UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

DONALD AGEE, JR. et al., Plaintiffs, v. JOCELYN BENSON, et al., Defendants.	**Case No. 1:22-CV-00272-PLM-RMK-JTN**

JOINT APPENDIX: Volume I of V (JA00001 to JA000276)

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EXPERT REPORT OF DR. LISA HANDLEY

I. Scope of Project

I was retained by lawyers for the Michigan Independent Citizens Redistricting Commission (MICRC) in *Agee v. Benson* to conduct an analysis of voting patterns by race in the 2022 Democratic primary and general election in Detroit area districts in the 2022 State House and State Senate Plans. In addition, I was asked to assess the opportunity that Black voters have to elect their candidates of choice in less than majority-Black legislative districts in the Detroit area in the 2022 State House and State Senate Plans based on the 2022 general and Democratic primary elections.[1]

As a consultant for the MICRC in 2021-2022, I analyzed earlier elections conducted under the 2012 Congressional, State Senate, and State House Plans and prepared a report entitled "Report to the Michigan Independent Citizens Redistricting Commission" ("2021 Report" attached at Appendix A).[2] Included in my 2021 Report were the following conclusions: (1) voting in Michigan is racially polarized, and as a consequence, (2) "districts that provide minority voters

[1] I am being compensated at a rate of $350 an hour for work on this project.

[2] I conducted the analysis and presented the results of my analysis to the MICRC during the redistricting process in 2021. My written report was completed and provided to the MICRC in January 2022.

with an opportunity to elect their candidates of choice must be drawn;"[3] and (3) "in no county [analyzed] is a 50% BVAP district required for the Black-preferred candidates to carry the district in a general election."[4] I incorporate by reference the contents of Appendix A, including but not limited to my analysis and conclusions related to the existence of polarized voting in Michigan.

II. Professional Background and Experience

I have over thirty-five years of experience as a voting rights and redistricting expert. I have advised scores of jurisdictions and other clients on minority voting rights and redistricting-related issues. I have served as an expert in dozens of voting rights cases. My clients have included state and local jurisdictions, independent redistricting commissions (Arizona, Colorado, Michigan), the U.S. Department of Justice, national civil rights organizations, and such international organizations as the United Nations.

I have been actively involved in researching, writing, and teaching on subjects relating to voting rights, including minority representation, electoral system design, and redistricting. I co-authored a book, *Minority Representation and the Quest for Voting Equality* (Cambridge University Press, 1992), and co-edited a volume, *Redistricting in Comparative Perspective* (Oxford University Press, 2008), on these subjects. In addition, my research on these topics has appeared in peer-reviewed journals such as *Journal of Politics*, *Legislative Studies Quarterly*, *American Politics Quarterly*, *Journal of Law and Politics*, and *Law and Policy*, as well as law reviews (e.g., *North Carolina Law Review*) and a number of edited books. I hold a Ph.D. in political science from The George Washington University.

I have been a principal of Frontier International Electoral Consulting since co-founding the company in 1998. Frontier IEC specializes in providing electoral assistance in transitional democracies and post-conflict countries. In addition, I am a Visiting Research Academic at Oxford Brookes University in Oxford, United Kingdom. Attached to the end of this report is a copy of my curriculum vitae.

[3] "2021 Report," page 17.

[4] "2021 Report," page 21.

III. Voting Patterns and Electing Black Voters' Candidates of Choice in Recent District Elections Prior to the Adoption of the 2022 Redistricting Maps

General Elections in 2018-2020 I analyzed 31 district-level 2018 and 2020 general elections (congressional, state senate and state house) in Detroit area districts in the 2012 Congressional, State Senate, and State House Plans with Black voting age populations (BVAP) greater than 25%.[5] The results of this analysis are found in my 2021 Report to the MICRC (Appendix A). Only five of these general election contests were racially polarized, with Black and White voters supporting different candidates.[6] The candidates preferred by Black voters was successful in all of these polarized 2018 and 2020 elections. In summary, the candidates supported by Black voters won in all 35 of the Detroit area district general elections analyzed in districts with BVAPs greater than 25%. Clearly, general elections do not pose a barrier to electing Black voters' candidates of choice in Detroit area districts with substantial BVAPs.

Democratic Primaries in 2018-2020 I analyzed 22 district-level Democratic primaries in 2018 and 2020 in Detroit-area districts in the 2012 Congressional, State Senate, and State House Plans with BVAPs greater than 25% BVAP (Appendix A). Table 1 summarizes the results of this analysis.[7]

[5] BVAP has been calculated here (as in my 2021 Report) by counting all persons 18 years and older who checked "Black or African American" on their census form, either alone or in conjunction with one or more additional races, but did not check that they were Hispanic.

[6] My assessment regarding whether a contest was racially polarized is based on the most methodologically sophisticated and what are generally accepted as the most accurate estimates, the EI RxC estimates. These estimates are found in the final column of the summary tables (Appendix B) in the 2021 Report and in the first column of estimates in the Appendices of this report.

[7] Table 1 considers all of the district-level elections – congressional, state senate and state house. I have combined all district elections to increase the number of observations. Tables 2 and 3 review state senate and state house districts separately with the addition of the earlier state senate and state house contests analyzed by Mr. Trende.

Table 1

2012 Districts	Percent BVAP	2020 Democratic Primary	2018 Democratic Primary
HD7	94.9	insufficient White voters for accurate estimates	insufficient White voters for accurate estimates
HD8	92.9	insufficient White voters for accurate estimates	insufficient White voters for accurate estimates
HD3	91.5	insufficient White voters for accurate estimates	insufficent White voters for accurate estimates
HD9	74.9	**polarized** - Black voters' choice won	not polarized (Black voters' choice won)
HD10	67.9	8 candidates, small vote variation, no accurate estimates	not polarized (Black voters' choice won)
HD1	65.2	no Democratic primary	not polarized (Black voters' choice won)
HD35	63.0	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won
HD2	58.1	not polarized (Black voters' choice won)	7 candidates, small vote variation, no accurate estimates
HD5	55.2	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won
SD5	54.7	no contest	**polarized** - Black voters' choice won
HD6	53.6	**polarized** - Black voters' choice won	10 candidates, small vote variation, no accurate estimates
CD14	53.5	not polarized (Black voters' choice won)	no Democratic primary
CD13	52.9	not polarized (Black voters' choice won)	**polarized** - Black voters' choice LOST
SD2	51.4	no contest	7 candidates, small vote variation, no accurate estimates
SD3	48.6	no contest	**polarized** - Black voters' choice won
HD4	47.7	11 candidates, small vote variation, no accurate estimates	14 candidates, small vote variation, no accurate estimates
SD4	47.6	no contest	not polarized (Black voters' choice won)
SD1	45.1	no contest	**polarized** - Black voters' choice LOST
HD29	36.8	no Democratic primary	**polarized** - Black voters' choice LOST
SD11	35.8	no contest	not polarized (Black voters' choice won)
HD12	27.4	not polarized (Black voters' choice won)	**polarized** - Black voters' choice LOST
HD11	26.9	no Democratic primary	**polarized** - Black voters' choice won

Voting in half of the primary contests analyzed in these districts (11 out of 22 contests) was not racially polarized. Of the 11 contests that were polarized, the candidate preferred by Black voters won in seven district primary elections. This included a contest in a district with a 26.9% BVAP (State House District 11 in 2018).

One of the four polarized Democratic primaries in which the Black-preferred candidate was not successful was in State House District 12, with a BVAP of only 27.4%. The three primary contests in districts with substantial Black populations that I analyzed in which the candidates supported by Black voters lost were as follows:

- *Congressional District 13 in 2018 (52.9% BVAP)* Six candidates competed in this contest, four of whom were Black candidates. Despite a larger number of Black voters than White voters (the district is majority Black and a higher percentage of the Black voting age citizens than White voting age citizens turned out to vote), Brenda Jones, the candidate who garnered the plurality of the Black vote (43.5%), lost to the White candidate of choice, Rashida Tlaib, by 900 votes.
- *State Senate District 1 in 2018 (45.1% BVAP)* This contest also included six candidates, several of whom were Black. The plurality choice of Black voters (47.1% of the Black vote), Alberta Tinsley Talabi, lost to Stephanie Chang, the candidate supported by a large majority of White voters (76.7%) and the distant second choice (27.1%) of Black voters.
- *State House District 29 in 2018 (36.8%)* Six Black candidates competed in this primary. White voters' support (58.4%) for their preferred candidate, Brenda Carter, was high enough to defeat the candidate of choice of Black voters, Kermit Williams, who garnered 49.8% of Black voters' support.

The 2018 and 2020 Democratic district-level primary elections did not yield a straightforward calculation of the BVAP needed to provide Black voters' with an opportunity to elect their candidates of choice. In my 2021 Report to the MICRC, I wrote:

> As the percentage Black VAP of proposed districts decreases, it may become more challenging for Black-preferred candidates to win not only the general election but the Democratic primary – but only if voting in Democratic primaries is racially polarized. Unfortunately, it is not possible to ascertain exactly how much more difficult it would be – or even if it would be more difficult – given the lack of Democratic primary election data.

Overall, candidates supported by Black voters won in 18 of the 22 Detroit area district contests analyzed – 11 contests that were not polarized and seven that were, including a polarized primary in a district that had a BVAP of only 26.9%. However, Black-preferred candidates lost in four district-level primaries, including a primary in a majority Black district (Congressional District 12), as well as districts that with BVAPs of 45.1%, 36.8%, and 27.4%.

While the picture was less-than-straightforward, the pattern that emerged (albeit one with exceptions) was that the chances of the candidate of choice of Black voters' winning increased as the BVAP percentage increased. In districts with BVAP over 50%, the success rate of Black-preferred candidates was 92.9%; for districts in the 45-49.9% BVAP range, the Black-preferred candidate success rate was 66.7%; there were no districts in the 40 to 44.9% BVAP range; in the 35 to 39.9% BVAP range the Black-preferred success rate was 50%; but in the 25 to 34.9% BVAP range, the Black-preferred success rate increased to 66.7%.

Additional Democratic Primary Elections Included in the Trende Report Mr. Trende, in his report ("Expert Report of Sean P. Trende," dated January 18, 2023) supplies the results of his analysis of some additional state senate (2014) and state house (2014 and 2016) Democratic primary elections in the 2012 State House and State Senate Plans. Without reflecting on the accuracy of his analysis or appropriateness of his approach, I have produced summary tables that combine the results of the state senate and state house contests each of us analyzed to determine if the addition of more contests shed more light on voting patterns in district-level Detroit area Democratic primaries. Table 2 summarizes the state senate contests.[8]

[8] There are no state senate districts with BVAPs between 25 and 35%.

Table 2

2012 State Senate District	Percent BVAP	2018 Democratic Primary	2014 Democratic Primary (Trende Analysis)
5	54.7	**polarized** - Black voters' choice won	**polarized**- Black voters' choice LOST
2	51.4	7 candidates, small vote variation made valid statistical analysis impossible	not polarized (Black voters' choice won)
3	48.6	**polarized** - Black voters' choice won	no Democratic primary
4	47.6	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won
1	45.1	**polarized** - Black voters' choice LOST	no Democratic primary
11	35.8	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won

Mr. Trende's analysis of the state senate contests in 2014 adds one contest that was not polarized and two contests that were racially polarized and the candidates of choice of Black voters won. Neither of these primaries were in majority Black districts: Senate District 4, with a BVAP of 47.6%, and Senate District 11, with a BVAP of 35.8%. Mr. Trende also found one racially polarized contest in which the Black-preferred candidate lost: State Senate District 5, which was a majority Black district (54.7% BVAP). Overall, in the nine 2014-2018 state senate primaries analyzed between Mr. Trende and myself, the candidates preferred by Black voters won seven and lost two contests.

Strangely, the success rate for Black-preferred candidates in the 2014 and 2018 state senate primaries is precisely the opposite of what might be expected (this is likely due, at least in part, to the limited number of contests considered): the chances of the candidate of choice of Black voters' winning decreased as the BVAP percentage increased: over 50% BVAP (two districts, three elections), the Black-preferred candidate success rate was 66.7%; 45-49.9% BVAP (three districts, four elections), the Black-preferred candidate success rate was 75.0%; 35 to 39.9% BVAP (one district, two elections), the Black-preferred success rate was 100%. There were no state senate districts between 40 and 44.9% BVAP, or between 25 to 34.9% BVAP.

Table 3 reports our combined results for state house elections between 2014 and 2020. Mr. Trende identifies 11 additional contests that were racially polarized and eight that are not polarized. The candidate of choice of Black voters won all of the 11 polarized contests.

Because there are so few Democratic primary results for districts with BVAP less than 50% but greater than 25%, the success rate for Black-preferred candidates in the 2014, 2016, 2018, and 2020 state house primaries is also odd: the chances of the candidate of choice of Black voters' winning districts over 50% BVAP was 100% (10 districts, 27 elections); for districts between 45-49.9% BVAP (one district, two elections), the Black-preferred candidate success rate was also 100.0%; there were no Detroit area state house districts between 40 to 44.9% BVAP; districts between 35 to 39.9% BVAP (one district, one election), the Black-preferred success rate was 0%; and districts between 25 to 34.9% BVAP (two districts, three elections): the Black-preferred success rate was 66.7%.

Conclusion The additional pre-2022 primary contests analyzed by Mr. Trende do not alter my conclusions regarding whether majority Black districts are necessary to provide Black voters with an opportunity to elect their candidates of choice to the state legislature – they are not. Moreover, majority Black districts do not necessarily elect the candidates of choice of Black voters. While the BVAP in a district has an impact on the success rate of candidates preferred by Black voters, so does such contest-specific factors as the number of candidates competing and the cohesiveness of Black voters in supporting their preferred candidates.

Table 3

2012 State House District	Percent Black VAP	2020 Democratic Primary	2018 Democratic Primary	2016 Democratic Primary (Trende analysis)	2014 Democratic Primary (Trende analysis)
7	94.9%	insufficient White voters for accurate estimates	insufficient White voters for accurate estimates	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won
8	92.9%	insufficient White voters for accurate estimates	insufficient White voters for accurate estimates	no Democratic primary	**polarized** - Black voters' choice won
3	91.5%	insufficient White voters for accurate estimates	insufficient White voters for accurate estimates	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won
9	74.9%	**polarized** - Black voters' choice won	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won	**polarized** - Black voters' choice won
10	67.9%	8 candidates, small vote variation, no accurate estimates	not polarized (Black voters' choice won)	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won
1	65.2%	no Democratic primary	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won	**polarized** - Black voters' choice won
35	63.0%	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won	no Democratic primary	*Trende does not report results*
2	58.1%	not polarized (Black voters' choice won)	7 candidates, small vote variation, no accurate estimates	**polarized** - Black voters' choice won	**polarized** - Black voters' choice won
5	55.2%	not polarized (Black voters' choice won)	**polarized** - Black voters' choice won	**polarized** - Black voters' choice won	not polarized (Black voters' choice won)
6	53.6%	**polarized** - Black voters' choice won	10 candidates, small vote variation, no accurate estimates	not polarized (Black voters' choice won)	not polarized (Black voters' choice won)
4	47.7%	11 candidates, small vote variation, no accurate estimates	14 candidates, small vote variation, no accurate estimates	not polarized (Black voters' choice won)	not polarized (Black voters' choice won)
29	36.8%	no Democratic primary	**polarized** - Black voters' choice LOST	no Democratic primary	no Democratic primary
12	27.3%	not polarized (Black voters' choice won)	**polarized** - Black voters' choice LOST	*Trende does not report results*	no Democratic primary
11	26.9%	no Democratic primary	**polarized** - Black voters' choice won	no Democratic primary	*Trende does not report results*

IV. Voting Patterns and Electing Black Voters' Candidates of Choice in the 2022 Elections

2022 General Election Contests I analyzed 27 district-level 2022 general elections (congressional, state senate and state house) in Detroit area districts in the 2022 Congressional, State Senate, and State House Plans with Black voting age populations (BVAP) greater than 25%. The results of this analysis can be found in Appendix B1 (Congress), B2 (State Senate) and B3 (State House).[9] Only one of these general election contests was racially polarized: State Senate District 10. The candidate of choice of Black voters was successful in this election contest. Overall, the candidates supported by Black voters won in all 27 of the Detroit area district general elections in districts with BVAPs greater than 25%. As was the case with the earlier general elections analyzed, the 2022 general election did not pose a barrier for electing Black voters' candidates of choice in districts with substantial BVAPs in the Detroit area.

2022 Democratic Primaries I analyzed 24 2022 district-level Democratic primaries in Detroit area districts in the 2022 Congressional, State Senate, and State House Plans with BVAPs greater than 25%. The results can be found in Appendix C1 (Congress), C2 (State Senate) and C3 (State House). Table 4 summarized the results of this analysis.

[9] The Center for Shared Solutions has not yet released the precinct level returns for the 2022 general election – the Center is still in the process of, among other things, disaggregating the City of Detroit Absentee Vote Counting Board (AVCB) returns down to the precinct level. In the City of Detroit, absentee ballots cast in general elections are counted at a higher geographic level than the precinct – instead a number of precincts are combined into AVCBs. To report Detroit returns at the precinct level, the AVCB returns must be disaggregated down to the precinct level. The Center does this on the basis of the ratio of precinct absentee ballots provided to the total number of absentee ballots counted at the AVCB level for each AVCB. Because this process has not yet been completed, I conducted my analysis of voting patterns in the 2022 general election twice: once using Detroit AVCBs (aggregating the precinct level demographics and election day ballots up to the AVCB level) and a second time using the precinct ratios the Center provided and plans to use for the disaggregation process. The results of the two analyses are very similar, with no estimate varying by more than a percentage point or two between the two approaches. Appendix B1-3 reports the estimates arrived at using AVCBs in the City of Detroit.

Table 4

2022 Districts	Percent BVAP	2022 Democratic Primary
HD4	57.2%	**polarized** - Black voters' choice won
HD5	56.9%	**polarized** - Black voters' choice LOST
HD16	56.5%	not polarized (Black voters' choice won)
HD6	56.5%	not polarized (Black voters' choice won)
HD18	54.0%	not polarized (Black voters' choice won)
HD9	53.2%	not polarized (Black voters' choice won)
SD7	46.5%	not polarized (Black voters' choice won)
CD13	46.3%	not polarized (Black voters' choice won)
HD7	45.9%	**polarized** - Black voters' choice won
HD8	45.7%	**polarized** - Black voters not cohesive, top choices LOST
CD12	45.3%	not polarized (Black voters' choice won)
HD11	44.0%	**polarized** - Black voters not cohesive, top choices LOST
HD17	44.0%	no Democratic primary
SD3	43.7%	not polarized (Black voters' choice won)
HD14	42.7%	**polarized** - Black voters' choice won
HD12	42.6%	**polarized** - Black voters' choice won
SD10	41.7%	no Democratic primary
SD8	41.6%	**polarized** - Black voters' choice LOST
SD6	40.6%	not polarized (Black voters' choice won)
HD10	40.2%	not polarized (Black voters' choice won)
HD13	39.8%	not polarized (Black voters' choice won)
HD1	39.7%	not polarized (Black voters' choice won)
HD26	37.8%	**polarized** - Black voters' choice LOST
SD1	36.6%	**polarized** - Black voters' choice LOST
HD53	34.3%	no Democratic primary
HD3	34.0%	not polarized (Black voters' choice won)
SD2	25.5%	not polarized (Black voters' choice won)

The majority of these contests (14) were not racially polarized. When only state senate and state house contests are considered, 22 primaries were analyzed, 12 (54.5%) of which were not polarized.[10]

The candidates of choice of Black voters won four of the 10 polarized 2022 state legislative primary contests. Three of the racially polarized contests won by the Black candidate of choice were held in less-than-majority Black districts: State House District 7 (45.9% BVAP), State House District 14 (42.7% BVAP), and State House District 12 (42.6% BVAP).[11]

In six of the state legislative primaries analyzed, the candidate preferred by Black voters was defeated. The range in the Black composition of these six districts was broad and included a majority Black district, State House District 5. The following provides a description of the polarized Democratic primaries lost by the candidates of choice of Black voters:

- *State House District 5 (56.9% BVAP)* Five candidates competed in this primary, two Black candidates and three White candidates. A majority of Black voters (55.2%) supported Black candidate Reggie Davis. He was defeated by a White candidate, Natalie Price, who was supported by a large majority (71.4%) of the White voters.
- *State House District 8 (45.7% BVAP)* Five candidates, two Black candidates and three White candidates, ran in this contest. A majority (56.5%) of the White voters supported one of the White candidates, Mike McFall. Black voters did not coalesce around a single candidate – they divided their support between the two Black candidates, with each receiving about 32% of the Black vote. (McFall received slightly less than 25% of the Black vote.) McFall won the election.
- *State House 11 (44.0% BVAP)* Nine candidates, including several Black candidates, several White candidates, and a Hispanic candidate, competed in this primary. Neither Black nor White voters coalesced around a single candidate. White voters primarily spread their votes across three candidates, with 27.1% supporting Hispanic candidate Veronica Paiz, 22.0% supporting Alex Manwell (White candidate), and 15.6% voting for

[10] Neither of the 2022 congressional district primaries (Congressional Districts 12 and 13) were racially polarized.

[11] The candidate preferred by Black voters also won a polarized primary election in majority Black House District 4 (56.9% BVAP).

Black candidate Ricardo White. Black voters primarily spread their votes across four candidates: 24.2% for Black candidate Regina Williams, 22.2% for Ricardo White, and 18.7% and 17.1% for Black candidates Athena Lynn Thorton and Marvin Cotton Jr., respectively. Veronica Paiz won the nine candidate primary with 1844 (18.9%) votes out of the 9751 votes cast.

- *State Senate District 8 (41.6% BVAP)* In this contest, a large majority (75.8%) of Black voters supported Black candidate Marshall Bullock and an even larger majority (95.9%) of White voters, who turned out at a very high rate relative to other districts, supported his White opponent, Mallory McMorrow. McMorrow won the primary with 68.4% of the vote.
- *State House District 26 (37.8% BVAP)* In this four candidate contest, a majority (55.4%) of Black voters supported Black candidate Steven Chisholm and a large majority (76.2%) of White voters cast their vote for White candidate Dylan Wegela. Wegela won the primary with a plurality of the vote.
- *State Senate District 1 (36.6% BVAP)* Six candidates, four of whom were Black candidates, competed in this primary contest. The plurality of Black voters (34.0%) supported Black candidate Brenda Sanders; the second choice of Black voters (24.3%) was Black candidate Erika Geiss. A majority (55.9%) of White voters supported Geiss. Geiss won the primary with 32.3% of the vote.

Overall, candidates supported by Black voters won in 16 of the 22 state legislative primary contests analyzed. This includes contests in State Senate District 2 (25.5% BVAP), State House District 3 (34.0% BVAP), State House District 1 (39.7% BVAP), and State House District 13 (39.8% BVAP) – all district contests in which Black and White voters supported the same candidate. It also includes several polarized contests in non-majority Black districts: State House District 12 (42.6% BVAP), State House District 14 (42.7% BVAP), and State House District 7 (45.9% BVAP). However, candidates preferred by Black voters lost primaries in six districts, with BVAPs as follows: 56.9%, 45.7%, 44.0%, 41.6%, 37.8% and 36.6%. In some instances, contest-specific factors such as the number of candidates competing and a lack of cohesion on the part of Black voters contributed to the loss.

Overall, districts with more substantial BVAPs produced a higher likelihood of success for candidates preferred by Black voters. However, the success rate never dipped below 50% for any

of the ranges examined. Considering all district-level primaries together (which produces more observations): for districts over 50% BVAP (six district primaries), the Black-preferred candidate success rate was 83.3%; for districts between 45-49.9% BVAP (five district primaries), the success rate for Black-preferred candidates was 80.0%; for districts in the range of 40 to 44.9% BVAP (nine districts but only seven district primaries), the Black-preferred success rate was 71.4%; for districts between 35 to 39.9% BVAP (four district primaries), the Black-preferred candidates success rate was 50%; and for districts in the 25 to 34.9% BVAP range (three districts, but only two primaries), the Black-preferred candidate success rate was 100.0%.

V. Conclusion

The district-level 2022 Democratic primary results reveal that majority Black districts are not necessary to provide Black voters with an opportunity to elect their candidates of choice to the Michigan state legislature in the Detroit area. Many less-than-majority districts elected the candidates supported by Black voters to legislative office. While this is obviously true in districts where voting was not polarized, it is also true in a substantial number of racially polarized primaries. On the other hand, majority Black districts did not necessarily elect the candidates of choice of Black voters. While districts with higher BVAPs are likely to produce more wins for candidates preferred by Black voters, candidates supported by Black voters were successful in 75% of the 2022 primary contests in Detroit area districts with between 40 and 49.9% BVAP and were successful in 68.8% of the primary contests in districts with between 35 and 49.9% BVAP.

CERTIFICATION

I certify that the statements and opinions provided in this report are true and accurate to the best of my knowledge, information, and belief.

Lisa Handley

Lisa Handley, Ph.D.

3/8/2023

Date

Lisa R. Handley
CURRICULUM VITAE

Professional Experience

Dr. Handley has over thirty years of experience in the areas of redistricting and voting rights, both as a practitioner and an academician, and is recognized nationally and internationally as an expert on these subjects. She has advised numerous clients on redistricting and has served as an expert in dozens of redistricting and voting rights court cases. Her clients have included the U.S. Department of Justice, civil rights organizations, independent redistricting commissions and scores of state and local jurisdictions. Internationally, Dr. Handley has provided electoral assistance in more than a dozen countries, serving as a consultant on electoral system design and redistricting for the United Nations, UNDP, IFES, and International IDEA. In addition, Dr. Handley served as Chairman of the Electoral Boundaries Commission in the Cayman Islands.

Dr. Handley has been actively involved in research, writing and teaching on the subjects of redistricting and voting rights. She has co-written a book, Minority Representation and the Quest for Voting Equality (Cambridge University Press, 1992) and co-edited a volume (Redistricting in Comparative Perspective, Oxford University Press, 2008) on these subjects. Her research has also appeared in peer-reviewed journals such as *Journal of Politics*, *Legislative Studies Quarterly*, *American Politics Quarterly*, *Journal of Law and Politics*, and *Law and Policy,* as well as law reviews and edited books. She has taught political science undergraduate and graduate courses related to these subjects at several universities including the University of Virginia and George Washington University. Dr. Handley is a Visiting Research Academic at Oxford Brookes University in the United Kingdom.

Dr. Handley is the President of Frontier International Consulting, a consulting firm that specializes in providing electoral assistance in transitional and post-conflict democracies. She also works as an independent election consultant both in the United States and internationally.

Education

Ph.D. The George Washington University, Political Science, 1991

Present Employment

President, Frontier International Electoral Consulting LLC (since co-founding company in 1998).

Senior International Electoral Consultant, Technical assistance for clients such as the UN, UNDP and IFES on electoral system design and boundary delimitation

Visiting Research Academic, Centre for Development and Emergency Practice (CENDEP), Oxford Brookes University

U.S. Clients since 2000

American Civil Liberties Union – expert testimony in Voting Right Act challenges in several states, expert testimony in Ohio partisan gerrymander challenge and challenge to Commerce Department inclusion of citizenship question on 2020 census form

Lawyers Committee for Civil Rights Under Law – expert testimony in challenges to statewide judicial elections in Texas and Alabama

US Department of Justice – expert witness testimony in several Section 2 and Section 5 cases

Alaska: Redistricting Board (2001 and 2011) – redistricting consultation, expert witness testimony

Arizona: Independent Redistricting Board (2001 and 2021) – redistricting consultation

Boston (2022): City Attorney General, redistricting consultation

Colorado: Redistricting Commission (2021), Redistricting Board (2001 and 2011) – redistricting consultation

Connecticut: State Senate and State House of Representatives (2001 and 2011) – redistricting consultation

Florida: State Senate (2000) – redistricting consultation

Kansas: State Legislative Research Department (2001, 2011, 2021) – redistricting consultation

Louisiana: Louisiana Legislative Black Caucus (2001) – expert witness testimony

Massachusetts: State Senate (2001 and 2011) – redistricting consultation

Maryland: Attorney General (2001) – redistricting consultation

Michigan: Michigan Independent Citizens Redistricting Commission (2021) – redistricting consultation

Miami-Dade County, Florida: County Attorney (2001 and 2011) – redistricting consultation

Nassau County, New York: Redistricting Commission (2001) – redistricting consultation

New Mexico: State House (2001) – redistricting consultation, expert witness testimony

New York: State Assembly (2001), State Senate (2021) – redistricting consultation

New York City: Redistricting Commission and Charter Commission (2001, 2011, 2022) – redistricting consultation and Section 5 submission assistance

New York State Court: Expert to the Special Master (drew congressional lines for state court)

Rhode Island: State Senate and State House (2001 and 2021) – redistricting consultation

International Clients since 2000

United Nations

- Afghanistan – electoral system design and district delimitation expert
- Bangladesh (UNDP) – redistricting expert
- Sierra Leone (UNDP) – redistricting expert
- Liberia (UNMIL, UN peacekeeping mission) – redistricting expert
- Democratic Republic of the Congo (MONUC, UN peacekeeping mission) – election feasibility mission, electoral system design and redistricting expert
- Kenya (UN) – electoral system design and redistricting expert
- Haiti (UN) – election feasibility mission, electoral system design and redistricting expert
- Zimbabwe (UNDP) – redistricting expert
- Lead Writer on the topic of boundary delimitation (redistricting) for ACE (Joint UN, IFES and IDEA project on the Administration and Cost of Elections Project)

International Foundation for Election Systems (IFES)

- Afghanistan – district delimitation expert
- Sudan – redistricting expert
- Kosovo – electoral system design and redistricting expert
- Nigeria – redistricting expert
- Nepal – redistricting expert
- Georgia – electoral system design and district delimitation expert
- Yemen – redistricting expert
- Lebanon – electoral system design and redistricting expert
- Malaysia – electoral system design and redistricting expert
- Myanmar – electoral system design and redistricting expert
- Ukraine – electoral system design and redistricting expert
- Pakistan – consultant for developing redistricting software
- Principal consultant for the Delimitation Equity Project – conducted research, wrote reference manual and developed training curriculum
- Writer on electoral boundary delimitation (redistricting), Elections Standards Project
- Training – developed training curriculum and conducted training workshops on electoral boundary delimitation (redistricting) in Azerbaijan and Jamaica

International Institute for Democracy and Electoral Assistance (International IDEA):

- Consultant on electoral dispute resolution systems
- Technology consultant on use of GIS for electoral district delimitation
- Training – developed training material and conducted training workshop on electoral boundary delimitation (redistricting) for African election officials (Mauritius)
- Curriculum development – boundary delimitation curriculum for the BRIDGE Project

Other international clients have included The Cayman Islands; the Australian Election Commission; the Boundary Commission of British Columbia, Canada; and the Global Justice Project for Iraq.

Publications

***Books**:*

Does Torture Prevention Work? Liverpool University Press, 2016 (served as editor and author, with Richard Carver)

Comparative Redistricting in Perspective, Oxford University Press, 2008 (first editor, with Bernard Grofman).

Delimitation Equity Project: Resource Guide, Center for Transitional and Post-Conflict Governance at IFES and USAID publication, 2006 (lead author).

Minority Representation and the Quest for Voting Equality, Cambridge University Press, 1992 (with Bernard Grofman and Richard Niemi).

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"Drawing Electoral Districts to Promote Minority Representation" Representation, forthcoming, published online DOI:10.1080/00344893.2020.1815076.

"Evaluating national preventive mechanisms: a conceptual model," Journal of Human Rights Practice, Volume 12 (2), July 2020 (with Richard Carver).

"Minority Success in Non-Majority Minority Districts: Finding the 'Sweet Spot'," Journal of Race, Ethnicity and Politics, forthcoming (with David Lublin, Thomas Brunell and Bernard Grofman).

"Has the Voting Rights Act Outlived its Usefulness: In a Word, "No," Legislative Studies Quarterly, volume 34 (4), November 2009 (with David Lublin, Thomas Brunell and Bernard Grofman).

"Delimitation Consulting in the US and Elsewhere," Zeitschrift für Politikberatung, volume 1 (3/4), 2008 (with Peter Schrott).

"Drawing Effective Minority Districts: A Conceptual Framework and Some Empirical Evidence," North Carolina Law Review, volume 79 (5), June 2001 (with Bernard Grofman and David Lublin).

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***Chapters in Edited Volumes**:*

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"The Impact of the Voting Rights Act on Minority Representation: Black Officeholding in Southern State Legislatures and Congressional Delegations," in The Quiet Revolution: The Impact of the Voting Rights Act in the South, 1965-1990, eds. Chandler Davidson and Bernard Grofman, Princeton University Press, 1994 (with Bernard Grofman).

"Preconditions for Black and Hispanic Congressional Success," in United States Electoral Systems: Their Impact on Women and Minorities, eds. Wilma Rule and Joseph Zimmerman, Greenwood Press, 1992 (with Bernard Grofman).

***Electronic Publication**:*

"Boundary Delimitation" Topic Area for the Administration and Cost of Elections (ACE) Project, 1998. Published by the ACE Project on the ACE website (www.aceproject.org).

***Additional Writings of Note**:*

Amicus brief presented to the US Supreme Court in Gill v. Whitford, Brief of Political Science Professors as Amici Curiae, 2017 (one of many social scientists to sign brief)

Amicus brief presented to the US Supreme Court in Shelby County v. Holder, Brief of Historians and Social Scientists as Amici Curiae, 2013 (one of several dozen historians and social scientists to sign brief)

Amicus brief presented to the US Supreme Court in Bartlett v. Strickland, 2008 (with Nathaniel Persily, Bernard Grofman, Bruce Cain, and Theodore Arrington).

