or election precincts using data that contain the entire population rather than a file that only told you the number of registered voters in an area.

A second concern with the use of the voter file is Dr. Rodden’s reliance on the party registration data contained in the file. While North Carolina’s voter file does contain a voter’s registered party, it is often the case that voters who are registered with a party may

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<sup>5</sup>Rodden is borrowing a method used by Ansolabehere in a previous racial gerrymandering case as a possible tool to make claims about racial motive in the configuration of the 2023 plan.

not always vote in line with that party registration. This would especially be the case in places in the South where people may have registered with the Democratic party decades ago, but have since realigned to vote primarily for Republicans.<sup>6</sup> Other instances of party registration being only a noisy signal of actual voting behavior would include people who are not registered with a party at all (approximately 38% of the North Carolina registered voters) but who might still exhibit consistently partisan voting behavior.<sup>7</sup> Another example of party registration masking voting preferences would include people who register with a party that they do not identify with so as to participate in the primary election knowing that the general election will not be especially competitive. In this way, voters who prefer Republicans but live in especially Democratic areas may register as Democrats so that they can support, in their view, the least objectionable Democrat in the primary who is then likely to win the general election in their district. And likewise, voters who prefer Democrats but live in especially Republican areas may register as Republicans so that they can support the least objectionable Republican who is likely to win the general election in their district. All of these reasons suggest that party registration is often not reflective of actual voting behavior. In my experience as a political scientist and in various redistricting cases, it is much more common to measure the political leanings of a jurisdiction by looking at aggregate vote returns rather than party registration information.<sup>8</sup>

Figure 6 shows that this is the case in North Carolina. In this figure I calculate the percentage of registered voters who are registered with the Democratic party in each county throughout the state. I then also calculate the share of the vote in that precinct that has historically gone to Democratic candidates. If party registration were a perfect reflection of

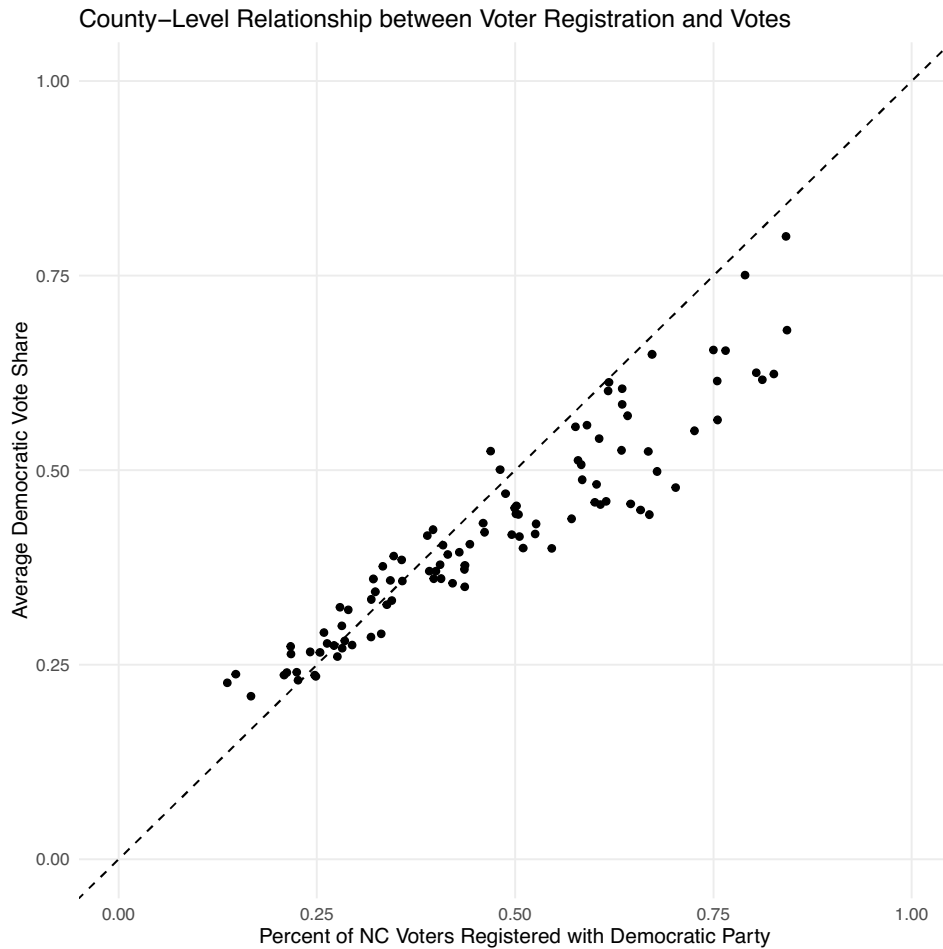
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<sup>6</sup>Hood III, M. V., and Seth C. McKee. *Rural republican realignment in the modern south: The untold story*. Univ of South Carolina Press, 2022.

<sup>7</sup><https://vt.ncsbe.gov/RegStat/>, Klar, Samara, Yanna Krupnikov, and John Barry Ryan. "Who Are Leaners? How True Independents Differ from the Weakest Partisans and Why It Matters." In *The Forum*, vol. 20, no. 1, pp. 147-159. De Gruyter, 2022.

<sup>8</sup>Levendusky, Matthew S., Jeremy C. Pope, and Simon D. Jackman. "Measuring district-level partisanship with implications for the analysis of US elections." *The Journal of Politics* 70, no. 3 (2008): 736-753. Rogers, Steven. "Electoral accountability for state legislative roll calls and ideological representation." *American Political Science Review* 111, no. 3 (2017): 555-571. Barber, Michael J. "Ideological donors, contribution limits, and the polarization of American legislatures." *The Journal of Politics* 78, no. 1 (2016): 296-310.

