

Expert Report Submitted on Behalf of Plaintiffs
in *Stone v. Allen*, Case No. 2:21-cv-01531-AMM (N.D. Ala.)

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University of Delaware

April 19, 2024

A. Background and Qualifications

1. I, Kassra A.R. Oskooii, am over 18 years of age and am competent to testify.
2. I am a tenured, Associate Professor and Provost Teaching Fellow in the department of Political Science and International Relations at the University of Delaware ("UD"), having joined the faculty in 2016 as an Assistant Professor. I am also an affiliated faculty member at UD's Data Science Institute, Master of Science in Data Science, Center for Political Communication, and Center for the Study of Diversity. My research and teaching focuses on American political behavior, political methodology, political psychology, political representation, voting rights, and redistricting. My research has appeared in numerous leading peer-reviewed, social science journals, including *Sociological Methods and Research*, *Political Behavior*, *Public Opinion Quarterly*, *Political Psychology*, *Advances in Political Psychology*, *British Journal of Political Science*, *Electoral Studies*, *Perspectives on Politics*, *Urban Affairs Review*, *State Politics and Policy Quarterly*, and *Journal of Public Policy*.
3. I received my Ph.D. in Political Science, specializing in American politics, minority and race politics, and political methodology, from the University of Washington in Seattle, Washington in 2016. Prior to that, I received my Master's Degree in Political Science at the University of Washington and received a political methodology field certificate from the Center for Statistics & the Social Sciences in 2013. I received

my Bachelor of Arts in Political Science in 2008 at the University of Washington, with minors in Human Rights and Law, Societies, and Justice.

4. Throughout my academic career, I have taught courses on a range of topics related to voting behavior and redistricting. This includes instruction on demographic and electoral data collection and analysis utilizing election returns, Decennial U.S. Census data, and American Community Survey data. I have also instructed on the evaluation of electoral maps for compliance with the Voting Rights Act of 1965 ("VRA") and traditional redistricting principles.
5. Additionally, I have served as an expert witness in various redistricting and voting rights cases, where I have utilized U.S. Census and American Community Survey data to conduct racially polarized voting analyses, to develop both illustrative and remedial plans, and to evaluate plans for compliance with the VRA and traditional and state-specific redistricting principles. The cases I have worked on include, *Dickinson Bay Area Branch NAACP v. Galveston County, Texas*, No. 3:22-cv-117-JVB (S.D. Tex. 2023) [Deposed & Testified], *Baltimore County Branch of the NAACP v. Baltimore County, Maryland*, No. 1:21-cv-03232-LKG (D. Md. 2022), *Common Cause Florida v. Lee*, No. 4:22-cv-00109-AW-MAF (N.D. Fla. 2022), *Common Cause Florida v. Byrd*, No. 4:22-cv-00109-AW-MAF (N.D. Fla. 2022) [Deposed], *Reyes v. Chilton*, No. 4:21-cv-05075-MKD (E.D. Wash. 2021) [Deposed], *Finn et al. v. Cobb County Board of Elections and Registration*, No. 1:22-cv-02300-ELR (N.D. Ga. 2022), *Caroline*

County Branch of the NAACP v. Town of Federalsburg, Civ. Action No. 23-SAG-00484 (D. Md. 2023), *Coca v. City of Dodge City, et al.*, Case No. 6:22-cv-01274 (D. Kan. 2022) [Deposed & Testified], *Soto Palmer v. Hobbs*, No. 3:22-cv-05035-RSL (W.D. Wash. 2021) [Testified], and *Wicomico County Branch of the NAACP et al v. Wicomico County, MD*, Civ. Action No. 23-MJM-03325 (D. Md. 2023).

6. As an expert consultant, I have advised the State of Maryland on its 2021 Congressional and Legislative redistricting plans as it pertains to compliance with the Voting Rights Act. I have also examined and redrawn the 2022 school board district boundaries of the Roswell Independent School District in the state of New Mexico.
7. I have published peer-reviewed academic papers on ecological inference methods as it pertains to racially polarized voting analysis. In 2022, I published a paper in the top-ranked *Sociological Methods and Research*¹ journal titled "Estimating Candidate Support in Voting Rights Act Cases: Comparing Iterative EI & EI-RxC Methods."² In 2016 I published a paper titled "eiCompare: Comparing Ecological

¹ SMR has been considered a top-ranked journal by Harvard University: "SMR is now the #1 methods journal in the social sciences, ahead of *Econometrica*, and it stands as #3 in sociology, ahead of the *American Journal of Sociology*. Over the years, SMR has generally ranked in terms of citation impact as one of the top five social science methods journals and sociology journals."

² Available at <https://journals.sagepub.com/doi/full/10.1177/0049124119852394>.

Inference Estimates across EI and EI:RxC” in the *R Journal*.³ Both papers utilize a software package I co-developed called “eiCompare,” which is a reproducible code that quantifies, compares, and represents racially polarized voting data. The package enables social scientists to use aggregate-level election and demographic data retrieved from the U.S. Census, American Community Survey, and voter files to predict racial and ethnic group voting behavior. To my knowledge, eiCompare has been cited in numerous academic papers and in court filings.⁴ More information about my qualifications and expert witness and consulting background, including all of my publications over the past ten years, can be found on my Curriculum Vitae, appended to this declaration as **Appendix A**.

8. I am being compensated by the plaintiffs at a rate of \$400 an hour for my work on this matter. My compensation is not in any way contingent on the content of my opinions or the outcome of this matter.

B. Scope of Work

9. I was asked to review and respond to Dr. Trende’s report to the extent it concerns demographic data and analysis.

³ Available at <https://journal.r-project.org/archive/2016/RJ-2016-035/RJ-2016-035.pdf>.