Recent Court Cases

Pending cases:

- Louisiana: *Nairne, et al., v. Ardoin* (Docket Number: 3:22-cv-00178-SDD-SDJ) (Middle District of Louisiana)
- Louisiana: *Robinson, et al., v. Ardoin* (Docket Number: 3:22-cv-0211-SDD-SDJ) (Middle District of Louisiana)
- Georgia: *Alpha Phi Alpha Fraternity, Inc., et al., v. Raffensperger, et al*. (Docket Number: 1:21-CV-05337-SCJ) (Northern District of Georgia)
- Arkansas: *Arkansas State Conference NAACP, et al., v. Arkansas Board of Apportionment, et al.* (Case Number: 4:21-cv-01239-LPR) (Eastern District of Arkansas, Eighth Circuit Court of Appeals)
- Ohio: *League of Women Voters of Ohio, et al., v. Ohio Redistricting Commission, et al.* (Case Number: 2021-1193) (Supreme Court of Ohio); *League of Women Voters of Ohio, et al., v. Governor DeWine* (Case Number: 2021-1449) (Supreme Court of Ohio)

Ohio Philip Randolph Institute v. Larry Householder (2019) – partisan gerrymander challenge to Ohio congressional districts; testifying expert for private plaintiffs on minority voting patterns

State of New York v. U.S. Department of Commerce (2018-2019) – challenge to inclusion of citizenship question on 2020 census form; testifying expert on behalf of private plaintiffs

U.S. v. City of Eastpointe (settled 2019) – minority vote dilution challenge to City of Eastpointe, Michigan, at-large city council election system; testifying expert on behalf of U.S. Department of Justice

Alabama NAACP v. State of Alabama (decided 2020) – minority vote dilution challenge to Alabama statewide judicial election system; testifying expert on behalf of private plaintiffs

Lopez v. Abbott (2017-2018) – minority vote dilution challenge to Texas statewide judicial election system; testifying expert on behalf of private plaintiffs

Personhuballuah v. Alcorn (2015-2017) – racial gerrymandering challenge to Virginia congressional districts; expert for the Attorney General and Governor of the State of Virginia

Perry v. Perez (2014) – Section 2 case challenging Texas congressional and state house districts; testifying expert for the U.S. Department of Justice

Jeffers v. Beebe (2012) – Arkansas state house districts; testifying expert for the Plaintiffs

State of Texas v. U.S. (2011-2012) – Section 5 case challenging Texas congressional and state house districts; testifying expert for the U.S. Department of Justice

Appendix A

Report to the Michigan Independent Citizens Redistricting Commission

Dr. Lisa Handley

Preface

This report outlines the analyses I conducted on behalf of the Michigan Independent Citizens Redistricting Commission (MICRC) and relays my findings. I also briefly explain the partisan fairness measures I advised the MICRC to adopt as a component of the redistricting software and why I made these recommendations. The legal implications of my findings and the assessment of any proposed plans have been left to the MICRC legal team.

I. The Voting Rights Act and Racially Polarized Voting

The Voting Rights Act of 1965 prohibits any voting standard, practice or procedure – including redistricting plans – that result in the denial or dilution of minority voting strength. Section 2 of the Voting Rights Act was amended in 1982 to establish that intentional discrimination need not be proven (as the Supreme Court determined was required under the 15th Amendment to the Constitution). The U.S. Supreme Court first interpreted the amended Act in *Thornburg v. Gingles*,[1] a challenge to the 1982 North Carolina state legislative plans. In this case the U.S. Supreme Court held that plaintiffs must satisfy three preconditions to qualify for relief:

- The minority group must be sufficiently large and geographically compact to form a majority in a single-member district
- The minority group must be politically cohesive
- Whites must vote as a bloc to usually defeat the minority-preferred candidates

What do we mean when we say minority voters must be politically cohesive? And how do we know if white voters usually vote as a bloc to defeat the candidates preferred by minority voters? According to the Court, racially polarized voting is the "evidentiary linchpin" of a vote dilution claim. Voting is racially polarized if minorities and whites consistently vote for different candidates. More specifically, if minorities consistently support the same candidates, they are said to be politically cohesive. If whites are consistently *not* supporting these candidates, they are said to be bloc voting against the minority-preferred candidates.

[1] 478 U.S. 30 (1986).

The Voting Rights Act requires a state or local jurisdiction to create districts that provide minority voters with an opportunity to elect their candidates of choice if voting is racially polarized and the candidates preferred by minority voters usually lose. If districts that provide minority voters with the opportunity to elect their preferred candidates already exist, these must be maintained.

A. Analyzing Voting Patterns by Race

An analysis of voting patterns by race serves as the foundation of two of the three elements of the "results test" as outlined in *Gingles*: a racial bloc voting analysis is needed to determine whether the minority group is politically cohesive; and the analysis is required to determine if whites are voting sufficiently as a bloc to usually defeat the candidates preferred by minority voters. The voting patterns of white and minority voters must be estimated using statistical techniques because direct information the race of the voters is not, of course, available on the ballots cast.

To carry out an analysis of voting patterns by race, an aggregate level database must be constructed, usually employing election precincts as the units of observation. Information relating to the demographic composition and election results in these precincts is collected, merged and statistically analyzed to determine if there is a relationship between the racial composition of the precincts and support for specific candidates across the precincts.

Standard Statistical Techniques Three standard statistical techniques have been developed over time to estimate vote choices by race: homogeneous precinct analysis, ecological regression, and ecological inference.[2] Two of these analytic procedures – homogeneous precinct analysis and ecological regression – were employed by the plaintiffs' expert in *Gingles*, have the benefit of the Supreme Court's approval in that case, and have been used in most subsequent voting rights cases. The third technique, ecological inference, was developed after the *Gingles* decision and was designed, in part, to address some of the disadvantages associated with ecological regression analysis. Ecological inference analysis has been introduced and accepted in numerous court proceedings.

[2] For a detailed explanation of homogenous precinct analysis and ecological regression see Bernard Grofman, Lisa Handley and Richard Niemi, *Minority Representation and the Quest for Voting Equality* (Cambridge University Press, 1992). See Gary King, *A Solution to the Ecological Inference Problem* (Princeton University Press, 1997) for a more detailed explanation of ecological inference.

Homogeneous precinct (HP) analysis is the simplest technique. It involves comparing the percentage of votes received by each of the candidates in precincts that are racially or ethnically homogeneous. The general practice is to label a precinct as homogeneous if at least 90 percent of the voting age population is composed of a single race.[3] In fact, the homogeneous results reported are not estimates – they are the actual precinct results. However, most voters in Michigan do not reside in homogeneous precincts and voters who reside in homogeneous precincts may not be representative of voters who live in more racially diverse precincts. For this reason, I refer to these percentages as estimates.

The second statistical technique employed, ecological regression (ER), uses information from all precincts, not simply the homogeneous ones, to derive estimates of the voting behavior of minorities and whites. If there is a strong linear relationship across precincts between the percentage of minorities and the percentage of votes cast for a given candidate, this relationship can be used to estimate the percentage of minority (and white) voters supporting the candidate.

The third technique, ecological inference (EI), was developed by Professor Gary King. This approach also uses information from all precincts but, unlike ecological regression, it does not rely on an assumption of linearity. Instead, it incorporates maximum likelihood statistics to produce estimates of voting patterns by race. In addition, it utilizes the method of bounds, which uses more of the available information from the precinct returns as well as providing more information about the voting behavior being estimated.[4] Unlike ecological regression, which can produce percentage estimates of less than 0 or more than 100 percent, ecological inference was designed to produce only estimates that fall within the possible limits. However, EI does not guarantee that the estimates for all of the candidates add to 100 percent for each of the racial groups examined.

In conducting my analysis of voting patterns by race in statewide elections in Michigan, I also used a more recently developed version of ecological inference, which I have labeled "EI

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[3] If turnout or registration by race is available, this information is used to identify homogenous precincts.

[4] The following is an example of how the method of bounds works: if a given precinct has 100 voters, of whom 75 are Black and 25 are white, and the Black candidate received 80 votes, then at least 55 of the Black voters voted for the Black candidate and at most all 75 did. (The method of bounds is less useful for calculating estimates for white voters in this example as anywhere between none of the whites and all of the whites could have voted for the candidate.)

RxC" in the summary tables found in the Appendices at the end of the report. EI RxC expands the analysis so that more than two racial/ethnic groups can be considered simultaneously. It also allows us to take into account differences in the relative rates of minority and white turnout when, as is the case in Michigan, we do not have turnout by race but instead must rely on voting age population by race to derive estimates of minority and white support for each of the candidates.

Database To analyze voting patterns by race using aggregate level information, a database that combines election results with demographic information is required. This database is almost always constructed using election precincts as the unit of analysis. The demographic composition of the precincts is based on voter registration or turnout by race/ethnicity if this information is available; if it is not, then voting or citizen voting age population is used. Michigan does not collect voter registration data by race and therefore voting age population (VAP) by race and ethnicity as reported in the PL94-171 census redistricting data was used for ascertaining the demographic composition of the precincts.[5]

The precinct election returns for the general elections, as well as precinct shape files, census block-to-precinct assignment files,[6] and election results disaggregated to the block level were supplied by the Michigan Secretary of State. The Democratic primary results had to be collected county by county and were either downloaded directly or cut and pasted from pdf files.

Geographic areas Producing reliable estimates of voting patterns by race requires an adequate number of minority and white voters, an adequate number of election precincts, and sufficient variation in the percentage of minority and white voters across the precincts. Only a few counties in Michigan satisfied these conditions, and only for one group of minority voters – Black voters. It was not possible to produce reliable statewide or countywide estimates for Hispanic or Asian voters in Michigan. However, estimates for Hispanics, as well as some additional minority groups, were produced for very localized areas in Michigan and this analysis is discussed below in a separate section entitled "Voting Patterns of Minority Voters other than Black Voters." As a

[5] Since the only minority group sufficiently large enough in the State of Michigan to produce estimates of voting patterns is Black residents and there is not a high non-citizenship rate to account for when conducting the analysis, estimates of citizen voting age population by race were not included in the database.

[6] Shape files and block-to-precinct equivalency files made it possible to account for changes in precinct boundaries, and therefore precinct demographics, over time.

consequence of the three limitations listed above, I was able to reliably estimate the voting patterns of Blacks and whites statewide and in the four counties: Wayne, Oakland, Genesee, and Saginaw.

Elections analyzed All statewide elections held in the State during the preceding decade (2012-2020) were analyzed, both for voters within the state as a whole and in the four counties that had a sufficient number of Black VAP conduct the analysis – Wayne, Oakland, Genesee, and Saginaw. The general elections analyzed included: U.S. President (2012, 2016, 2020), U.S. Senate (2012, 2014, 2018, 2020), and the statewide offices of Governor, Secretary of State, and Attorney General in 2014 and 2018.

Four of these contests included African American candidates:[7] the 2012 presidential election, the 2014 election contest for Secretary of State, and the U.S. Senate contests in 2018 and 2020. Only two of these four contests included African American candidates supported by Black voters, however: Barack Obama in his bid for re-election in 2012 and Godfrey Dillard in his race for Secretary of State in 2014. John James, an African American Republican who ran for U.S. Senate in 2018 and 2020, was not the candidate of choice of Black voters. In addition, two election contests included African American candidates as running mates: the 2018 gubernatorial race in which Garlin Gilchrist ran for Lieutenant Governor and Gretchen Whitmer as Governor, and the 2020 presidential race in which Kamala Harris ran for Vice President. Both sets of running mates were strongly supported by Black voters.

There was only one statewide Democratic primary for statewide office the previous decade: the 2018 race for governor. I analyzed this Democratic primary (as well as congressional and state legislative Democratic primaries) and not Republican primaries because the overwhelming majority of Black voters who choose to vote in primaries cast their ballots in Democratic rather than Republican primaries. As a consequence, Democratic primaries are far more probative than Republican primaries for ascertaining the candidates preferred by Black voters.[8] Moreover, this

[7] Courts consider election contests that include minority candidates more probative than contests that include only white candidates for determining if voting is racially polarized. This is because it is not sufficient for minority voters to be able to elect their candidates of choice only if these candidates are white. On the other hand, it is important to recognize that not all minority candidates are the preferred candidates of minority voters.

[8] In addition, producing reliable estimates for Black voters in Republican primaries would not have been possible.

primary included two minority candidates: Abdul El-Sayed, who is of Egyptian descent, and Shri Thanedar, who is Indian-American.

In addition to these statewide elections, I also analyzed recent congressional and state legislative elections in districts that fell within Wayne, Oakland, Saginaw and Genesee Counties and had a Black VAP that was large enough to produce reliable estimates.[9] Because of the very substantial changes in district boundaries between the current district boundaries and any of the proposed district plan boundaries, these election contests cannot be considered indicative of voting patterns in any proposed districts. However, they are important for at least two reasons. First, although few minority candidates ran for office statewide, there were many who ran in legislative elections, especially in Wayne County. Second, while there was only one statewide Democratic primary conducted over the course of the previous decade, there have been numerous recent Democratic primaries for congressional and state legislative office.

B. Statewide and County Results

Table 1, below, lists the number of statewide election contests that were racially polarized, both for Michigan as a whole, and for each of the four counties considered individually. This tabulation is based on the racial bloc voting summary tables found in Appendix A. The second column indicates the number of contests that included African American candidates that were polarized (over the total number of contests with African American candidates), the third column is the number of statewide general elections (out of the 13 analyzed) that were polarized and the final column reports the results of the only statewide Democratic primary.

Statewide, all election contests other than the 2012 US. Senate race won by Debbie Stabenow were racially polarized. (Her 2018 election contest, however, was racially polarized.) The candidate who obtained the lowest vote percentage statewide was African American candidate for Secretary of State in 2014, Godfrey Dillard. This was because he received less white crossover votes than any other candidate – the percentage of Black voters supporting him was comparable to the percentage of Black voters supporting the other Democratic candidates competing statewide.

[9] In some state house districts, there was not enough whites of voting age to conduct an analysis of voting patterns by race.

Table 1: Number of Statewide Elections Analyzed that were Polarized

	General Elections with Minority Candidates	All Statewide General Election Contests	Statewide Democratic Primary
Statewide	6/6	12/13	1/1
Genesee	5/6	9/13	1/1
Saginaw	6/6	11/13	1/1
Oakland	6/6	13/13	0/1
Wayne	3/6	7/13	1/1

Every statewide general election contest analyzed was polarized in Oakland County – only in the Democratic primary for Governor in 2018 did Black and white voters support the same candidate (Gretchen Whitmer). Voting in Saginaw County was nearly as polarized: two U.S. Senate contests (2012 and 2014) were not polarized, but the gubernatorial primary was polarized. Black and white voters agreed on the same candidates slightly more often in Genesee County – in addition to supporting U.S. senate candidates Debbie Stabenow in 2012 and Gary Peters in 2014, they both supported Barack Obama in 2012 and Democrat Mark Schauer for Governor in 2014.

Voting in Wayne County was considerably less racially polarized than statewide or in the other three counties studied. However, slightly more than half of the general election contests and the one statewide Democratic primary analyzed were polarized, with Black and white voters supporting the same candidates in 2012, disagreeing on the three statewide offices, but supporting the same U.S. Senate candidate in 2014, supporting different candidates for U.S. President in 2016 and 2020, and voting for most of the same candidates in 2018.

C. Congressional and State Legislative Election Results

This section provides a summary of my racial bloc voting analysis of recent congressional and state legislative districts in the four-county area of Wayne, Oakland, Genesee and Saginaw. I analyzed 2018 and 2020 general elections, and the 2018 and 2020 Democratic primaries if at least one African American candidate competed in the election contest. However, for a number of state

legislative elections, there were too many candidates and too few votes cast to obtain reliable estimates. In addition, there were three state house districts – districts 3, 7, 8 – where there were an insufficient number of white voters to produce reliable estimates. The summary tables reporting each of estimates for these contests are found in Appendix B.

Table 2, below, summarizes the congressional district results for congressional districts 5, 9, 12, 13 and 14.[10] In most instances, voting was not racially polarized – in 80% of the general elections and 75% of the contested Democratic primaries analyzed, Black and white voters supported the same candidates. Three of the contests analyzed were, however, polarized. The Black-preferred candidate won two of these contests: Districts 5 and 13 in the 2020 general election. The other polarized contest was the 2018 bid for the Democratic nomination for full two-year term the in District 13. Six candidates competed in this contest, four African American candidates, including the candidate of choice of a plurality of Black voters, Brenda Jones; Bill Wild, a white candidate; and Rashida Tlaib, an American of Palestinian descent. White voters divided their votes between Wild and Tlaib. Tlaib won the nomination with 27,841 votes (31.17%), and Benda Jones came in a close second with 26,941 votes (30.16%).[11]

Table 2: Summary of Congressional District Racial Bloc Voting Analysis

Congress District	Location	Percent BVAP	2018 Democratic primary	2018 General election	2020 Democratic primary	2020 General election
5	Genesee & Saginaw, plus	16.63	no contest	not polarized	no contest	polarized - won
9	Oakland & Macomb	13.83	only white candidates	not polarized	no contest	not polarized
12	Wayne & Washtenaw	11.73	no contest	not polarized	not polarized	not polarized

[10] Congressional District 11, which is also located in the area of interest (Oakland and Wayne), as well as Districts 8 (partially in Oakland) and 4 (partially in Saginaw), had too few Black voters to produce reliable estimates of their vote choices.

[11] A special election for filling the partial term for District 13 – left vacant when John Conyers resigned – was conducted at the same time with many of the same candidates. Brenda Jones won this contest with 32,769 (37.75%) votes; Rashida Tlaib came in second with 31,121 (35.85%) votes.

Congress District	Location	Percent BVAP	2018 Democratic primary	2018 General election	2020 Democratic primary	2020 General election
13	Wayne	54.78	polarized - lost	not polarized	not polarized	polarized - won
14	Wayne & Oakland	55.16	no contest	not polarized	not polarized	not polarized

The results of my analysis recent state senate elections is found in Table 3, below. There were no Democratic primaries in two districts (12 and 27), and no minority candidates competed in a third (District 32). In addition, there was one Democratic primary in which 11 candidates competed – too many to produce reliable estimates. Of the 16 contests analyzed, 10 were not polarized (three primaries and seven general elections), four were polarized but the Black-preferred candidate won (two primaries and two generals), and two were polarized and the candidates of choice of Black voters lost. One of these contests was the general election in District 32, which has only 13.45% BVAP.[12] The other polarized contest that the Black-preferred candidate lost was the Democratic primary in State Senate District 1 in 2018. Six candidates competed in this election. The plurality choice of Black voters was African American candidate, Alberta Tinsley Talabi. A very large majority of white voters supported the Asian candidates, Stephanie Chang, who was the second choice of Black voters. Chang won with 49.8% of the vote (Talabi received 26.4%).

Table 3: Summary of State Senate District Racial Bloc Voting Analysis

State Senate District	Location	Percent BVAP	2018 Democratic primary	2018 General election
1	Wayne	44.68	polarized - lost	not polarized
2	Wayne	50.82	*na* (11 candidates)	not polarized

[12] The Black VAP percentages listed throughout this report are from the MICRC redistricting GIS active matrix tab labeled "5A," which indicates the percentage of non-Hispanic voting age population who indicated they were Black or Black in combination with any other race. This produces the maximum number of individuals within each racial group, including Black, but will result in totals over 100% since persons identifying as more than one race will be counted more than once.

State Senate District	Location	Percent BVAP	2018 Democratic primary	2018 General election
3	Wayne	48.14	polarized - won	not polarized
4	Wayne	47.00	not polarized	not polarized
5	Wayne	54.25	polarized - won	not polarized
6	Wayne	21.29	not polarized	polarized - won
11	Oakland	35.48	not polarized	not polarized
12	Oakland	14.87	no contest	polarized - won
27	Genesee	30.42	no contest	not polarized
32	Genesee & Saginaw	13.45	no minority candidates	polarized - lost

The final table in this section, Table 4, summarized the results of my analysis of recent state house election. A number of the cells in the table have "na" as an entry because estimates are not available. This was for one of two reasons: there were too many candidates and too few votes cast to obtain reliable estimates, or there were an insufficient number of white voters to produce reliable estimates (state house districts 3, 7, 8).

It was possible to produce estimates for 54 contests. The majority of these contests were not polarized – in 37 contests (68.5%), white and Black voters supported the same candidates. In another 13 contests, voting was polarized but the candidate preferred by Black voters won. There were four contests – all Democratic primaries – that were racially polarized and the Black-preferred candidate lost. In three of these contests, the BVAP of the districts was less than 30% (Districts 12, 16, and 37). The Black-preferred candidates also lost the 2018 Democratic primary in House District 29, which has a 36.04% BVAP. All six of the candidates competing were African Americans. The plurality choice of Black voters was Kermit Williams; Brenda Carter was the candidate of choice of a majority of white voters. Carter won with 30.7% of the vote and Williams came in second with 24.7% of the vote.

Table 4: Summary of State House District Racial Bloc Voting Analysis

State House District	Location	Percent BVAP	2018 Democratic primary	2018 General election	2020 Democratic primary	2020 General election
1	Wayne	64.76	not polarized	polarized - won	no contest	polarized - won
2	Wayne	57.70	*na* (7 candidates)	not polarized	not polarized	not polarized
3	Wayne	90.93	*na*	*na*	*na*	*na*
4	Wayne	47.27	*na* (15 candidates)	not polarized	*na* (13 candidates)	not polarized
5	Wayne	54.12	polarized - won	not polarized	not polarized	not polarized
6	Wayne	52.86	*na* (10 candidates)	not polarized	polarized - won	no contest
7	Wayne	94.27	*na*	*na*	*na*	*na*
8	Wayne	92.42	*na*	*na*	*na*	*na*
9	Wayne	74.22	not polarized	not polarized	polarized - won	not polarized
10	Wayne	67.41	not polarized	not polarized	*na* (8 candidates)	not polarized
11	Wayne	26.53	polarized - won	not polarized	no contest	not polarized
12	Wayne	26.97	polarized - lost	polarized - won	not polarized	polarized - won
16	Wayne	23.25	polarized - lost	not polarized	no contest	not polarized
27	Oakland	24.35	not polarized	not polarized	*na* (8 candidates)	not polarized

State House District	Location	Percent BVAP	2018 Democratic primary	2018 General election	2020 Democratic primary	2020 General election
29	Oakland	36.04	polarized - lost	not polarized	no contest	not polarized
35	Oakland	62.50	polarized - won	not polarized	not polarized	not polarized
37	Oakland	17.91	no contest	not polarized	polarized - lost	not polarized
34	Genesee	60.96	not polarized	polarized - won	not polarized	polarized - won
49	Genesee	29.47	not polarized	not polarized	no contest	not polarized
95	Saginaw	35.50	no contest	not polarized	polarized - won	polarized - won

D. Voting Patterns of Minority Voters other than Black Voters

As noted above, it was not possible to produce estimates of voting patterns by race for any groups other than Blacks and whites (more specifically, non-Hispanic whites) statewide or by county. However, by localizing the analysis in geographic areas much smaller than counties, it was possible to derive estimates for several additional minority groups: Hispanics, Arab Americans, Chaldeans, and Bangladeshi Americans.[13] Because these estimates could not be generated statewide, it is difficult to know if the voters included in the analysis are representative of the group as a whole statewide. The summary tables reporting the estimates for these groups can be found in the Appendix C.

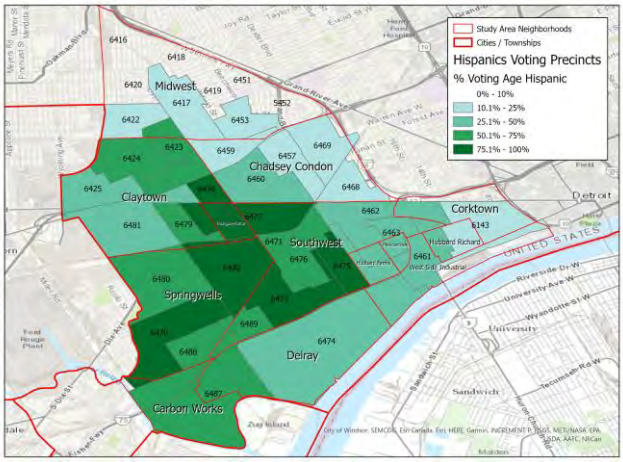
Hispanic Voters Hispanics live in large enough concentrations to produce estimates in two areas of Michigan. Because these concentrations are in different areas of the state, I did not combine them. Instead, I have produced estimates for Hispanics living in the area of Detroit depicted in the first map below ("Areas included in Analysis of Voting Patterns – Hispanics

[13] Interest in the voting patterns of Arab Americans, Chaldeans and Bangladeshi Americans was prompted by comments received in public hearings and on the public portal.

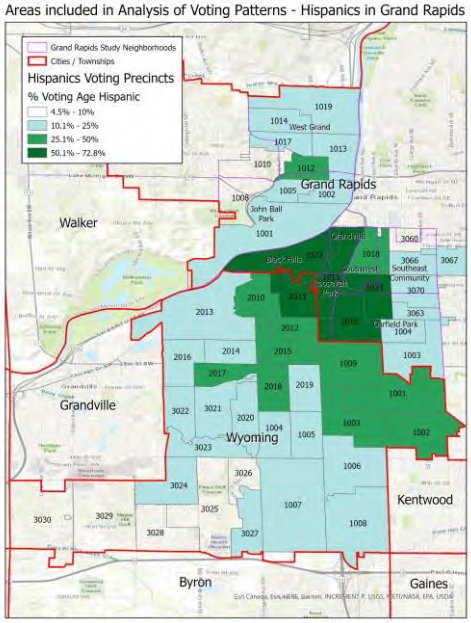
(Detroit)") and in the Grand Rapids area depicted in the second map ("Areas included in Analysis of Voting Patterns – Hispanics in Grand Rapids"). In both maps, the precincts are shaded based on the percentage Hispanic in the precinct.[14]

While the voting patterns do not appear to be very different – both groups provide strong support for Democratic candidates in general elections – the turnout levels differ. In the Grand Rapids area, turnout among Hispanics of voting age is lower than it is in the Detroit area.

Areas included in Analysis of Voting Patterns - Hispanics (Detroit)



Areas included in Analysis of Voting Patterns - Hispanics in Grand Rapids

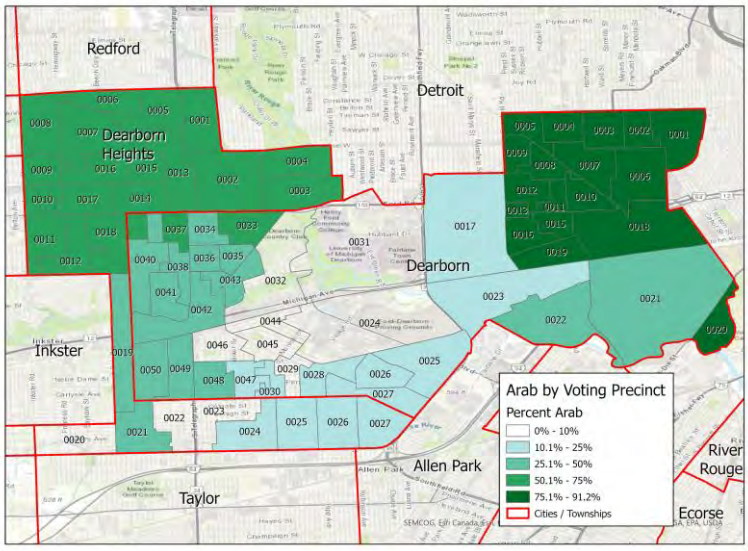


[14] The Hispanic VAP used for shading the map and conducting the racial bloc voting analysis was derived from the 2020 94-171 census redistricting data, which reports Hispanic VAP by census block. This data was then aggregated up to the precinct level.

Arab American Voters Approximately 38% of the Arab American population in Michigan is concentrated in the Dearborn and Dearborn Heights area. Localizing the racial bloc voting analysis to this specific area offered sufficient variation across the precincts to produce estimates of the voting behavior of this group. The map below indicates the geographic area included in the analysis; the precincts are shaded by the percentage of residents who are Arab American.[15]

Arab Americans voters, at least in this area of Michigan, strongly support Democratic candidates in general elections – over 80% consistently supported the Democratic candidate in the six 2018-2020 general elections examined. These voters, unlike other groups of voters studied, were also very cohesive in 2018 Democratic primary for Governor – they strongly supported of Abdul El-Sayed in his bid for the nomination.

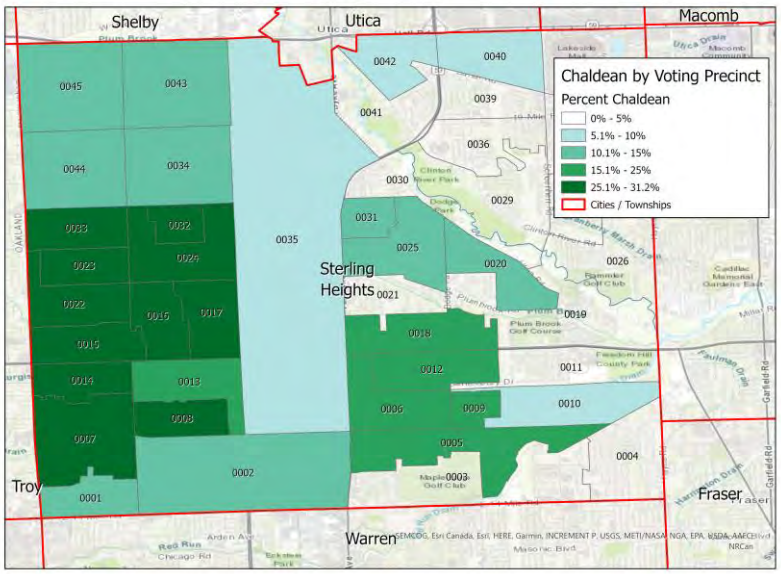
Areas included in Analysis of Voting Patterns - Arabs in Dearborn/Dearborn Heights



[15] The Arab American data was derived from the U.S. Census Bureau's American Community Survey (ACS), Table B04004, "People Reporting Single Ancestry." This data, reported at the census tract level, was attributed down to the census block level and then aggregated up to the election precinct level.

Chaldeans, like Arab Americans in Michigan, tend to reside in a geographically concentrated area of Michigan – in this instance, Sterling Heights. Over 40% of the Chaldean population cand be found here.[16] Localizing the voting analysis to Sterling Heights produced reliable estimates of the voting patterns of this community. Chaldeans are not nearly as cohesive as Arab Americans – they consistently divided their support between the Democratic and Republican candidates. However, a clear majority of Chaldean voters supported Donald Trump in his bid for re-election in 2020.

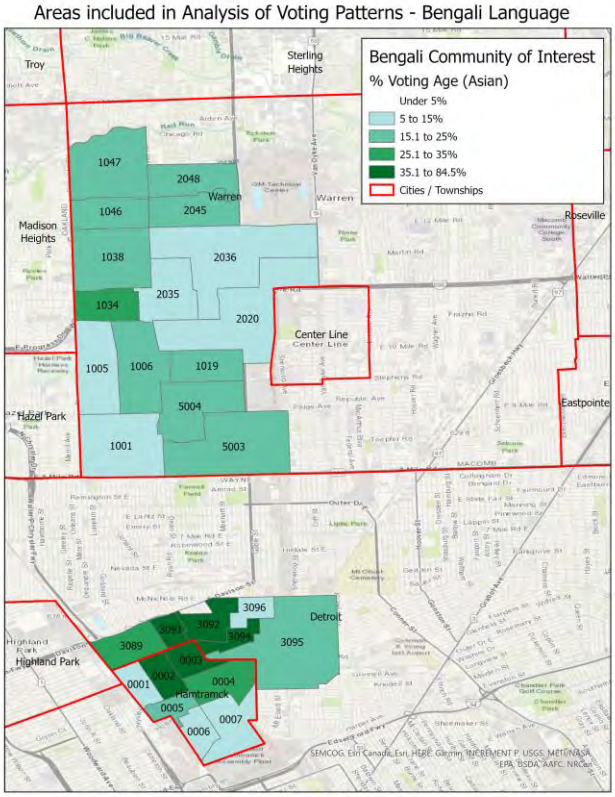
Areas included in Analysis of Voting Patterns - Chaldeans in Sterling Heights



[16] The Chaldean data was derived from the U.S. Census Bureau's American Community Survey (ACS), Table B04004, "People Reporting Single Ancestry" using the Assyrian/Chaldean/Syriac designation. This census tract level data was attributed down to the census block level and then aggregated up to the election precinct level.

Bangladeshi American Voters Using a map identifying the Bangladeshi American community of interest submitted to the MICRC,[17] this localized analysis focused on West Warren and Hamtramck to produce estimates of the vote choices of this group. Bangladeshi American voting patterns are very similar to Arab American voting patterns.[18] Both groups provided strong support for Democratic candidates in general elections and both groups were cohesive in their support of Abdul El-Sayed in the 2018 Democratic primary for Governor.

Areas included in Analysis of Voting Patterns - Bengali Language



[17] The map was submitted on the public comment portal on 9/8/2021 by Hayg Oshagan with the following comment "This is the Bengali community of SE MI. The area around Hamtramck (to the South) is most densely populated and is the center of the community."

[18] Asian VAP by census block as reported by the 2020 94-171 census redistricting data was used to create the shading on the map and the racial bloc voting database.

II. Drawing Minority Opportunity Districts

Because voting in Michigan is racially polarized, districts that provide minority voters with an opportunity to elect their candidates of choice must be drawn. If they already exist – as many do in Michigan – they must be maintained. But maintaining minority opportunity districts does not necessarily require that the districts be redrawn with the same percentage minority voting age population. In fact, many of the minority districts in the current plan are packed with far more Black VAP than needed to elect candidates of choice, as indicated by the percentage of votes the minority candidates are garnering. (See Tables 9 and 10, in the next section of this report, for the Black VAP of the current state house and senate districts, the current incumbents and their race and party, and the percentage of votes each of the incumbents received in 2020.)