Figure 6: Partisan Registration and Vote Shares in NC Counties



Note: Each point shows the share of the county's registered voters who are registered Democrats (horizontal axis), and the share of the county's votes that went to Democratic candidates over the past several years. Democratic registration percents are the 2-party registration rates.

voting behavior, we would see the points fall on, or very close to, the 45-degree line. However, the figure shows that this is not always the case. While there is a strong correlation between the two variables, there are many counties in which vote shares are quite far from party registration numbers. Several counties have a 20 percentage-point gap in the two measures. This is especially true in counties with Democratic voter registration above 50%. Here we see that Democratic vote shares tend to be much lower than party registration numbers. The counties where the deviation between party registration and vote shares are the largest are Bertie, Hyde, Northampton, Robeson, Tyrrell, and Washington Counties. Four of these



six counties are located in Congressional District 1.

This difference between party registration and vote shares shows how a map drawer who went about drawing districts using the voter file, and party registration from the voter file, would often produce districts that are not only malapportioned, but are also not reflective of the partisan balance they may have sought to achieve.

The Supreme Court, in the recent *Alexander* decision noted the difficulty in using individual registered voter records versus the more intuitive approach of looking at census blocks or precincts when considering racial gerrymandering claims. In their decision, the majority stated “This methodology [used by Dr. Liu] was highly unrealistic because it treated each voter as an independent unit that South Carolina could include or exclude from District 1. No map-maker who respects contiguity and compactness could take such an approach...To accurately reflect the district process, an analysis would have to pay attention to whether a voter’s neighbors were moved too.” In my own work as a court-appointed Mapping Special Master in Michigan, I found this statement to accurately reflect my experience. I did not rely on the state voter file at all because it would not have been helpful for creating districts that needed to achieve population balance.

In his report, Dr. Rodden conducts an envelope analysis for 2023 Congressional Districts 1, 6, 12 and 14. Aside from the issue of using the voter file for this analysis, there are other problems that lead to this analysis not offering much insight into the degree to which race was a factor in the creation of the congressional district boundaries. Below I show that when the voter file is replaced with precinct-level analysis that contains the total population, racial demographics, and actual voting behavior of the precinct, many of the results in Dr. Rodden’s analysis either disappear or entirely reverse direction.

To conduct this analysis I take each precinct within the county envelope and note if the precinct is included within the congressional district in question or is excluded. I then conduct a similar regression analysis to Dr. Rodden where the outcome variable is a binary variable for whether or not the precinct was included in the congressional district.

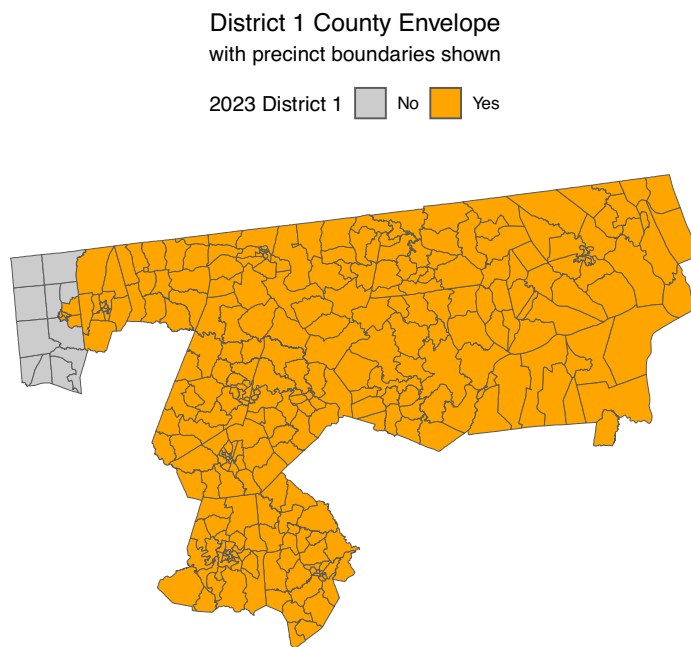
The key independent variables in the regression model are similar to those included by Dr. Rodden: the precinct's Black population percentage, the precinct's Democratic vote percentage (averaged from past statewide elections), a variable indicating if the precinct is located within the district's major city (as identified by Dr. Rodden), and a variable measuring the precinct's distance from the district's geographic center of population. To account for the need to achieve relative population parity, I also include a variable measuring the total population of each precinct.

#### **4.1.1 Congressional District 1**

Figure 7 shows the county envelope for Congressional District 1. Precincts included in District 1 are highlighted orange and precincts not included are left in grey. This district poses a significant challenge for any statistical analysis because the district is nearly entirely contained within county boundaries. Therefore, the only precincts that are not included in the district within the envelope are those on the western edge of Granville County. Furthermore, including precincts on the western side of Granville county would violate contiguity without also including connecting precincts on the east side of the county. However, this would then violate population equality. Thus, there is little discretion left with regards to the choice of precincts that are included or excluded from the district within this particular county envelope.

If we nevertheless proceed with the regression analysis, we find that race is not a statistically significant or substantively large predictor of inclusion in the district. Table 1 shows the regression coefficients for this district.

Figure 7: Congressional District 1 County Envelope



Note: Precincts included in the district are highlighted in orange.

Table 1: County Envelope Regression Model - District 1

Variable:	Coefficient	St. Error	p-value
Black Percentage [0-1]	0.201	0.107	0.061
Democratic Percentage [0-1]	-0.223*	0.111	0.046
Total Population (in 1,000s)	-0.020*	0.010	0.035
Distance [miles]	-0.002*	0.001	0.002
Intercept	1.133*	0.046	0.000

Note: Coefficients show the relationship between each independent variable and the dependent variable: precinct inclusion in the district. Coefficients that are statistically significant at the  $p < 0.05$  level are indicated with an asterisk.