⁴ For example, the Southern District of New York accepted the use of the eiCompare software in the matter *NAACP v. E. Ramapo Cent. Sch. Dist.*, 462 F. Supp. 3d 369, 383 (S.D.N.Y. 2020).

C. Sources of Data

10. I received Mr. Fairfax's report and Senate legislative illustrative map block equivalency file from counsel for the plaintiffs. I downloaded the enacted Senate legislative map block equivalency file from Dave's Redistricting Application ("DRA"), which is also available on the U.S. Census website.⁵
11. I rely on two primary sources of data to produce total population, voting age population ("VAP"), and citizen voting age population estimates ("CVAP") for the state of Alabama and any other levels of geography within the state.
12. For both total population and VAP at different levels of geography (e.g., blocks, block-groups, tracts, and counties) I rely on the 2020 Decennial U.S. Census, which I downloaded with the "censable" package in the statistical computing and graphing software called R.⁶
13. I obtained 2021 5-Year American Community Survey ("ACS") block-group CVAP estimates by race and ethnicity disaggregated to census blocks from the

⁵ Block equivalency file from the U.S. Census is available here: <https://www.census.gov/geographies/mapping-files/2023/dec/rdo/2022-state-legislative-bef.html>. I verified that the enacted map boundaries uploaded to DRA are identical to the boundaries made available by the U.S. Census.

⁶ Kenny C (2024). *censable: Making Census Data More Usable*. R package version 0.0.6, <https://github.com/christopherkenny/censable>, <https://christophertkenny.com/censable/>.

redistricting data hub ("RDH").⁷ RDH disaggregates block-group CVAP data to blocks by taking two key measures.

14. First, RDH ensures that CVAP racial data conforms to the Office of Management and Budget ("OMB") racial categories, such that "Black or African American" represents a comprehensive racial category that encompasses all relevant subcategories within that race. Specifically, the Black or African American CVAP ("BCVAP") field in the RDH data includes non-Hispanic Blacks alone or in combination, incorporating the combination of the following fields: "Black or African American Alone", "Black or African American and White", and "American Indian and Alaska Native and Black or African American".
15. Second, RDH disaggregates CVAP block-group data to blocks weighted by the proportion of a block's VAP for *each* racial/ethnic group. In cases in which no blocks in a block group contain a 2020 value for a racial or ethnic group combination but contain values in the 2021 estimate, RDH uses total CVAP as a proxy. This process is detailed in Appendix B.

⁷ <https://redistrictingdatahub.org/dataset/alabama-cvap-data-disaggregated-to-the-2020-block-level-2021/>. At the time of my analysis, RDH's 2022 5-Year ACS CVAP data had not yet been made publicly available.

16. I have used RDH's CVAP data regularly in numerous jurisdictions for teaching and expert witness work purposes. RDH CVAP data is also used by very well-known map-making applications such as DRA.⁸

D. ACS is the Only Reliable Data Source to Estimate Eligible Voters within Alabama's Enacted or Illustrative Senate Legislative Districts

17. Prior to 2010, the Decennial Census included a citizenship question in the long form questionnaire, which was disseminated to approximately one out of seven households. However, the use of the long form questionnaire was discontinued for the 2010 Decennial Census. With this change, the citizenship question was removed.
18. The long form questionnaire was eventually replaced with the ACS, which is considered the premier source of detailed population and housing information about the nation, particularly CVAP estimates.⁹
19. Unlike the Decennial Census, the ACS is conducted every month of every year (sample of about 3.5 million households), thereby providing the most current information on a rolling basis.

⁸ See, <https://davesredistricting.org/maps#aboutdata>.

⁹ <https://www.census.gov/programs-surveys/acs>.

20. The sampling procedure of the ACS is designed to provide reliable annual estimates of various population characteristics for cities, counties, and other geographic regions with a population of 65,000 or more.¹⁰ For smaller geographic units, the ACS provides sufficiently reliable statistics by aggregating several yearly estimates known as 5-year estimates. The 5-year ACS produces demographic estimates for all census geographic units as low as the block-group level.¹¹
21. It is well understood that the ACS does not provide a count of the United States (U.S.) population. In fact, it is not intended to do so. Therefore, ACS total population estimates are not used in redistricting for population parity (or equal population) requirements. However, ACS is regularly used to estimate the proportion of eligible voters by race and ethnicity across electoral districts.
22. ACS has two notable advantages over the Decennial Census.
23. First, ACS provides more updated data since data collection occurs every month and is released every year. In comparison, data from the Decennial Census is not collected on a rolling basis.

¹⁰ <https://www.census.gov/programs-surveys/acs/guidance/estimates.html>.

¹¹ Disaggregation techniques are used to determine 5-year ACS CVAP estimates by race and ethnicity for Census blocks (the smallest Census geographic unit on which the Census Bureau reports data).

24. Second, and more notably, the ACS provides data not available in the Decennial Census, namely CVAP estimates by race and ethnicity.¹²
25. ACS is the gold standard and best source of reliable data to estimate the proportion of eligible voters within electoral jurisdictions—U.S. Citizens above the age of 18. In fact, ACS is the *only* source of data that provides CVAP statistics by race and ethnicity at various geographic units across the U.S.
26. When seeking to determine the overall electoral influence of various racial and ethnic groups, the ACS holds a distinct advantage over the Decennial Census. This advantage stems from the fact that the Decennial Census lacks a citizenship variable, thus only allowing for the derivation of VAP data. When considering groups' overall electoral power, VAP data is overly inclusive as it encompasses non-citizens—individuals ineligible to vote. Consequently, utilizing VAP data tends to overstate the eligible voting population, particularly for groups like Hispanics and Asians, which typically exhibit lower citizenship rates compared to non-Hispanic White and Black residents.
27. This discrepancy also affects the calculations of eligible voters for other racial and ethnic groups, as demonstrated by Mr. Fairfax. For instance, while Black Voting

¹² ACS also includes various socioeconomic variables used and accepted by the courts in voting rights cases as part of the Senate Factors. These data include variables such as income, healthcare status, educational attainment, and poverty rates.