An analysis must be undertaken to determine if a proposed district is likely to provide minority voters with an opportunity to elect their candidates of choice to office. This analysis must be district-specific – that is, must recognize there are likely to be differences in participation rates and voting patterns in districts across the state – and it must be functional – that is, it must be based on actual voting behavior of whites and minorities. There is no single universal or statewide demographic target that can be applied for Black voters to elect their candidates of choice in Michigan.[19]

There are two related approaches to conducting a district-specific, functional analysis, both of which take into account the relative turnout rates and voting patterns of minorities and whites. The first approach uses estimates derived from racial bloc voting analysis to calculate the percent minority population needed in a specific area for minority-preferred candidates to win a district in that area.

The second approach relies on election results from previous contests that included minority-preferred candidates (as identified by the racial bloc voting analysis) to determine if these candidates would win election in the proposed districts. The election results for these "bellwether elections" – racially polarized elections that include minority candidates who are preferred by minority voters – are disaggregated down from the election precinct to the census block level and then recompiled to reflect the boundaries of the proposed district. If the minority-

[19] Establishing a demographic target (e.g., 55% black voting age population) for all minority districts across the jurisdiction was, in fact, expressly forbidden by the U.S. Supreme Court in *Alabama Legislative Black Caucus v. Alabama,* 575 U.S. 254 (2015).

preferred candidates in these bellwether elections win in the proposed district, this district is likely to provide minority voters with an opportunity to elect their candidates of choice. This latter approach can be used only if proposed district boundaries have been drawn. The former approach can be carried out before any new boundaries are drafted.

A. Calculating the Black VAP Needed to Elect Black-Preferred Candidates

The percentage of minority voting age population needed in a district to provide minority voters with the opportunity to elect minority-preferred candidates to congress or to the state legislature varies. Using the estimates produced from the racial bloc voting analysis, I calculated the Black VAP percentages needed to elect minority-preferred candidates in each of the general elections included in the summary tables in the Appendix. This calculation takes into account the relative participation rates of age eligible Blacks and whites, as well as the level of Black support for the Black-preferred candidate (the "cohesiveness" of Black voters), and the level of whites "crossing over" to vote for the Black-preferred candidate.

Equalizing minority and white turnout Because Blacks who are age eligible to vote often turn out to vote at lower rates than white voters in Michigan, the Black VAP needed to ensure that Black voters comprise at least half of the voters in an election is often higher than 50%. Once the respective turnout rates of Black and Whites eligible to vote have been estimated using the statistical techniques described above (HP, ER and EI), the percentage needed to equalize Black and white voters can be calculated mathematically.[20] But equalizing turnout is

[20] The equalizing percentage is calculated mathematically by solving the following equation:

Let
M = the proportion of the district's voting age population that is Black
W = 1-M = the proportion of the district's voting age population that is white
A = the proportion of the Black voting age population that turned out to vote
B = the proportion of the white voting age population that turned out to vote

Therefore,
M(A) = the proportion of the population that is Black and turned out to vote (1)
(1-M)B = the proportion of total population that is white and turned out to vote (2)

To find the value of M that is needed for (1) and (2) to be equal, (1) and (2) are set as equal and we solve for M algebraically:

$$M(A) = (1 - M)\,B$$
$$M(A) = B - M(B)$$
$$M(A) + M(B) = B$$
$$M(A + B) = B$$
$$M = B/(A+B)$$

only the first step in the process – it does not take into account the voting patterns of Black and white voters. If voting is racially polarized but a significant number of white voters typically "crossover" to vote for Black voters' preferred candidate, it may be the case that crossover voting can more than compensate for depressed Black turnout.

Incorporating Minority Cohesion and White Crossover Voting Even if Black citizens are turning out at lower rates than whites, and voting is racially polarized, if a relatively consistent percentage of white voters support Black-preferred candidates, the candidates preferred by Black voters can be elected in districts that are less than majority Black. On the other hand, if voting is starkly polarized, with few or no whites crossing over to vote for the candidates supported by Black voters, it may be the case that a district that is more than 50% Black VAP is needed to elect Black-preferred candidates. A district-specific, functional analysis should take into account not only differences in turnout rates, but also the voting patterns of Black and white voters.[21]

To illustrate this mathematically, consider a district that has 1000 persons of voting age, 50% of who are Black and 50% of who are white. Let us begin by assuming that Black turnout is lower than white turnout in a two-candidate general election. In our hypothetical election example, 42% of the Black VAP turn out to vote and 60% of the white VAP vote. This means that, for our illustrative election, there are 210 Black voters and 300 white voters. Further suppose that 96% of the Black voters supported their candidate of choice and 25% of the white voters cast their votes for this candidate (with the other 75% supporting her opponent in the election contest). Thus, in our example, Black voters cast 200 of their 210 votes for the Black-preferred candidate and their other 8 votes for her opponent; white voters cast 75 of their 300 votes for the Black-preferred candidate and 225 votes for their preferred candidate:

Thus, for example, if 39.3% of the Black population turned out and 48.3% of the white population turned out, B= .483 and A = .393, and M = .483/ (.393+.483) = .483/.876 = .5513, therefore a Black VAP of 55.1% would produce an equal number of Black and white voters. (For a more in-depth discussion of equalizing turnout see Kimball Brace, Bernard Grofman, Lisa Handley and Richard Niemi, "Minority Voting Equality: The 65 Percent Rule in Theory and Practice," *Law and Policy*, 10 (1), January 1988.)

[21] For an in-depth discussion of this approach to creating effective minority districts, see Bernard Grofman, Lisa Handley and David Lublin, "Drawing Effective Minority Districts: A Conceptual Framework and Some Empirical Evidence," *North Carolina Law Review*, volume 79 (5), June 2001.

	VAP	turnout	voters	support for Black-preferred candidate	votes for Black-preferred candidate	support for white-preferred candidate	votes for white-preferred candidate
Black	500	0.42	210	0.96	202	0.04	8
White	500	0.60	300	0.25	75	0.75	225
			510		277		233

The candidate of choice of Black voters would receive a total of 277 votes (202 from Black voters and 75 from white voters), while the candidate preferred by white voters would receive only 233 votes (8 from Black voters and 225 from white voters). The Black-preferred candidate would win the election with 55.4% (277/500) of the vote in this hypothetical 50% Black VAP district. And the Black-preferred candidate would be successful despite the fact that the election was racially polarized and that Blacks turned out to vote at a lower rate than whites.

The candidate of choice of Black voters would still win the election by a very small margin (50.9%) in a district that is 45% Black with these same voting patterns:

	VAP	turnout	voters	support for Black-preferred candidate	votes for Black-preferred candidate	support for white-preferred candidate	votes for white-preferred candidate
Black	450	0.42	189	0.96	181	0.04	8
White	550	0.60	330	0.25	83	0.75	248
			519		264		255

In a district with a 40% BVAP, however, the Black-preferred candidate would garner only 47.5% of the vote in this example.

Percent Black VAP needed to win recent general elections in Michigan Counties

Tables 5, 6, 7, and 8 utilize the results of the racial bloc voting analysis (see Appendix A) to indicate the percentage of vote a Black-preferred candidate would receive, given the turnout rates of Blacks and whites and the degree of black cohesion and white crossover voting for each

general election contests examined, in a 55%, 50%, 45%, 40% and 35% BVAP district in Wayne, Oakland, Genesee, and Saginaw Counties.[22] Because voting patterns vary by county, the percentage of votes the Black-preferred candidates would receive also varies. However, in no county is a 50% BVAP district required for the Black-preferred candidates to carry the district in a general election.

Table 5 reports the percentage of votes the Black-preferred candidate would receive in Wayne County, given voting patterns in previous general elections, The Black-preferred candidate would win every general election in a district with a BVAP of 35% or more, and would win with at least 54.4% of the vote – and in most election contests, a substantially higher percentage of the vote. The variation in the percentage of votes received by the Black-preferred candidate is due to the variation in the white vote rather than the Black vote because in in every election contest considered at least 95% of Black voters supported the Black-preferred candidate. The Black-preferred candidate of choice who would receive the lowest percentage of the vote would be African American Godfrey Dillard, a candidate for Secretary of State in 2014.

The voting patterns by race, and therefore the percent BVAP needed to win general elections is very similar in Genesee County, as shown in Table 6. Unlike Wayne County, however, the percentage of vote the Black-preferred candidate would garner in a 35% BVAP district in this county is declining slightly over the course of the decade – although the Black-preferred candidate would still win every general election in a 35% BVAP district.

In Oakland County, the Black-preferred candidate does not win every general election contest in a 35% BVAP district. It is not until the 40% BVAP column in Table 7 that the candidate of choice of Black voters wins every election examined. The most challenging election is again the race for Secretary of State in 2014. And even at 40% BVAP, Dillard would receive only 51.3% of the vote.

Saginaw County (Table 8) is similar to Oakland County in that it is only at 40% that the Black-preferred candidate wins every general election contest – and at 40% a couple of the contests are very close. Not only are the winning percentages for the Black-preferred candidates consistently lower in Saginaw County than they are for Oakland County, they have been decreasing over the course of the decade.

[22] Tables 5, 6, 7, and 8 are generated using EI RxC estimates reported in the racial bloc voting tables in the Appendix.

Table 5: Percent BVAP Needed to Win, Wayne County

WAYNE COUNTY Percent Black VAP needed to win	race of B-P candidate	turnout rate for office and percent vote for black-preferred candidates						percent of vote B-P cand would have received if district was 55% black VAP	percent of vote B-P cand would have received if district was 50% black VAP	percent of vote B-P cand would have received if district was 45% black VAP	percent of vote B-P cand would have received if district was 40% black VAP	percent of vote B-P cand would have received if district was 35% black VAP
		Black votes			White votes							
		votes cast for office	B-P	all others	votes cast for office	B-P	all others					
GENERAL ELECTIONS												
2020 President	W	58.0	97.5	2.5	76.6	47.5	52.5	71.5	69.0	66.6	64.3	62.0
2020 US Senate	W	57.8	95.2	4.8	75.6	47.2	52.8	70.4	68.0	65.7	63.4	61.2
2018 Governor	W	33.2	97.0	3.0	63.2	53.5	46.5	70.5	68.5	66.6	64.8	63.1
2018 Secretary of State	W	33.1	97.0	3.0	62.2	53.6	46.4	70.7	68.7	66.8	65.0	63.3
2018 Attorney General	W	32.7	95.5	4.5	61.3	49.4	50.6	67.6	65.4	63.4	61.5	59.7
2018 US Senate	W	33.1	95.8	4.2	63.1	52.3	47.7	69.3	67.3	65.4	63.6	61.9
2016 President	W	57.0	98.4	1.6	64.0	39.7	60.3	70.3	67.4	64.4	61.6	58.7
2014 Governor	W	35.8	96.5	3.5	47.7	41.3	58.7	67.7	65.0	62.3	59.7	57.2
2014 Secretary of State	AA	35.5	96.8	3.2	46.1	36.8	63.2	65.9	62.9	60.0	57.2	54.4
2014 Attorney General	W	35.3	95.7	4.3	45.9	41.0	59.0	67.5	64.8	62.1	59.5	57.0
2014 US Senate	W	35.7	98.0	2.0	46.8	53.4	46.6	74.9	72.7	70.5	68.4	66.4
2012 President	AA	60.4	99.0	1.0	65.7	51.9	48.1	76.8	74.5	72.1	69.8	67.5
2012 US Senate	W	59.9	98.1	1.9	64.4	57.6	42.4	79.1	77.1	75.1	73.1	71.1

Table 6: Percent BVAP Needed to Win, Genesee County

GENESEE COUNTY Percent Black VAP needed to win	race of B-P candidate	turnout rate for office and percent vote for black-preferred candidates						percent of vote B-P cand would have received if district was 55% black VAP	percent of vote B-P cand would have received if district was 50% black VAP	percent of vote B-P cand would have received if district was 45% black VAP	percent of vote B-P cand would have received if district was 40% black VAP	percent of vote B-P cand would have received if district was 35% black VAP
		Black votes			White votes							
		votes cast for office	B-P	all others	votes cast for office	B-P	all others					
GENERAL ELECTIONS												
2020 President	W	53.0	96.1	3.9	79.6	42.1	57.9	66.3	63.7	61.1	58.7	56.4
2020 US Senate	W	56.6	95.0	5.0	78.7	43.5	56.5	67.6	65.0	62.6	60.2	57.9
2018 Governor	W	45.1	95.3	4.7	59.8	46.2	53.8	69.8	67.3	64.9	62.6	60.4
2018 Secretary of State	W	44.9	95.2	4.8	58.6	48.0	52.0	70.8	68.5	66.2	64.0	61.8
2018 Attorney General	W	44.6	94.1	5.9	58.4	41.1	58.9	66.7	64.0	61.5	59.0	56.5
2018 US Senate	W	45.1	95.2	4.8	59.6	45.8	54.2	69.5	67.1	64.7	62.4	60.1
2016 President	W	59.0	96.4	3.6	67.3	37.4	62.6	67.9	65.0	62.0	59.2	56.3
2014 Governor	W	35.8	95.8	4.2	47.5	51.8	48.2	72.9	70.7	68.6	66.5	64.5
2014 Secretary of State	AA	35.9	95.6	4.4	46.1	46.2	53.8	70.3	67.8	65.4	63.1	60.8
2014 Attorney General	W	35.9	95.6	4.4	45.5	45.2	54.8	69.9	67.4	65.0	62.6	60.2
2014 US Senate	W	36.1	95.6	4.4	47.1	58.6	41.4	76.5	74.7	72.9	71.1	69.4
2012 President	AA	61.0	97.6	2.4	68.4	53.7	46.3	76.6	74.4	72.2	70.1	67.9
2012 US Senate	W	60.7	96.7	3.3	67.5	60.2	39.8	79.3	77.5	75.7	73.9	72.1

Table 7: Percent BVAP Needed to Win, Oakland County

OAKLAND COUNTY Percent Black VAP needed to win	race of B-P candidate	turnout rate for office and percent vote for black-preferred candidates						percent of vote B-P cand would have received if district was 55% black VAP	percent of vote B-P cand would have received if district was 50% black VAP	percent of vote B-P cand would have received if district was 45% black VAP	percent of vote B-P cand would have received if district was 40% black VAP	percent of vote B-P cand would have received if district was 35% black VAP
		Black votes			White votes							
		votes cast for office	B-P	all others	votes cast for office	B-P	all others					
GENERAL ELECTIONS												
2020 President	W	71.6	93.4	6.6	86.4	45.9	54.1	69.8	67.4	65.1	62.8	60.6
2020 US Senate	W	71.4	92.1	7.9	85.4	43.5	56.5	68.1	65.6	63.2	60.9	58.6
2018 Governor	W	53.2	94.1	5.9	68.8	47.4	52.6	70.1	67.8	65.5	63.3	61.1
2018 Secretary of State	W	53.1	94.2	5.8	67.7	47.5	52.5	70.4	68.0	65.8	63.5	61.4
2018 Attorney General	W	52.5	93.8	6.2	67.0	43.0	57.0	67.9	65.3	62.8	60.4	58.1
2018 US Senate	W	53.2	93.0	7.0	68.7	45.5	54.5	68.6	66.2	63.9	61.7	59.5
2016 President	W	65.6	95.1	4.9	73.5	39.1	60.9	68.3	65.5	62.7	60.0	57.3
2014 Governor	W	46.3	94.8	5.2	54.6	30.6	69.4	63.3	60.1	56.9	53.8	50.7
2014 Secretary of State	AA	45.9	94.6	5.4	53.1	26.4	73.6	61.4	58.0	54.7	51.3	48.1
2014 Attorney General	W	45.8	94.1	5.9	52.6	32.9	67.1	64.5	61.4	58.4	55.4	52.4
2014 US Senate	W	46.5	95.0	5.0	53.7	46.7	53.3	71.5	69.1	66.7	64.4	62.1
2012 President	AA	68.9	95.7	4.3	75.7	42.1	57.9	70.3	67.6	65.0	62.3	59.7
2012 US Senate	W	67.8	95.8	4.2	74.0	47.6	52.4	73.1	70.6	68.3	65.9	63.5

Table 8: Percent BVAP Needed to Win, Saginaw County

SAGINAW COUNTY Percent Black VAP needed to win	race of B-P candidate	turnout rate for office and percent vote for black-preferred candidates						percent of vote B-P cand would have received if district was 55% black VAP	percent of vote B-P cand would have received if district was 50% black VAP	percent of vote B-P cand would have received if district was 45% black VAP	percent of vote B-P cand would have received if district was 40% black VAP	percent of vote B-P cand would have received if district was 35% black VAP
		Black votes			White votes							
		votes cast for office	B-P	all others	votes cast for office	B-P	all others					
GENERAL ELECTIONS												
2020 President	W	48.6	95.3	4.7	79.6	36.3	63.7	61.5	58.7	56.0	53.4	50.9
2020 US Senate	W	48.4	93.8	6.2	78.7	37.5	62.5	61.7	58.9	56.3	53.9	51.5
2018 Governor	W	37.7	93.6	6.4	63.0	40.9	59.1	63.2	60.6	58.2	55.9	53.7
2018 Secretary of State	W	38.0	93.7	6.3	61.4	39.2	60.8	62.7	60.0	57.5	55.1	52.8
2018 Attorney General	W	37.6	93.4	6.6	61.0	33.3	66.7	59.1	56.2	53.4	50.8	48.3
2018 US Senate	W	37.8	93.5	6.5	62.8	39.3	60.7	62.3	59.7	57.2	54.8	52.6
2016 President	W	52.3	95.0	5.0	70.2	30.6	69.4	61.3	58.1	55.0	52.0	49.0
2014 Governor	W	32.7	94.1	5.9	50.8	42.2	57.8	65.1	62.5	60.1	57.8	55.6
2014 Secretary of State	AA	32.6	94.4	5.6	49.2	36.3	63.7	62.3	59.5	56.7	54.1	51.6
2014 Attorney General	W	32.4	94.1	5.9	50.1	32.6	67.4	59.8	56.8	53.9	51.1	48.5
2014 US Senate	W	32.7	94.1	5.9	50.1	50.6	49.4	69.9	67.8	65.7	63.8	61.9
2012 President	AA	56.2	95.7	4.3	70.3	42.9	57.1	69.0	66.4	63.8	61.3	58.8
2012 US Senate	W	55.7	95.4	4.6	68.7	52.3	47.7	73.8	71.6	69.5	67.4	65.4

It is important to remember that winning office in the United States usually requires winning two elections: a primary and a general election. The tables above consider only general election contests. Producing a comparable set of tables for Democratic primaries is not possible. First, there was only one statewide Democratic primary – the 2018 primary contest for Governor. There were three candidates competing in this election and because 50% of the vote was not required to win the election, a mathematical equation setting the percentage needed to win 50% of the vote does not work. Second, Black voters were not cohesive in support of any one of these three candidates. In fact, the candidate preferred by even the plurality of Black voters was not the same in the four counties examined. Drawing a district that Black-preferred candidate could win this primary is not possible when there is no Black-preferred candidate.

In areas where most of the white voters are likely to vote in Republican primaries, the inability to calculate the percent needed to win in Democratic primaries is not particularly important. Black voters will dominate the Democratic primary unless they make up only a very small portion of the voters in the district. However, in the counties examined in Michigan, many white voters elect to participate in the Democratic primary, especially in Wayne County. As the percentage Black VAP of proposed districts decreases, it may become more challenging for Black-preferred candidates to win not only the general election but the Democratic primary – but only if voting in Democratic primaries is racially polarized. Unfortunately, it is not possible to ascertain exactly how much more difficult it would be – or even if it would be more difficult – given the lack of Democratic primary election data.

B. Threshold of Representation in the Current State House and Senate Districts

A useful check on the percent needed to win estimates found in Tables 5-8 that can be done prior to drawing any districts is to produce what have been referred to by some political scientists as "threshold of representation" tables. These tables are designed to identify the lowest minority percentage above which minority candidates are consistently elected. Tables 9 and 10, below, report the BVAP of the current Michigan state house and senate districts with over 20% BVAP, and indicate the race and party of the candidate elected to represent the district.[23] Sorted

[23] There are no African American state senators or representatives elected from districts that are less than 20% Black in VAP. However, there are other minority candidates (Hispanic, Asian, and Middle Eastern) elected to state house districts with considerably less than 20% BVAP.

by the percent BVAP, the tables can sometimes provide evidence of a clear breakpoint between those districts that are probably electing candidates of choice and those that are not.[24]

An examination Table 9 indicates that every Michigan state house district with a BVAP of at least 35% elects a minority representative to the state house. In fact, every district with a BVAP of more than 26.53% elects a minority to office with the exception of District 49 in Genesee County. And the racial bloc voting analysis of House District 49 indicates that the white incumbent, John Cherry, is the candidate of choice of Black voters, even in the 2018 Democratic primary when he faced several African American candidates.

Table 9: Threshold of Representation for State House Districts, 2021

State House District	Total VAP	Black VAP	Percent Black VAP	Name	Party	Race	Percent of Vote 2020
7	60347	57256	94.27%	Helena Scott	D	Black	93.00%
8	62448	58042	92.42%	Stephanie A. Young	D	Black	96.70%
3	54130	49536	90.93%	Shri Thanedar	D	Asian	93.30%
9	62529	46806	74.22%	Karen Whitsett	D	Black	94.20%
10	69209	46977	67.41%	Mary Cavanagh	D	Hispanic	84.80%
1	59788	38993	64.76%	Tenisha R. Yancey	D	Black	75.80%
35	78306	49325	62.50%	Kyra Harris Bolden	D	Black	82.90%
34	49491	30419	60.96%	Cynthia R. Neeley	D	Black	86.70%
2	57031	33142	57.70%	Joe Tate	D	Black	74.10%
5	49290	27190	54.12%	Cynthia A. Johnson	D	Black	93.40%
6	67505	36182	52.86%	Tyrone Carter	D	Black	100.00%
4	68749	32761	47.27%	Abraham Aiyash	D	ME	89.80%
29	72319	26621	36.04%	Brenda Carter	D	Black	72.90%
95	58640	21320	35.50%	Amos O'Neal	D	Black	70.10%
49	64844	19308	29.47%	John D. Cherry	D	White	68.90%
54	72426	21212	28.79%	Ronnie Peterson	D	Black	77.70%
12	73883	20207	26.97%	Alex Garza	D	Hispanic	62.40%
11	73586	19760	26.53%	Jewell Jones	D	Black	65.20%
92	66135	16957	25.34%	Terry J. Sabo	D	White	65.30%
27	73337	18051	24.35%	Regina Weiss	D	White	74.40%
16	74617	17556	23.25%	Kevin Coleman	D	White	62.50%
75	76956	18127	22.56%	David LaGrand	D	White	74.60%
68	71672	16808	22.44%	Sarah Anthony	D	Black	75.90%
18	75251	16519	21.76%	Kevin Hertel	D	White	60.30%
22	68758	14588	21.00%	Richard Steenland	D	White	59.90%
60	74176	15887	20.97%	Julie M. Rogers	D	White	71.40%

[24] Without the confirmation provided by a racial bloc voting analysis, it could conceivably be the case that the minority legislator is not the candidate of choice of minority voters.

Interpreting Table 10, for the Michigan state senate, is less straightforward. The four districts with BVAP percentages over 47% elect African Americans to office. However, Stephanie Chang, the state senator in District 1, which is 44.68% BVAP, was not the candidate of choice of Black voters in the 2018 Democratic primary, though she is the candidate of choice in the general election.

Table 10: Threshold of Representation for State Senate Districts, 2021

State Senate District	Total VAP	Black VAP	Percent Black VAP	Name	party	race	Percent of vote 2018
5	203828	111418	54.25%	Betty Alexander	D	Black	77.4%
2	169357	86961	50.82%	Adam Hollier	D	Black	75.7%
3	186758	90737	48.14%	Sylvia Santana	D	Black	81.8%
4	180199	85691	47.00%	Marshall Bullock	D	Black	78.3%
1	193087	87075	44.68%	Stephanie Chang	D	Asian	72.0%
11	229870	82336	35.48%	Jeremy Moss	D	White	76.7%
27	175918	54071	30.42%	Jim Ananich	D	White	71.2%
9	219325	50800	22.95%	Paul Wojno	D	White	65.9%
6	217734	46997	21.29%	Erika Geiss	D	Black	61.4%

C. Recompiled Election Results

As noted above, once draft districts have been drawn, there is a second approach available for ascertaining whether a proposed district is likely to provide minority voters with an opportunity to elect their candidates of choice to legislative or congressional office. This approach relies on recompiling election results from previous elections to see if the candidates preferred by minority voters would win in the draft district. This process entails (1) identifying "bellwether" elections, (2) disaggregating the precinct level results for these elections down to the census block level and then (3) re-aggregating the results up to conform to proposed district boundaries to determine if the minority-preferred candidate would win. This recompilation can only be done

for elections that cover a broad enough area to encompass all of the draft districts, hence only statewide elections can be used for this exercise. "Bellwether" elections are statewide elections that included minority candidates who were the candidates of choice of minority voters but were not supported by white voters.

Although there were six statewide general elections that included African American candidates or running mates, the African American was the candidate of choice of Black voters in only four of these contests: U.S. President in 2012 and 2020, Secretary of State in 2014, and Governor in 2018. All of these contests were racially polarized statewide, but only the 2014 Secretary of State contest was polarized in all four counties. This election contest was also the contest in which the candidate strongly preferred by Black voters garnered the least amount of white crossover votes. Thus, while recompiled elections results for all four elections provide important information for determining if a proposed district would provide Black voters with an opportunity to elect their preferred candidates in general elections, the single best "bellwether" contest for that purpose is the vote for Godfrey Dillard in 2014.

The redistricting software used by MICRC automatically included recompiled election results for all draft districts for all four of these elections – in fact, it included this information for every statewide general election conducted between 2012 and 2020. Ascertaining if the African American candidates of choice of Black voters, especially Dillard in 2014, carried a proposed district provides evidence that the proposed district in a draft plan will provide Black voters with an opportunity to elect their candidates of choice in general elections.

The redistricting software also reported recompiled election results for the one statewide Democratic primary conducted in the past decade: the 2018 race for Governor. However, because there were three candidates and because Black voters were not cohesive in supporting any of these candidates, these recompiled results are not particularly useful in ascertaining whether a proposed district would provide minority voters with an opportunity to elect their preferred candidates in Democratic primaries.

III. Measuring Partisan Fairness in Redistricting Plans

According to 13(d) of Article IV, Section 6 of the Michigan State Constitution: "Districts shall not provide a disproportionate advantage to any political party. A disproportionate advantage to a political party shall be determined using accepted measures of partisan fairness." A number of objective mathematical measures have been developed by social scientists and mathematicians to determine if an existing or proposed redistricting map disadvantages one political party relative to the other. Using these measures, we can compare an existing or proposed redistricting map to a large set of other possible maps to determine if the proposed map exhibits more or less political bias. The maps used for comparative purposes can be previous redistricting maps used in the state, or the redistricting maps of other states, or they can be computer simulated maps.

I proposed incorporating three measures of partisan fairness measures into the redistricting software used by the MICRC to draw redistricting maps. The reasons for my choice were as follows:

- The measures are easy to understand and straightforward to calculate. They produce scores that indicate both the direction and the magnitude of any political bias in the redistricting map.
- Because I easily calculated the scores for each of these measures in excel, I knew it would be possible to incorporate an automated report function into the redistricting software that could provide these scores for any draft plans drawn.
- Although these three measures have only recently been developed, they have all have been introduced and accepted by federal and state courts as useful tools for determining if a redistricting map is politically fair.

The three partisan fairness measures I selected are the lopsided margins test, the mean-median difference, and the efficiency gap.

In addition to these three measures, a simple metric for indicating whether a redistricting plan is fair is to compare the proportion of the statewide vote each party receives to the proportion of the districts each party wins or is likely to win under the proposed plan. The proportionality of a redistricting plan is calculated by subtracting the percentage of votes won by the party from the percentage of seats that party won (or would win) in congressional and state

legislative elections. So, for example, if Party A won 52.3% of the vote statewide but only won 44.7% of the seats in the state senate, the proportionality bias would be 44.7 – 52.3 or -7.6 in favor of Party B.

Each of these measures use historical election results to evaluate the partisan fairness of redistricting plans. However, in the case of proposed districts, previous election results must be reconfigured to conform to the proposed district boundaries to evaluate the partisan fairness of the proposed plans.[25] A composite election index was constructed using the statewide general elections between 2012 and 2020 – all 13 of the election contests included in the GIS redistricting database and analyzed in the racial bloc voting analysis. The composite index was weighted to give each election cycle equal weight in the index. However, the partisan fairness report function in the redistricting software was designed so that any of the individual 13 elections could be substituted for the composite index in calculating the partisan fairness scores.

A. Lopsided Margins Test

In a perfectly fair plan – at least in a state in which the two political parties are competitive (closely divided) – we would expect a mix of districts, some strongly partisan districts, some moderately reliable districts, and some tossups – but each party would have a roughly similar mix. If one party has a smaller number of victories with larger margins of victory that the other party, this is an indication that one party is being disfavored over the other in the map. This pattern of outcomes can be quantified by sorting the districts into two groups, by winning party. Each party's winning vote share can then be compared to see if one party has significantly higher margin of victories than the other.[26] The following is an example of how this is calculated:

[25] Both the efficiency gap and the mean-median difference have been used to evaluate computer simulated alternative redistricting maps for comparative purposes in partisan gerrymandering challenges. Election results for select statewide elections were reconfigured to determine how the candidates in these elections would have fared in the alternative districts.

[26] This measure was first discussed in Sam Wang, "Three Tests for Practical Evaluation of Partisan Gerrymandering," *Stanford Law Journal*, 16, June 2016. Available at: https://www.stanfordlawreview.org/print/article/three-tests-for-practical-evaluation-of-partisan-gerrymandering/)

				Percent of Votes			Party Wins	
District	Party A	Party B	Total Votes	Party A	Party B		Party A	Party B
1	279	120	399	69.9%	30.1%		69.9%	
2	172	198	370	46.5%	53.5%			53.5%
3	167	192	359	46.5%	53.5%			53.5%
4	148	212	360	41.1%	58.9%			58.9%
5	185	180	365	50.7%	49.3%		50.7%	
6	139	193	332	41.9%	58.1%			58.1%
7	169	201	370	45.7%	54.3%			54.3%
8	179	206	385	46.5%	53.5%			53.5%
9	234	99	333	70.3%	29.7%		70.3%	
10	178	199	377	47.2%	52.8%			52.8%
TOTAL	**1850**	**1800**	**3650**	**50.7%**	**49.3%**		**63.6%**	**54.9%**

Party A in the example is winning districts with a much higher average vote (63.6%) than Party B (54.9%) – and the difference between the two percentages is 8.7 (63.6 – 54.9). This indicates that Party A supporters are packed into a few districts that it wins by large margins. Party B, on the other hand, is winning substantially more districts with substantially lower vote margins.

B. Mean-Median Difference

Comparing a dataset's mean and median is a common statistical analysis used to assess how skewed the dataset is – if the dataset is balanced, the mean will be very close in value to its median. As a dataset becomes more skewed, the mean and median begin to diverge; looking at the difference between the two can be used determine the extent to which the data is skewed.

Based on this principle, the mean-median district vote share difference compares a party's mean district vote share to its median district vote share:[27]

- Mean = average party vote share across all districts
- Median = party vote share in the median district when districts are sorted on share of party vote

[27] This approach to ascertaining political bias in redistricting maps was proposed by Michael D. McDonald and Robin Best in "Unfair Partisan Gerrymanders in Politics and Law: A Diagnostic Applied to Six Cases," *Election Law Journal* 14(4), 2015 (available at: https://www.liebertpub.com/doi/abs/10.1089/elj.2015.0358). It was further quantified by Wang (see full citation above).

The difference between the mean and median vote shares provides a measure of whether the redistricting map produces skewed election results. The following is an example of how this is calculated:

Party A	Percentages I
	41.1%
	41.9%
	45.7%
	46.5%
	46.5%
	46.5%
	47.2%
	50.7%
	69.9%
	70.3%
District median percentage	46.5%
Statewide mean percentage	50.7%
Mean-Median Difference	4.2%

In this example, Party A received 50.7% of the statewide vote. Party A's median vote share (46.5%) is 4.2% lower than its mean vote share of 50.7%. This indicates that Party A must win more districts than Party B to win half of the seats – the redistricting map in skewed in favor of Party B. In fact, Party A would have had to win 54.2% (50.0 + 4.2) of the statewide vote to win 50% of the seats.

C. Efficiency Gap

This measure, introduced by University of Chicago law professor Nick Stephanopoulos and Public Policy Institute of California research fellow Eric McGhee, looks at the number of "wasted votes" across districts.[28]

In any election, nearly 50 percent of votes are wasted: all votes cast for a losing candidate, and any votes cast for a winning candidate beyond the threshold needed to win (50 percent in a two-candidate contest). In a hypothetical map with perfect partisan symmetry, both

[28] Nicholas O. Stephanopoulos and Eric M. McGhee, "Partisan Gerrymandering and the Efficiency Gap," *University of Chicago Law Review*: Vol. 82 (2), 2015. Available at: https://chicagounbound.uchicago.edu/uclrev/vol82/iss2/4.

parties would waste the same number of votes. A large difference between the parties' wasted votes indicates one party is treated more favorably than the other by the redistricting map. This is because the plan packs and cracks one party's supporters more than the other party's supporters.