#### 4.1.2 Congressional District 6

Figure 8 shows the county envelope for Congressional District 6. Precincts included in District 6 are highlighted orange and precincts not included are left in grey. This district is composed of all of Davidson, Davie, and Rowan Counties and portions of Guilford, Forsyth and Cabarrus Counties. Table 2 shows the regression coefficients for this district. In the

regression analysis we find that race is a statistically significant predictor of inclusion in the district, but the results run in the opposite direction of what Dr. Rodden found in this analysis of District 6. In Dr. Rodden's regression models, race was negatively associated with inclusion in District 6. As he says of his results, "the likelihood of a Black registered voter being included in District 6 is 11 percentage points lower than for registered voters of any other race, even controlling for distance and city residence" (Rodden Report, pg. 13).

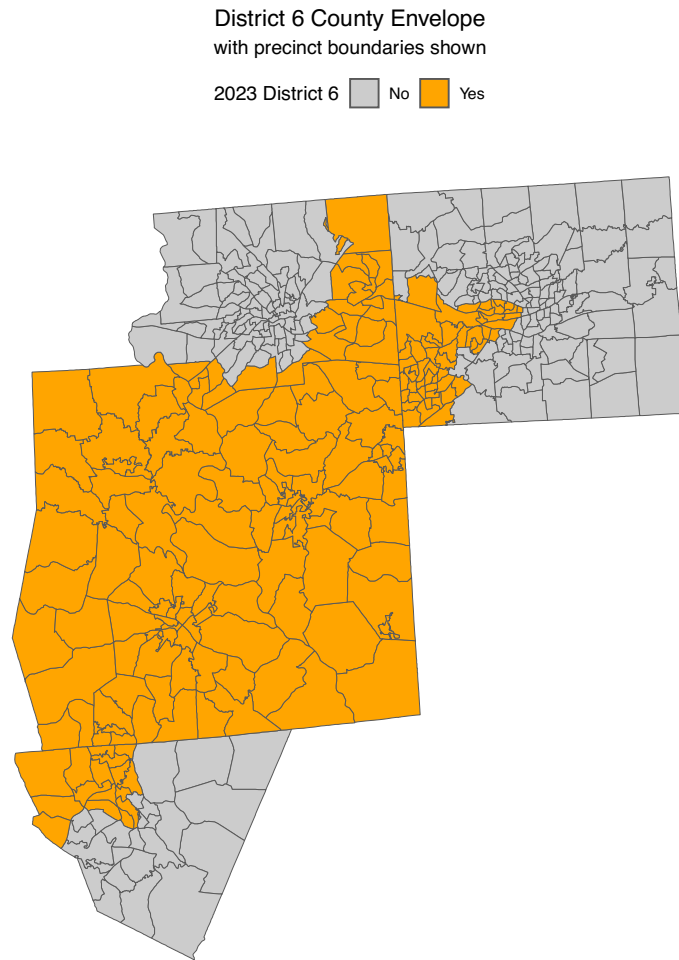
However, in the regression analysis below, precincts with higher Black share of the population are predicted to be *more likely* to be included in District 6, holding the other factors constant. This is shown by the positive and statistically significant coefficient in the table below (0.661\*). The conflicting results suggest two things. First, the regression results are highly dependent on which data are used and how the analysis is conducted. This kind of conflicting result suggests that race was not a strong predictor of how District 6 was ultimately drawn. If it were, we would expect to find similar results across a variety of different regression specifications and models. Second, in the regression model below, while the BVAP of the precinct is a statistically significant predictor of precinct inclusion in District 6, it is smaller in absolute magnitude than partisanship, by about half (0.661 versus -1.31).

Table 2: County Envelope Regression Model - District 6

Variable:	Coefficient	St. Error	p-value
Black Percentage [0-1]	0.661*	0.168	0.0001
Democratic Percentage [0-1]	-1.31*	0.165	0.000
Total Population (in 1,000s)	0.036*	0.012	0.003
Distance [miles]	-0.026*	0.002	0.000
Greensboro	0.130*	0.055	0.018
Highpoint	0.558*	0.036	0.000
Intercept	1.395*	0.078	0.000

Note: Coefficients show the relationship between each independent variable and the dependent variable: precinct inclusion in the district. Coefficients that are statistically significant at the  $p < 0.05$  level are indicated with an asterisk.

Figure 8: Congressional District 6 County Envelope

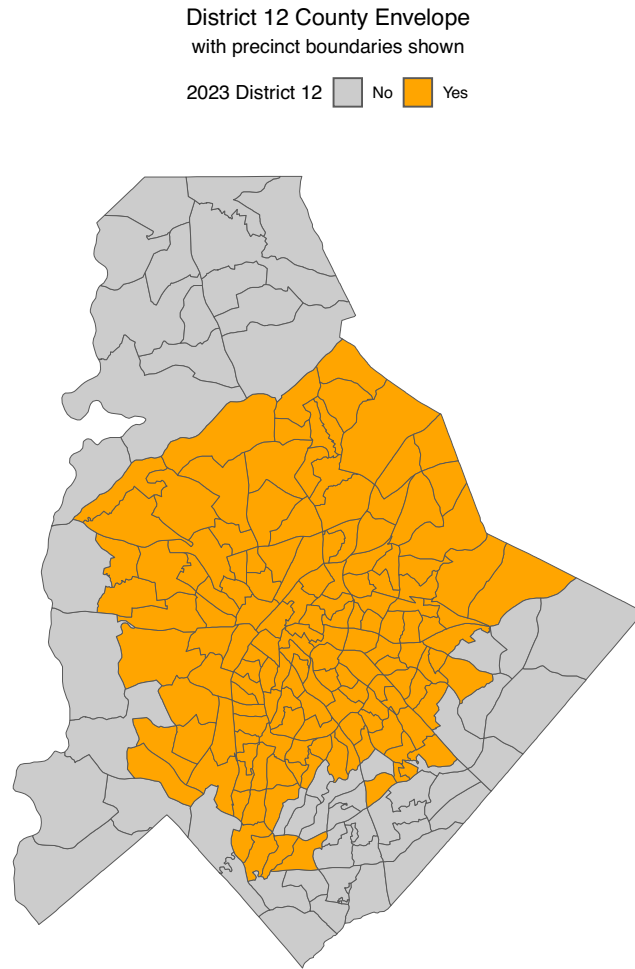


Note: Precincts included in the district are highlighted in orange.