Age Population (VAP) falls just below 50% in the plaintiff's illustrative District 7 in Mr. Fairfax's February 2, 2024 Report, the 2021 5-year Black Citizen Voting Age Population ("BCVAP") surpasses this threshold. This is primarily because the Hispanic share of eligible voters ("HCVAP") is less than half of Hispanic VAP ("HVAP").¹³ Similarly, in illustrative District 7, the non-Hispanic White CVAP stands at 42.7%, exceeding the non-Hispanic White VAP, which is at 39.0%.

28. Dr. Trende has acknowledged this issue of overinflation, choosing to rely on ACS CVAP data when evaluating or drawing electoral plans. For instance, in his special master report for the state of Virginia, he supported the use of CVAP data to determine the proportion of eligible Black voters, as Mr. Fairfax has also done in his report. Dr. Trende stated: "We also observe that the NAACP memo has called attention to differences between CVAP estimates of African-American proportions (taken from 2019 ACS data) and VAP estimates (taken from the 2020 census). We would simply note that (a) we have examined both VAP and CVAP data, and (b) that the presence of non-citizen Latinos and Asian-Americans in a district can raise the black CVAP share above the black VAP share, making it a useful metric for assessing a district's actual electorate."¹⁴

¹³ Hispanics make up 10.1% of the VAP in illustrative District 7 but make up only 4.4% of the eligible voters (CVAP) in the same district.

¹⁴ Bernard Grofman, Ph.D. and Sean Trende, Memo to The Chief Justice and Justices of the Supreme Court of Virginia re: Redistricting maps (Dec. 27, 2021), Page 8, https://www.vacourts.gov/courts/scv/districting/2021_virginia_redistricting_memo.pdf

29. In a memo to Arizona's Independent Redistricting Commission, Dr. Trende utilized ACS CVAP data and argued for its necessity in VRA cases: "To assess compliance with the Voting Rights Act, an analyst must identify the count of citizens who are at least 18 years of age *and* are citizens of the United States."¹⁵
30. In two recent cases where I created illustrative maps (*Coca v. City of Dodge City, et al.*) and remedial maps (*Soto Palmer, et al. v. Hobbs, et al.*), Dr. Trende, acting as the expert witness for the defendants, utilized ACS data to compute CVAP estimates without expressing any concerns about estimation uncertainty or offering any margins of error (guessed or otherwise). Interestingly, he provided precise CVAP calculations down to the tenth percentage point, aiming to demonstrate that one of the Washington State legislative remedial plans had less than 50% Hispanic CVAP.¹⁶
31. Having repeatedly relied on ACS CVAP data as other experts, including myself, have done over the years, Dr. Trende seems to now question the reliability of ACS estimates. He does this by juxtaposing block-group CVAP estimates with

¹⁵ Stephen Ansolabehere, Ph.D., David Sutton, Sean Trende, *Arizona Independent Redistricting Commission: Overview of Decennial Redistricting Process and Maps*, Appendix A: Memo to Arizona Redistricting Commission re Characteristics of Congressional District (CD) Map 14.0 (Jan. 20, 2022), Page 2, https://irc.az.gov/sites/default/files/meeting-files/IRC%2520Comprehensive%25202022%2520Report%2520DRAFT_0.pdf (emphasis in original).

¹⁶ In Washington, Dr. Trende proposed his own remedial map and supplied 5-year ACS CVAP estimates by race and ethnicity. The court ultimately selected one of my remedial plans for the 2024 state legislative elections.

Decennial Census VAP or total population block-group counts. Through this comparison, he emphasizes cases where the total 2021 CVAP count surpasses that of the 2020 VAP.

32. However, Mr. Fairfax's aim is not to determine BCVAP counts at the block-group level, where larger margins of error (MOE) are often observed due to the smaller sample size. Instead, Mr. Fairfax is computing CVAP proportions at a significantly larger geographic scale, namely state senatorial districts. Senate legislative districts in Alabama boast an ideal population size of 143,551, which is vastly different from Alabama's average block-group population of only 1,280 people, with a minimum of 0 and a maximum of 5,534 population.
33. As a general rule, as the sample size increases the MOE declines. Therefore, comparing CVAP counts to VAP and total population counts in larger geographic units, which offer a larger sample size, produces much more precise results, particularly with 5-year ACS data.
34. Table 1 reports total population, total VAP, and total estimated CVAP for illustrative Districts 7 and 25. As shown, the concern Dr. Trende raised, where the estimated CVAP count exceeds that of VAP or even total population, is not applicable.