The efficiency gap is calculated by taking one party's total wasted votes in an election, subtracting the other party's total wasted votes, and dividing this by the total number of votes cast. It captures in a single number the extent to which district lines waste the two parties votes unequally.

$$\text{Efficiency Gap} = \frac{\text{[Party A wasted votes]} - \text{[Party B wasted votes]}}{\text{total number of votes cast statewide}}$$

Example:

				Lost Votes		minimum	Surplus Votes		Total Wasted Votes	
District	Party A	Party B	Total Votes	Party A	Party B	to win	Party A	Party B	Party A	Party B
1	279	120	399	0	120	200	79	0	79	120
2	172	198	370	172	0	185	0	13	172	13
3	167	192	359	167	0	180	0	12	167	12
4	148	212	360	148	0	180	0	32	148	32
5	185	180	365	0	180	183	2	0	2	180
6	139	193	332	139	0	166	0	27	139	27
7	169	201	370	169	0	185	0	16	169	16
8	179	206	385	179	0	193	0	13	179	13
9	234	99	333	0	99	167	67	0	67	99
10	178	199	377	178	0	189	0	10	178	10
TOTAL	1850	1800	3650	1152	399		148	123	1300	522

In this example, supporters of Party A cast 1152 votes for losing candidates and 148 surplus votes – votes beyond what was necessary to elect Party A candidates. Supporters of Party B, on the other hand, cast only 399 of their votes for losing candidates and 522 surplus votes. Adding together these two sets of votes, Party A had a total of 1300 wasted votes; Party B had a total of only 522 votes. The efficiency gap is therefore calculated as 21.3% (1300-522/3650 = 778/3650 = .213). This efficiency gap in favor of Party B can be interpreted as the percentage of seats Party B won above what would be expected in a politically fair or neutral map.

D. Court Acceptance of these Measures

These three measures have all been developed within the last decade and therefore do not have a long history of consideration by the courts. However, they have been introduced recently

in the context of partisan gerrymandering challenges. While recognizing each of the measures have some disadvantages, the courts in each instance relied on these measures (in addition to other measures introduced) to find the plans before them were politically biased towards one of the political parties at the expense of the other.[29]

[29] Examples of court cases relying on at least one of the measures of political fairness described in this report include*: League of Women Voters of Michigan v. Benson*, in which the federal court held the congressional and state legislative plans in Michigan to be an unconstitutional gerrymander; *Ohio A. Philip Randolph Institute v. Householder*, which held the Ohio congressional map to be an unconstitutional partisan gerrymander; *League of Women Voters of Pennsylvania v. Commonwealth of Pennsylvania* in which the State Supreme Court held the Pennsylvania congressional districts to be in violation of the Pennsylvania Constitution; *Whitford v. Gill* in which the federal court determined the Wisconsin state assembly districts were unconstitutional; *Common Cause v. Rucho* in which the federal court found the North Carolina congressional district plan adopted in 2016 was an unconstitutional partisan gerrymander. This North Carolina decision, along with the Maryland case, *Lamone v. Benisek*, was later overturned by the U.S. Supreme Court on unrelated grounds, but grounds that served to moot all of the federal decisions discussed above. However, in a separate challenge before the North Carolina Superior Court, *Common Cause v. Lewis*, the court held that the state legislative districts violated the North Carolina State Constitution.

APPENDIX A

Statewide				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
2012 General											
U.S. President											
Barack Obama	D	AA	54.2%	98.6	106.5	99.2	97.8	44.0	42.7	43.3	44.5
Mitt Romney	R	W	44.7%	1.2	-6.6	0.4	1.2	54.8	55.9	55.3	54.6
others				0.2	0.2	1.1	1.1	1.3	13.8	1.2	1.0
votes for office				*62.1*	*57.3*	*59.1*	*59.1*	*69.2*	*66.1*	*68.1*	*68.1*
U.S. Senate											
Debbie Stabenow	D	W	58.8%	97.3	103.8	99.2	96.8	50.1	49.4	49.1	50.6
Peter Hoekstra	R	W	38.0%	1.2	-5.3	0.5	1.1	46.5	46.9	46.9	46.2
others				1.5	1.5	1.7	2.0	3.4	3.7	3.6	3.2
votes for office				*61.6*	*56.9*	*58.8*	*58.8*	*68.0*	*64.9*	*66.9*	*66.9*
2014 General											
Governor											
Mark Schauer	D	W	46.9%	94.4	101.3	97.4	95.7	38.7	37.1	36.2	38.4
Rick Snyder	R	W	50.9%	4.8	-2.2	2.1	2.5	58.9	60.2	61.3	59.4
others				0.8	0.8	1.4	1.8	2.4	2.7	2.5	2.1
votes for office				*36.9*	*31.6*	*35.1*	*35.1*	*49.6*	*46.7*	*49.1*	*49.1*
Secretary of State											
Godfrey Dillard	D	AA	42.9%	94.4	102.0	97.6	95.8	33.8	31.9	31.3	33.5
Ruth Johnson	R	W	53.5%	4.2	-3.3	1.5	2.1	62.3	63.9	64.7	62.9
others				1.4	1.3	1.2	2.1	3.9	4.3	4.0	3.6
votes for office				*36.5*	*31.3*	*34.8*	*34.8*	*48.3*	*45.4*	*47.8*	*47.8*
Attorney General											
Mark Totten	D	W	44.2%	93.3	101.3	97.0	95.2	34.7	32.8	33.0	35.0
Bill Schuette	R	W	52.1%	5.2	-2.9	2.1	2.5	61.3	62.8	62.9	61.2
others				1.5	1.6	1.2	2.2	4.0	4.4	4.1	3.8
votes for office				*36.4*	*31.2*	*34.6*	*34.6*	*48.3*	*45.5*	*47.8*	*47.8*

Statewide				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate											
Gary Peters	D	W	54.6%	96.8	103.9	99.1	96.5	46.2	44.8	45.1	47.3
Terry Lynn Land	R	W	41.3%	2.0	-5.0	0.5	1.6	49.4	50.3	50.2	48.5
others				1.2	1.1	1.0	2.0	4.5	4.8	4.6	4.2
votes for office				*36.8*	*31.5*	*35.0*	*35.0*	*48.9*	*46.1*	*48.5*	*48.5*
2016 General											
U.S. President											
Hillary Clinton	D	W	47.3%	96.8	106.3	98.9	97.3	33.6	30.2	32.0	34.3
Donald Trump	R	W	47.5%	2.0	-7.4	0.3	1.1	61.0	63.9	61.6	60.0
others				1.2	1.2	0.8	1.6	5.4	6.0	6.2	5.7
votes for office				*58.9*	*53.6*	*54.1*	*54.1*	*68.2*	*65.8*	*67.2*	*67.2*
2018 General											
Governor											
Whitmer/Gilchrist	D	W/AA	53.3%	95.6	104.3	98.6	95.3	41.1	38.9	40.6	44.8
Schuette/Lyons	R	W/W	43.8%	2.5	-6.4	0.6	1.8	56.0	57.9	56.2	52.8
others				1.9	2.1	2.6	2.9	2.9	3.2	2.9	2.5
votes for office				*36.6*	*31.6*	*35.2*	*35.2*	*61.9*	*61.7*	*63.3*	*63.3*
Secretary of State											
Jocelyn Benson	D	W	52.9%	95.7	104.7	98.7	95.6	40.1	38.0	39.9	43.9
Mary Treder Lang	R	W	44.0%	2.4	-6.6	0.6	1.8	56.5	58.3	56.4	53.1
others				1.9	1.9	1.7	2.7	3.4	3.7	3.5	2.9
votes for office				*36.4*	*31.6*	*35.1*	*35.1*	*60.9*	*60.7*	*62.2*	*62.2*
Attorney General											
Dana Nessel	D	W	49.0%	94.1	103.3	97.7	94.4	36.1	33.6	35.3	39.4
Tom Leonard	R	W	46.3%	2.4	-6.9	0.5	1.7	59.0	61.1	59.3	55.9
others				3.5	3.6	3.0	3.9	4.9	5.3	5.2	45.9
votes for office				*36.0*	*31.2*	*34.6*	*34.6*	*60.4*	*60.1*	*61.7*	*61.7*

Statewide				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate											
Debbie Stabenow	D	W	52.3%	93.9	102.5	97.5	94.3	40.3	38.1	39.5	43.7
John James	R	AA	45.8%	3.8	-5.1	1.1	2.0	57.8	59.9	58.4	55.1
others				2.3	2.5	2.4	3.7	1.9	2.0	1.7	1.2
votes for office				*36.5*	*31.5*	*35.0*	*35.0*	*61.8*	*61.6*	*63.1*	*63.1*
2020 General											
U.S. President											
Joseph Biden	D	W	50.6%	95.4	105.0	98.4	96.2	37.0	34.7	36.9	40.0
Donald Trump	R	W	47.8%	3.8	-5.4	1.1	1.9	61.5	63.6	61.2	59.1
others				0.8	0.8	1.3	1.9	1.6	1.7	1.6	1.0
votes for office				*61.2*	*53.3*	*55.2*	*55.2*	*79.1*	*77.7*	*79.0*	*79.0*
U.S. Senate											
Gary Peters	D	W	49.9%	93.4	102.3	97.2	93.9	36.9	34.8	36.4	39.4
John James	R	AA	48.2%	3.8	-5.6	1.1	1.7	61.5	63.5	61.7	59.8
others				2.7	3.1	3.7	4.4	1.6	1.6	1.4	0.9
votes for office				*59.9*	*53.0*	*55.0*	*55.0*	*78.3*	*76.8*	*78.1*	*78.1*

County: Genesee			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
2012 General										
U.S. President										
Barack Obama	D	AA	99.0	107.0	99.5	97.6	52.9	52.7	52.8	53.7
Mitt Romney	R	W	0.7	-6.7	0.5	1.3	46.1	46.0	46.0	45.5
others			0.2	0.3	0.7	1.1	1.1	1.3	0.9	0.8
votes for office			*64.1*	*57.4*	*61.0*	*61.0*	*70.1*	*65.1*	*68.4*	*68.4*
U.S. Senate										
Debbie Stabenow	D	W	97.8	103.9	99.7	96.7	59.7	59.8	59.4	60.2
Peter Hoekstra	R	W	0.9	-5.3	0.5	1.3	36.7	36.3	36.5	35.2
others			1.3	1.3	1.1	2.0	3.6	3.9	3.8	32.2
votes for office			*63.7*	*57.3*	*60.7*	*60.7*	*69.2*	*64.4*	*67.5*	*67.5*
2014 General										
Governor										
Mark Schauer	D	W	97.1	104.2	99.3	95.8	50.7	50.5	49.5	51.8
Rick Snyder	R	W	2.0	-5.0	0.6	2.3	46.5	46.5	47.5	45.8
others			0.9	0.9	1.1	1.9	2.8	3.0	2.8	2.4
votes for office			*37.6*	*31.4*	*35.8*	*35.8*	*48.8*	*44.6*	*47.5*	*67.5*
Secretary of State										
Godfrey Dillard	D	AA	96.1	104.3	99.0	95.6	45.3	45.8	44.2	46.2
Ruth Johnson	R	W	2.6	-5.3	0.3	2.2	50.7	50.5	51.5	50.2
others			1.3	1.1	1.1	2.2	4.1	4.3	4.1	3.6
votes for office			*37.4*	*31.5*	*35.9*	*35.9*	*47.4*	*43.3*	*46.1*	*46.1*
Attorney General										
Mark Totten	D	W	95.2	103.4	98.7	95.6	44.2	43.9	43.3	45.2
Bill Schuette	R	W	3.7	-4.4	0.8	2.4	52.6	52.6	53.3	51.9
others			1.1	1.1	0.9	2.0	3.3	3.5	3.3	2.9
votes for office			*37.3*	*31.4*	*35.9*	*35.9*	*46.8*	*42.8*	*45.5*	*45.5*

County: Genesee			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate										
Gary Peters	D	W	97.2	103.9	99.5	95.6	57.0	57.0	56.4	58.6
Terry Lynn Land	R	W	1.7	-4.8	0.6	2.2	38.7	38.3	39.0	37.5
others			1.2	0.9	0.8	2.2	4.3	4.6	4.4	3.9
votes for office			*37.6*	*31.5*	*36.1*	*36.1*	*48.3*	*44.3*	*47.1*	*47.1*
2016 General										
U.S. President										
Hillary Clinton	D	W	97.5	106.0	99.5	96.4	37.8	34.5	35.3	37.4
Donald Trump	R	W	1.5	-7.0	0.4	1.7	57.0	59.4	58.5	57.1
others			1.0	1.1	1.0	1.9	5.2	6.1	6.1	5.5
votes for office			*70.6*	*59.8*	*59.0*	*59.0*	*70.9*	*63.5*	*67.3*	*67.3*
2018 General										
Governor										
Whitmer/Gilchrist	D	W/AA	96.2	103.6	99.2	95.3	46.7	45.5	45.8	46.2
Schuette/Lyons	R	W/W	2.2	-5.5	0.2	2.0	50.5	50.9	50.5	50.8
others			1.6	1.9	1.7	2.7	2.8	3.6	3.2	3.0
votes for office			*54.2*	*43.5*	*45.1*	*45.1*	*62.6*	*57.0*	*59.8*	*59.8*
Secretary of State										
Jocelyn Benson	D	W	96.5	103.7	99.2	95.2	45.7	44.7	44.9	48.0
Mary Treder Lang	R	W	2.0	-5.8	0.3	2.0	50.9	51.2	50.8	48.7
others			1.5	2.1	1.4	2.8	3.4	4.2	3.7	3.4
votes for office			*53.9*	*43.5*	*44.9*	*44.9*	*61.3*	*55.7*	*58.6*	*58.6*
Attorney General										
Dana Nessel	D	W	94.5	102.3	98.6	94.1	39.9	37.6	37.9	41.1
Tom Leonard	R	W	2.3	-5.8	0.6	2.0	55.3	56.3	55.9	53.7
others			3.2	3.5	3.8	3.9	47.7	6.0	5.1	5.1
votes for office			*53.7*	*43.2*	*44.6*	*44.6*	*61.0*	*55.6*	*58.4*	*58.4*

County: Genesee			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate										
Debbie Stabenow	D	W	95.3	103.2	98.9	95.2	43.8	42.6	42.8	45.8
John James	R	AA	3.0	-5.3	0.7	2.1	54.3	54.8	54.6	52.6
others			1.7	2.2	1.7	2.8	1.9	2.6	1.8	1.6
votes for office			*54.2*	*43.8*	*45.1*	*45.1*	*62.4*	*56.8*	*59.6*	*59.6*
2020 General										
U.S. President										
Joseph Biden	D	W	96.5	104.4	99.3	96.1	39.9	37.7	38.6	42.1
Donald Trump	R	W	3.0	-5.1	0.5	2.1	58.7	60.5	59.6	56.7
others			0.5	0.7	0.9	1.8	1.4	1.8	1.8	1.2
votes for office			*67.3*	*54.8*	*53.0*	*53.0*	*81.5*	*75.4*	*79.6*	*79.6*
U.S. Senate										
Gary Peters	D	W	95.1	103.0	98.9	95.0	41.1	39.7	40.1	43.5
John James	R	AA	3.2	-5.3	0.7	1.8	57.4	58.4	57.6	55.5
others			1.7	2.1	2.7	3.2	1.6	2.0	1.5	1.1
votes for office			*67.1*	*54.8*	*56.6*	*56.6*	*80.6*	*74.4*	*78.7*	*78.7*

County: Saginaw			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
2012 General										
U.S. President										
Barack Obama	D	AA		114.3	99.5	95.7	41.6	39.2	41.1	42.9
Mitt Romney	R	W		-14.8	0.4	2.5	57.0	59.1	57.1	55.9
others				0.2	0.6	1.8	1.5	1.7	1.7	1.2
votes for office				*56.7*	*56.2*	*56.2*	*71.4*	*69.5*	*70.3*	*70.3*
U.S. Senate										
Debbie Stabenow	D	W		111.0	99.5	95.4	51.0	49.0	50.1	52.3
Peter Hoekstra	R	W		-11.6	0.7	2.2	46.0	47.6	46.3	44.9
others				0.7	0.0	2.4	2.9	3.3	3.3	2.8
votes for office				*56.3*	*55.7*	*55.7*	*69.9*	*67.7*	*68.7*	*68.7*
2014 General										
Governor										
Mark Schauer	D	W		11.2	99.6	94.1	41.1	38.4	39.1	42.2
Rick Snyder	R	W		-12.3	0.5	3.0	56.3	58.9	58.1	55.7
others				1.0	0.7	2.8	2.6	2.7	2.6	2.1
votes for office				*31.1*	*32.7*	*32.7*	*51.5*	*49.9*	*50.8*	*50.8*
Secretary of State										
Godfrey Dillard	D	AA		111.3	99.2	94.4	35.3	32.6	33.5	36.3
Ruth Johnson	R	W		-12.5	0.5	2.8	60.5	63.0	62.0	59.9
others				1.1	0.9	2.8	4.2	4.5	4.4	3.8
votes for office				*31.4*	*32.6*	*32.6*	*49.9*	*48.4*	*49.2*	*49.2*
Attorney General										
Mark Totten	D	W		110.7	98.6	94.1	32.1	28.9	29.8	32.6
Bill Schuette	R	W		-12.1	0.5	2.9	65.2	68.2	67.2	65.1
others				1.3	1.1	3.0	2.7	3.0	2.9	23.3
votes for office				*31.0*	*32.4*	*32.4*	*50.8*	*49.3*	*50.1*	*50.1*

County: Saginaw			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate										
Gary Peters	D	W		110.3	99.5	94.1	48.3	46.7	47.6	50.6
Terry Lynn Land	R	W		-10.6	0.7	3.0	47.8	49.2	47.9	45.8
others				0.5	0.4	2.9	3.9	4.3	4.2	3.5
votes for office				*31.2*	*32.7*	*32.7*	*50.8*	*49.2*	*50.1*	*50.1*
2016 General										
U.S. President										
Hillary Clinton	D	W		116.7	99.6	95.0		25.1	28.1	30.6
Donald Trump	R	W		-17.2	0.5	2.5		69.0	66.1	64.0
others				0.4	0.0	2.5		5.8	5.6	5.4
votes for office				*55.5*	*52.3*	*52.3*		*69.0*	*70.2*	*70.2*
2018 General										
Governor										
Whitmer/Gilchrist	D	W/AA		112.4	99.4	93.6		34.8	36.4	40.9
Schuette/Lyons	R	W/W		-14.2	0.6	2.9		62.4	60.3	56.9
others				1.8	1.6	3.5		2.8	2.5	2.2
votes for office				*38.9*	*37.7*	*37.7*		*61.5*	*63.0*	*63.0*
Secretary of State										
Jocelyn Benson	D	W		113.3	99.6	93.7		33.6	35.4	39.2
Mary Treder Lang	R	W		-14.9	0.6	3.2		62.8	60.6	57.7
others				3.5	1.2	3.1		3.6	3.3	3.0
votes for office				*39.7*	*38.0*	*38.0*		*60.0*	*61.4*	*61.4*
Attorney General										
Dana Nessel	D	W		112.5	99.0	93.4		27.6	29.0	33.3
Tom Leonard	R	W		-15.5	0.5	2.6		66.8	64.6	61.7
others				3.0	2.1	4.0		5.6	5.5	5.0
votes for office				*38.7*	*37.6*	*37.6*		*59.7*	*61.0*	*61.0*

County: Saginaw			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate										
Debbie Stabenow	D	W		110.6	99.3	93.5		33.7	34.6	39.3
John James	R	AA		-13.0	0.8	2.9		64.5	63.0	59.6
others				2.4	2.2	3.6		1.8	1.8	1.2
votes for office				*39.2*	*37.8*	*37.8*		*61.5*	*62.8*	*62.8*
2020 General										
U.S. President										
Joseph Biden	D	W		114.2	99.0	95.3		29.3	32.0	36.3
Donald Trump	R	W		-14.9	0.6	2.7		69.0	66.2	62.6
others				0.6	1.1	2.0		1.6	1.5	1.1
votes for office				*50.7*	*48.6*	*48.6*		*78.3*	*79.6*	*79.6*
U.S. Senate										
Gary Peters	D	W		112.5	99.5	93.8		31.1	33.1	37.5
John James	R	AA		-14.7	0.6	3.0		67.3	65.0	61.6
others				2.1	2.8	3.2		1.5	1.2	0.9
votes for office				*50.7*	*48.4*	*48.4*		*77.2*	*78.7*	*78.7*

County: Oakland			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
2012 General										
U.S. President										
Barack Obama	D	AA	98.2	111.7	99.4	95.7	43.9	39.5	40.7	42.1
Mitt Romney	R	W	1.6	-11.8	0.5	2.3	55.0	59.4	58.1	57.2
others			0.3	0.2	1.7	2.1	1.1	1.1	1.0	0.6
votes for office			*78.9*	*69.2*	*68.9*	*68.2*	*75.7*	*74.8*	*75.7*	*75.7*
U.S. Senate										
Debbie Stabenow	D	W	97.3	110.5	99.1	95.8	48.4	44.5	45.7	47.6
Peter Hoekstra	R	W	1.6	-11.4	0.0	1.9	47.9	51.8	50.3	49.2
others			1.1	0.9	0.8	2.3	3.7	3.7	3.5	3.2
votes for office			*78.3*	*69.2*	*67.8*	*67.8*	*74.0*	*73.0*	*74.0*	*74.0*
2014 General										
Governor										
Mark Schauer	D	W	94.5	108.9	99.1	94.8	33.9	27.9	28.2	30.6
Rick Snyder	R	W	5.0	-9.5	0.8	2.8	64.1	70.1	69.8	68.1
others			0.5	1.9	1.0	2.5	2.0	2.0	1.9	1.3
votes for office			*51.5*	*44.4*	*46.3*	*46.3*	*54.5*	*53.6*	*54.6*	*54.6*
Secretary of State										
Godfrey Dillard	D	AA	93.3	109.7	99.1	94.6	29.1	23.5	24.3	26.4
Ruth Johnson	R	W	5.4	-9.5	0.4	2.7	67.9	73.5	72.7	71.4
others			1.3	1.9	1.2	2.7	2.9	3.0	2.7	2.2
votes for office			*51.1*	*44.4*	*45.9*	*45.9*	*53.2*	*52.1*	*53.1*	*53.1*
Attorney General										
Mark Totten	D	W	93.0	107.5	98.8	94.1	35.0	30.1	30.3	32.9
Bill Schuette	R	W	5.6	-8.8	0.8	3.0	61.3	66.2	65.9	64.0
others			1.4	1.3	1.5	2.9	3.7	3.7	3.5	3.1
votes for office			*51.1*	*44.2*	*45.8*	*45.8*	*52.7*	*51.7*	*52.6*	*52.6*

County: Oakland			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate										
Gary Peters	D	W	96.8	110.6	99.4	95.0	46.9	43.0	44.0	46.7
Terry Lynn Land	R	W	2.0	-10.9	0.0	2.4	48.7	52.6	51.5	49.7
others			1.2	0.3	0.5	2.6	4.4	4.4	4.4	3.6
votes for office			*51.5*	*44.7*	*46.5*	*46.5*	*53.7*	*53.7*	*53.7*	*53.7*
2016 General										
U.S. President										
Hillary Clinton	D	W	95.2	108.8	99.4	95.1	36.0	34.2	34.3	39.1
Donald Trump	R	W	3.4	-9.7	0.8	2.4	58.6	59.8	59.6	55.8
others			1.4	0.7	0.1	2.5	5.4	6.0	6.0	5.1
votes for office			*73.0*	*61.1*	*65.6*	*65.6*	*74.6*	*72.4*	*73.5*	*73.5*
2018 General										
Governor										
Whitmer/Gilchrist	D	W/AA	95.3	107.6	99.3	94.1	44.2	42.4	42.2	47.4
Schuette/Lyons	R	W/W	3.5	-9.0	0.7	2.7	53.3	55.0	54.6	50.7
others			1.2	1.3	1.4	3.3	2.5	2.6	2.6	1.9
votes for office			*62.5*	*51.6*	*53.2*	*53.2*	*69.6*	*68.2*	*68.8*	*68.8*
Secretary of State										
Jocelyn Benson	D	W	95.2	108.1	99.1	94.2	44.3	42.4	42.3	47.5
Mary Treder Lang	R	W	3.4	-9.4	0.7	2.7	53.0	54.7	54.5	50.5
others			1.4	1.3	1.3	3.1	2.7	2.8	2.6	2.0
votes for office			*62.1*	*51.5*	*53.1*	*53.1*	*68.7*	*67.1*	*67.7*	*67.7*
Attorney General										
Dana Nessel	D	W	93.8	107.3	99.2	93.8	40.2	37.9	37.5	43.0
Tom Leonard	R	W	3.5	-9.7	0.6	2.6	55.4	96.8	57.5	53.0
others			2.7	2.4	2.0	3.6	4.4	0.5	4.4	4.0
votes for office			*61.4*	*50.7*	*52.5*	*52.5*	*67.9*	*66.4*	*67.0*	*67.0*

County: Oakland			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate										
Debbie Stabenow	D	W	93.8	106.5	98.7	93.0	42.7	41.1	40.9	45.5
John James	R	AA	4.8	-8.4	0.8	2.8	55.9	57.5	57.5	53.6
others			1.5	1.7	1.6	4.2	1.4	1.4	1.5	0.9
votes for office			*62.5*	*51.5*	*53.2*	*53.2*	*69.5*	*68.1*	*68.7*	*68.7*
2020 General										
U.S. President										
Joseph Biden	D	W	94.2	105.1	99.0	93.4	42.0	41.6	41.2	45.9
Donald Trump	R	W	5.3	-5.7	1.3	3.6	56.4	56.8	57.2	53.1
others			0.6	1.6	1.7	3.0	1.5	1.6	1.6	1.0
votes for office			*76.1*	*64.6*	*71.6*	*71.6*	*85.7*	*84.9*	*86.4*	*86.4*
U.S. Senate										
Gary Peters	D	W	93.1	104.5	98.8	92.1	40.7	39.9	39.4	43.5
John James	R	AA	5.2	-6.7	0.8	2.9	57.9	58.9	59.3	55.7
others			1.8	2.2	2.2	5.0	1.4	1.2	1.2	0.8
votes for office			*75.7*	*64.7*	*71.4*	*71.4*	*84.8*	*84.1*	*85.4*	*85.4*

County: Wayne			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
2012 General										
U.S. President										
Barack Obama	D	AA	98.6	102.2	99.5	99.0	51.1	51.2	51.1	51.9
Mitt Romney	R	W	1.2	-2.4	0.5	0.6	48.0	47.8	47.7	47.3
others			0.2	0.2	0.3	0.4	0.9	1.1	0.9	0.8
votes for office			*61.3*	*58.3*	*60.4*	*60.4*	*68.9*	*63.4*	*65.7*	*65.7*
U.S. Senate										
Debbie Stabenow	D	W	97.3	100.2	98.9	98.1	56.8	57.2	56.6	57.6
Peter Hoekstra	R	W	1.2	-1.6	0.4	0.6	39.6	38.8	39.1	38.6
others			1.5	1.5	1.5	1.3	3.6	4.0	4.0	3.8
votes for office			*60.8*	*57.8*	*59.9*	*59.9*	*67.6*	*62.1*	*64.4*	*64.4*
2014 General										
Governor										
Mark Schauer	D	W	94.2	97.8	96.4	96.5	41.1	41.2	39.2	41.3
Rick Snyder	R	W	5.0	1.4	2.9	2.6	56.9	56.3	58.4	56.6
others			0.8	0.8	0.7	0.9	2.0	2.5	2.3	2.0
votes for office			*36.3*	*33.0*	*35.8*	*35.8*	*50.7*	*44.1*	*47.7*	*47.7*
Secretary of State										
Godfrey Dillard	D	AA	94.3	98.4	96.7	96.8	36.8	36.6	35.0	36.8
Ruth Johnson	R	W	4.3	0.3	2.1	1.9	59.7	59.2	61.2	59.6
others			1.4	1.4	1.3	1.3	3.4	4.1	3.8	3.6
votes for office			*35.9*	*32.7*	*35.5*	*35.5*	*49.0*	*42.5*	*46.1*	*46.1*
Attorney General										
Mark Totten	D	W	93.2	97.0	95.5	95.7	41.0	40.7	39.1	41.0
Bill Schuette	R	W	5.3	1.5	3.2	2.9	55.4	54.9	56.8	55.1
others			1.5	1.5	1.4	1.4	3.7	4.4	4.1	3.9
votes for office			*35.7*	*32.5*	*35.3*	*35.3*	*48.8*	*42.3*	*45.9*	*45.9*

County: Wayne			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate										
Gary Peters	D	W	96.8	100.0	98.5	98.0	52.8	52.7	51.4	53.4
Terry Lynn Land	R	W	2.0	-1.1	0.6	1.0	42.7	42.0	43.4	41.8
others			1.2	1.1	1.0	1.1	4.5	5.3	5.0	4.7
votes for office			*36.2*	*32.9*	*35.7*	*35.7*	*49.8*	*43.2*	*46.8*	*46.8*
2016 General										
U.S. President										
Hillary Clinton	D	W	96.8	101.0	99.0	98.4	47.1	39.1	38.2	39.7
Donald Trump	R	W	2.0	-2.1	0.6	0.7	47.8	54.8	55.4	54.4
others			1.2	1.1	1.0	0.9	5.1	6.1	6.0	5.9
votes for office			*57.7*	*55.7*	*57.0*	*57.0*	*72.2*	*61.6*	*64.0*	*64.0*
2018 General										
Governor										
Whitmer/Gilchrist	D	W/AA	95.6	99.0	97.6	97.0	53.4	49.7	47.9	53.5
Schuette/Lyons	R	W/W	2.5	-1.0	0.9	1.1	44.6	47.3	49.1	44.0
others			2.0	2.0	2.1	1.9	2.0	3.0	2.8	2.5
votes for office			*33.9*	*30.9*	*33.2*	*33.2*	*67.2*	*59.8*	*63.2*	*63.2*
Secretary of State										
Jocelyn Benson	D	W	95.7	99.0	97.7	97.0	53.1	50.0	49.1	53.6
Mary Treder Lang	R	W	2.4	-1.0	1.0	1.1	44.7	46.8	48.5	43.6
others			2.0	2.0	2.0	1.8	2.2	3.2	3.2	2.8
votes for office			*33.7*	*30.8*	*33.1*	*33.1*	*66.2*	*58.8*	*62.2*	*62.2*
Attorney General										
Dana Nessel	D	W	94.1	97.7	96.3	95.5	49.6	45.6	43.6	49.4
Tom Leonard	R	W	2.4	-1.3	0.8	1.0	47.2	49.9	51.8	46.6
others			3.6	3.6	3.5	3.5	3.3	44.9	4.3	4.1
votes for office			*33.3*	*30.4*	*32.7*	*32.7*	*65.4*	*58.0*	*61.3*	*61.3*

County: Wayne			Estimates for Black Voters				Estimates for White Voters			
	Party	Race	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
U.S. Senate										
Debbie Stabenow	D	W	93.8	97.1	95.9	95.8	52.4	48.9	47.1	52.3
John James	R	AA	3.8	0.4	1.9	1.5	46.5	49.4	52.2	46.5
others			2.4	2.5	2.4	2.7	1.1	1.7	1.4	1.3
votes for office			*33.7*	*30.8*	*33.1*	*33.1*	*67.2*	*59.6*	*63.1*	*63.1*
2020 General										
U.S. President										
Joseph Biden	D	W	95.4	99.0	97.9	97.5	53.3	45.9	44.5	47.5
Donald Trump	R	W	3.8	0.2	1.6	1.5	45.4	52.6	53.9	51.3
others			0.8	0.8	0.8	0.9	1.3	0.8	1.5	1.3
votes for office			*59.2*	*55.6*	*58.0*	*58.0*	*81.3*	*74.1*	*76.6*	*76.6*
U.S. Senate										
Gary Peters	D	W	93.3	967.0	95.3	95.2	51.7	46.6	44.4	47.2
John James	R	AA	3.8	0.3	1.7	1.6	47.0	52.1	53.7	51.5
others			2.8	3.0	2.9	3.2	1.3	1.9	1.8	1.4
votes for office			*58.9*	*55.3*	*57.8*	*57.8*	*80.6*	*73.0*	*75.6*	*75.6*

2018 Democratic Primary for Governor				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
STATEWIDE											
Abdul El-Sayed	D	ME	30.2%	21.0	24.2	23.5	26.0	25.7	27.1	30.2	28.5
Shri Thanedar	D	A	17.7%	42.5	44.2	42.2	39.0	15.8	12.9	10.8	9.4
Gretchen Whitmer	D	W	52.0%	36.5	31.6	33.5	35.0	58.6	60.0	59.4	62.0
votes for office				*23.0*	*22.5*	*24.5*	*24.5*	*13.9*	*12.0*	*14.0*	*14.0*
Genesee											
Abdul El-Sayed	D	ME	22.9%	16.5	18.6	17.9	21.0	22.3	24.8	24.2	23.5
Shri Thanedar	D	A	23.6%	46.0	49.9	47.2	43.4	15.7	13.6	13.3	11.5
Gretchen Whitmer	D	W	53.4%	37.5	31.6	34.5	35.7	62.0	61.6	61.9	65.1
votes for office				*26.9*	*23.4*	*25.9*	*25.9*	*15.5*	*13.3*	*14.8*	*14.8*
Saginaw											
Abdul El-Sayed	D	ME	22.2%		18.9	17.5	21.0		21.9	23.6	21.0
Shri Thanedar	D	A	24.7%		51.5	51.1	44.7		16.8	14.7	14.5
Gretchen Whitmer	D	W	53.1%		29.6	31.3	34.4		61.4	61.8	64.5
votes for office					*19.7*	*20.7*	*20.7*		*12.4*	*13.2*	*13.2*
Oakland											
Abdul El-Sayed	D	ME	32.5%	23.2	24.1	23.2	25.3	29.8	34.2	36.0	34.9
Shri Thanedar	D	A	13.4%	32.7	38.5	37.5	34.7	8.4	4.3	4.3	3.0
Gretchen Whitmer	D	W	54.1%	44.1	37.5	39.0	40.0	61.8	61.4	61.0	62.1
votes for office				*31.4*	*33.3*	*35.0*	*35.0*	*20.8*	*16.1*	*18.2*	*18.2*
Wayne											
Abdul El-Sayed	D	ME	32.0%	21.2	20.8	21.0	22.2	43.4	41.3	41.3	41.6
Shri Thanedar	D	A	24.3%	42.8	45.6	43.8	42.5	7.5	4.8	5.4	3.9
Gretchen Whitmer	D	W	43.7%	36.1	33.7	34.8	35.3	49.2	53.9	54.0	54.5
votes for office				*22.4*	*21.1*	*23.5*	*23.5*	*19.3*	*16.0*	*17.4*	*17.4*