#### 4.1.3 Congressional District 12

Figure 9 shows the county envelope for Congressional District 12. Precincts included in District 12 are highlighted orange and precincts not included are left in grey. This district is composed of portions of Mecklenburg County. In the regression analysis we find that race is not a statistically significant predictor of inclusion in the district. Table 3 shows the regression coefficients for this district.

Figure 9: Congressional District 12 County Envelope



Note: Precincts included in the district are highlighted in orange.

#### 4.1.4 Congressional District 14

Figure 10 shows the county envelope for Congressional District 14. Precincts included in District 14 are highlighted orange and precincts not included are left in grey. This district is composed of all of Burke, Rutherford, Cleveland, and Gaston Counties and portions of Polk and Mecklenburg Counties. Table 4 shows the regression coefficients for this district. In the regression analysis we find that race is a statistically significant predictor of inclusion in the district, but the results run in the opposite direction of what Dr. Rodden found in this

Table 3: County Envelope Regression Model - District 12

Variable:	Coefficient	St. Error	p-value
Black Percentage [0-1]	-0.182	0.168	0.280
Democratic Percentage [0-1]	1.062*	0.309	0.001
Total Population (in 1,000s)	-0.006	0.007	0.406
Distance [miles]	-0.054*	0.008	0.000
Charlotte	0.196*	0.085	0.022
Intercept	0.331	0.190	0.083

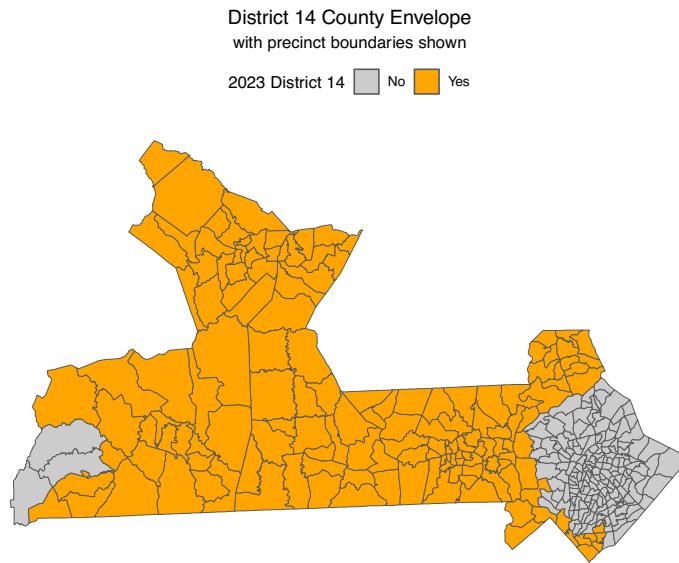
Note: Coefficients show the relationship between each independent variable and the dependent variable: precinct inclusion in the district. Coefficients that are statistically significant at the  $p < 0.05$  level are indicated with an asterisk.

analysis of District 14. In Dr. Rodden's regression models, race was negatively associated with inclusion in District 14. As he says of his results, "Black voters were far more likely to be selected for District 12, and not for District 14." (Rodden Report, pg. 23).

However, in the regression analysis below, precincts with higher BVAP are predicted to be *more likely* to be included in District 14, holding the other factors constant. The conflicting results suggest two things. First, the regression results are highly dependent on how the data and analysis are conducted. This kind of conflicting result suggests that race was not a strong predictor of how District 14 or the adjacent District 12 were ultimately drawn. If it were, we would expect to find similar results across a variety of different regression specifications and models. Second, in the regression model below, while the BVAP of the precinct is a statistically significant predictor of inclusion in District 14, it is smaller in absolute magnitude than partisanship, by about three times (0.294 versus -0.887).

The regression analyses show that the results of the envelope analysis are highly dependent on the data and regression specifications used. In many cases the results are either statistically insignificant or run in the opposite direction of the results in Dr. Rodden's report.

Figure 10: Congressional District 14 County Envelope



Note: Precincts included in the district are highlighted in orange.

Table 4: County Envelope Regression Model - District 14

Variable	Coefficient	St. Error	p-value
Black Percentage [0-1]	0.294*	0.116	0.012
Democratic Percentage [0-1]	-0.887*	0.193	0.000
Total Population (in 1,000s)	0.020*	0.007	0.005
Distance [miles]	-0.005*	0.002	0.003
Charlotte	-0.583*	0.069	0.000
Intercept	1.227*	0.062	0.000

Note: Coefficients show the relationship between each independent variable and the dependent variable: precinct inclusion in the district. Coefficients that are statistically significant at the  $p < 0.05$  level are indicated with an asterisk.

#### 4.1.5 The County Envelope Method is Unreliable

Another larger issue looms over the envelope analysis in general. One important question is to what degree does a statistically significant coefficient indicate racially-motivated redistricting at all? Race is highly correlated with a number of factors that are essential to the redistricting process. These include not only partisanship, but also geographic location,



population density, historical trends in employment, migration, transportation, and even the type of soil in the area—something that was determined millions of years before humans were ever here.<sup>9</sup> These factors cannot all be entirely accounted for in a regression model, leading to the question of how often the variable that measures a precinct’s Black voting age population may be capturing something other than racial motivations for inclusion of the precinct in a district that is simply correlated with race. Dr. Rodden states in his report, “If the lines were drawn without respect to race, one would expect the likelihood of inclusion to be roughly similar for White and Black voters” (Rodden Report, pg 11). However, given the correlation between race and many other factors, this statement is not correct.

One way to test whether the envelope method is a good tool to detect possible racial gerrymandering is to look at a set of maps in which the researcher is absolutely certain that race played no role in the drawing of the districts. If we run these same regression models on this set of maps, the number of times that the model flags race as a significant predictor of a district’s shape provides us with a reasonable measure of the degree to which these regression models are producing “false positives,” or statistically significant coefficients for race when race was not in fact considered in the drawing of the district boundaries and is simply correlated with other geographic and population-related factors that did impact the district’s shape. These false positives could arise because of the correlation between race and other factors that are used in redistricting, such as compactness, population equality, and divisions of counties and cities.