Table 1: 2020 Decennial Census Total Population and Total VAP vs. 2021 ACS 5-Year Total CVAP Estimates by Illustrative Districts

District	Total Pop	VAP	CVAP
7	137221	108202	100871
25	137414	106162	99244

35. Table 2 provides total population, total VAP, and total estimated CVAP for each county partially or fully encompassed within illustrative Districts 7 and 25. Even within these smaller geographic areas compared to Senate districts, CVAP estimates do not surpass total VAP or total population counts reported by the Decennial U.S. Census.
36. Overall, I consider Mr. Fairfax's utilization of 5-Year 2021 ACS CVAP data to determine the proportion of eligible Black voters within Senate legislative districts a sensible and valid approach to assess the electoral influence of Black Alabamians.¹⁷

¹⁷ Dr. Trende asserts that the Black eligible population in Illustrative District 7 would decrease to 46.8% when incorporating state-level felony conviction statistics provided by Dr. Burch. (Trende report, page 21). However, it remains unclear how Dr. Trende arrived at this conclusion, as no block or block-group data on Black felony rates in the state of Alabama was reported. To my knowledge, reliable block or block-group data on Black felony rates or counts is not available for the state of Alabama. Therefore, I view Dr. Trende's conclusion as purely speculative. Furthermore, I have never encountered an expert adjusting a district's CVAP share based on felony convictions, especially when reliable block or block-group data on felony rates is unavailable to them.

Table 2: 2020 Decennial Census Total Population and Total VAP vs. 2021 ACS 5-Year Total CVAP Estimates by Counties within Illustrative Districts 7 and 25

County	Total Pop	VAP	CVAP
Crenshaw	13194	10360	10160
Limestone	4241	3422	3390
Madison	103853	82367	77112
Montgomery	124220	95802	89084
Morgan	29127	22413	20369

E. Plaintiff's Illustrative Districts 7 2021 5-Year ACS BCVAP Share and CVAP**Calculation Methods**

37. To calculate the proportion of BCVAP within Mr. Fairfax's illustrative District 7, I utilized the 2021 5-Year ACS CVAP data provided by RDH. This process involved importing RDH's block-level CVAP data into the statistical computing and graphing software "R" and aggregating BCVAP and Total CVAP for all Census blocks within the boundaries of the illustrative Senate legislative District 7. Subsequently, I computed the proportion of eligible Black voters by dividing the total BCVAP by the total CVAP in District 7.
38. Based on this computation I find a BCVAP of 50.11% in illustrative District 7.
39. However, Dr. Trende's report indicates 2021 BCVAP percentages for illustrative District 7 that are slightly below 50%. After reviewing his R code and data, I believe

that the variance between his estimates and mine (as well as Mr. Fairfax's estimate) likely stems from a combination of at least three factors.¹⁸

40. First, Dr. Trende's R code and CVAP data include three fields for individuals identifying as Black or African American: "b1 = 'cvap_est_Black or African American Alone'," "b2 = 'cvap_est_Black or African American and White'," and "b3 = 'cvap_est_American Indian or Alaska Native and Black or African American'" (found in "AL_Leg_Final.R", lines 145-147). These categories align with the three categories RDH employs to report "Black alone or in combination" CVAP. However, when Dr. Trende creates the total BCVAP variable to calculate the proportion of BCVAP in a district, he excludes the third category: "b3 = 'cvap_est_American Indian or Alaska Native and Black or African American.'" ¹⁹
41. Second, Dr. Trende's CVAP calculation methods do not appear to consider the proportion of VAP of each racial/ethnic group within Census blocks. Instead, he relies only on total VAP within Census blocks. Relying on total VAP may lead to an underestimation of the share of BCVAP in a district if BVAP is unevenly distributed across Census blocks nested within block-groups partially included in illustrative District 7. Dr. Trende does not consider this at all in his calculations.

¹⁸ I note here that both Mr. Fairfax and I independently find that the 2021 5-Year ACS BCVAP is above 50% in Illustrative District 7.

¹⁹ See Line 153 where only b1 is added to b2, while b3 is excluded: "mutate(cBlack21 = b1 + b2)".

42. To illustrate this point, consider the following example. Suppose we have a block-group with two blocks ("A" and "B") totaling 2000 VAP. Block A is situated within illustrative District 7, while block B lies outside of it. Block A has a total VAP of 1000, with 900 being BVAP. In contrast, block B also has a total VAP of 1000 but only 100 BVAP. According to ACS data, suppose all 2000 voting-age individuals in the block-group are citizens (CVAP), with half of them (or 1000) being BCVP.
43. Applying Dr. Trende's approach to compute BCVP for block A and B, we would multiply 0.5 (half of the 2000 total VAP) by the total block-group BCVP of 1000. This calculation yields a BCVP of 500 for block A and a BCVP of 500 for block B. This approach wrongly assumes BVAP is equally distributed across the blocks when that is not the case.
44. However, considering the share of BVAP in each block rather than the total VAP of each block allows for a more precise estimation of BCVP. To determine BCVP for block A, we would multiply 0.9 (900 BVAP out of 1000 VAP) by the total block-group BCVP of 1000, resulting in a BCVP of 900 for block A. Using the same approach, we would multiply 0.1 (100 BVAP out of 1000 VAP) by the total block-group BCVP of 1000, yielding a BCVP of only 100 for block B. This approach is more precise because it accounts for the uneven distribution of BVAP present within the blocks nested inside the block-group.

45. Therefore, a more precise approach would entail disaggregating CVAP block-group data to blocks for each racial/ethnic group based on the group's VAP ratio within blocks, rather than solely relying on the total VAP in a block. By adopting this method, we avoid assuming equal distribution of BVAP across blocks nested within block-groups. This approach aligns with the disaggregation methodology employed by RDH.
46. Third, Dr. Trende's approach seems to overlook scenarios where a block within a block-group does not contain a voting-age value for a specific race/ethnicity (e.g. Black or African American) in 2020 but does have a value in the more recent 2021 ACS CVAP data. While these occurrences are rare, RDH addresses this situation differently by not multiplying a value of 0 by a 2021 CVAP value greater than 0 in a block group. This prevents the inadvertent removal of any CVAP counts greater than 0 for a racial/ethnic group, such as Black or African American.²⁰

F. Dr. Trende's Dot Density Plots are Layered in a Manner that Greatly Conceals the White VAP Concentrations Across Blocks or Block-Groups

47. Dr. Trende crafted dot density plots representing 10 voting-age Whites with an orange "X" and 10 voting-age Blacks with a blue dot.