APPENDIX B

Congressional District General Elections				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
Congressional District 5											
2018 General											
Daniel Kildee	D	W	59.5%	96.2	104.4	99.1	95.0	48.4	46.5	47.5	50.5
Travis Wines	R	W	35.9%	1.3	-7.8	0.2	1.7	47.0	48.3	46.9	44.9
others				2.5	3.3	3.2	3.3	4.6	5.2	4.9	4.7
votes for office				*53.8*	*42.7*	*43.8*	*43.8*	*59.2*	*56.5*	*58.3*	*58.3*
2020 General											
Daniel Kildee	D	W	54.5%	95.4	105.2	99.0	95.0	41.6	39.6	41.0	44.2
Tim Kelly	R	W	41.8%	2.1	-8.4	0.6	1.6	54.8	56.3	54.4	52.3
others				2.6	3.2	3.0	3.4	3.6	4.1	3.9	3.5
votes for office				*67.1*	*54.5*	*54.5*	*54.5*	*76.6*	*73.8*	*76.0*	*76.0*
Congressional District 9											
2018 General											
Andy Levin	D	W	59.7%		95.2	98.2	71.5		50.2	48.9	55.7
Candius Stearns	R	W	36.8%		-3.5	0.3	62.9		47.5	47.4	43.2
others					8.4	9.4	22.2		2.4	2.3	1.1
votes for office					*17.9*	*17.5*	*17.5*		*66.2*	*66.4*	*66.4*
2020 General											
Andy Levin	D	W	57.7%		92.6	96.6	74.7		48.3	45.9	52.0
Charles Langworthy	R	W	38.4%		-0.6	0.5	5.6		48.8	50.0	46.7
others					7.9	8.1	19.7		3.0	2.7	1.3
votes for office					*37.9*	*27.6*	*27.6*		*80.2*	*82.7*	*82.7*
Congressional District 12											
2018 General											
Debbie Dingell	D	W	68.1%		91.9	97.3	75.5		58.4	57.5	63.3
Jeff Jones	R	W	28.9%		3.1	1.8	9.8		38.6	38.9	35.6
others					5.0	4.4	14.7		3.0	3.0	1.1
votes for office					*33.4*	*37.1*	*37.1*		*58.9*	*62.4*	*62.4*

Congressional District General Elections				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
2020 General											
Debbie Dingell	D	W	66.4%		91.2	95.9	75.3		56.4	55.3	58.7
Jeff Jones	R	W	30.7%		4.2	2.7	11.4		40.6	41.6	40.0
others					4.3	4.2	13.2		3.0	3.2	1.3
votes for office					*50.3*	*58.2*	*58.2*		*73.8*	*75.0*	*75.0*
Congressional District 13											
2018 General											
Rashida Tlaib	D	ME	84.2%	93.4	95.5	94.9	95.2		64.2	64.5	65.6
others				6.6	4.5	5.4	4.8		35.7	35.7	34.4
votes for office				*32.5*	*32.3*	*34.7*	*34.7*		*39.1*	*41.3*	*41.3*
2020 General											
Rashida Tlaib	D	ME	78.1%	94.6	97.8	96.5	96.1		46.5	47.0	46.9
David Dudenhoefer	R	W	18.7%	2.7	-0.4	1.1	1.2		49.2	48.7	49.0
others				2.7	2.7	2.6	2.7		4.4	4.2	4.1
votes for office				*587.0*	*57.5*	*60.0*	*60.0*		*59.0*	*61.1*	*61.1*
Congressional District 14											
2018 General											
Brenda Lawrence	D	AA	80.9%	96.3	99.3	98.1	96.7	40.8	51.3	52.3	61.1
Marc Herschfus	R	W	17.3%	1.7	-1.4	0.5	1.6	58.1	46.9	40.9	36.9
others				2.0	2.1	1.8	1.7	1.1	1.8	2.2	2.1
votes for office				*36.1*	*33.8*	*40.0*	*40.0*	*74.3*	*72.6*	*74.5*	*74.5*
2020 General											
Brenda Lawrence	D	AA	79.3%	95.0	97.9	96.6	96.5	41.6	49.3	50.3	55.6
Robert Vance Patrick	R	W	18.3%	2.6	-0.3	0.9	1.3	56.4	48.2	47.5	41.7
others				2.4	2.5	2.2	2.2	2.0	2.5	2.4	2.6
votes for office				*59.9*	*57.4*	*61.7*	*61.7*	*90.7*	*85.0*	*86.3*	*86.3*

2018 General: State Senate Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 1 (Wayne)											
Stephanie Chang	D	A	72.0%	91.3	97.8	94.1	93.2	47.2	49.0	48.8	53.3
Pauline Montie	R	W	24.2%	2.1	-4.2	0.8	1.1	51.0	49.4	48.6	44.6
others			3.8%	6.1	6.4	6.3	5.6	1.8	1.6	1.6	2.1
votes for office				*33.3*	*27.8*	*31.0*	*31.0*	*66.6*	*54.7*	*57.3*	*57.3*
District 2 (Wayne)											
Adam Hollier	D	AA	75.7%	96.4	99.5	98.0	97.9	37.7	47.7	46.5	52.8
Lisa Papas	R	W	24.3%	3.6	0.5	2.0	2.1	62.3	52.2	53.4	47.2
votes for office				*31.3*	*28.0*	*30.9*	*30.9*	*74.1*	*69.6*	*73.3*	*73.3*
District 3 (Wayne)											
Sylvia Santana	D	AA	81.8%	94.2	95.6	95.4	95.6	78.8	67.9	64.4	66.3
Kathy Stecker	R	W	15.3%	2.5	1.1	1.5	1.3	18.9	29.3	32.6	31.0
others			2.9%	3.9	3.3	3.3	3.1	2.3	2.8	2.7	2.7
votes for office				*30.7*	*29.2*	*30.0*	*30.0*	*38.7*	*42.8*	*45.4*	*45.4*
District 4 (Wayne)											
Marshall Bullock	D	AA	78.3%		97.0	100.2	98.7		45.3	46.1	51.1
Angela Savino	R	W	21.7%		3.0	-0.1	1.3		54.7	53.9	48.9
votes for office				*32.4*	*30.6*	*32.2*	*32.2*		*50.2*	*51.2*	*51.2*
District 5 (Wayne)											
Betty Jean Alexander	D	AA	77.4%	93.4	95.5	95.4	95.3		49.9	48.9	50.7
DeShawn Wilkins	R	AA	18.2%	3.3	1.2	1.6	1.6		43.7	44.5	43.1
others			4.4%	3.3	3.3	3.2	3.1		6.4	6.5	6.2
votes for office				*34.9*	*36.2*	*39.4*	*39.4*		*44.2*	*44.1*	*44.1*
District 6 (Wayne)											
Erika Geiss	D	AA	61.4%		107.3	99.4	92.8		42.6	43.8	47.8
Brenda Jones	R	AA	38.7%		-7.2	0.5	7.2		57.4	56.4	52.3
votes for office					*38.3*	*35.9*	*35.9*		*50.0*	*52.9*	*52.9*

2018 General: State Senate Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 11 (Oakland)											
Jeremy Moss	D	W	76.7%		99.0	99.2	96.3	80.9	60.2	56.9	60.2
Boris Tuman	R	W	20.9%		0.0	0.4	2.0	17.5	36.0	39.2	36.6
others			12.4%		1.0	1.0	1.7	1.6	3.7	3.8	3.2
votes for office					*60.6*	*63.4*	*63.4*	*83.7*	*59.9*	*60.1*	*60.1*
District 12 (Oakland)											
Rosemary Bayer	D	W	49.4%		122.0	99.6	87.9		33.2	33.3	42.1
Michael D. McCready	R	W	48.6%		-23.8	0.6	4.6		64.9	64.2	56.7
others			2.0%		1.7	2.0	7.4		2.0	2.0	1.2
votes for office					*14.5*	*25.6*	*25.6*		*75.1*	*74.4*	*74.4*
District 27 (Genesee)											
Jim Ananich	D	W	71.2%	97.6	103.0	99.3	97.7	53.9	53.3	54.2	55.6
Donna Kekesis	R	W	28.8%	2.4	-3.0	0.7	2.3	46.1	46.7	45.8	44.4
votes for office				*53.7*	*46.5*	*50.5*	*50.5*	*58.7*	*46.9*	*49.9*	*49.9*
District 32 (Genesee and Saginaw)											
Phil Phelps	D	W	44.5%		113.0	99.7	96.1		29.5	30.1	33.5
Ken Horn	R	W	55.5%		-13.0	0.4	3.9		70.5	69.9	66.5
votes for office					*37.9*	*37.6*	*37.6*		*61.4*	*62.3*	*62.3*

2018 General: State House Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 1 (Wayne)											
Tenisha Yancey	D	AA	72.9%	96.3	101.0	99.1	97.3		33.3	36.2	47.0
Mark Corcoran	R	W	25.0%	2.2	-2.5	0.5	1.7		63.8	59.7	49.5
others			2.1%	1.5	1.5	1.6	0.9		2.9	3.9	3.5
votes for office				*30.5*	*28.8*	*30.1*	*30.1*		*81.0*	*80.4*	*80.4*
District 2 (Wayne)											
Joe Tate	D	AA	73.5%	97.4	101.5	98.8	98.8	41.6	46.8	47.2	53.0
John Palffy	R	W	26.5%	2.6	-1.4	1.1	1.2	58.5	53.1	53.1	47.0
votes for office				*33.9*	*26.9*	*28.3*	*28.3*	*74.0*	*77.0*	*78.2*	*78.2*
District 3 (Wayne)											
Wendell L. Byrd	D	AA	96.7%		97.4	97.8	98.8		89.6	87.3	80.4
Dolores Brodersen	R		3.3%		2.6	2.2	1.2		10.5	12.3	19.6
votes for office					*28.5*	*32.0*	*32.0*		*76.7*	*67.4*	*67.4*
District 4 (Wayne)											
Isaac Robinson	D	W	94.6%	97.6	97.3	97.7	97.2		89.5	86.3	85.5
Howard Weathington	R	AA	5.4%	2.4	2.7	2.2	2.8		10.4	13.6	14.5
votes for office				*27.0*	*30.1*	*30.3*	*30.3*		*24.5*	*24.1*	*24.1*
State House District 5											
Cynthia A. Johnson	D	AA	92.5%	97.0	97.8	98.2	97.7		72.4	62.2	na
Dorothy Patterson	R		5.5%	3.0	2.2	2.0	2.4		27.8	37.8	na
votes for office				*29.8*	*30.2*	*31.3*	*31.3*		*na*	*na*	
District 6 (Wayne)											
Tyrone Carter	D	AA	91.1%	95.6	98.4	98.2	96.3		66.3	65.0	66.0
Linda Sawyer	R	W	8.9%	4.4	1.7	1.9	3.7		33.5	35.0	34.0
votes for office				*34.9*	*35.3*	*38.2*	*38.2*		*18.2*	*25.3*	*25.3*

2018 General: State House Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 7 (Wayne)				insufficient white voters to produce estimates of voting patterns by race							
LaTanya Garrett	D	AA	97.6%								
Marcelis Turner	R	AA	2.4%								
others											
votes for office											
District 8 (Wayne)				insufficient white voters to produce estimates of voting patterns by race							
Sherry Gay Dagnogo	D	AA	96.4%								
Valerie R. Parker	R	AA	3.7%								
others											
votes for office											
District 9 (Wayne)											
Karen Whitsett	D	AA	95.1%		97.5	97.7	98.5		85.2	84.1	78.8
James Stephens	R		4.9%		2.5	2.3	1.5		14.8	16.0	21.2
votes for office					*30.8*	*31.4*	*31.4*		*18.1*	*17.6*	*17.6*
District 10 (Wayne)											
Leslie Love	D	AA	84.0%		99.1	98.7	96.7		48.3	48.8	59.3
William Brang	R	W	14.2%		-0.3	0.6	2.2		47.8	46.1	37.5
others			1.8%		1.2	1.2	1.2		3.9	3.6	3.3
votes for office					*33.4*	*34.8*	*34.8*		*65.1*	*69.4*	*69.4*
District 11 (Wayne)											
Jewell Jones	D	AA	66.9%		106.0	99.2	96.2		50.4	51.0	51.9
James Townsend	R	W	33.1%		-6.0	0.8	3.8		49.8	49.1	48.1
votes for office					*37.9*	*38.9*	*38.9*		*44.9*	*45.2*	*45.2*
District 12 (Wayne)											
Alex Garza	D	H	66.6%		104.7	98.8	90.6		43.9	46.3	49.0
Michelle Bailey	R	W	33.4%		-4.7	1.1	9.4		56.1	54.1	51.0
votes for office					*47.8*	*48.0*	*48.0*		*41.8*	*42.8*	*42.8*

2018 General: State House Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 16 (Wayne)											
Kevin Coleman	D	W	67.3%		111.8	99.1	***81.5***		50.2	51.5	***60.1***
Jody Rice-White	R	W	32.8%		-11.9	1.1	***18.5***		49.8	48.9	***39.9***
votes for office					*18.3*	*48.0*	***18.7***		*56.1*	*57.0*	***57.0***
District 27 (Oakland)											
Robert Wittenberg	D	W	78.5%		96.3	97.6	93.0	75.4	71.2	70.3	73.8
Janet Flessland	R	W	18.5%		1.7	1.0	3.0	22.5	35.6	26.2	24.3
others			3.0%		2.1	2.1	4.0	2.0	3.2	3.4	1.9
votes for office					*53.6*	*58.1*	*58.1*	*78.1*	*67.4*	*65.8*	*65.8*
District 29 (Oakland)											
Brenda Carter	D	AA	74.1%		114.5	99.2	94.5		36.7	41.8	***54.6***
Timothy D. Carrier	R	W	25.9%		-14.5	1.1	5.5		63.1	58.3	***45.4***
votes for office					*32.8*	*46.3*	*46.3*		*54.5*	*52.1*	***52.1***
District 34 (Genesee)											
Sheldon A. Neeley	D	AA	90.0%		101.5	99.5	98.7		58.9	64.0	***46.7***
Henry Swift	R		10.0%		-1.4	0.5	9.3		41.1	0.5	***53.4***
votes for office					*52.6*	*54.7*	*54.7*		*18.8*	*22.1*	***22.1***
District 35 (Oakland)											
Kyra Harris Bolden	D	AA	85.5%		102.7	99.6	98.2		53.5	57.2	63.1
Theodore Alfonsetti III	R	W	14.6%		-2.7	0.3	1.8		46.5	42.9	36.9
votes for office					*56.1*	*55.6*	*55.6*		*74.5*	*77.2*	*77.2*
District 37 (Oakland)											
Christine Greig	D	W	67.2%		111.4	98.2	69.5		59.6	61.5	68.2
Mitch Swoboda	R	W	32.8%		-11.2	2.2	30.5		40.6	38.7	31.8
votes for office					*34.8*	*35.6*	*35.6*		*85.0*	*82.3*	*82.3*

2018 General: State House Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 49 (Genesee)											
John D. Cherry	D	W	72.4%		104.9	99.2	94.1		55.6	57.2	61.4
Patrick Duvendeck	R	W	27.6%		-5.0	0.8	6.0		44.4	42.7	38.7
votes for office					*40.0*	*42.3*	*42.3*		*53.0*	*57.8*	*57.8*
District 95 (Saginaw)											
Vanessa Guerra	D	H	73.1%		109.8	99.0	96.0		43.3	47.3	50.5
Dorothy Tanner	R	W	26.9%		-9.9	0.8	4.0		56.7	52.8	49.5
votes for office					*44.9*	*46.1*	*46.1*		*50.1*	*49.4*	*49.4*

2020 General: State House Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 1 (Wayne)											
Tenisha R. Yancey	D	AA	75.8%	94.9	99.4	97.3	98.3		38.0	42.2	46.9
Latricia Ann Lanier	R	AA	22.2%	3.7	-0.7	1.5	0.9		59.0	55.7	49.5
others			2.0%	1.4	1.3	1.0	0.8		3.0	3.1	3.6
votes for office				*53.8*	*52.3*	*53.0*	*53.0*		*94.2*	*92.4*	*92.4*
District 2 (Wayne)											
Joe Tate	D	AA	74.1%	93.5	96.8	95.0	95.9	46.0	50.7	50.9	54.6
Mayra Rodriguez	R	H	23.8%	3.2	-0.2	1.3	1.0	53.1	48.7	47.9	44.4
others			2.1%	3.3	3.5	3.5	3.0	1.0	0.7	0.7	1.1
votes for office				*55.8*	*51.5*	*51.9*	*51.9*	*89.8*	*92.0*	*92.9*	*92.9*
District 3 (Wayne)											
Shri Thanedar	D	A	93.3%		95.0	95.0	97.7		73.1	72.9	55.4
Anita Vinson	R	AA	4.0%		3.3	3.3	1.4		12.3	12.6	25.1
others			2.7%		1.6	1.8	0.9		14.5	12.9	19.5
votes for office					*50.8*	*55.8*	*55.8*		*117.2*	*97.7*	*97.7*
District 4 (Wayne)											
Abraham Aiyash	D	ME	89.8%		95.9	96.7	95.5		92.9	90.3	86.6
Howard Weatherington	R	AA	5.7%		1.1	1.3	1.8		5.7	7.6	8.7
others			4.5%		3.0	3.0	2.8		1.3	1.4	4.7
votes for office					*89.7*	*90.1*	*90.1*		*57.7*	*68.1*	*68.1*
District 5 (Wayne)											
Cynthia A. Johnson	D	AA	93.0%	97.3	98.0	98.0	98.3		73.2	69.1	na
Harold M. Day	R		2.3%	2.7	2.1	2.0	1.7		27.1	32.7	na
votes for office				*54.3*	*55.7*	*56.9*	*56.9*		*na*	*na*	
District 6 (Wayne)											
Tyrone Carter	D	AA	100%								
votes for office											

2020 General: State House Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 7 (Wayne)				insufficient white voters to produce estimates of voting patterns by race							
Helena Scott	D	AA	93.0%								
Ronald Cole	R		2.3%								
others			4.7%								
votes for office											
District 8 (Wayne)				insufficient white voters to produce estimates of voting patterns by race							
Stephanie A. Young	D	AA	96.7%								
Miroslawa Teresa Gorak	R	W	3.3%								
votes for office											
District 9 (Wayne)											
Karen Whitsett	D	AA	94.2%		96.5	96.5	97.2		83.7	83.4	75.4
James Stephens	R		5.8%		3.5	3.4	2.8		16.3	16.1	24.5
votes for office					*56.3*	*57.3*	*57.3*		*29.7*	*27.1*	*27.1*
District 10 (Wayne)											
Mary Cavanagh	D	H	84.8%		99.1	98.9	98.3		51.1	50.8	53.7
Cathy L. Alcorn	R		15.3%		0.9	1.1	1.7		48.9	49.4	46.3
votes for office					*62.9*	*65.3*	*65.3*		*69.1*	*68.3*	*68.3*
District 11 (Wayne)											
Jewell Jones	D	AA	65.2%		104.7	99.0	96.9		48.8	48.5	50.7
James C. Townsend	R	W	34.8%		-4.6	1.0	3.1		51.2	51.5	49.3
votes for office					*53.0*	*53.5*	*53.5*		*62.1*	*63.2*	*63.2*
District 12 (Wayne)											
Alex Garza	D	H	62.4%		103.0	99.4	91.8		38.2	38.8	41.4
Michelle Bailey	R	W	37.7%		-3.0	0.6	8.2		61.8	60.9	58.6
votes for office					*64.7*	*66.4*	*66.4*		*57.9*	*57.9*	*57.9*

2020 General: State House Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 16 (Wayne)											
Kevin Coleman	D	W	62.5%		111.3	99.0	84.8		44.4	45.6	54.2
Emily Bauman	R	W	37.5%		-11.4	1.0	15.2		55.7	54.4	45.8
votes for office					*29.9*	*33.5*	*33.5*		*75.1*	*76.0*	*76.0*
District 27 (Oakland)											
Regina Weiss	D	W	74.4%		95.4	97.3	93.3	68.7	64.2	63.4	66.4
Elizabeth Goss	R	W	22.4%		2.6	1.5	3.9	28.8	32.0	32.5	30.6
others			3.2%		1.7	1.6	2.8	2.5	3.9	4.1	33.0
votes for office					*73.8*	*76.6*	*76.6*	*88.1*	*77.7*	*77.4*	*77.4*
District 29 (Oakland)											
Brenda Carter	D	AA	72.9%		111.1	99.1	94.7		37.1	38.8	51.3
S. Dave Sullivan	R	W	27.1%		-11.0	0.8	53.3		62.7	61.5	48.7
votes for office					*47.6*	*61.1*	*61.1*		*67.5*	*61.5*	*61.5*
District 34 (Oakland)											
Cynthia R. Neeley	D	AA	86.7%		100.5	99.2	98.3		51.6	56.1	45.9
James Miraglia	R	W	13.3%		-4.8	0.7	1.7		48.4	43.8	54.1
votes for office					*65.6*	*67.6*	*67.6*		*32.5*	*36.8*	*36.8*
District 35 (Oakland)											
Kyra Harris Bolden	D	AA	82.9%		99.8	99.4	97.2		51.5	51.2	58.5
Daniela Davis	R	AA	15.9%		-0.4	0.3	2.3		46.4	46.2	39.3
others			1.0%		0.6	0.5	0.5		2.1	2.4	2.2
votes for office					*70.1*	*68.4*	*68.4*		*93.4*	*94.5*	*94.5*
District 37 (Oakland)											
Samantha Steckloff	D	W	63.9%		106.1	96.4	***57.5***		56.8	56.9	***66.4***
Mitch Swoboda	R	W	34.1%		-8.7	0.8	***34.2***		41.7	40.8	***32.2***
others			2.0%		2.5	6.3	***8.3***		1.7	1.3	***1.4***
votes for office					*55.5*	*54.9*	***54.9***		*106.2*	*94.0*	***94.0***

2020 General: State House Districts				Estimates for Black Voters				Estimates for White Voters			
	Party	Race	Vote	HP	ER	EI 2x2	EI RxC	HP	ER	EI 2x2	EI RxC
District 49 (Genesee)											
John D. Cherry	D	W	68.9%		104.3	98.8	94.8		50.2	51.9	56.6
Bryan Lutz	R	W	31.1%		-4.3	1.0	5.2		49.8	48.3	43.6
votes for office					*52.5*	*60.7*	*60.7*		*68.0*	*69.1*	*69.1*
District 95 (Saginaw)											
Amos O'Neal	D	AA	70.1%		111.7	99.2	96.6		34.7	41.1	42.7
Charlotte DeMaet	R	W	29.9%		-11.5	0.9	3.4		65.2	58.9	57.3
votes for office					*59.0*	*60.6*	*60.6*		*62.9*	*61.5*	*61.5*

Recent Democratic Primaries: Congress			Estimates for Black Voters			Estimates for White Voters		
	Race	Vote	HP	ER	EI	HP	ER	EI
2018								
Congressional District 13								
Ian Conyers	B	6.6	8.3	9.1	9.3		1.3	1.1
Shanelle Jackson	B	5.4	7.7	7.1	7.5		1.6	1.2
Brenda Jones	B	30.2	42.5	43.7	43.5		2.9	5.3
Rashinda Tlaib	ME	31.2	22.3	21.3	22.4		48.1	45.3
Bill Wild	W	14.1	1.6	-1.4	0.7		46.2	43.9
Coleman Young II	B	12.5	17.7	20.1	18.9		-0.3	1.1
turnout of VAP			*23.0*	*22.2*	*24.3*		*12.2*	*14.1*
2020								
Congressional District 12								
Debbie Dingell	W	80.9		81.4	81.2		87.9	87.7
Solomon Rajput	A	19.1		18.9	19.0		12.1	12.2
turnout of VAP				*18.8*	*24.2*		*13.6*	*13.1*
Congressional District 13								
Brenda Jones	B	33.7	37.8	37.7	37.3		27.0	27.9
Rashida Tlaib	ME	66.3	62.2	62.3	62.7		72.9	72.1
turnout of VAP			*28.0*	*26.7*	*29.5*		*14.1*	*15.8*
Congressional District 14								
Brenda Lawrence	B	93.2	92.7	92.7	92.8	92.1	91.6	92.0
Terrance Morrison		6.8	7.3	7.3	7.5	7.9	8.4	8.7
turnout of VAP			*25.9*	*23.7*	*28.0*	*22.4*	*13.3*	*18.5*

Recent Democratic Primaries: 2018 State Senate			Estimates for Black Voters			Estimates for White Voters		
	Race	Vote	HP	ER	EI	HP	ER	EI
State Senate District 1 (Wayne)								
Stephanie Chang	A	49.8	24.6	23.5	27.1	71.6	79.2	76.7
James Cole	B	5.2	6.2	7.8	6.2	4.3	3.6	3.9
Nicholas Rivera	H	2.9	1.3	0.9	0.8	4.3	5.9	5.2
Stephanie Roehm		4.4	2.1	1.0	1.5	8.6	9.9	8.7
Bettie Cook Scott	B	11.2	18.2	17.9	15.7	6.6	17.0	6.1
Alberta Tinsley Talabi	B	26.4	47.7	48.9	47.1	4.7	-2.7	2.9
turnout of VAP			*20.0*	*20.9*	*23.3*	*17.4*	*13.3*	*13.9*
State Senate District 3 (Wayne)								
Anita Belle	B	14.3	23.7	25.5	25.4	4.9	1.9	1.9
Terry Burrell	W	5.5	8.5	8.6	8.4	3.9	2.1	2.2
Sylvia Santana	B	41.5	56.6	60.2	60.3	20.2	19.9	18.7
Gary Woronchak	W	38.7	11.2	5.7	8.0	71.0	76.2	76.0
turnout of VAP			*18.7*	*16.8*	*17.9*	*17.2*	*17.3*	*17.8*
State Senate District 4 (Wayne)								
Marshall Bullock	B	44.3	46.8	44.5	47.2		39.2	38.6
Fred Durhal	B	38.3	39.4	42.6	40.6		30.8	31.3
Carron Pinkins	B	17.5	13.8	12.8	12.6		30.0	29.1
turnout of VAP			*21.5*	*21.8*	*26.3*		*8.7*	*10.5*
State Senate District 5 (Wayne)								
Betty Jean Alexander	B	54.5	66.9	69.1	68.1		27.2	27.5
David Knezek	W	45.5	33.1	30.9	31.9		72.8	72.6
turnout of VAP			*22.2*	*21.6*	*23.1*		*10.7*	*11.4*
State Senate District 6								
Erika Geiss	B	65.4		86.1	89.5		55.6	55.9
Robert Kosowski	W	34.6		13.9	10.3		44.4	44.0
turnout of VAP				*19.5*	*18.0*		*12.4*	*14.3*
State Senate District 11 (Oakland)								
Crystal Bailey	B	21.2	36.6	27.0	24.9	7.9	16.7	17.3
Jeremy Moss	W	51.8	35.4	49.0	53.1	78.1	51.9	51.0
Vanessa Moss	B	18.5	20.2	17.5	16.2	10.2	20.4	20.3
James Turner	B	8.6	7.8	6.5	5.8	3.7	11.0	10.9
turnout of VAP			*29.0*	*30.8*	*33.4*	*43.3*	*20.5*	*20.6*

APPENDIX C

Detroit area			Estimates for Hispanics	
	Party	Race	ER	EI 2x2
2020 General				
U.S. President				
Joseph Biden	D	W	75.4	76.0
Donald Trump	R	W	24.3	23.9
others			0.3	0.2
votes for office			*13.9*	*14.8*
U.S. Senate				
Gary Peters	D	W	73.6	74.8
John James	R	W	22.6	21.9
others			3.8	3.2
votes for office			*13.5*	*14.6*
2018 General				
Governor				
Gretchen Whitmer	D	W	83.1	80.0
Bill Schuette	R	W	15.3	14.8
others			1.5	1.8
votes for office			*3.5*	*5.1*
Secretary of State				
Jocelyn Benson	D	W	84.0	82.6
Mary Treder Lang	R	W	14.4	13.5
others			1.7	14.0
votes for office			*3.3*	*4.4*
Attorney General				
Dana Nessel	D	W	80.1	78.9
Tom Leonard	R	W	16.4	15.2
others			3.4	3.7
votes for office			*3.4*	*4.8*

Detroit area			Estimates for Hispanics	
	Party	Race	ER	EI 2x2
U.S. Senate				
Debbie Stabenow	D	W	82.5	82.2
John James	R	W	16.4	17.1
others			1.3	0.0
votes for office			*3.3*	*4.5*
2018 Democratic Primary				
Governor				
Abdul El-Sayed	D	ME	55.5	58.5
Shri Thanedar	D	A	13.6	12.7
Gretchen Whitmer	D	W	30.8	28.7
votes for office			-2.0	1.0

Grand Rapids area			Estimates for Hispanics	
	Party	Race	ER	EI 2x2
2020 General				
U.S. President				
Joseph Biden	D	W	98.6	94.8
Donald Trump	R	W	0.5	0.1
others			1.0	1.3
votes for office			*0.0*	*8.6*
U.S. Senate				
Gary Peters	D	W	96.1	93.3
John James	R	W	-1.6	3.2
others			5.3	9.2
votes for office			*0.0*	*7.3*
2018 General				
Governor				
Gretchen Whitmer	D	W	99.5	95.0
Bill Schuette	R	W	-4.5	1.6
others			5.6	6.1
votes for office			*-9.0*	*1.1*
Secretary of State				
Jocelyn Benson	D	W	102.1	97.0
Mary Treder Lang	R	W	-5.3	1.1
others			3.3	6.9
votes for office			*-9.0*	*0.3*
Attorney General				
Dana Nessel	D	W	97.2	93.1
Tom Leonard	R	W	-6.4	1.2
others			9.3	9.8
votes for office			*-9.0*	*0.8*

Grand Rapids area			Estimates for Hispanics	
	Party	Race	ER	EI 2x2
U.S. Senate				
Debbie Stabenow	D	W	97.2	93.2
John James	R	W	-3.4	2.0
others			6.2	10.4
votes for office			*-9.0*	*1.1*
2018 Democratic Primary				
Governor				
Abdul El-Sayed	D	ME	51.1	51.3
Shri Thanedar	D	A	39.8	42.4
Gretchen Whitmer	D	W	8.9	11.9
votes for office			-2.3	0.1

			Estimates for Arab Americans	
	Party	Race	ER	EI 2x2
2020 General				
U.S. President				
Joseph Biden	D	W	98.3	98.9
Donald Trump	R	W	1.3	0.8
others			0.6	1.0
votes for office			*24.1*	*26.7*
U.S. Senate				
Gary Peters	D	W	100.7	99.0
John James	R	W	-2.9	0.8
others			2.1	2.1
votes for office			*22.2*	*24.9*
2018 General				
Governor				
Gretchen Whitmer	D	W	103.9	99.3
Bill Schuette	R	W	-6.2	1.1
others			2.5	2.1
votes for office			*8.6*	*10.3*
Secretary of State				
Jocelyn Benson	D	W	104.7	99.3
Mary Treder Lang	R	W	-6.3	0.9
others			1.7	1.7
votes for office			*8.5*	*9.8*
Attorney General				
Dana Nessel	D	W	106.8	99.5
Tom Leonard	R	W	-8.0	0.6
others			1.3	1.3
votes for office			*8.6*	*10.1*

			Estimates for Arab Americans	
	Party	**Race**	**ER**	**EI 2x2**
U.S. Senate				
Debbie Stabenow	D	W	107.2	99.1
John James	R	W	-9.0	1.1
others			1.9	1.9
votes for office			*8.4*	*10.0*
2018 Democratic Primary				
Governor				
Abdul El-Sayed	D	ME	116.4	92.8
Shri Thanedar	D	A	-0.3	0.2
Gretchen Whitmer	D	W	-16.0	0.6
votes for office			15.0	15.1

			Estimates for Chaldeans	
	Party	Race	ER	EI 2x2
2020 General				
U.S. President				
Joseph Biden	D	W	19.5	20.5
Donald Trump	R	W	81.9	80.3
others			-0.8	2.0
votes for office			*31.2*	*29.6*
U.S. Senate				
Gary Peters	D	W	26.3	26.2
John James	R	W	74.0	72.8
others			-0.6	0.2
votes for office			*27.9*	*27.2*
2018 General				
Governor				
Gretchen Whitmer	D	W	52.9	48.9
Bill Schuette	R	W	47.9	47.4
others			0.2	8.0
votes for office			*-12.2*	*0.0*
Secretary of State				
Jocelyn Benson	D	W	55.3	53.7
Mary Treder Lang	R	W	44.7	42.0
others			0.4	7.9
votes for office			*-10.8*	*0.3*
Attorney General				
Dana Nessel	D	W	52.5	48.0
Tom Leonard	R	W	47.4	47.4
others			0.4	0.1
votes for office			*-10.3*	*2.5*

			Estimates for Chaldeans	
	Party	**Race**	**ER**	**EI 2x2**
U.S. Senate				
Debbie Stabenow	D	W	55.2	55.6
John James	R	W	43.2	44.0
others			0.7	0.9
votes for office			*-11.4*	*0.4*
2018 Democratic Primary				
Governor				
Abdul El-Sayed	D	ME	50.1	na
Shri Thanedar	D	A	11.2	na
Gretchen Whitmer	D	W	38.7	na
votes for office			-1.1	0.1