To do this, I use a common redistricting algorithm to generate 5,000 congressional district maps that adhere to traditional redistricting criteria of equal population, geographic compactness, avoidance of county divisions, and contiguity.<sup>10</sup> The algorithm is provided no

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<sup>9</sup>See: Barber, Michael, and Jeremy C. Pope. “The Crucial Role of Race in Twenty-First Century US Political Realignment.” *Public Opinion Quarterly* 88, no. 1 (2024): 149-160. Rodden, Jonathan A. *Why cities lose: The deep roots of the urban-rural political divide*. Basic Books, 2019. Nall, Clayton. *The road to inequality: how the federal highway program polarized America and undermined cities*. Cambridge University Press, 2018. Acharya, Avidit, Matthew Blackwell, and Maya Sen. *Deep Roots: How slavery still shapes southern politics*. Princeton University Press, 2018.

<sup>10</sup>The algorithm is called *redist* and has been used in a number of redistricting-related cases in state and federal court throughout the country, and has been published in a peer reviewed academic journal:

information about race or partisanship as it produces the districts. These algorithms have been used in numerous redistricting cases to provide a comparison set of maps to which an enacted map can be compared on various metrics. Once the algorithm has generate the set of 5,000 maps, I compute the BVAP, partisan lean, and total population of each precinct in each district. I also calculate the county envelope for each district and the population center of each district. I then conduct the same county envelope analysis on each of these districts as was done in the analysis above to see if the BVAP of the precinct was as a statistically significant predictor of whether or not that precinct was included in the district.<sup>11</sup>

In the cases where race is a statistically significant predictor of precinct inclusion in the district, we know that each and every one of these results is a false positive for racial gerrymandering because we knew from the outset that race played no role in the district's formation. When I conduct this analysis, the most common outcome is 7 of the 14 districts in a map to be flagged as a potential racial gerrymander. These results run contrary to the assertion that if race is not a factor in the drawing of district boundaries then we would expect the likelihood of inclusion in a district to be "roughly similar for White and Black voters" (Rodden Report, pg. 11). If this were the case, then we would expect to see nearly no districts flagged by the envelope analysis as potential racial gerrymanders. However, this is not the case. Figure 11 shows the distribution of outcomes for the 5,000 maps. There were zero maps in which zero districts were identified as a potential racial gerrymander. The fewest number of districts with a statistically significant relationship between precinct BVAP and inclusion in the district was 2, and the greatest number of districts flagged in a map was 13. The most common outcomes were between 6 and 9 districts where race was a statistically significant predictor of precinct inclusion in the district. This is remarkable given the fact that none of these districts were drawn with any racial (or partisan, for that matter)

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McCartan, Cory, Christopher T. Kenny, Tyler Simko, George Garcia III, Kevin Wang, Melissa Wu, Shiro Kuriwaki, and Kosuke Imai. "Simulated redistricting plans for the analysis and evaluation of redistricting in the United States." *Scientific Data* 9, no. 1 (2022): 689.

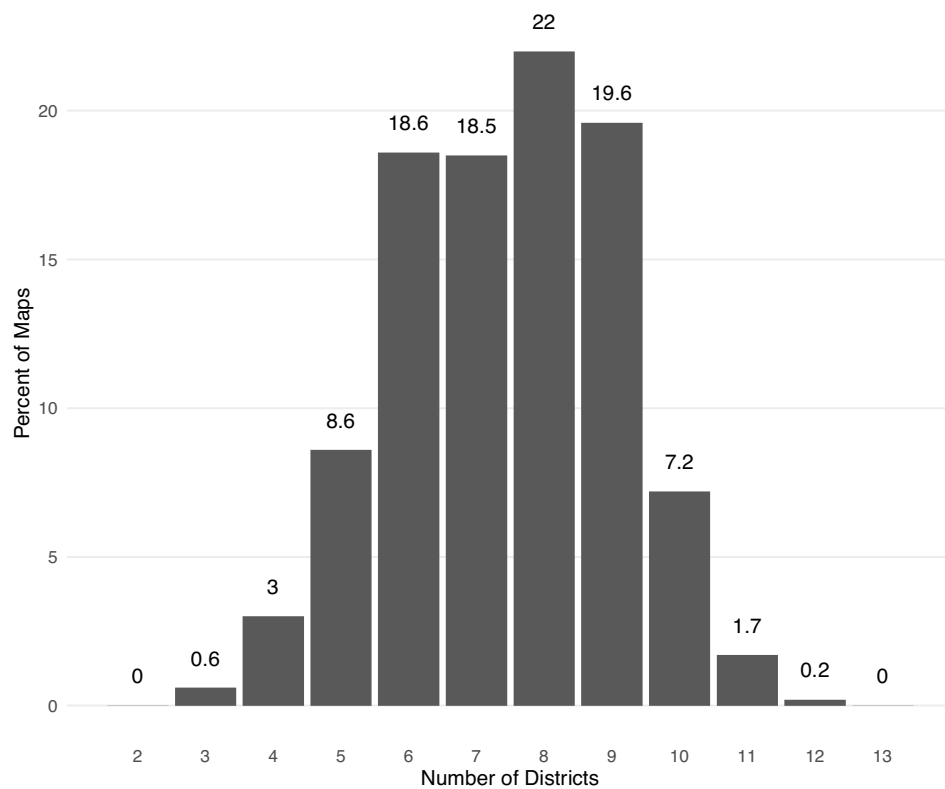
<sup>11</sup>As in the district specific analysis above, I use the precinct as the unit of analysis and calculate the Black population share of each precinct and the Democratic partisan lean of each precinct.

information. The algorithm was simply attempting to draw equal-population districts that were geographically contiguous and compact that limited split counties.