²⁰ RDH's data description ("README.txt" file), which is attached to this report under Appendix B, takes the following approach: "In the scenario where no blocks in a block group contain a value for a particular race/ethnicity combination in 2020, but have a value in the 2021 estimates, total CVAP population or total citizen estimate population was used as a proxy, depending on the variable. In the scenario where a block group does not contain[] a value in [its] respective population or voting-age population field in the PL data, the 2021 population is divided evenly amongst all blocks in the block group."

48. Upon inspecting Dr. Trende's R code, I noticed he opted to layer blue dots atop orange Xs, effectively obscuring the concentration of White VAP within census blocks or block-groups.²¹
49. Using his data and code, I replicated his plots and generated an alternate version by layering orange Xs (White VAP) over blue dots (Black VAP).
50. Figure 1 reproduces Dr. Trende's Figure 10, based on block-group VAP data. Figure 2, using the same data, plots blue dots (Black VAP) first and then overlays orange Xs (White VAP).
51. Figure 3 replicates Dr. Trende's Figure 11, employing block-level VAP data where Black VAP is superimposed on White VAP.
52. Figures 4 use the same block-level data, displaying White VAP over Black VAP using identical-sized symbols (dots for both racial groups).
53. Figures 5 mirrors Dr. Trende's Figure 13, utilizing block-group VAP data to depict Black VAP atop White VAP.
54. Figure 6, using the same block-group VAP data, layers White VAP over Black VAP.
55. Overall, the layering technique employed in Dr. Trende's dot plots significantly influences the portrayal of populations in various areas. His approach hides

²¹ Dr. Trende asserts that his dot plots "should be read in conjunction with the choropleth maps above, as they both provide different types of information." Trende March 29, 2024 Report, Page 23. However, the choropleth maps fall short in revealing the concentration of White and Black VAP across blocks or block-groups within and beyond illustrative Districts 7 and 25. This limitation stems from his presentation of Black VAP exclusively at the precinct level, covering only specific regions of Alabama (Limestone, Madison, and Morgan Counties).

significant concentrations of White VAP while disproportionately highlighting Black VAP in numerous regions within illustrative Districts 7 and 25. Consequently, interpretations based on his dot density plots, without employing methods to effectively differentiate between population symbols, yield highly inaccurate inferences regarding the inclusion or exclusion of heavy Black or White VAP blocks or block-groups within district boundaries. Therefore, I find Dr. Trende's conclusions regarding the boundary choices made by Mr. Fairfax to be unreliable.

Figure 1: Dr. Trende's Figure 10 Dot Density Map of Black and White populations, Illustrative District 7 (Black VAP at the block-group level is plotted on top of White VAP).