			Estimates for Bangladeshi Americans	
	Party	Race	ER	EI 2x2
2020 General				
U.S. President				
Joseph Biden	D	W	104.7	96.1
Donald Trump	R	W	-4.4	3.2
others			0.1	0.1
votes for office			*31.6*	*25.2*
U.S. Senate				
Gary Peters	D	W	104.4	96.2
John James	R	W	-5.2	3.3
others			0.9	1.1
votes for office			*31.6*	*24.6*
2018 General				
Governor				
Gretchen Whitmer	D	W	105.7	99.1
Bill Schuette	R	W	-7.4	1.1
others			1.1	1.1
votes for office			*13.7*	*18.7*
Secretary of State				
Jocelyn Benson	D	W	105.7	98.9
Mary Treder Lang	R	W	-7.1	1.3
others			2.5	2.4
votes for office			*13.9*	*19.3*
Attorney General				
Dana Nessel	D	W	107.5	98.2
Tom Leonard	R	W	-8.0	0.7
others			2.3	2.3
votes for office			*13.8*	*19.2*

			Estimates for Bangladeshi Americans	
	Party	**Race**	**ER**	**EI 2x2**
U.S. Senate				
Debbie Stabenow	D	W	107.1	99.1
John James	R	W	-7.7	0.9
others			1.7	0.7
votes for office			*13.9*	*18.4*
2018 Democratic Primary				
Governor				
Abdul El-Sayed	D	ME	98.8	97.3
Shri Thanedar	D	A	6.5	5.1
Gretchen Whitmer	D	W	-5.2	4.5
votes for office			16.4	14.7

Appendix B

APPENDIX B1
Michigan
2022 General Election
Congressional
Contests

Estimates of Voting Patterns by Race in 2022 General Election

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
Congress 12th District													
Rashida Tliab	ME	D	70.8	97.8	97.2, 98.3	98.0	98.6	95.5	52.3	50.4, 54.0	44.8	46.0	50.5
Steven Elliot	W	R	26.3	1.4	1.0, 2.0	0.8	-0.2	2.8	46.7	45.0, 48.5	50.4	49.4	46.1
Gary Walkowicz	W	WC	2.9	0.8	.6, 1.0	1.5	1.6	1.7	1.0	.8, 1.3	4.6	4.6	3.4
Turnout:votes/VAP						*44.7*	*43.9*	*42.0*			*57.4*	*53.5*	*59.9*
Congress 13th District													
Shri Thandedar	A	D	71.1	94.2	93.5, 94.8	94.6	96.1	91.4	55.6	54.4, 56.7	43.8	42.5	44.0
Martell Bivings	B	R	24.0	1.3	.9, 1.7	0.9	-1.5	3.5	42.8	41.8, 43.9	50.8	52.6	53.9
Others			4.9	4.5	4.0, 5.1	5.3	5.4	5.1	1.7	1.2, 2.3	4.8	4.9	2.1
Turnout:votes/VAP						*36.2*	*34.6*	*35.8*			*57.4*	*56.3*	*74.6*

APPENDIX B2
Michigan
2022 General Election
State Senate Contests

Estimates of Voting Patterns by Race in 2022 General Election

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State Senate District 1													
Erika Geiss	B	D	71.6	98.3	97.2, 99.1	99.2	101.0	96.7	55.2	52.5, 57.5	43.2	42.5	-
Erik Soderquist		R	28.4	1.7	.9, 2.8	0.9	-1.1	3.3	44.8	42.5, 47.5	56.8	57.5	-
Turnout:votes/VAP						*34.4*	*33.4*	*34.6*			*50.0*	*49.8*	-
State Senate District 2													
Sylvie Santana	B	D	68.0	95.0	92.7, 96.8	97.5	99.1	94.7	58.7	56.1, 61.2	52.1	53.3	59.8
Harry Sawicki		R	29.4	2.2	1.0, 3.9	0.5	-2.0	2.7	40.4	38.0, 43.0	44.8	43.9	37.5
Others			2.6	2.8	1.7, 4.4	2.8	3.0	2.6	0.8	.5, 1.3	2.8	2.8	2.7
Turnout:votes/VAP						*35.2*	*32.8*	*36.3*			*41.6*	*39.3*	*35.4*
State Senate District 3													
Stephanie Chang	A	D	85.7	96.6	95.3, 97.6	96.8	97.8	94.2	78.8	75.0, 83.4	71.1	69.4	-
Linda Rayburn		R	14.3	3.4	2.4, 4.7	3.2	2.2	5.8	21.2	16.6, 25.0	28.9	30.5	-
Turnout:votes/VAP						*36.2*	*34.9*	*36.8*			*37.4*	*37.2*	-
State Senate District 6													
Mary Cavanagh	H	D	68.0	94.3	93.0, 95.5	95.9	96.6	93.4	55.6	53.5, 57.8	45.8	46.1	50.5
Ken Crider		R	28.9	1.3	.8, 2.1	0.6	-1.3	2.8	43.6	41.4, 45.7	50.4	51.5	47.6
Kimberly Givens		WC	3.1	4.4	3.3, 5.5	4.6	4.7	3.8	0.8	.4, 1.4	2.3	2.4	1.8
Turnout:votes/VAP						*41.4*	*40.3*	44.5			*70.9*	*69.2*	*72.0*
State Senate District 7													
Jeremy Moss	W	D	74.2	97.9	96.9, 98.7	99.1	102.8	96.8	57.6	55.7, 59.4	45.3	43.3	48.0
Corinne Khederian		R	25.8	2.1	1.3, 3.1	0.9	-2.9	3.2	42.4	40.6, 44.3	54.7	56.7	52.0
Turnout:votes/VAP						*48.2*	*45.0*	43.8			*76.0*	*74.9*	*84.1*
State Senate District 8													
Mallory McMorrow	W	D	78.9	99.0	98.4, 99.4	98.6	98.6	96.8	72.0	70.2, 73.8	66.3	66.2	70.0
Brandon Ronald Simpson		R	21.1	1.0	.6, 1.6	1.6	1.4	3.2	28.0	26.2, 29.8	33.7	33.9	30.0
Turnout:votes/VAP						*43.4*	*42.7*	43.8			*73.4*	*73.0*	*78.4*

APPENDIX B2
Michigan
2022 General Election
State Senate Contests

Estimates of Voting Patterns by Race in 2022 General Election

	Race	Party	Vote	Black Voters EI[1]	Black Voters 95% confidence interval	Black Voters EI[2]	Black Voters ER	Black Voters HP	White Voters EI[1]	White Voters 95% confidence interval	White Voters EI[2]	White Voters ER	White Voters HP
State Senate District 10													
Paul Wojno	W	D	67.7	98.2	97.0, 99.1	98.7	100.5	95.6	49.1	44.3, 54.0	43.9	43.5	-
Paul Smith		R	32.3	1.8	.9, 3.0	1.2	-0.5	4.4	50.9	46.0, 55.7	56.2	56.6	-
Turnout:votes/VAP						*32.5*	*30.8*	33.7			*55.2*	*54.4*	-

APPENDIX B3
Michigan
2022 General Election
State House Contests

Estimates of Voting Patterns by Race in 2022 General Election

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State House District 1													
Tyrone Carter	B	D	87.5	95.5	92.3, 97.9	96.0	97.0	93.9	70.0	51.2, 83.6	48.4	46.4	-
Paula Campbell		R	10.8	3.3	1.2, 6.5	3.0	1.6	4.2	26.7	13.8, 44.1	48.6	49.6	-
Donnie Love		L	1.7	1.1	.4, 2.0	1.3	1.2	1.9	3.4	1.1, 6.8	5.1	3.8	-
Turnout:votes/VAP						*41.7*	*40.9*	*37.2*			*39.5*	*27.1*	-
State House District 3													
Alabas Farhat	ME	D	74.6	94.6	89.0, 98.3	99.1	101.9	-	65.8	58.6, 73.0	55.6	57.2	-
Ginger Shearer		R	25.4	5.4	1.7, 11.0	0.8	-2.2	-	34.2	27.0, 41.4	44.3	42.8	-
Turnout:votes/VAP						*RF*	*25.9*	-			*39.2*	*39.9*	-
State House District 4													
Karen Whitsett	B	D	87.1	99.2	98.4, 99.7	98.3	98.1	96.5	66.2	57.8, 74.1	60.5	60.9	64.2
Tonya Renay Wells		R	12.9	0.8	.3, 1.6	1.7	1.9	3.5	33.8	25.9, 42.2	39.5	39.1	35.8
Turnout:votes/VAP						*37.7*	*37.1*	*36.8*			*19.8*	*19.8*	*21.0*
State House District 5													
Natalie Price	W	D	78.4	99.0	98.1, 99.6	98.8	98.9	97.2	62.5	59.8, 65.1	56.6	56.7	56.6
Paul Taros		R	21.7	1.0	.4, 1.9	1.3	1.1	2.8	37.5	34.9, 40.3	43.4	43.3	43.4
Turnout:votes/VAP						*42.9*	*42.7*	*44.5*			*75.8*	*75.2*	*77.3*
State House District 6													
Regina Weiss	W	D	83.9	99.2	98.5, 99.7	99.0	99.5	97.4	72.8	70.1, 75.3	67.3	68.2	75.2
Charles Villerot		R	16.1	0.8	.3, 1.5	1.4	0.6	2.6	27.2	24.7, 29.9	32.7	31.8	24.8
Turnout:votes/VAP						*42.7*	*41.9*	*43.8*			*75.1*	*75.2*	*79.1*
State House District 8													
Mike McFall	W	D	78.9	97.7	95.9, 99.0	97.4	100.5	95.8	65.8	60.8, 70.8	59.8	57.7	-
Robert Noble		R	21.1	2.3	1.0, 4.1	2.6	-0.5	4.2	34.2	29.2, 39.2	40.2	42.2	-
Turnout:votes/VAP						*34.9*	*34.2*	*36.9*			*50.0*	*49.2*	-

APPENDIX B3
Michigan
2022 General Election
State House Contests

Estimates of Voting Patterns by Race in 2022 General Election

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State House District 9													
Abraham Aiyash	ME	D	91.6	97.2	95.0, 98.9	97.1	97.7	96.4	83.9	67.6, 94.9	73.7	76.8	-
Michele Lundgren		R	8.4	2.8	1.1, 5.0	2.9	2.3	3.6	16.1	5.1, 32.4	26.2	23.1	-
Turnout:votes/VAP						*38.3*	*36.7*	*34.9*			*16.5*	*16.6*	-
State House District 10													
Joe Tate	B	D	68.4	98.2	96.6, 99.3	99.1	108.1	97.2	58.8	56.3, 60.9	52.2	46.8	45.1
Mark Corcoran		R	31.6	1.8	.7, 3.4	0.5	-7.8	2.8	41.2	39.1, 43.7	47.8	53.3	54.9
Turnout:votes/VAP						*25.8*	*26.3*	*36.7*			*81.4*	*80.8*	*75.8*
State House District 11													
Veronica Paiz	H	D	66.6	97.9	95.6, 99.3	99.1	101.6	95.8	50.2	46.7, 53.7	44.3	43.4	46.8
Mark Foster		R	33.4	2.1	.7, 4.4	0.9	-1.6	4.2	49.8	46.3, 53.3	55.6	56.6	53.2
Turnout:votes/VAP						*36.5*	*37.1*	*34.5*			*64.9*	*64.6*	*64.8*
State House District 12													
Kimberyly Edwards	B	D	70.4	95.0	91.1, 97.6	98.8	101.9	95.2	51.7	43.7, 59.0	45.5	43.5	-
Diane Saber		R	27.4	3.9	1.4, 7.8	0.9	-2.9	3.4	47.4	40.1, 55.3	51.4	53.3	-
Gregory Creswell		L	2.2	1.1	.4, 2.0	1.0	1.0	1.4	0.9	.3, 1.9	3.1	3.2	-
Turnout:votes/VAP						*47.7*	*41.7*	*32.1*			*42.4*	*47.5*	-
State House District 13													
Lori Stone	W	D	67.4	95.2	90.1, 98.3	99.2	101.3	96.6	53.2	46.5, 59.2	44.5	43.7	-
Ronald Singer		R	32.6	4.8	1.7, 9.9	0.4	-1.4	3.4	46.8	40.8, 53.5	55.4	56.3	-
Turnout:votes/VAP						*30.6*	*27.8*	*32.6*			*54.5*	*54.2*	-
State House District 14													
Donavan McKinney	B	D	71.4	94.5	90.7, 97.2	98.0	98.6	95.0	56.9	40.3, 71.6	40.0	40.0	-
Wendy Jo Watters		R	27.0	3.8	1.4, 7.6	1.0	0.2	3.8	42.0	27.4, 58.5	57.4	57.6	-
Jeff Sparling		G	1.7	1.6	.8, 2.7	1.2	1.4	1.2	1.1	.4, 2.0	2.3	2.4	-
Turnout:votes/VAP						*34.4*	*30.3*	*35.7*			*46.6*	*48.6*	-

APPENDIX B3
Michigan
2022 General Election
State House Contests

Estimates of Voting Patterns by Race in 2022 General Election

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State House District 16													
Stephanie Young	B	D	77.9	98.3	96.5, 99.4	99.0	100.5	96.1	57.1	52.6, 61.5	50.4	49.5	55.7
Keith Jones		R	22.1	1.7	.6, 3.5	0.8	-0.5	3.9	42.9	38.5, 47.4	49.6	50.5	44.3
Turnout:votes/VAP						*46.0*	*46.4*	*45.0*			*64.7*	*63.7*	*66.3*
State House District 17													
Laurie Pohutsky		D	69.0	97.4	94.9, 99.6	98.5	99.6	96.3	56.0	51.5, 60.1	47.3	46.9	49.9
Penny Crider		R	31.0	2.6	1.0, 5.1	1.5	0.4	3.7	44.0	39.9, 48.5	52.7	53.2	50.1
Turnout:votes/VAP						*34.7*	*33.2*	*42.0*			*68.5*	*67.4*	*74.5*
State House District 18													
Jason Hoskins	B	D	79.6	96.9	94.6, 98.6	98.4	97.7	95.3	60.6	53.2, 67.6	50.5	51.0	-
Wendy Webster Jackson		R	20.4	3.1	1.4, 5.5	1.6	2.4	4.7	39.4	32.4, 46.8	49.4	48.9	-
Turnout:votes/VAP						*58.4*	*57.7*	*49.7*			*62.9*	*62.2*	-
State House District 19													
Samantha Steckloff		D	67.1	94.8	89.7, 98.2	99.8	106.5	-	60.1	56.7, 63.2	50.1	48.5	-
Anthony Paesano		R	32.9	5.2	1.8, 10.3	0.0	-6.5	-	39.9	36.8, 43.3	50.3	51.6	-
Turnout:votes/VAP						*42.7*	*41.2*	-			*82.5*	*82.5*	-
State House District 26													
Dylan Wegela	W	D	67.8	96.4	93.2, 98.7	99.2	102.8	-	51.0	45.1, 56.5	44.3	43.4	-
James Townsend		R	32.2	3.6	1.3, 6.8	0.8	-2.8	-	49.0	43.4, 54.9	55.8	56.6	-
Turnout:votes/VAP						*35.8*	*35.3*	-			*50.6*	*49.0*	-
State House District 53													
Brenda Carter	B	D	67.4	95.4	90.5, 98.6	98.9	112.7	-	53.3	47.3, 58.8	38.9	37.6	-
Anthony Bartolotta		R	32.6	4.6	1.4, 9.5	1.0	-12.7	-	46.7	41.2, 52.7	61.4	62.4	-
Turnout:votes/VAP						*38.2*	*24.7*	-			*60.6*	*57.6*	-

Appendix C

APPENDIX C1
Michigan
2022
Congressional
Democratic Primaries

Estimates of Voting Patterns by Race in 2022 Democratic Primary

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
Congress 12th District													
Rashida Tliab	ME	D	63.8	57.7	56.7, 58.6	55.5	56.2	57.1	79.7	77.6, 81.8	74.2	76.0	72.5
Janice Winfrey	B	D	22.4	30.6	29.8, 31.4	31.9	32.4	31.7	12.3	10.2, 13.8	10.6	9.8	13.5
Kelly Garrett	B	D	8.6	6.2	5.6, 6.7	6.6	5.5	5.5	5.3	4.1, 6.9	11.3	10.6	10.0
Shanelle Jackson	B	D	5.1	5.6	5.2, 6.1	6.1	5.9	5.7	2.7	2.1, 3.4	3.7	3.6	4.0
Turnout:votes/VAP						*22.6*	*18.5*	*19.4*			*15.8*	*14.1*	*16.4*
Congress 13th District													
Shri Thandedar	A	D	28.3	25.4	24.7, 26.1	25.2	26.8	28.9	34.0	32.9, 35.1	32.4	34.6	21.9
Adam Hollier	B	D	23.5	24.5	23.8, 25.2	24.7	23.7	23.6	23.1	22.1, 24.1	22.4	20.9	28.6
Portia Roberson	B	D	16.9	14.3	13.6, 14.9	14.2	12.2	10.7	20.4	19.4, 21.4	21.4	19.9	26.7
John Conyers	B	D	8.6	9.6	9.1, 10.0	9.7	10.1	10.0	6.8	6.0, 7.6	6.8	7.7	3.6
Sherry Gay-Dagnogo	B	D	8.2	11.5	11.1, 12.0	11.8	11.8	11.5	3.1	2.5, 3.7	2.6	3.1	2.5
Sharon McPhail	B	D	6.4	8.3	7.9, 8.7	8.4	9.0	8.8	3.4	2.8, 4.0	3.1	3.3	2.7
Michael Griffie	B	D	4.6	2.6	2.3, 2.9	2.4	2.1	2.3	6.8	6.2, 7.4	6.6	7.6	12.1
Sam Riddle	B	D	2.3	3.2	3.0, 3.5	3.3	3.7	3.6	1.0	.8, 1.2	0.9	0.6	0.5
Lorrie Rutledge	B	D	1.2	0.6	.5, .8	0.7	0.6	0.7	1.4	1.2, 1.6	1.6	2.1	1.3
Turnout:votes/VAP						*17.8*	*15.6*	*15.0*			*16.1*	*13.2*	*18.5*

APPENDIX C2
Michigan
2022
State Senate
Democratic Primaries

Estimates of Voting Patterns by Race in 2022 Democratic Primary

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State Senate District 1													
Erika Geiss	B	D	32.3	24.3	21.6, 27.1	23.4	21.2	21.8	55.9	50.8, 60.6	45.6	47.3	-
Brenda Sanders	B	D	23.3	34.0	31.8, 36.1	33.7	38.7	40.1	16.8	13.5, 20.2	14.4	15.4	-
Frank Liberati	W	D	22.9	13.8	12.2, 15.5	15.4	9.8	5.5	11.0	7.3, 15.2	18.0	18.4	-
Shellee Brooks	B	D	9.9	13.4	12.0, 14.8	13.2	13.7	14.8	7.1	5.0, 9.3	7.2	9.1	-
Ricardo Moore	B	D	7.9	11.2	10.1, 12.3	10.6	12.7	14.3	5.7	4.2, 7.4	5.5	5.1	-
Carl Schwartz	W	D	3.7	3.4	2.6, 4.2	4.1	4.0	3.6	3.5	2.4, 4.8	3.8	4.7	-
Turnout:votes/VAP						*18.3*	*14.2*	*14.3*			*9.2*	*7.8*	-
State Senate District 2													
Sylvie Santana	B	D	80.7	79.9	76.5, 83.2	79.5	79.5	79.4	90.6	85.9, 94.0	81.3	80.0	80.1
Maurice Sanders		D	19.3	20.1	16.8, 23.5	20.4	20.4	20.6	9.4	6.0, 14.1	18.6	20.0	19.9
Turnout:votes/VAP						*14.3*	*12.6*	*15.6*			*11.8*	*10.1*	*10.8*
State Senate District 3													
Stephanie Chang	A	D	82.8	77.2	75.1, 79.2	76.3	73.5	73.0	93.4	90.8, 95.7	92.3	93.4	-
Toinu Reeves	B	D	17.2	22.9	20.8, 24.9	23.8	26.6	27.0	6.6	4.3, 9.2	7.7	6.6	-
Turnout:votes/VAP						*16.8*	*15.3*	*15.0*			*13.2*	*11.5*	-
State Senate District 6													
Mary Cavanagh	H	D	43.9	49.4	46.9, 52.0	47.4	47.9	46.6	50.0	43.8, 56.8	41.4	45.0	50.0
Vicki Barnett	W	D	35.8	13.1	10.9, 15.4	14.3	13.4	16.3	45.9	38.5, 52.4	57.2	52.2	43.2
Darryl Brown	B	D	20.2	37.5	35.2, 39.7	38.8	38.5	37.1	4.2	2.5, 6.2	3.2	2.7	6.8
Turnout:votes/VAP						*19.7*	*17.2*	19.4			*17.3*	*16.7*	*17.4*
State Senate District 7													
Jeremy Moss	W	D	82.9	85.2	82.9, 87.4	83.3	78.4	74.8	91.4	87.0, 94.8	85.8	84.5	89.4
Ryan Foster	B	D	17.1	14.8	12.6, 17.1	16.6	21.5	25.2	8.6	5.2, 13.0	14.2	15.3	10.6
Turnout:votes/VAP						*25.7*	*21.8*	18.3			*20.5*	*19.0*	*20.3*

APPENDIX C2
Michigan
2022
State Senate
Democratic Primaries

Estimates of Voting Patterns by Race in 2022 Democratic Primary

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State Senate District 8													
Mallory McMorrow	W	D	68.4	24.2	21.7, 26.6	26.0	27.2	30.9	95.9	94.3, 97.2	97.1	97.1	90.5
Marshall Bullock II	B	D	31.6	75.8	73.4, 78.3	73.9	72.8	69.1	4.1	2.8, 5.7	2.8	2.9	9.5
Turnout:votes/VAP						*20.5*	*17.5*	18.9			*30.5*	*28.8*	*36.1*

APPENDIX C3
Michigan
2022
State House
Democratic Primaries

Estimates of Voting Patterns by Race in 2022 Democratic Primary

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State House District 1													
Tyrone Carter	B	D	78.4	83.1	79.5, 86.7	85.2	79.1	78.4	64.8	43.1, 81.6	59.2	64.5	-
Jermaine Tobey	B	D	21.6	16.9	13.3, 20.5	14.9	21.0	21.6	35.2	18.4, 56.9	40.7	35.0	-
Turnout:votes/VAP						*18.0*	*15.5*	*14.3*			*7.9*	*2.3*	-
State House District 3													
Alabas Farhat	ME	D	54.3	62.9	55.0, 70.3	61.9	61.1	60.8	57.8	48.5, 67.4	49.5	47.1	-
Sam Luqman	ME	D	28.7	15.1	9.1, 22.2	15.8	16.4	17.9	30.0	20.2, 39.3	37.5	38.0	-
Khalil Othman	ME	D	17.0	22.0	15.9, 28.5	21.8	22.5	21.4	12.2	6.9, 17.9	13.5	14.8	-
Turnout:votes/VAP						*10.5*	*8.4*	*12.6*			*13.0*	*11.7*	-
State House District 4													
Karen Whitsett	B	D	55.2	65.4	63.3, 67.5	64.5	61.1	62.5	17.0	6.8, 30.8	27.4	27.0	28.1
Lori Lynn Turner	B	D	26.9	32.7	30.6, 34.8	32.6	36.0	31.7	11.0	4.4, 20.1	9.6	10.3	11.3
Gus Tarraf	ME	D	17.9	1.9	1.0, 3.0	3.3	3.2	5.8	72.0	56.1, 84.6	62.0	62.7	60.6
Turnout:votes/VAP						*15.6*	*13.9*	*15.2*			*5.6*	*5.4*	*6.2*
State House District 5													
Natalie Price	W	D	38.4	16.7	14.1, 19.2	16.7	16.0	17.9	71.4	62.9, 78.4	66.0	63.4	54.7
Reggie Davis	B	D	29.7	55.2	52.9, 57.4	51.6	54.6	51.6	4.2	2.0, 7.3	2.2	1.0	8.4
Michelle Wooddell	W	D	18.9	10.5	8.6, 12.7	12.1	12.5	12.7	19.8	13.2, 27.9	27.5	28.6	30.4
Steele Hughes	B	D	10.3	15.6	14.2, 17.1	15.6	14.2	15.1	3.0	1.4, 5.2	3.7	3.9	4.6
Ksenia Milstein	W	D	2.8	2.0	1.3, 2.9	2.8	2.7	2.7	1.5	.7, 2.6	2.7	2.9	1.9
Turnout:votes/VAP						*19.2*	*17.5*	*19.3*			*25.1*	*24.7*	*22.6*
State House District 6													
Regina Weiss	W	D	62.0	44.1	41.4, 46.9	42.7	41.7	41.6	91.2	87.9, 94.0	82.0	82.1	84.6
Danielle Hall	B	D	14.8	24.5	22.5, 26.4	23.8	23.3	24.4	3.4	1.6, 5.6	5.6	5.4	5.0
Myya Jones	B	D	14.8	21.5	19.6, 23.5	22.1	23.2	22.3	3.3	1.4, 5.9	7.0	6.8	5.9
Mark Murphy		D	8.4	9.9	8.4, 11.4	11.1	11.8	11.7	2.1	.9, 3.9	5.5	5.7	4.5
Turnout:votes/VAP						*17.4*	*15.9*	*18.0*			*33.2*	*32.6*	*38.8*

APPENDIX C3
Michigan
2022
State House
Democratic Primaries

Estimates of Voting Patterns by Race in 2022 Democratic Primary

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State House District 7													
Helena Scott	B	D	53.2	87.5	84.0, 90.6	80.8	80.2	77.4	37.4	29.0, 45.5	33.4	31.9	-
Melanie Macey	W	D	40.1	10.1	7.0, 13.4	14.2	14.4	17.4	59.3	51.3, 67.7	58.8	60.4	-
Grant Rivet	W	D	6.7	2.5	1.4, 3.7	4.8	5.4	5.3	3.2	1.5, 5.4	8.0	7.8	-
Turnout:votes/VAP						*20.4*	*15.3*	*13.6*			*31.7*	*30.4*	-
State House District 8													
Mike McFall	W	D	37.8	24.7	20.4, 29.1	24.5	23.5	27.6	56.5	47.9, 64.3	53.9	54.6	-
Durrel Douglas	B	D	21.6	31.6	27.5, 35.6	33.1	31.9	26.8	9.0	4.4, 14.9	8.1	9.7	-
Ernest Little	B	D	17.2	32.3	29.0, 35.7	33.6	33.2	29.3	3.9	1.7, 7.0	0.7	-1.1	-
David Soltis	W	D	14.0	3.8	2.4, 5.5	3.8	2.1	6.3	24.0	17.0, 30.4	26.5	26.7	-
Ryan Nelson	W	D	9.4	7.5	5.0, 10.2	8.8	9.5	10.0	6.6	3.2, 10.9	10.2	10.4	-
Turnout:votes/VAP						*14.6*	*13.4*	*13.8*			*14.0*	*13.4*	-
State House District 9													
Abraham Aiyash	ME	D	61.3	50.5	46.8, 54.2	46.0	45.7	48.2	77.9	65.9, 85.9	91.7	98.4	-
Darnell Gardner	B	D	18.1	25.7	23.1, 28.4	27.6	26.4	24.7	6.3	2.5, 12.6	4.4	-3.0	-
Abraham Shaw	B	D	8.8	11.2	9.4, 12.9	12.6	13.3	12.9	5.4	2.5, 9.6	1.2	-1.0	-
William Phillips	B	D	6.1	6.9	5.3, 8.5	7.6	7.8	7.7	4.7	2.0, 8.7	2.2	2.1	-
Paul Smith	B	D	5.8	5.6	4.3, 7.1	7.2	6.8	6.5	5.7	2.7, 10.0	0.0	3.8	-
Turnout:votes/VAP						*13.9*	*13.1*	*12.7*			*8.4*	*7.5*	-
State House District 10													
Joe Tate	B	D	81.3	83.2	77.8, 88.3	76.4	78.8	82.1	92.5	87.6, 96.1	84.5	84.1	88.0
Toni Mua	B	D	18.7	16.8	11.7, 22.2	23.2	21.2	17.9	7.5	3.9, 12.4	15.4	15.8	12.0
Turnout:votes/VAP						*16.5*	*15.0*	*15.6*			*21.2*	*19.1*	*16.8*

APPENDIX C3
Michigan
2022
State House
Democratic Primaries

Estimates of Voting Patterns by Race in 2022 Democratic Primary

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State House District 11													
Veronica Paiz	H	D	18.9	6.6	3.0, 10.9	12.6	9.5	6.9	27.1	16.3, 37.3	24.4	25.4	23.1
Ricardo White	B	D	18.1	22.2	18.5, 26.0	22.1	22.6	23.8	15.6	7.1, 24.5	14.7	14.2	14.4
Alex Manwell	W	D	15.3	6.7	4.2, 9.7	7.2	8.0	9.7	22.0	12.3, 31.2	22.2	22.0	21.1
Regina Williams	B	D	14.5	24.2	20.7, 27.7	23.3	23.6	21.7	6.5	2.8, 12.1	7.1	7.4	9.2
Athena Lynn Thornton	B	D	10.2	18.7	15.6, 21.7	18.4	17.1	15.6	4.1	1.7, 7.3	3.4	3.9	4.8
Marvin Cotton Jr.	B	D	7.8	17.1	14.3, 19.7	16.5	15.1	13.4	3.1	1.3, 5.6	1.1	1.0	2.2
David Maynard		D	7.2	1.7	.8, 2.9	2.4	2.5	4.4	9.0	4.1, 14.5	11.3	12.3	9.7
Paul Robert Francis	W	D	4.9	1.6	.8, 2.6	1.5	1.3	2.8	7.9	4.8, 11.2	7.5	8.5	10.6
Patrick Biange	W	D	3.0	1.2	.6, 2.1	1.0	0.5	1.5	4.6	2.3, 7.1	5.0	5.4	5.0
Turnout:votes/VAP						*14.8*	*12.3*	*10.6*			*14.6*	*15.0*	*14.6*
State House District 12													
Kimberyly Edwards	B	D	51.9	83.4	73.1, 91.7	85.8	85.9	83.0	42.0	20.6, 65.6	17.9	18.0	-
Richard Steenland	W	D	48.1	16.7	8.3, 26.9	14.1	14.0	17.0	58.0	34.4, 79.4	82.2	82.0	-
Turnout:votes/VAP						*14.3*	*12.0*	*10.3*			*8.4*	*10.0*	-
State House District 13													
Lori Stone	W	D	73.7	53.0	48.9, 57.3	51.3	51.8	52.6	91.5	86.9, 95.3	91.7	93.0	-
Myles Miller	B	D	26.3	47.0	42.7, 51.1	48.4	48.3	47.4	8.5	4.7, 13.1	9.1	7.1	-
Turnout:votes/VAP						*9.8*	*9.4*	*10.3*			*11.8*	*11.1*	-
State House District 14													
Donavan McKinney	B	D	59.3	80.6	77.8, 83.2	82.8	82.2	80.4	39.5	31.1, 48.7	26.0	25.8	-
Kristina Lodovisi	W	D	28.4	13.9	11.7, 16.5	12.7	13.4	14.1	42.3	33.0, 50.2	50.5	49.5	-
Aaron Delikta	W	D	12.3	5.4	4.0, 7.1	4.7	4.5	5.6	18.2	12.7, 23.1	24.2	24.7	-
Turnout:votes/VAP						*13.2*	*12.8*	*13.8*			*8.8*	*9.1*	-

APPENDIX C3
Michigan
2022
State House
Democratic Primaries

Estimates of Voting Patterns by Race in 2022 Democratic Primary

				Black Voters					White Voters				
	Race	Party	Vote	EI[1]	95% confidence interval	EI[2]	ER	HP	EI[1]	95% confidence interval	EI[2]	ER	HP
State House District 16													
Stephanie Young	B	D	88.4	93.0	90.5, 95.1	89.2	89.3	90.7	91.4	84.2, 96.4	87.2	86.3	87.9
Ishmail Terry	B	D	11.6	7.0	4.9, 9.5	10.7	10.7	9.3	8.6	3.6, 15.8	13.0	13.8	12.1
Turnout:votes/VAP						*22.7*	*19.9*	*21.9*			*15.6*	*14.2*	*16.8*
State House District 18													
Jason Hoskins	B	D	55.1	53.1	47.6, 58.4	52.1	51.7	47.2	65.0	44.2, 83.6	61.5	61.6	-
Caprice Jackson	B	D	44.9	46.9	41.6, 52.4	47.7	48.1	52.8	35.0	16.4, 55.8	38.8	38.3	-
Turnout:votes/VAP						*31.2*	*29.4*	*21.5*			*17.4*	*16.2*	-
State House District 26													
Dylan Wegela	W	D	42.1	6.4	2.7, 11.5	1.2	-5.3	-	76.2	66.4, 84.3	78.2	82.3	-
Steven Chisholm	B	D	29.7	55.4	49.1, 62.0	59.6	64.4	-	9.1	4.3, 15.8	3.5	1.0	-
Allen Wilson	B	D	18.9	32.2	25.8, 38.1	32.7	32.2	-	9.0	4.0, 15.6	6.7	6.4	-
Stephen Patterson	W	D	9.3	5.9	2.9, 9.6	8.6	9.2	-	5.6	2.6, 10.2	9.9	9.8	-
Turnout:votes/VAP						*15.1*	*14.9*	-			*11.6*	*10.2*	-

IN THE UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

DONALD AGEE, JR. et al., Plaintiffs, v. JOCELYN BENSON, et al., Defendants.	Case No. 1:22-CV-00272-PLM-RMK-JTN

EXPERT REPORT OF MAXWELL PALMER, PH.D.

March 8, 2023

EXPERT REPORT OF MAXWELL PALMER, PH.D.

Contents

Introduction & Summary of Findings

I, Dr. Maxwell Palmer, declare as follows:

1. My name is Maxwell Palmer. I am currently an Associate Professor of Political Science at Boston University. I joined the faculty at Boston University in 2014, after completing my Ph.D. in Political Science at Harvard University. I was promoted to Associate Professor, with tenure, in 2021. I am also a Civic Tech Fellow in the Faculty of Computing & Data Sciences and a Faculty Fellow at the Initiative on Cities. I teach and conduct research on American politics and political methodology.