While Dr. Rodden conducted an envelope analysis on only four districts, if we conduct a similar analysis on all 14 districts in the 2023 Enacted Congressional Map, 8 of them are flagged by the regression models as potential racial gerrymanders where precinct BVAP is a statistically significant predictor of precinct assignment to the district. Doing the exact same procedure on the 2022 court-appointed Special Master Map also yields 8 districts where race is identified as a statistically significant predictor of the district's shape.

These numbers very closely resembles the numbers from the analysis of the 5,000 simulated districts. This close correspondence suggests a number of things. First, the envelope analysis is severely flawed because it produces many "false positives" where race is flagged as a significant predictor of precinct assignment to a district when we know that race played no role in the process. Second, this raises the question of whether the statistically significant results we find in the 2023 Enacted Congressional Map or the 2022 Special Master Congressional Map are also the result of false positives in which the regression model identifies race as a statistically significant predictor of precinct assignment to a district, when the legislature in fact gave no consideration to race at all. Given these concerning results, it is my opinion that the envelope method is not a reliable method for determining if race played a significant role in the assignment of precincts to districts.

Figure 11: Distribution of Districts Identified as Possible Racial Gerrymanders from County Envelope Method Conducted on 5,000 Maps Drawn by Redistricting Algorithm without Any Racial Information



Note: While all 5,000 maps were drawn without racial information and were only instructed to adhere to traditional non-racial and non-partisan redistricting criteria, every map was identified by a county envelope regression analysis as containing numerous districts where race was a statistically significant predictor of the district's shape.

determined by the population of the counties and not the legislature.<sup>30</sup> Only after the groupings are determined does the legislature begin the line drawing process within each grouping. In essence, the redistricting process is a multi-step process. First, the county groupings are assigned and those groupings that contain only one district are determined outside of the legislature's control. After that, the legislature draws district boundaries within each grouping — in essence completing a series of smaller “mini-redistrictings” within each grouping. Finally, within each county grouping, the legislature is further constrained by the *Stephenson* criteria because within the clusters that contain multiple districts, districts can traverse county lines one time at most.

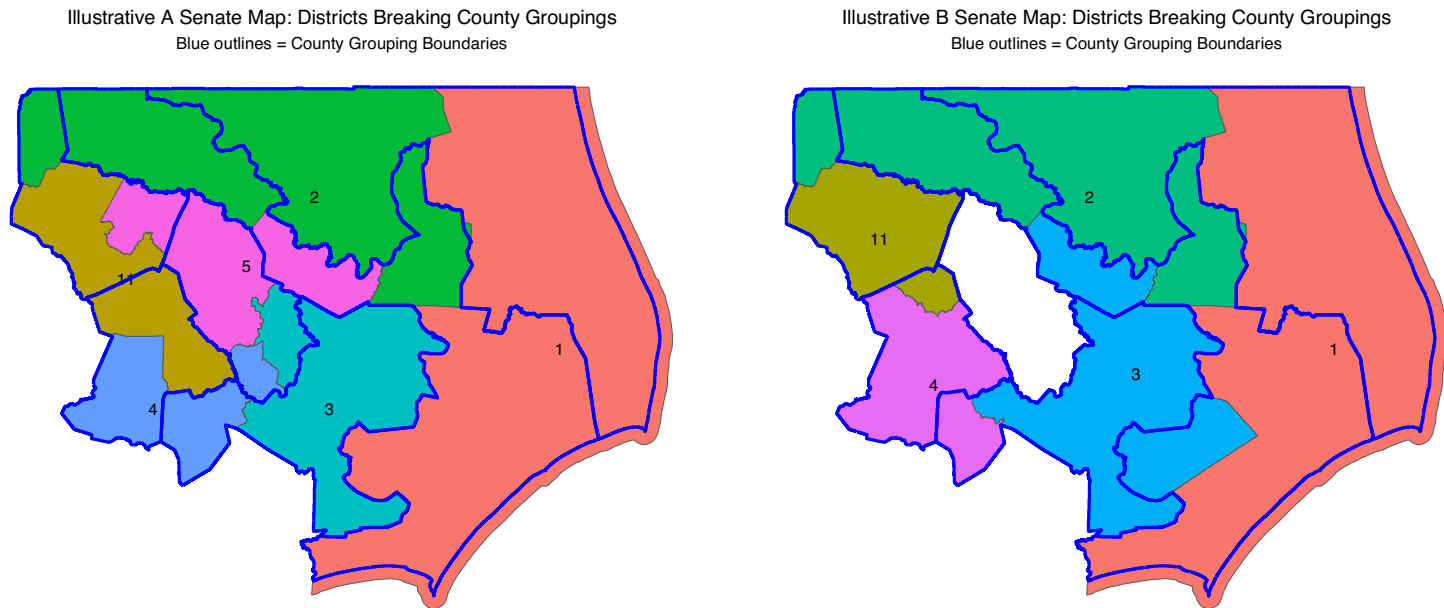
Mr. Fairfax's illustrative Senate Maps do not adhere to the *Stephenson* criteria in two ways. First, many of the districts in the illustrative map do not follow the county clusters.

Figure 21 shows districts in the Illustrative Senate Maps that break the county grouping boundaries. Importantly, by adding the additional majority BVAP districts (2 in Illustrative Map A, 1 in Illustrative Map B), there is a spillover effect that implicates many other districts across the eastern third of the state. In Illustrative Senate Map A, 6 county clusters composing 6 districts (12% of Senate Districts) are divided. This impacts 1,240,506 people, constituting 11.9% of the state's population, who are assigned into districts that do not adhere to the county clusters. In Illustrative Senate Map B, which contains only 1 additional majority BVAP district, the creation of this district has the downstream effect of impacting 5 Senate districts (10% of Senate Districts) constituting 9.57% of the state's population who are drawn into districts that do not adhere to the county cluster boundaries.

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<sup>30</sup>In some cases there are multiple options for county groupings, at which point the legislature can choose between grouping options.