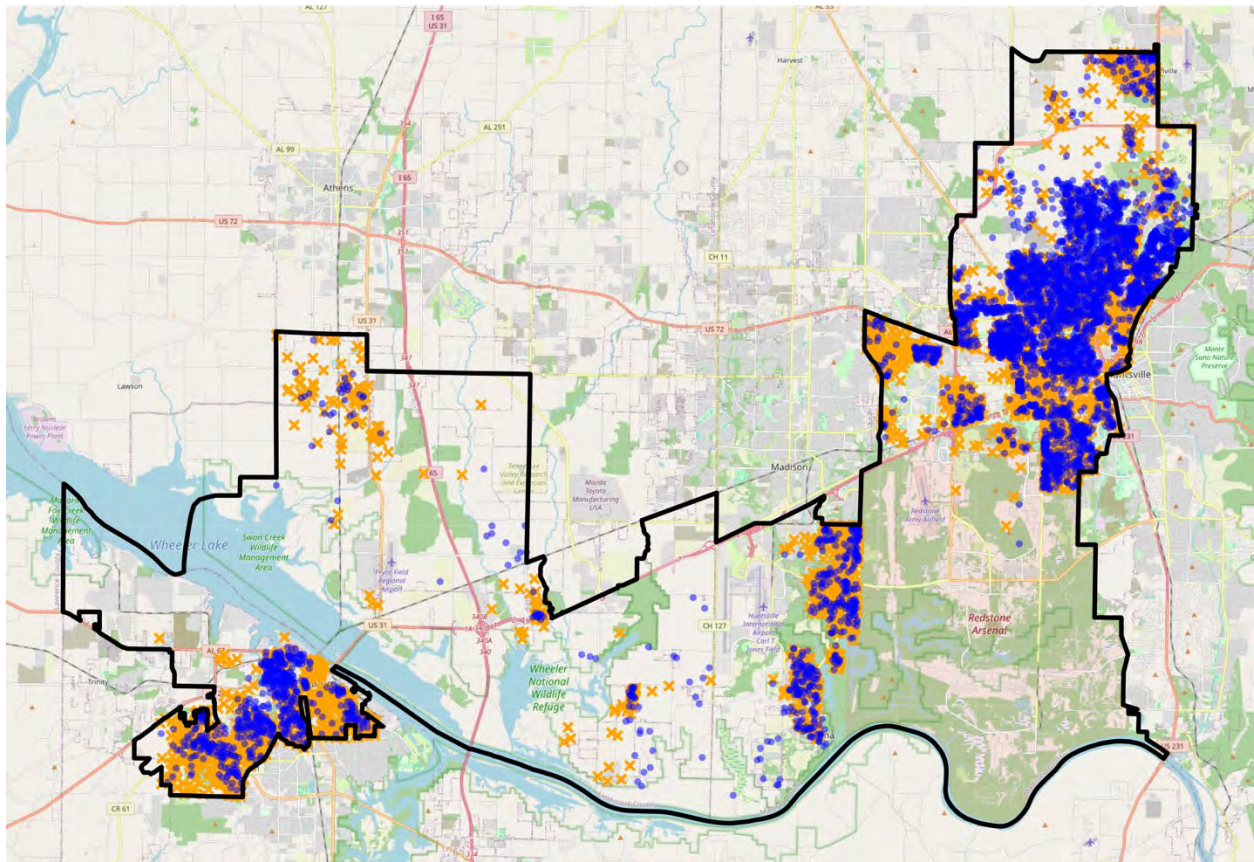


Figure 2: Dot Density Map of Black and White populations, Illustrative District 7 (White VAP at the block-group level is plotted on top of Black VAP).

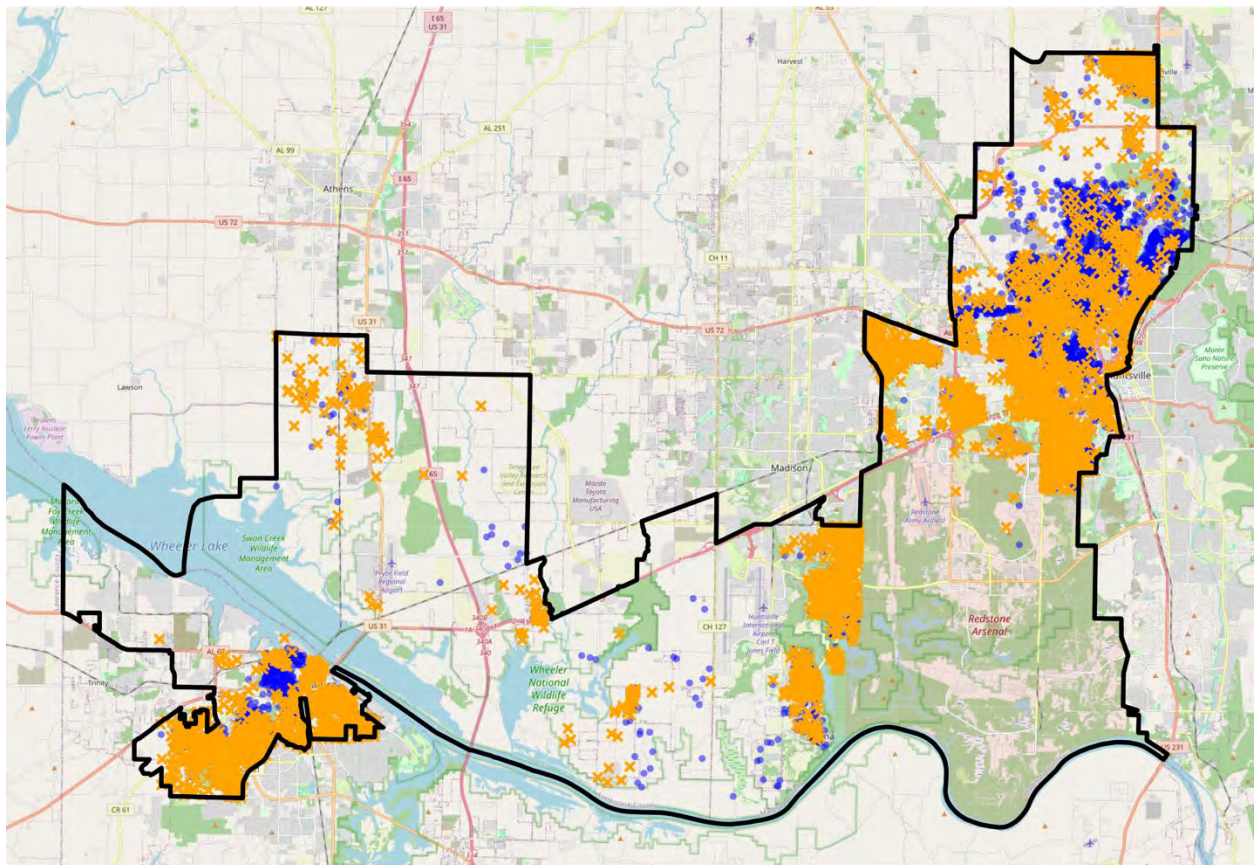


Figure 3: Dr. Trende's Figure 11 Dot Density Map of Black and White populations, Illustrative District 7 (Black VAP at the block level is plotted on top of White VAP).