2. I have published academic work in leading peer-reviewed academic journals, including the *American Political Science Review*, *Journal of Politics*, *Perspectives on Politics*, *British Journal of Political Science*, *Journal of Empirical Legal Studies*, *Political Science Research and Methods*, *Legislative Studies Quarterly*, and *Urban Affairs Review*. My book, *Neighborhood Defenders: Participatory Politics and America's Housing Crisis*, was published by Cambridge University Press in 2019. I have also published academic work in the *Ohio State University Law Review*. My published research uses a variety of analytical approaches, including statistics, geographic analysis, and simulations, and data sources including academic surveys, precinct-level election results, voter registration and vote history files, and census data. My curriculum vitae is attached to this report.

3. I have served as an expert witness or litigation consultant on numerous cases involving redistricting or voting restrictions. I testified at trial, court hearing, or by deposition in *Bethune Hill v. Virginia* before the U.S. District Court for the Eastern District of Virginia (No. 3:14-cv-00852-REP-AWA-BMK); *Thomas v. Bryant* before the U.S. District Court for the Southern District of Mississippi (No. 3:18-CV-00441-CWR-FKB); *Chestnut v. Merrill* before the U.S. District Court for the Northern District of Alabama (No. 2:18-cv-00907-KOB); *Dwight v. Raffensperger* before the U.S. District Court for the Northern District of Georgia (No. 1:18-cv-2869-RWS); *Bruni v. Hughs* before the U.S. District Court for the Southern District of Texas (No. 5:20-cv-35); *Caster v. Merrill* before the U.S. District Court for the Northern District of Alabama (No. 2:21-cv-1536-AMM); *Pendergrass v. Raffensperger* before the U.S. District Court for the Northern District of Georgia (No. 1:21-CV-05339-SCJ); *Grant v. Raffensperger* before the U.S. District Court for the Northern District of Georgia (No. 1:22-CV-00122-SCJ); and *Galmon v. Ardoin* before the U.S. District Court for the Middle District of Louisiana (3:22-cv-00214-SDD-SDJ). I also served as the independent racially polarized voting analyst for the Virginia Redistricting Commission in 2021, and I have worked as a consultant to the United State Department of Justice on several matters. My expert testimony has been accepted and relied upon by courts; in no case has my testimony been rejected or found unreliable.

4. I am being compensated at a rate of $500/hour for my work in this case. No part of my compensation is dependent upon the conclusions that I reach or the opinions that I offer.

5. I was asked by defendants in this litigation to opine on the report submitted by Mr. Trende on racially polarized voting in the Detroit Area and on the extent to which race predominated in the drawing of the Hickory and Linden Plans.

6. In this report I primarily focus on the analyses presented by Mr. Trende. In writing this report I relied on data and computer code provided by Mr. Trende to replicate his analyses, as well as election data from the website of the Michigan Secretary of State. Below, I address many of Mr. Trende's analyses. However, my silence on a particular point or analysis offered by Mr. Trende is not an indication of my agreement with that point.

7. Overall, I find that Mr. Trende has not found evidence of a consistent pattern of racially polarized voting in the Challenged Districts (House Districts 1, 2, 7, 8, 10, 11, 12, 13, 14, and 26 in the Hickory Map, and Senate Districts 1, 3, 5, 6, 8, 10, and 11 in the Linden Map). I also find that Mr. Trende has not demonstrated that race predominated in the drawing of the Hickory and Linden Maps. In particular, his simulation analysis fails to show that race predominated over partisan fairness considerations in the drawing of the maps.

Racially Polarized Voting

8. Racially polarized voting centers around the concept of a "candidate of choice." Do voters from different racial or ethnics groups have a clear candidate of choice in an election, and, if so, are these candidates different? For example, suppose 80% of Black voters in a given geographic area support Candidate A, and 80% of White voters in that same area support Candidate B. Black and White voters each have a clear candidate of choice, and, because these candidates are different, voting is racially polarized. However, suppose that the White voters in this area are split, with about 50% of White voters supporting each candidate. In this case, while Black voters have a clear candidate of choice, White voters do not have a candidate of choice, and as a result there is not racially polarized voting in this election.

9. The above examples demonstrate that three things are required for racially polarized voting between two groups to exist. First, Group 1 must have a clear candidate of choice. Second, Group 2 must have a clear candidate of choice. Third, the candidates of choice of Group 1 and Group 2 must be different.

10. In my discussion below, I use the terms "candidate of choice" and "preferred candidate" interchangeably. Both mean a candidate who is preferred above all others by voters of a racial or ethnic group. I define "preferred" in two ways. First, a preferred candidate should receive a substantially larger vote share than the candidate receiving the second-highest vote share. For instance, a candidate winning support from a group with 51% of their votes while their opponent receives 49% of their votes may be preferred by a majority of the voters in the group, but this is not a substantively meaningful margin. Second, when estimating level of support using empirical methods, such as ecological

inference, the difference between vote shares of the top candidate for a group and the candidate receiving the second-highest vote share must be statistically significant. This can be determined using statistical tests of if the two candidates received the same vote share or if one was greater than the other.[1]

11. Another important element in analyzing racially polarized voting is determining, when there is an identifiable Black-preferred candidate, if White voters vote as a bloc to defeat the Black-preferred candidate. This depends on both the level of polarization and the size of each group in the electorate. Suppose a district is 55% Black and 45% White, and two candidates, X and Y, run in the election. Black voters support X with 90% of the vote, and Y with 10% of the vote. White voters support X with 10% of the vote, and Y with 90% of the vote. Despite high levels of polarization, X, the Black-preferred candidate wins the election. Now, suppose that the share of White voters supporting candidate X increases to 25% of the vote. This increase in White support for the Black-preferred candidate, often called "White crossover voting," increases the winning margin of the Black-preferred candidate when the district is 55% Black, and even allows the Black-preferred candidate to win if the Black population of the district were to decrease below 50%.

Racially Polarized Voting in Primaries

12. In general elections, analyzing racially polarized voting is straightforward, as there are usually only two competitive candidates in the election. For Black voters to have a candidate of choice, one candidate must get at least 50% of the vote from Black voters, and the other candidate will necessarily receive less than 50%.[2] However, primary elections may be contested by more than two candidates, such that no candidate receives a majority of the vote. When this occurs, the existence of a candidate of choice is less obvious. Suppose three candidates, A, B, and C, run in the election; Black voters support A with 40% of the vote, B with 35% of the vote, and C with 25% of the vote. Does there exist a Black-preferred candidate in this election? Mr. Trende treats A as the preferred candidate in cases like this, as they received the highest vote share (plurality winner). However, no candidate received a majority of the vote, and a majority of Black voters supported someone other than A, so there is not a Black-preferred candidate. If a candidate of choice can be identified based on receiving the plurality of the vote, rather than a majority, then it is possible, with more than three candidates, for a candidate of choice to be identified with a relatively small share of the vote.

[1] In ecological inference, as used by Mr. Trende in his analysis, the model simulates thousands of draws with different possible values of vote shares for each candidate from each group. The mean of these draws for each group and candidate is reported as the estimate. The interval containing 95% of the values from the draws is used to determine the confidence intervals. I use these draws to conduct my statistical tests. Candidate 1 receives a statistically significant higher share of the vote than Candidate 2 from a group if the share for Candidate 1 is higher than the share for Candidate 2 in 95% or more of the simulations.

[2] Racially polarized voting is not a simple binary, but can be a matter of degree. When analyzing racially polarized voting, experts may differ on where to draw the line to identify polarization.

13. The analysis is further complicated when trying to identify if there is polarization between racial and ethnic groups in the primary. Continuing the above example, suppose White voters support A with 30% of the vote, B with 55% of the vote, and C with 15% of the vote. Candidate B is the White-preferred candidate. Suppose that we define candidate of choice to be winning the plurality, such that A is the Black-preferred candidate. Is there racially polarized voting in this case? Black and White voters have different candidates of choice, but we do not know if a majority of Black voters supports the White-preferred candidate. Suppose that the 25% of Black voters who supported C prefer B to A as their second choice. In that case, a majority of Black and White voters prefer B over A, despite A being the Black-preferred candidate.

14. These examples demonstrate some of the complexities of analyzing racially polarized voting in primaries with more than two candidates. How do we define candidates of choice, and is plurality vote enough? If so, how do we know when groups are actually polarized, compared to small pluralities having different preferences? There are other complexities to consider as well. Is polarization different when the Black-preferred candidate is the least preferred-candidate by White voters, instead of receiving the second-most votes? Or, suppose that Candidate X is the plurality winner for Black voters with 40% of the vote, and Candidate Y comes in second with Black voters with 35% of the vote. Suppose white voters are more fragmented, and their plurality winner is Candidate Y, with 35% of the vote. In this scenario, by plurality rule this election would be racially polarized, but Candidate Y receives the exact same percentage of the vote from Black and White voters.

15. A second obstacle is that primaries are highly idiosyncratic. Some primaries are uncontested, others have only two candidates, and others have three of more candidates. For example, Mr. Trende examined primary elections in 19 House Districts and eight Senate Districts under the Prior Maps, the 2011 House and Senate District Plans that governed elections from 2012-2020. Across the 19 House Districts, every district had at least one contested Democratic primary from 2012 to 2020, and 17 districts had at least one Democratic primary with three or more candidates. Among these districts, the average Democratic primary had 3.7 candidates, with a maximum of 14 (House District 4 in 2018). Across the eight Senate Districts, seven districts had at least one contested Democratic primary from 2012 to 2020, and five districts had at least one Democratic primary with three or more candidates. Among these districts, the average Democratic primary had 3.4 candidates, with a maximum of 11 (Senate District 2 in 2018).[3]

16. Figure 1 shows the number of candidates in the Democratic primary election for each of the Prior House Districts where Mr. Trende examined primary elections, and Figure 2 shows the number of candidates in each of the Prior Senate Districts. Both figures show significant variation in the number of candidates across districts and years.

[3]I exclude candidates that withdrew before the primary from this analysis, and only count candidates that received votes. I also exclude write-in candidates.

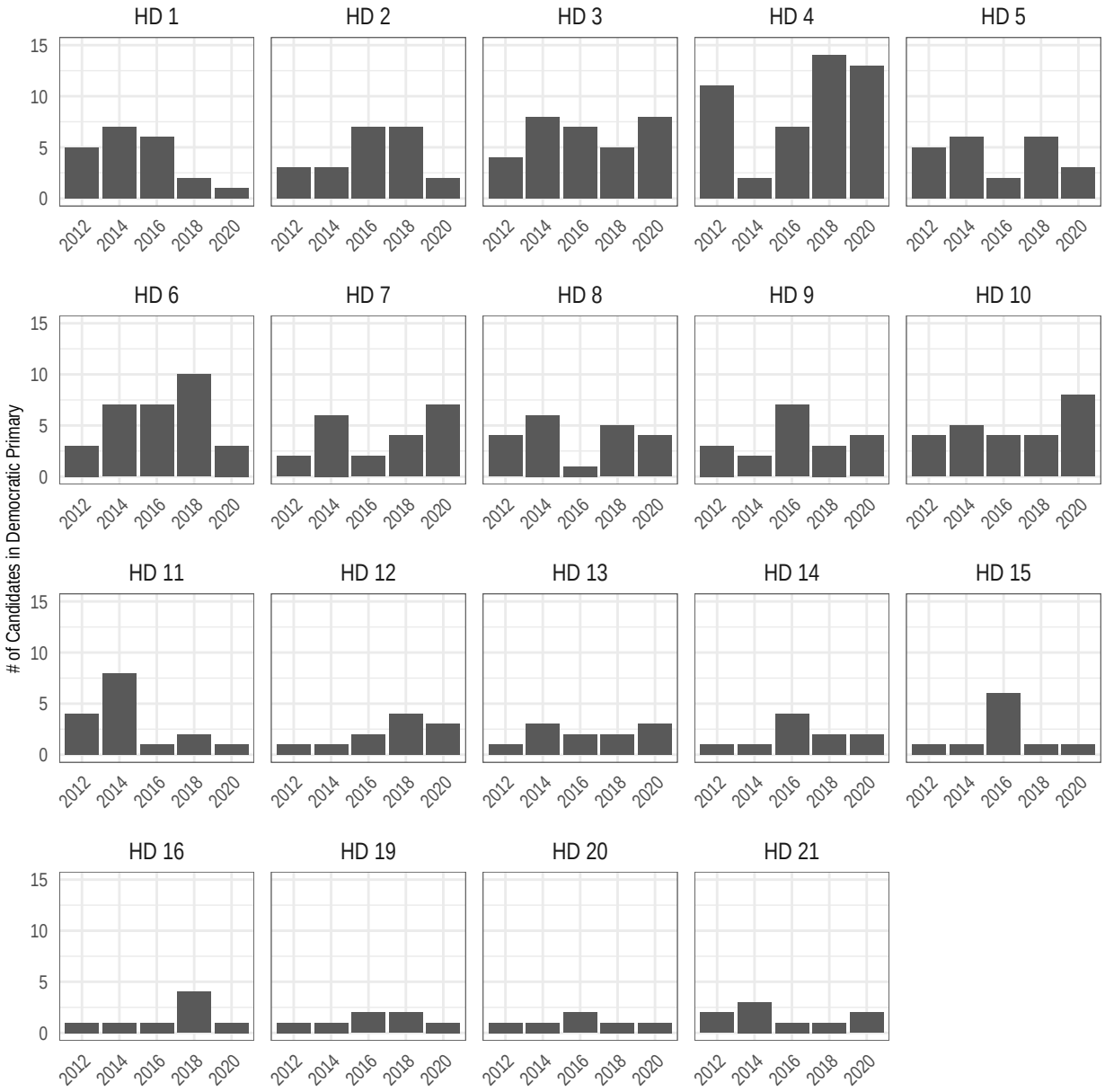


Figure 1: Number of Candidates in Democratic Primary Elections for State House, 2012 2020, Prior Map.

17. There is similar variation in the number of candidates running in the Democratic primary in 2022. Figure 3 shows the number of candidates running in each of the ten challenged Hickory Districts and the seven challenged Linden Districts. Among the ten challenged Hickory Districts, nine had a contested Democratic primary and five had at least three candidates. Among the seven challenged Linden Districts, six had a contested Democratic primary and two had at least three candidates.

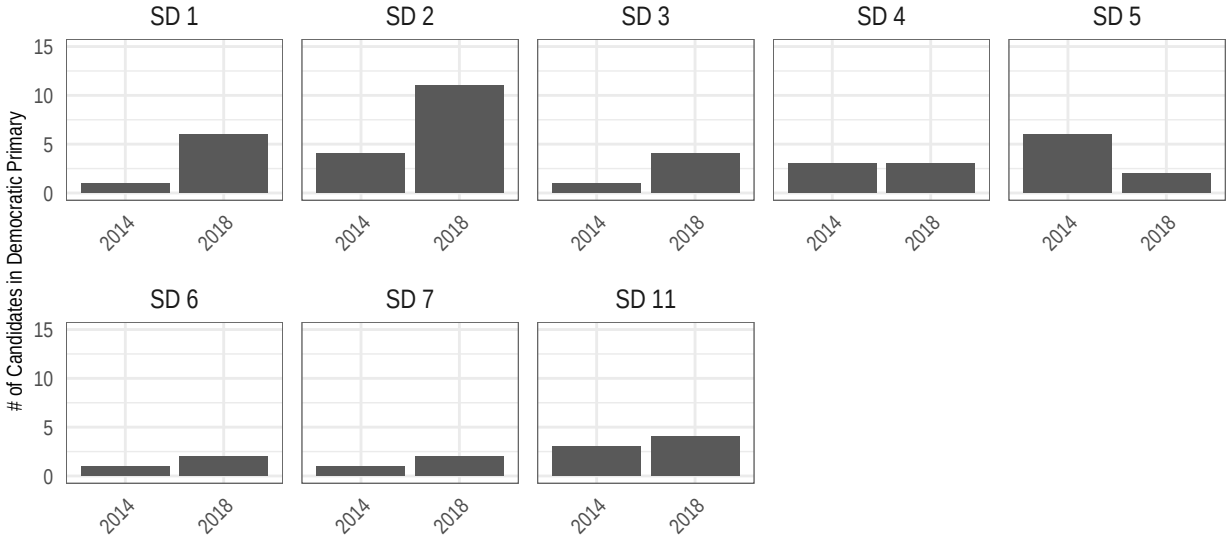


Figure 2: Number of Candidates in Democratic Primary Elections for State Senate, 2012 2020, Prior Map.

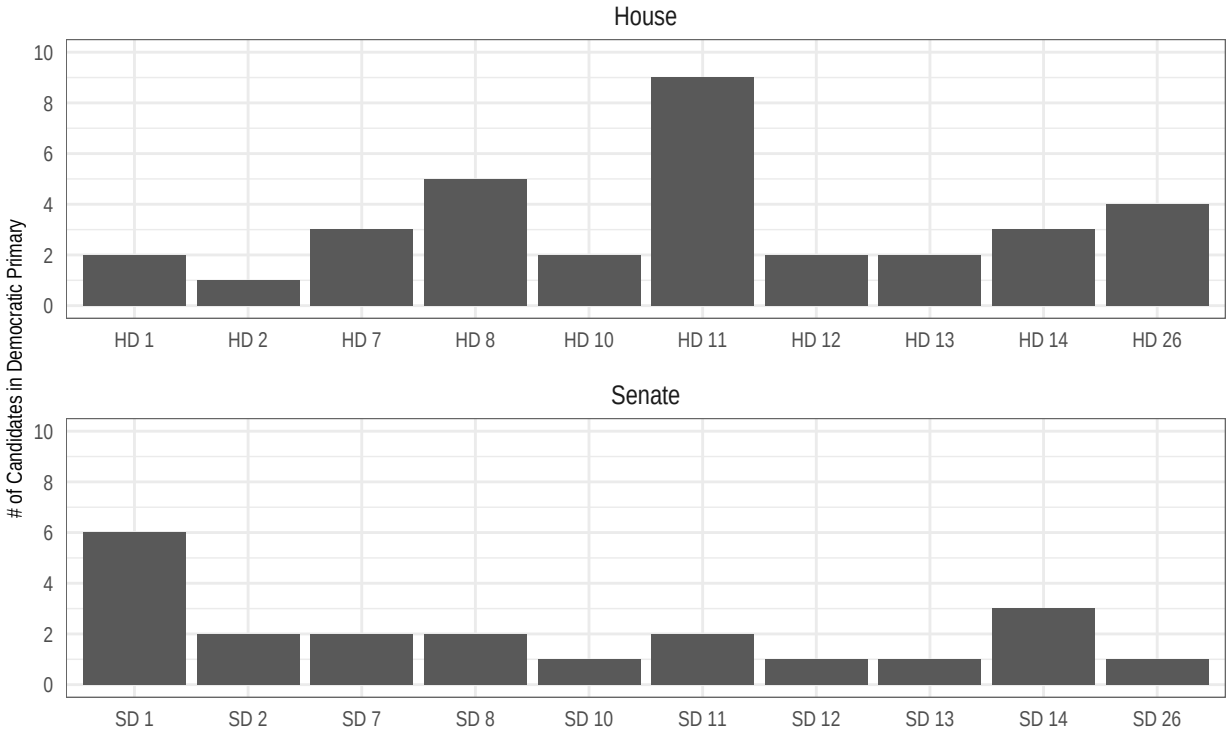


Figure 3: Number of Candidates in Democratic Primary Elections in Challenged House and Senate Districts, 2022

18. If a candidate of choice is defined as the plurality vote winner among each group, then the variation in the number of candidates in the Democratic primary creates further problems for creating districts where Black-preferred candidates can regularly win primaries in the presence of racially polarized voting. Consider the example in Table 1. This district is 60% Black and 40% White. In Scenario 1, suppose two candidates run in the primary. Black voters support Candidate X with 75% of the vote, and Candidate Y with 25% of the vote. White voters support Candidate X with 25% of the vote and Candidate Y with 75% of the vote. Black and White voters each have a clear candidate of choice (X for Black voters, Y for White voters), and voting is polarized. Candidate X, the Black-preferred candidate, wins the primary with 55% of the vote.

19. In Scenario 2, suppose a third candidate, Candidate Z, enters the primary, and divides support for Candidate X, but not for Candidate Y. Candidate X continues to be the Black-preferred candidate (under the plurality definition), but no candidate receives a majority of the vote from Black voters. Candidate Y is the White-preferred candidate. However, due to the split support by Black voters for Candidate X and Candidate Z, Candidate Y is able to win the primary with 45% of the vote. Holding support for each candidate constant, the district population would have to increase to more than 75% Black for Candidate X to win. But, even in that case, the entry of a fourth candidate who takes any support from Candidate X but not from Candidate Y would still allow Candidate Y to win the primary. This example illustrates how the idiosyncrasies of primaries can affect the ability of Black-preferred candidates to win primary elections. In Scenario 2, suppose that all of the voters who do not vote for Candidate Y prefer Candidate X and Candidate Z to Candidate Y. If either candidate X or candidate Z were to withdraw from the primary, the other candidate would then defeat candidate Y. However, due to a failure to coordinate behind a single candidate, Candidate Y wins instead. A Black-preferred candidate fails to win this primary not due to an insufficient Black voting population but due to candidate entry and a lack of coordination in the primary.

Table 1: Illustrative example of how the number of candidates affects the ability of Black-preferred candidates to win primary elections.

	Black Voters	White Voters	Total Vote
% of Population	60%	40%	
Scenario 1			
Support for Candidate X	75%	25%	55%
Support for Candidate Y	25%	75%	45%
Scenario 2			
Support for Candidate X	45%	15%	33%
Support for Candidate Y	25%	75%	45%
Support for Candidate Z	30%	10%	22%

20. District primaries are idiosyncratic, with different numbers of candidates, varying degrees of group cohesion in support of candidates, and levels of racially polarized voting. Mr. Trende recognizes this problem in his report, writing "[m]ost of the races here are difficult to interpret, because they often feature multiple candidates running" (Trende, p.36). Furthermore, the presence of polarized voting in one primary election may not predict polarization in future primaries. In contrast, polarization in general elections is relatively consistent and stable; if voters in a district are polarized in an election for one office in a given year, they are generally also polarized in the elections for other offices elected in that year, as well as polarized in future elections in that district.

21. A third obstacle to using primaries to identify racially polarized voting is the relatively low level of voter turnout in primary elections compared to general elections. Figure 4 shows the total number of voters participating in the August primary and November general elections from 2012 to 2022 statewide and in Wayne County. In 2018 about half the number of people voted in the primary as in the general election, and in every other year primary turnout was even lower relative to the general election. If we assume that every primary voter also voted in the general election, then racially polarized voting analyses of the primary only reveals the preferences of at most half of the general election voters. Racially polarized voting analyses using election results reveal no information about the primary election preferences of the people who only participated in the general election. These voters may or may not have had a preferred candidate in the primary, and that candidate may or may not have won the primary election. Furthermore, we cannot assume that the preferences of primary voters are representative of the preferences of voters who only voted in the general election. However, racially polarized voting analyses of the general election can reveal the preferences of all of the voters in the general election, if different groups had different preferred candidates, and, if so, if the Black-preferred candidate is able to win the election.

22. Figure 5 plots the ratio of primary election voters to general election voters in each of the Challenged Districts in 2022. In every challenged district, there were fewer than half the number of general election votes cast in the primary elections. This shows us that racially polarized voting analyses of primary elections can only inform us about the preferences of less than half of the general electorate.

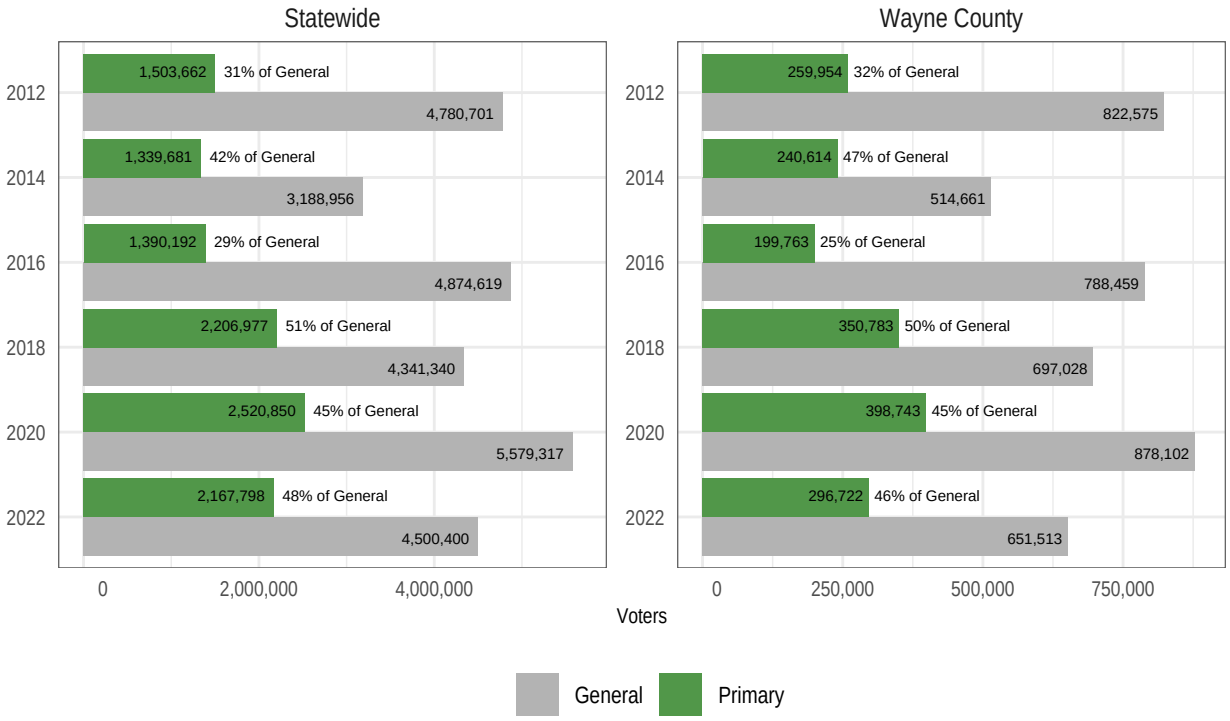


Figure 4: Primary and General Election Turnout by Year

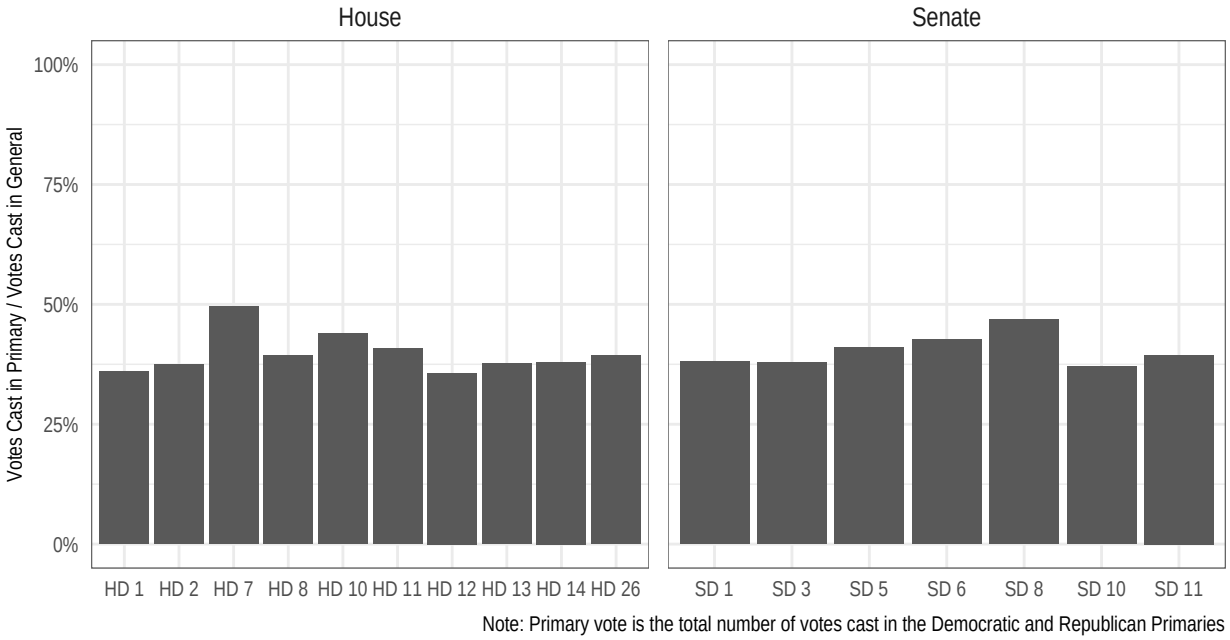


Figure 5: Ratio of Primary Voters to General Election Voters in Challenged House and Senate Districts, 2022

Mr. Trende's Racially Polarized Voting Analysis

23. Above, I outlined the reasons why primary elections are less useful for identifying racially polarized voting than general elections. While I disagree with Mr. Trende on the use of primaries for RPV, I now turn to examining Mr. Trende's RPV analysis under the assumption that winning a plurality of a group's vote is sufficient to identify a candidate of choice. Using Mr. Trende's methodology, I find that Mr. Trende has not demonstrated systematic evidence of racially polarized voting in the Detroit area.

24. Mr. Trende's RPV analysis can be categorized into four different groups: (1) analysis of the 2018 gubernatorial primary in Wayne County; (2) analysis of the 2018 gubernatorial primary in selected districts in Wayne County under the Prior Maps for House and Senate; (3) analysis of selected State House and State Senate primaries from 2014 to 2020 under the Prior Maps; and (4) analysis of selected 2022 primaries for State House and State Senate under the Hickory and Linden Maps.

25. Mr. Trende employs the same methodology across all of his RPV analyses. He uses Ecological Inference (EI), a statistical technique that seeks to estimate group-level preferences based on aggregate election data.[4] Mr. Trende estimates preferences for five racial and ethnic groups: Black, Non-Hispanic White (hereafter "White"), Hispanic, Asian, and Other. Each election and geographic area is analyzed using a separate ecological inference model. The model produces estimates of the percentage of each group that voted for the candidate from each party in each election. The results include both a mean estimate (the most likely vote share), and a 95% confidence interval.[5] Mr. Trende provides these results in some of this tables (e.g. Table 5). In other parts of his report, Mr. Trende only reports the mean estimates (e.g. Table 7) and omits the confidence intervals. It is also possible to estimate other quantities of interest from these models, such as the difference in support for two candidate by voters of a certain group.

26. Overall, Mr. Trende makes three significant errors in his RPV analysis. First, he ignores measures of statistical uncertainty, such as the confidence intervals that he calculated for each EI model, and identifies candidates of choice even when such a finding is not supported by the statistical results. Second, even when he does find a statistically significant result, he ignores the importance of substantive significance if the result is actually meaningful in the electoral context. Third, Mr. Trende cherry picks which analyses he includes in his report. He changes the scope of this analysis (which districts to examine) from one section to the next, without any justification.

[4]The specifics of Mr. Trende's EI analysis are not provided in his report. However, Mr. Trende provided all of his code in his replication materials. By reviewing and running his code I am able to identify exactly how Mr. Trende performed this analysis.

[5]The 95% confidence interval is a measure of uncertainty in the estimates from the model. For example, the model might estimate that 94% of the members of a group voted for a particular candidate, with a 95% confidence interval of 91-96%. This means that based on the data and the model assumptions, 95% of the simulated estimates for this group fall in the range of 91–96%, with 94% being the average value. Larger confidence intervals reflect a higher degree of uncertainty in the estimates, while smaller confidence intervals reflect less uncertainty.

He also omits analyses that he performed where the results do not match his narrative, including some that directly contradict his findings.

27. Below, I discuss each of Mr. Trende's RPV analyses. In many cases I replicated Mr. Trende's analysis by using his code, supplied with his report. This code reproduces all of Mr. Trende's results, both reported in his report and unreported.[6] In all of the analysis below I am relying on Mr. Trende's code and results, rather than my own RPV analysis. I use Mr. Trende's RPV analysis so that this report is methodologically consistent with Mr. Trende's report and so that I can see the same results available to Mr. Trende. However, my use of Mr. Trende's code and RPV analysis should not be understood to be an endorsement of his methodology.

28. Mr. Trende begins his racially polarized analysis using the 2018 Democratic primary for governor. This is the only statewide office with a contested Democratic primary over the past decade. First, he looks at Wayne County as a whole. He estimates that 59.3% of Whites voted for Whitmer, 41.13% of Blacks voted for Thanedar, and 37.4% of Blacks voted for Whitmer in the gubernatorial primary. Mr. Trende declares that "Black voters expressed a clear preference for Thanedar over Whitmer" (p.29).[7] While Mr. Trende is correct that the models show a statistically significant preference for Thanedar over Whitmer, this is a case of confusing statistical significance for substantive significance.[8] Black voters are almost evenly divided between Thanedar and Whitmer, with only 4 percentage points separating their vote shares. Black voters are not voting as a cohesive bloc. Despite the statistically significant difference, this is not strong substantive evidence of racially polarized voting.

Racially Polarized Voting in House Districts

29. In addition to looking at RPV in Wayne County, Mr. Trende examines the results of the 2018 Democratic primary for governor at the district level, for the House and Senate districts located entirely in Wayne County under the Prior Map. Mr. Trende estimates ecological inference models for 21 districts. I replicated Mr. Trende's results, and find that only five districts have statically significant levels of polarization. In eight districts, White voters have a preferred candidate but there is not a clear Black-preferred candidate, and in two districts Black voters have a preferred candidate but there is not a clear White-preferred candidate. In five districts voters of neither group have a clear preferred candidate, and in one district voters of both groups have the same

[6]The EI results generated by Mr. Trende's code and presented here are nearly identical to those in Mr. Trende's report, but there are some small (and not statistically or substantively significant) differences caused by the random simulations used by the EI algorithm. Mr. Trende failed to set a random seed in his code, such that, due only to randomness, I cannot perfectly replicate his results and there may be a few trivial differences.