Figure 21: Senate County Grouping Violations in Illustrative Senate Maps



Note: County groupings are outlined in blue. Illustrative districts are shaded and labelled.

Illustrative Senate Map A further violates the *Stephenson* criteria by dividing Pitt County across three different districts even though the population of Pitt County is small enough to be included in a single Senate district. Figure 22 shows a map of the county and how it is divided across Illustrative Senate Districts 3, 4, and 5 in Senate Map A.

### 6.3 Partisan and Racial Breakdown of Senate Districts

In this section I analyze the partisan and racial composition of the Enacted Senate Map as well as the Illustrative Senate Maps A and B. Because the Illustrative maps are identical to the Enacted Map outside of the eastern third of the state, I will focus only on the districts that are altered by the Illustrative maps. The eastern third of the state contains six Senate districts that are altered in Illustrative Map A and five Senate districts that are altered in Illustrative Map B. In all three maps (Enacted, Illustrative A and B) these districts

The district has a Reock compactness score of .33 and a Polsby-Popper compactness score of .18. Mr. Fairfax notes that these scores are higher than the *least* compact districts in the Illustrative map and the Enacted Map. However, the comparison to the least compact districts sets a pretty low bar, ensuring only that the district is not the least compact. However, it is the case that SD-5 in Illustrative Map A is less compact than the average district in Illustrative Map A (average Reock score of 0.40 and average Polsby-Popper score of 0.31) and the Enacted Map (average Reock score of 0.40 and average Polsby-Popper score of 0.31).<sup>34</sup>

While Illustrative SD-5 in Map A is majority BVAP, many of the voters in this district are already residing in districts that are likely to elect Democratic candidates. Illustrative SD-5 is composed of portions of Enacted SDs 5, 11, and 2. Enacted SD-5 is a heavily Democratic district with a partisan index of 0.57 and Enacted SD-11 is a Democratic leaning district with a partisan index of 0.51.<sup>35</sup> The remaining portion of Illustrative SD-5 covers Martin County, which is located in Enacted SD-2, which is a Republican leaning district and has a partisan index of 0.46.

Illustrative SD-5 incorporates only the northern third of Pitt County. One implication of this change is that residents of the bottom two thirds of Pitt county no longer live in a district that is Democratic leaning. Illustrative SD-3 and SD-4, which divide the remainder of Pitt County, are strongly Republican districts in the Illustrative Senate Map A (See Figure 24 above). Yet, there are approximately 20,000 Black residents of voting age who reside in that portion of Pitt County. On the other hand, Enacted SD-5, which covers the entirety of Pitt County, is a heavily Democratic district (See Figure 23 above). Thus, in creating Illustrative SD-5, many voters in Pitt County are moved from a district that will likely elect Black voters' candidates of choice to districts that will likely not elect Black

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<sup>34</sup>See Fairfax Report, pg 60 for compactness scores.

<sup>35</sup>Of the 19 elections used to calculate the partisan index, Democratic statewide candidates won the most votes in Enacted SD-5 in 19 of the 19 elections. Of the 19 elections used to calculate the partisan index, Democratic statewide candidates won the most votes in Enacted SD-11 in 13 of the 19 elections. This analysis sheds light on the partisan tendencies of the districts in the Enacted Plan. It is not meant to serve as a racial polarization analysis or a district specific functional analysis as part of a *Gingles* II inquiry.

Illustrative A Senate Map: Senate District 5

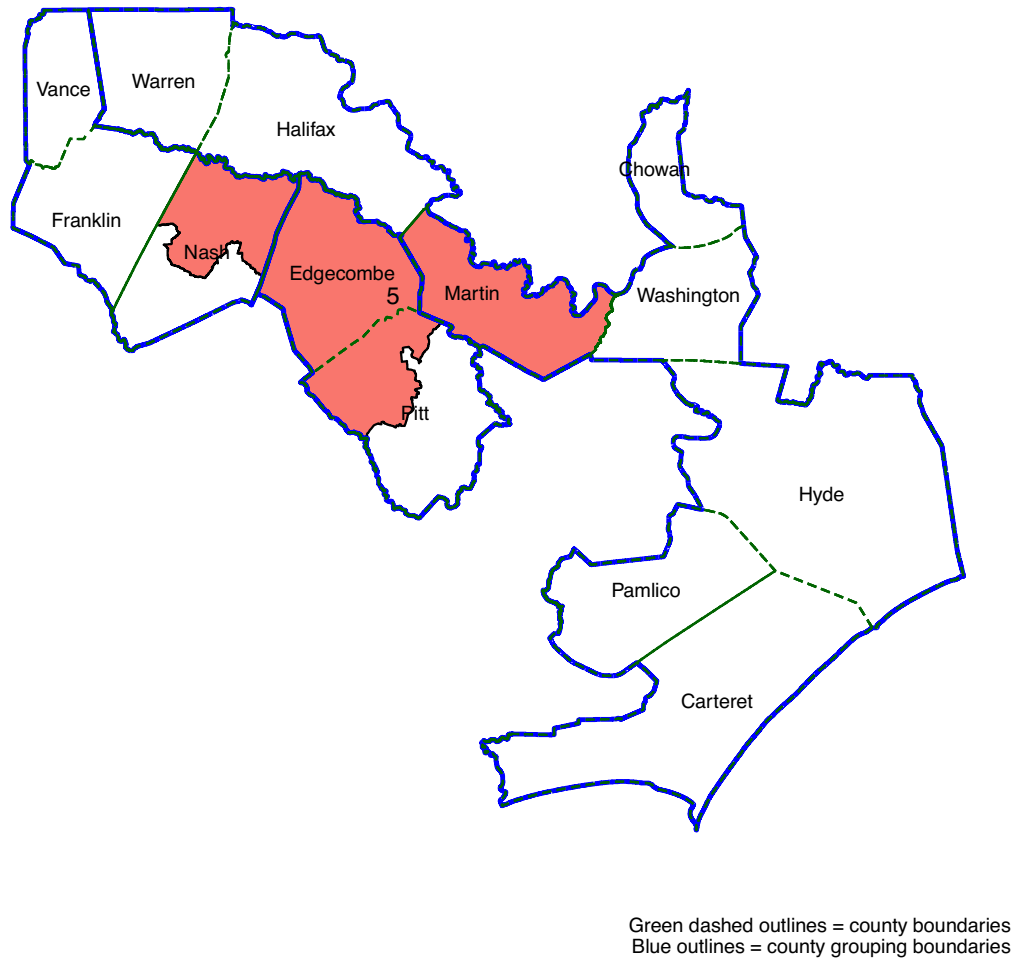


Figure 28: Illustrative Senate District 5. Green dashed lines show county boundaries. Solid blue lines show county cluster boundaries.