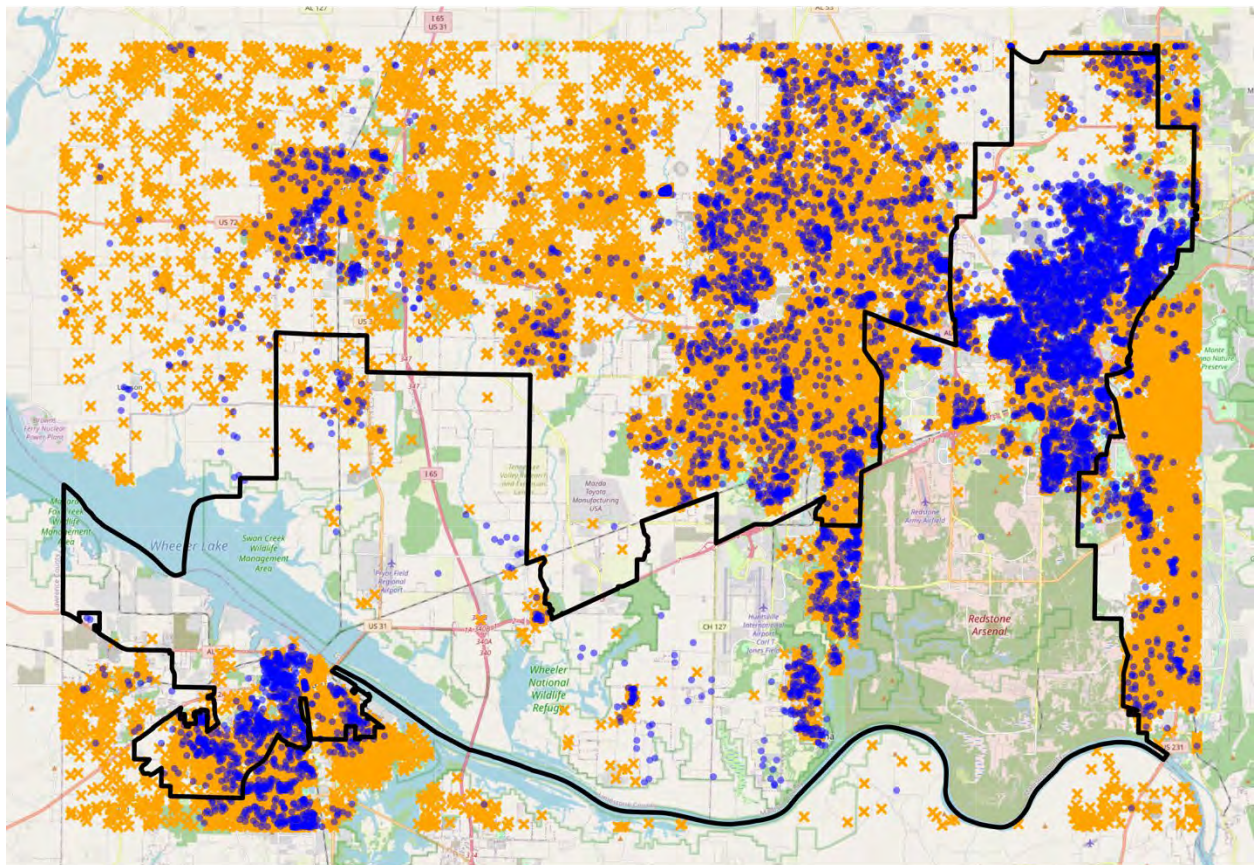


Figure 4: Dot Density Map of Black and White populations (Identical Symbols and Symbol Sizes), Illustrative District 7 (White VAP at the block level is plotted on top of Black VAP).

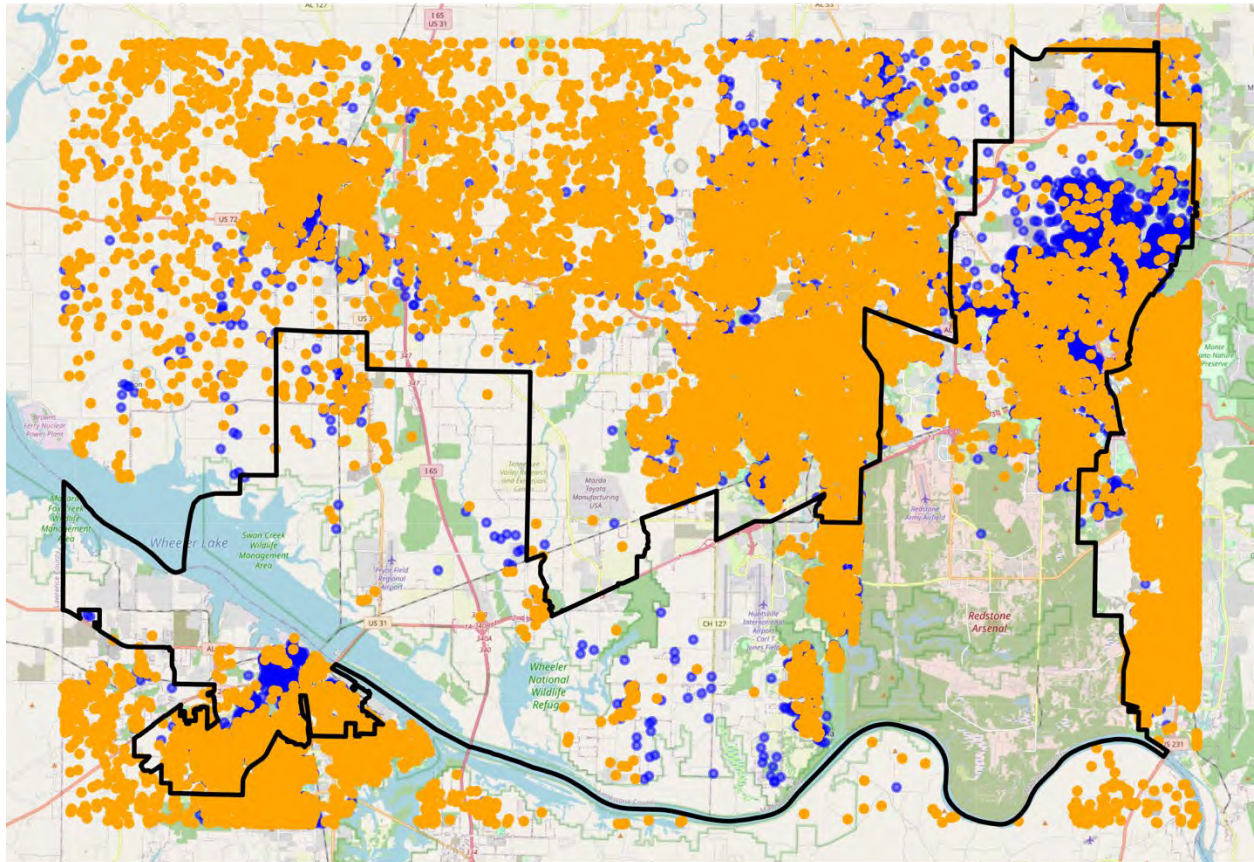


Figure 5: Dr. Trende's Figure 13 Dot Density Map of Black and White populations, Illustrative District 25 (Black VAP at the block-group level is plotted on top of White VAP).

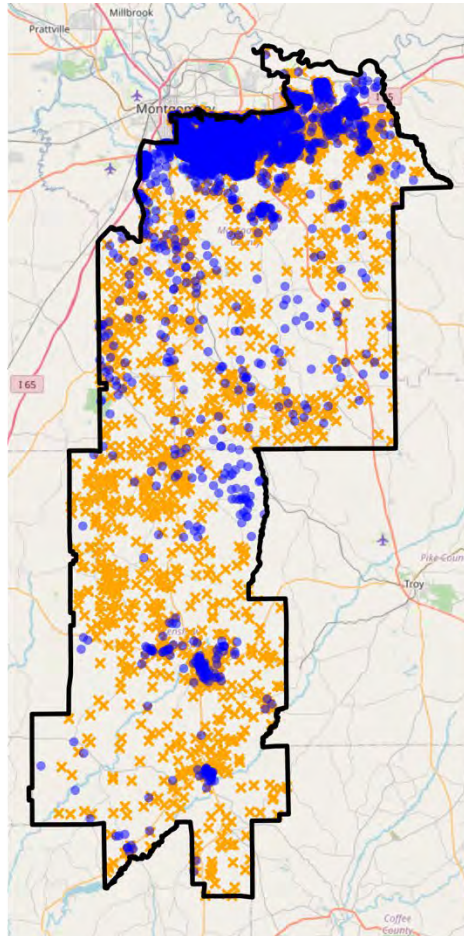
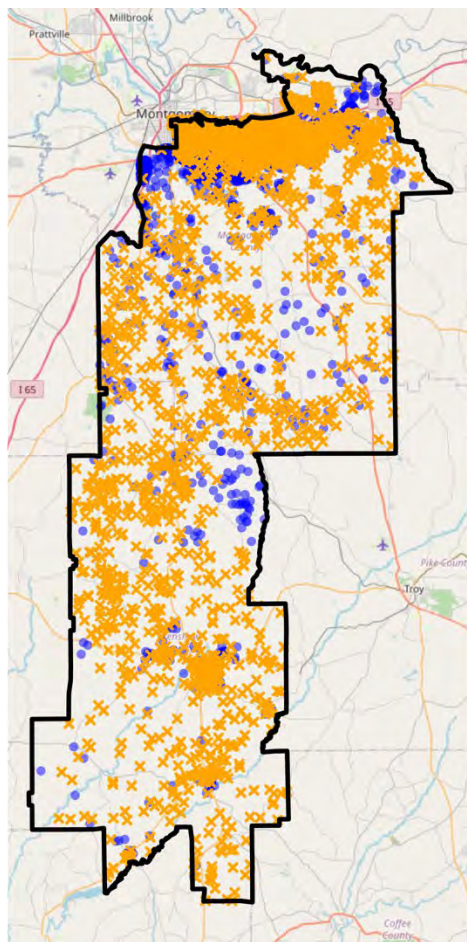


Figure 6: Dot Density Map of Black and White populations, Illustrative District 25 (White VAP at the block-group level is plotted on top of Black VAP).



G. Conclusion

56. ACS is the premier source of data to estimate CVAP by race and ethnicity within electoral jurisdictions such as Alabama's Senate legislative districts.
57. The 2021 5-Year ACS is a valid and reliable source of data to determine the share of eligible Black voters within illustrative Districts 7 and 25.
58. Using RDH's 2021 5-Year ACS Census block-group CVAP data disaggregated to Census blocks, I find a BCVAP of 50.11% for illustrative District 7.
59. After scrutinizing Dr. Trende's data and R code, several noteworthy observations emerge. Firstly, his BCVAP estimates notably exclude individuals identifying as "American Indian or Alaska Native and Black or African American." Secondly, there is a lack of consideration for the ratio of BVAP within each census block when estimating CVAP, which disregards any uneven distribution of BVAP within blocks nested inside block-groups. Lastly, there is no provision for scenarios where a block within a block-group lacks a voting-age value for a specific race/ethnicity (e.g., Black or African American) in 2020 but possesses one in the more recent 2021 ACS CVAP data. These elements contribute to the production of less precise CVAP estimates compared to approaches that account for these factors.
60. Finally, after examining Dr. Trende's dot density plots, it became evident that the method he employed to layer voting-age populations by race significantly

influences the depiction of demographic concentrations within census blocks or block-groups. Dr. Trende's decision to overlay blue dots representing Black voting-age population (VAP) on top of orange Xs representing White VAP tends to obscure the actual distribution of White VAP within each area. Upon replicating his plots and altering the layering sequence, it became apparent that the choice of layering significantly impacts the portrayal of demographic distributions. Specifically, the plots revealed that Dr. Trende's approach obscured significant concentrations of White VAP in numerous areas across illustrative Districts 7 and 25 leading to inaccurate conclusions regarding the inclusion or exclusion of heavily concentrated Black or White VAP blocks or block-groups within the illustrative district boundaries.

61. I reserve the right to modify, update, or supplement my report as additional information is made available to me.

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

Executed by:



Dr. Kassra AR Oskooii

Dated: April 19, 2024