voters' candidates of choice.<sup>36</sup>

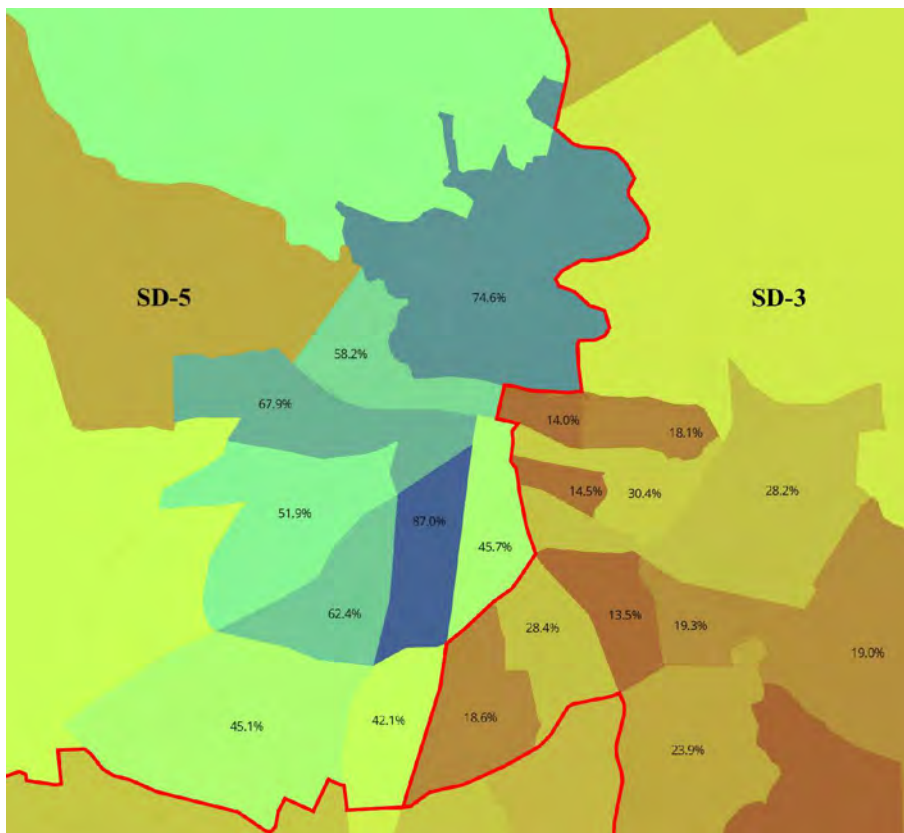
As noted above, Illustrative Map A divides Pitt County and Greenville (its largest city) across three districts. Figure 29 zooms in to Greenville and shows the specific precinct

<sup>36</sup>Political science literature has repeatedly confirmed that Black voters, for the past several decades, have strongly preferred Democratic candidates at all levels of government. See, for example, White, Ismail K., and Chryl N. Laird. *Steadfast democrats: How social forces shape Black political behavior*. Princeton University Press, 2020. Philpot, Tasha S. *Conservative but not Republican*. Cambridge University Press, 2017. Wamble, Julian J., Chryl N. Laird, Corrine M. McConaughy, and Ismail K. White. "We are one: the social maintenance of Black Democratic party loyalty." *The Journal of Politics* 84, no. 2 (2022): 682-697. For purposes of this report, I rely on this literature in my assessment that Democratic leaning districts are likely to elect Black voters' candidates of choice.



assignments between SD-5 and SD-3 in Illustrative Map A. In the map, precincts are colored and labelled by their Black Voting Age Population percentage. Looking at the figure, it is immediately apparent that the division of Greenville very closely follows the racial boundaries of the city. Those precincts with majority, or near majority BVAP, are placed in SD-5 while those precincts with lower BVAP scores are placed in SD-3. This careful attention to race suggests that the particular boundaries of these districts was primarily guided by racial considerations since no other traditional redistricting criteria, such as population equality, municipal boundaries, county boundaries, or any apparent communities of interest are noted by Mr. Fairfax for why the district boundary traverses the city in the way that it does. For example, SD-5 is underpopulated by approximately 7,500 people while SD-3 is overpopulated by roughly 3,500 people. Moving one or two precincts on this boundary from SD-3 to SD-5 would bring the two districts closer to population parity without introducing any additional city or county splits while maintaining the district's compactness scores. However, doing so would drop SD-5 below 50% BVAP, indicating that race predominated over population equality in the precinct assignments between the two districts in Greenville.

Figure 29: Division of Greenville by Illustrative Map A SD-5 and SD-3



Boundary between Illustrative Senate District 5 and 3 in Greenville. The red line shows the Senate district boundary. Precincts are shaded and labelled by their Black Voting Age Population percentage. Map source: <https://davesredistricting.org/>

#### 6.4.2 Illustrative Senate Map B

Illustrative SD-2 in Map B is identical in shape to SD-2 in Illustrative Map A. In Illustrative Senate Map B SD-5 is no longer a majority BVAP district and retains the same orientation as in the Enacted Map.

Dated: September 26, 2024

Michael Barber

Signed: \_\_\_\_\_