[7]While Mr. Trende does not report confidence intervals for these estimates, I replicated his analysis using his code, and produced confidence intervals.

[8]See Bueno de Mesquita, Ethan, and Anthony Fowler. *Thinking clearly with data: A guide to quantitative reasoning and analysis.* Princeton University Press, 2021, page 107.

preferred candidate. Mr. Trende's conclusions from this analysis are not supported by his analysis (p.33). Table 6 presents the full results for this analysis.[9]

30. Mr. Trende examines the results of Democratic primaries in selected districts of the Prior Maps. He begins with the House primaries in 2018, and states that he focused on Prior House Districts 2, 4, 5, 6, 9, 10, and 35 (p.35). However, he only reports results for Districts 2 and 5, writing "most of the other races are difficult to interpret." I replicated all of Mr. Trende's House RPV analyses for 2018 by running his code and saving all of the model results.

31. Mr. Trende's analysis of Prior District 2 illustrates a case where there is not racially polarized voting because Black voters did not have a preferred candidate. Seven candidates contested this primary election. Of these seven, four received similar levels of support from Black voters. Figure 6 presents the results, including confidence intervals. Given the level of uncertainty in these results, we cannot conclude that Carla Tinsley-Smith is the Black-preferred candidate. While she has the highest estimated mean level of support, we cannot reject the hypotheses that Carol Banks or Latisha Johnson received the same or higher levels of support from Black primary voters.[10] Therefore, ecological inference does not identify a Black-preferred candidate, and Black voters are not cohesive in this primary. Without a Black candidate of choice, this election cannot be racially polarized.

32. Mr. Trende's analysis of Prior House District 5 in 2018 also does not show racially polarized voting. Mr. Trende concludes that "Black voters generally backed Cynthia Johnson, while White voters favored Rita Ross." (p.38) However, the confidence intervals on the estimates tell a different story. As Figure 7 shows, there is substantial overlap of the confidence intervals for Johnson and Ross for both Black and White voters. We cannot reject the hypotheses that the levels of support for these candidate are not equal for both groups.[11] By ignoring uncertainty in his estimates, Mr. Trende finds this election to be polarized, even though neither group has an identifiable candidate of choice.

[9]Tables 6-14 present district level EI results. For each district there are three sets of columns. First, I identify the top two candidates for Black voters, with the mean estimates of support and 95% confidence intervals for each. The following column $Pr(c1 > c2)$, indicates the probability that the first candidate listed has a higher vote share than the second candidate listed, across all of the EI simulations. The third following column then uses that result to determine if there is a candidate of choice for Black voters. The next set of columns repeats the analysis for White voters. The final column uses then identifies if the election is polarized.

[10]To test for statistical significance, I use the ecological inference simulation results, and calculate the percentage of draws where Candidate i received a higher vote share than Candidate j. Using a one-sided test, I reject that the levels of support are equal if the percentage of simulations where $v_i > v_j$ is 95% or higher.

[11]Black voters supported Ross at a higher level than Johnson in 9% of the draws, and White voters supported Johnson at a higher level than Ross in 16% of the draws.

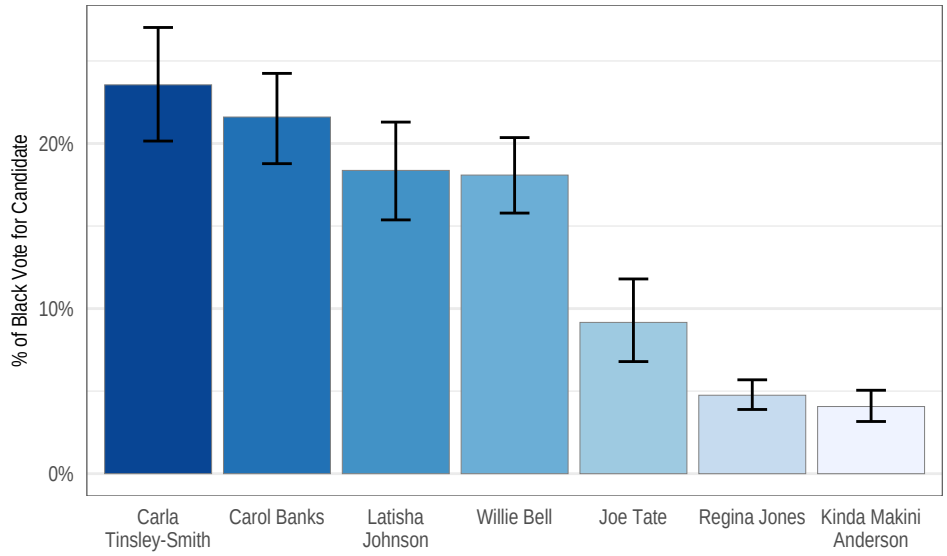


Figure 6: Estimates of Black Support for 2018 Democratic Primary Candidates in Prior House District 2

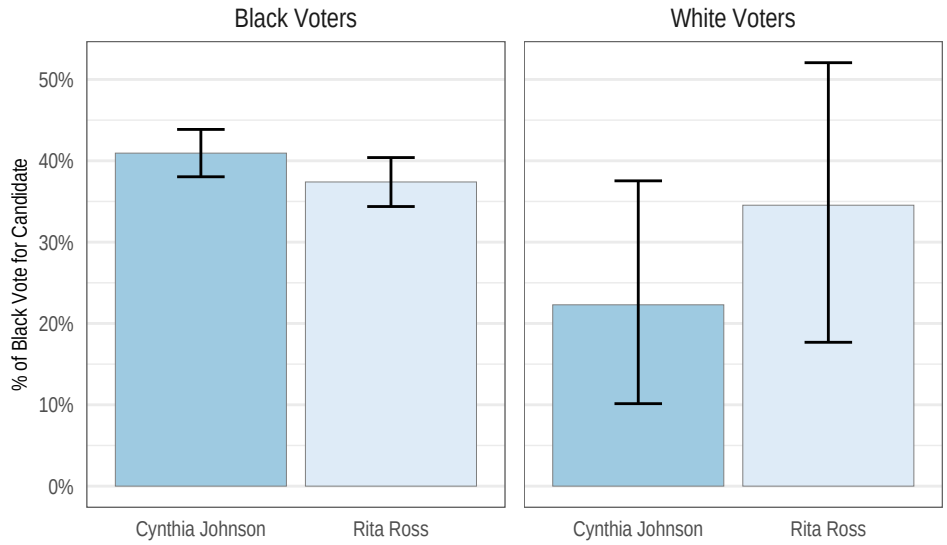


Figure 7: Estimates of Black Support for 2018 Democratic Primary Candidates in Prior House District 5

33. Mr. Trende writes in his report that he focused on Prior House Districts 2, 4, 5, 6, 9, 10, and 35 (p.35), but he only presents detailed results for Districts 2 and 5. However, Mr. Trende's code includes ecological inference analysis for Districts 4, 6, 9, and 10, as well as for Districts 3, 7, 8, and 11.[12] In Districts 1, 6, and 9 there is not racially polarized voting; Black and White voters share the same preferred candidates. In Districts 3, 7, 8, and 10 there is not racially polarized voting; the Black-preferred candidate wins and there is not a White-preferred candidate.

34. In Prior House District 4, there is evidence of racially polarized voting; Black and White voters have different identifiable candidates of choice. The Black-preferred candidate won the primary in House District 4. House District 4 is 45.6% BVAP. This is especially notable because Mr. Trende, reviewing Dr. Handley's report, states that "there is no evidence suggesting that the Black candidate of choice can win a polarized primary in a district with a BVAP below 47%" (p.35). Mr. Trende's analysis of the 2018 primary in District 4 is direct evidence contradicting this assertion. Furthermore, Mr. Trende wrote code to perform this analysis himself, including code to generate a table presenting the results, but these results are not included in his report (see Mr. Trende's file `07_house_rpv.R`, lines 1004 1137). Mr. Trende's table, as generated by running his replication code, is included in this report on page 62.

35. Mr. Trende also analyzed the 2018 primary in Prior House District 11, which is only 25.5% BVAP (and 65.6% White). Here, there is clear evidence of racially polarized voting, and the Black-preferred candidate defeated the White-preferred candidate. This is further evidence against Mr. Trende's claim that "there is no evidence suggesting that the Black candidate of choice can win a polarized primary in a district with a BVAP below 47%" (p.35). While Mr. Trende briefly notes that District 11 was polarized and the Black-preferred candidate won (contradicting his prior statement), he does not report his own analysis. Once again, Mr. Trende wrote code to perform this analysis himself, including code to generate a table presenting the results, but these results are not included in his report (see Mr. Trende's file `07_house_rpv.R`, lines 1580 1684). Mr. Trende's table, as generated by running his replication code, is included in this report on page 69.

36. The examples above show that Mr. Trende wrote code to analyze the 2018 primaries in eleven districts, but only reported the results for two districts, where he (erroneously) found evidence of racially polarized voting. The unreported districts include three districts where Black and White voters shared the same candidate of choice, and four districts where White voters did not have a candidate of choice. Most seriously, despite collecting the data and writing the code to do so, he did not include two districts where there was racially polarized voting, the Black-preferred candidate won the election, and the BVAP of the districts was below 47%.

37. Mr. Trende also examined the results of the 2014, 2016, and 2020 Democratic primaries

[12] All of these analyses can by found in Mr. Trende's replication code, in the file `07_house_rpv.R`. I cannot find any analysis of District 35 in Mr. Trende's report or replication code. To examine RPV in the unreported districts, I ran Mr. Trende's code and examined the results.

in Districts 1 10 under the Prior Map. Mr. Trende makes the same statistical errors in these analyses as discussed above: he ignores statistical uncertainty and identifies candidates of choice even when we cannot reject the hypothesis that the first and second choice candidates received the same vote share. Table 2 presents a summary of the results for each district, and Tables 8 11 present detailed results with confidence intervals and statistical results. Across these ten districts and four primary election cycles from 2014 to 2020, there are eight polarized contests (20%), two uncontested races (5%), and 30 contests that are not polarized (75%).[13]

38. Mr. Trende finds that seven Prior House districts had polarized primaries in 2014. When statistical uncertainty is taken into account, there is only evidence of polarization in three districts. Similarly, Mr. Trende finds that four House districts had polarized primaries in 2016. When statistical uncertainty is taken into account, there is only evidence of polarization in two districts.

39. Table 2 also shows that polarization is inconsistent across districts. The eight polarized cases are spread across four districts; in all of these districts there are some years with polarized contests, and some years with non-polarized contests.

40. Mr. Trende's fourth RPV analysis examines the 2022 primaries under the Hickory Map. Mr. Trende examines the primary elections in 16 districts. He finds no evidence of polarization in nine districts. In three districts (HD 4, 7, and 12) he finds evidence of racially polarized voting, and that the Black-preferred candidate won the election. In four districts (HD 5, 8, 11, and 26) he finds evidence of racially polarized voting and

Table 2: Summary of RPV Analyses for Prior House Districts, 2014 2020

	2014	2016	2018	2020
HD 1	Polarized	Polarized	Same CoC	Uncontested
HD 2	Polarized	Polarized	No Black CoC	Same CoC
HD 3	No White CoC	No White CoC	No White CoC	No White CoC
HD 4	Same CoC	Same CoC	Polarized	Polarized
HD 5	No White CoC	No White CoC	No CoCs	No White CoC
HD 6	Same CoC	Same CoC	Same CoC	Same CoC
HD 7	No CoCs	No White CoC	No White CoC	No White CoC
HD 8	No White CoC	Uncontested	No White CoC	No White CoC
HD 9	No White CoC	No White CoC	Same CoC	No White CoC
HD 10	Polarized	No White CoC	No White CoC	Polarized

[13] In his replication code for his analysis of the 2020 elections Mr. Trende omitted the Prior House District 8 primary election. This appears to be an error, as the code for the District 7 primary election is repeated twice (see Mr. Trende's file `12_2020_analysis.R`, lines 373–415). Using Mr. Trende's data and exact EI methodology, I ran EI for the District 8 primary and included it in the analysis. There is not evidence of racially polarized voting in this election.

that the White-preferred candidate won the election. In these analyses Mr. Trende again fails to consider statistical uncertainty. In HD 12, which Mr. Trende reports as polarized with the Black-preferred candidate winning, there is no White-preferred candidate, and therefore no evidence of racial polarized voting. In HD 8 and HD 11, which Mr. Trende reports as polarized with White-preferred candidates winning, there are not statistically identifiable Black-preferred candidates, and therefore no evidence of racially polarized voting. Accounting for statistical uncertainty reduces the number of districts with racially polarized primaries from seven to four, and there are only two cases where a White-preferred candidate won the primary. Table 12 presents these results with confidence intervals and statistical tests.

Racially Polarized Voting in Senate Districts

41. Mr. Trende's RPV analysis for the Senate districts has the same errors as his analysis of the House districts.

42. Mr. Trende examines the results of the 2018 Democratic primary for governor at the district level. For the Prior Senate Map, Mr. Trende estimates ecological inference models for seven districts. I replicated Mr. Trende's results, and find that only four districts have statically significant levels of polarization. In two districts, White voters have a preferred candidate but there is not a clear Black-preferred candidate, and in one district neither group has a clear candidate of choice. Table 7 presents the full results for this analysis.

43. Mr. Trende examines the results of Democratic primaries in selected districts of the Prior Senate Map for the 2014 Democratic primary. He examines four districts (Districts 2, 4, 5 and 11). Mr. Trende determines that three districts were polarized, but after accounting for statistical uncertainty there is no evidence of polarization in District 11 because White voters do not have a candidate of choice. Table 13 presents the full results of this analysis.

44. Mr. Trende also examines the 2018 Democratic primaries for the Prior Senate Map. While he produced replication code for all of his analyses, including a file for 2018 (`09_senate_spv.R`), he appears to have used the 2018 primary results from Dr. Handley's report in his Table 19, rather than his own analysis. His replication code for 2018 appears incomplete and I was not able to run this code to produce his analysis. While this analysis does not include confidence intervals, it is clear from the table that Mr. Trende's finding of polarization in District 2 (in both the primary and special election) are not supported by the estimates of support for each candidate by Black voters. The table shows that Black voters supported Banks with an estimated 27.3% of the vote and Hollier with 25.65% of the vote in the primary election (28.8% and 27.5% in the special election). These differences are trivially small, and much smaller than the typical range of the confidence intervals in Mr. Trende's analyses. Consequently, it is highly unlikely that Black voters have a candidate of choice in these elections.

45. Mr. Trende's final RPV analysis examines the 2022 primaries under the Linden Map. Mr. Trende examines the primary elections in six districts (SD 1, 3, 6, 7, 8, and 11), but omits the results of District 11 from his report. Table 14 presents the full results of this analysis. He finds no evidence of polarization in two districts; Black and White voters both strongly support the same candidates. In District 1, Mr. Trende finds evidence of racially polarized voting, and that the Black-preferred candidate lost the election. However, voting is not polarized in this district because, when taking into account statistical uncertainty, there is no White-preferred candidate.

46. After accounting for these errors, there is only one district with evidence of racially polarized voting, Linden District 8. Here, as discussed by Mr. Trende, two incumbents faced each other in the primary election. Senator Mallory McMorrow, who is White, defeated Senator Marshall Bullock, who is Black, with 68.5% of the vote. This single election does not reflect a consistent pattern of racial polarization in this district, but rather demonstrates the idiosyncrasies of primary elections. Senator McMorrow's substantial margin of victory, and high level of support from White voters, may be at least partially due to the national attention she received after a widely publicized speech on transgender rights. Furthermore, while Black voters cohesively supported Senator Bullock in this election, 20% of Black voters supported McMorrow.

47. Mr. Trende also wrote code to analyze the primary election in Linden Senate District 11, which is one of the challenged districts, but did not include the results in his report. I ran Mr. Trende's replication code and find that District 11 was not polarized because Black voters did not vote cohesively in the primary. Once again, Mr. Trende wrote code to perform this analysis himself, including code to generate a table presenting the results, but these results are not included in his report (see Mr. Trende's file `10_2022_analysis.R`, lines 276 307). Mr. Trende's table, as generated by running his replication code, is included in this report on page 99.

Racially Polarized Voting in the Challenged Districts

48. While Mr. Trende analyzed the 2022 primaries in many districts, only some are challenged in this litigation. Table 3 shows the results for the challenged districts. Of the nine challenged House districts Mr. Trende analyzed, only two had primary elections where there is evidence of racially polarized voting. Of the six challenged Senate districts analyzed by Mr. Trende, only one had a primary election with evidence of racially polarized voting. In all of the other districts, either voting was not polarized, there were not identifiable candidates of choice, or there was not a contested primary. Mr. Trende has not demonstrated a consistent pattern or pattern of racially polarized voting for any individual challenged district or the set of challenged districts for neither the Hickory Map nor the Linden Map.

Table 3: Summary of RPV Analyses for Challenged Districts, 2022

Chamber	District	RPV Result
House	HD 1	No White CoC
	HD 7	Polarized
	HD 8	No Black CoC
	HD 10	Same CoC
	HD 11	No Black CoC
	HD 12	No White CoC
	HD 13	No Black CoC
	HD 14	No White CoC
	HD 26	Polarized
Senate	SD 1	No White CoC
	SD 3	Same CoC
	SD 6	No White CoC
	SD 8	Polarized
	SD 11	No Black CoC

Racial Predominance

50. Mr. Trende seeks to analyze the role of race in the drawing of the enacted maps, and concludes that "[r]ace predominated in the drawing" of the Hickory and Linden Maps. He writes that "[t]his is confirmed by both qualitative and quantitative examinations of the districts." (p.9) In this section I will show that (1) Mr. Trende's quantitative examinations of the districts do not hold up to scrutiny, and (2) that Mr. Trende did not engage in sufficient qualitative examinations of the districts to show predominance.

51. Mr. Trende performs four quantitative analyses to identify racial predominance in the Hickory and Linden maps: (1) compactness; (2) county splits; (3) core preservation (for the Linden map only), and (4) redistricting simulations. These four analyses, either individually or together, fail to show that race predominated in the drawing of either plan.

52. The Michigan Constitution specifies seven redistricting criteria, in order of priority (Article 4, Section 6(13)). Compactness is the final, and least important criteria. County splits are in the sixth criteria. The fifth criteria specifies that "Districts shall not favor or disfavor an incumbent elected official or a candidate." Core preservation often serves to protect incumbents. Thus, three of Mr. Trende's four analyses of racial predominance focus on the three criteria that are constitutionally the least important when drawing maps. We should expect that all three are subordinated to the more important criteria of compliance with the voting rights act, representing communities of interest, and partisan fairness.

53. In the compactness, county split, and core preservation analyses, Mr. Trende compares the Hickory and Linden maps to the prior maps, and uses differences between the Prior Maps and the Commission Maps as evidence of racial predominance. But, such a comparison assumes that the prior maps were race-neutral maps themselves. Mr. Trende provides no evidence that the prior maps are race-neutral. However, one of the map makers in the 2011 redistricting cycle, Jeff Timmer, stated in an interview that the 2011 districts deliberately packed Black voters in the Detroit area to help Republicans win more seats in the state legislature.[14]

> *"Timmer says the reason those districts include such large African American majorities in the first place is because Republican gerrymanderers used the strategy of"packing" those voters into single districts to their own advantage, using minority representation requirements under the Voting Rights Act as an excuse.*
>
> *"There were two main keys to gerrymandering in Michigan when I sat down to draw maps 10 and 20 years ago. Relying on county and city or township geography, keeping those intact, helps Republicans. The other thing that helped*

[14]Neher, Jake. "Two Authorities on Gerrymandering Weigh in on Michigan's Redistricting Commission." WDET Interview, October 14, 2021. https://wdet.org/2021/10/14/two-authorities-on-gerrymandering-weigh-in-on-michigans-redistricting-commission/

Republicans was the Voting Rights Act packing those districts, those majority minority districts, into cities like Detroit," says Timmer.

54. Given these statements, the prior maps are not a neutral baseline for identifying racial predominance.

Compactness

55. Mr. Trende's analyzes the compactness of the districts in the Hickory and Linden Maps, as well as the Prior Maps, using three different measures of compactness: Reock, Polsby-Popper, and MAGiK. Mr. Trende claims that "the commission subverted compactness to the goal of drawing districts with particular racial characteristics in mind" (p.50). He seeks to demonstrate this claim by showing that there is a statistically significant relationship between the BVAP of the districts and their compactness scores.

56. Mr. Trende uses a statistical analysis to show that there is a negative correlation between BVAP and compactness: "But rather than relying on what we see with our eyes, we can more rigorously examine how compactness was sacrificed for race by conducting a simple regression analysis." (p.60) For each map, he estimates three regressions. In each regression the dependent variable is the BVAP of the district, and the independent variable is a compactness measure.[15]

57. Mr. Trende incorrectly interprets the statistical significance of the correlations he estimates in his regressions. Describing the results of Table 11, the estimates for the Prior House Districts, he writes: "Under the Prior Map, we lack sufficient evidence to support a claim that there is a relationship between the BVAP and any of the three metrics." (p.61) This is incorrect. Mr. Trende estimates a p-value of 0.048 for the regression using the MAGiK compactness measure. As Mr. Trende explains in this section, a p-value between .01 and 0.05 is "strong evidence against the null hypothesis" (p.61). Thus, he finds a statistically significant relationship between BVAP and MAGiK under the Prior House map. Describing the results in Table 14, the estimates for the Hickory Map districts in the Detroit area, he writes "when we look at the Hickory Plan districts in the Detroit area, all three metrics are statistically significant." (p.62). However, the p-value for the Polsby-Popper regression is 0.139, which is not statistically significant.

58. Mr. Trende's comparisons of the relationship between BVAP and compactness in the Prior Maps and the Commission Maps, both statewide and in the Detroit area, fail to show any evidence of racial predominance. All four analyses of the Prior Maps show a statistically significant relationship between BVAP and lack of compactness for at least one of the three measures Mr. Trende examines. Mr. Trende even finds that "the

[15]The choice of making BVAP the dependent variable, rather than the independent variable is odd, as it makes more sense to think of BVAP as an explanatory or predictive variable of the district's compactness. However, for the purpose of estimating only if the correlation is statistically significant, it does not matter.

Linden plan is more compact, at least in the Detroit area, than the Benchmark Plan" (p.106)

59. Finally, Mr. Trende's redistricting simulations, discussed below, demonstrate that a relationship between BVAP and lower compactness scores is not evidence of racial predominance at all. Using Mr. Trende's race-neutral simulations, I randomly selected 100 simulated maps from the House and Senate simulations and calculated the Polsby-Popper and Reock scores for each district.[16] I then ran regressions estimating the correlation between BVAP and each compactness score. As reported in Table 4, I find a negative and statistically significant relationship between BVAP and both compactness measures for both the House and the Senate. As these simulations are necessarily race-neutral, this relationship cannot be generated by any racial intent. If such a relationship occurs in race neutral maps, then its existence in the Hickory and Linden plans, to the extent Mr. Trende finds such relationships, cannot be attributed to racial predominance.

Table 4: Relationship Between BVAP and Compactness Using Trende's Simulated Plans

	House		Senate	
	Polsby-Popper	Reock	Polsby-Popper	Reock
BVAP	-0.054***	-0.021***	-0.171***	-0.053***
	(0.005)	(0.006)	(0.011)	(0.012)
Num.Obs.	5200	5200	1900	1900

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001
Each model includes plan-level fixed effects.

County Splits

60. Mr. Trende calculates the number of county splits in the Hickory and Linden plans, and compares them to the splits under the Prior Maps. He finds that there are significantly more county splits under the Hickory and Linden plans than the Prior Maps. However, this is exactly what we should expect to see if the Prior Maps were partisan gerrymanders. As Jeff Timmer, one of the map drawers in the 2011 cycle, explained in an interview, "Relying on county and city or township geography, keeping those intact, helps Republicans."

61. Furthermore, the Michigan Constitution subordinates county splits to other redistricting criteria, including equal population, contiguity, diversity and communities of interest, partisan fairness, and incumbency.[17]

[16] I used Mr. Trende's second set of simulations, which do not restrict county splits. However, this relationship also holds in his other two simulations for each chamber.

[17] Michigan Constitution, Article 4, Section 6.

Core Retention

62. Mr. Trende also examines core retention in the Hickory and Linden plans. As Mr. Trende notes, core retention is "not listed among the Michigan criterion" (p.106). Mr. Trende only reports statistical results for his analysis of core retention for the Linden map, because he finds, in an unreported analysis, "insufficient evidence to conclude that the Hickory Map subordinates this concern to racial factors." (p.106) For the Linden Map, Mr. Trende finds a statistically significant correlation between increased BVAP in a district and lower core retention. While this analysis demonstrates that districts with higher BVAP were changed more than districts with lower BVAP relative to the Prior Map, this is entirely consistent with undoing a previous racial gerrymander. As Jeff Timmer, one of the map drawers in the 2011 cycle, explained in an interview, "The other thing that helped Republicans was the Voting Rights Act packing those districts, those majority minority districts, into cities like Detroit." If the MICRC prioritized core preservation in high BVAP districts, then it would be preserving this prior gerrymander.

Simulation Analysis

63. Mr. Trende conducts a simulation analysis for both the Hickory and Linden Plans, and claims that the simulations reveal evidence of racial predominance in the drawing of both maps. However, the simulations do not show that race was the predominant factor in the drawing the maps. These simulations fail to consider, among other things, the role of partisan fairness in drawing the Hickory and Linden Plans.

64. Redistricting simulations create an ensemble of maps that are supposed to represent the distribution of maps that comply with a set of redistricting criteria. The analyst can choose what constraints to include in the simulations, including population equality, compactness, or county or other geographic splits. If the constraints in the simulations accurately reflect the constraints of the actual map-drawers, then the simulations can produce a set of maps that could plausibly have been produced through the actual map drawing process. By comparing various statistics from the simulations to the enacted map, we can see if the enacted map systematically deviates from the ensemble of plausible maps. However, if the constraints do not accurately reflect the map-drawing process, then differences between the enacted map and the simulations will not be informative.

65. Mr. Trende runs three sets of simulations for each plan, with different constraints in each. In his first simulation, Mr. Trende includes a constraint that seeks to minimize the number of county splits. As is clear from the enacted map, minimizing county splits in the Wayne County area was not one of the MICRC's commissions goals, and, as discussed above, minimizing splits in Wayne County serves to maintain the 2011 partisan gerrymander. In his second simulation, Mr. Trende removes this county split constraint. In his third simulation, Mr. Trende adds a constraint that seeks to reduce splitting communities of interest (COIs). However, this constraint is extremely limited,

because he defines a COI only as any city or town that is *not split* in the enacted plans, and prevents these places from being split in his simulations. There are X such places in the Hickory Map, and Y such places in the Linden Map. However, this does not account for COIs within larger places (such as Detroit), or COIs that might span multiple municipalities.

66. Mr. Trende analyzes his simulations by looking at two different statistical measures: deviations in the distribution of BVAP, and deviations in the distribution of Democratic vote share, as defined by the results of the 2020 presidential election. He calculates a "gerrymandering index," which other scholars have used to measure partisan gerrymandering. I am not aware of other academics or experts using this index to measure racial gerrymandering.

67. Mr. Trende provides several graphs of the deviations, but does not present the statistics that he calculates (the sum of squared deviations) for all of his simulations. I present these results, based on replicating Mr. Trende's simulations, in Table 5. The fourth column in this table shows the sum of squared deviations for the enacted plans, which Mr. Trende calls the "gerrymandering index." It is important to note that the values of the statistics for BVAP and Democratic vote share cannot be directly compared; these statistics are measured relative to the deviations in each simulation. In the fifth column, I use the deviations of the enacted plans and the simulated plans to calculate another statistics, the percentage of simulations with deviations higher than the deviations in the enacted plans. If the enacted plans were to look like the simulated plans, this value would be close to 0.5. If the enacted plans deviate significantly from the simulated plans, this value would be close to 0 or close to 1.

68. This table reveals two important features of the simulation results. First, as Mr. Trende's constraints become closer to the actual practices of the MICRC (removing the county split constraint, respecting communities of interest), the deviation statistic decreases. In other words, the enacted maps, while still systematically

Table 5: Sum of Squared Deviations for Trende Simulations

Metric	Chamber	Constraints	Sum Sq. Dev.	% Sims. w/ Higher SSD
BVAP	House	County	0.707	0.000%
		None	0.634	0.000%
		COI	0.610	0.000%
	Senate	County	0.448	0.000%
		None	0.326	0.014%
		COI	0.346	0.022%
Dem Vote	House	County	0.242	0.000%
		None	0.220	0.000%
		COI	0.232	0.000%
	Senate	County	0.205	0.000%
		None	0.184	0.138%
		COI	0.177	0.052%

different from the simulated maps, look *closer* to the simulated maps as the simulation constraints become more realistic. It is likely that improving these constraints may further reduce the calculated deviations.

69. Second, Table 5 shows that the enacted maps differ from the simulated maps on both race and party. Mr. Trende dismisses the significance of the partisanship deviations because they are smaller than the racial deviations. As I explain above, the relative size of the deviations for race and party are not a useful comparison. Furthermore, the results are statistically significant for both measures; in all of the simulations for the House, and one of the three simulations for the Senate, the deviations for race and party are both large and significantly outside of the range of simulated deviations. Given the correlation between race and party in Michigan, we can't separate out the role of both factors in drawing the maps from this simulation analysis.

70. Additionally, the MICRC prioritized partisan fairness when drawing the enacted maps. Dr. Handley highlighted three tests for partisan fairness, the Lopsided Margins Test, the Mean-Median Difference, and the Efficiency Gap. Mr. Trende's simulations do not constrain for partisan fairness. Doing so likely requires running simulation for the entire state, rather than just the area examined by Mr. Trende, as these measures require the full set of districts rather than a subset to calculate. These constraints may have a substantial impact on the racial and partisan deviations measured in the simulations.

Qualitative Analysis

71. Finally, Mr. Trende's qualitative assessment of racial predominance in the Hickory plan is minimal, comprising only about 2 pages of text (and 4 maps) of the 120 pages in his report for the Hickory Plan. In this section, Trende comments on the number of county splits and the shapes of the districts (which is largely duplicative of his quantitative analysis to follow). While he briefly comments on the communities in HD 1, HD 8, HD 10, and HD 26 (one sentence on each), he does not provide any analysis of the communities of interest in the other challenged House districts. Mr. Trende also suggests that race predominated in the drawing of HD 7 and HD 5; neither district is challenged in this litigation, despite Mr. Trende describing HD 5 as "perhaps the most egregious district on the map." (p48)

72. Similarly, Mr. Trende conducts a minimal qualitative assessment of the Linden plan, confined primarily to comments on how districts cross county lines. Mr. Trende makes no mention at all of two of the challenged districts, SD 10 and SD 11.

Trende's Demonstration Plans

73. Mr. Trende's demonstration plans have ten majority-Black districts in the House, and five in the Senate. Using the logic of Mr. Trende's simulation analysis, both demonstration maps are extreme outliers with extremely large sums of squared deviations. Using the simulations without any county or COI constraints, less than 1% of the House simulations produced a map with ten majority-Black districts, and only 2% produced a map with 9 majority-Black districts. Similarly, none of the Senate simulations produced a map with five majority-Black districts, and less than 1% produced a map with four majority-Black districts.

74. Mr. Trende's House map also fails his own compactness test for predominance. There is a statistically significant negative correlations between BVAP and the Polsby-Popper compactness measure for the House plan.

75. The only statewide primary election available for analyzing racially polarized voting is the 2018 primary for Governor. In Wayne County, Mr. Trende finds that voting is racially polarized, with Gretchen Whitmer the White-preferred candidate and Shri Thanedar the Black-preferred candidate. Mr. Trende criticizes the Hickory Map for having zero districts won by Thanedar, while the Prior Map has four. However, Mr. Trende's demonstration map has only two districts that would be won by Thanedar; the other eight Black-majority districts would be won by Whitmer or El-Sayad.

76. Additionally, Mr. Trende fails to do any analysis of the performance of the new majority-Black districts under his demonstration maps. He does not provide any evidence that these districts will elect Black-preferred candidates in Democratic primaries. He also does not provide any evidence that Black voters in neighboring districts, which are also affected by this map, will not have their ability to elect Black-preferred candidates reduced.

I reserve the right to supplement my report in this case in light of additional facts, testimony, and/or materials that may come to light.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Maxwell Palmer

Executed this 8th day of March, 2023, at Arlington, Massachusetts.

Table 6: RPV Analyses for 2018 Gubernatorial Primary in Prior House Districts

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
HD 1	Thanedar Whitmer	46.1% 36.4%	(40.6%, 52.2%) (30.1%, 42.3%)	97.27%	CoC	Whitmer El-Sayed	59.9% 35.0%	(52.1%, 67.4%) (27.4%, 42.5%)	99.94%	CoC	Polarized
HD 2	Thanedar Whitmer	50.4% 32.3%	(46.3%, 54.1%) (27.7%, 36.7%)	100.00%	CoC	Whitmer El-Sayed	59.3% 37.7%	(53.5%, 65.2%) (31.9%, 43.3%)	100.00%	CoC	Polarized
HD 3	Whitmer Thanedar	41.3% 39.8%	(33.5%, 47.7%) (34.4%, 44.9%)	61.31%	No CoC	El-Sayed Whitmer	44.2% 31.7%	(19.4%, 69.3%) (11.5%, 58.2%)	70.90%	No CoC	No CoCs
HD 4	Thanedar Whitmer	50.0% 35.5%	(44.4%, 55.5%) (29.6%, 40.7%)	99.96%	CoC	El-Sayed Whitmer	78.2% 14.1%	(67.6%, 86.3%) (7.5%, 22.9%)	100.00%	CoC	Polarized
HD 5	Thanedar Whitmer	50.8% 34.4%	(47.5%, 54.0%) (31.1%, 37.9%)	100.00%	CoC	El-Sayed Whitmer	58.9% 22.6%	(36.5%, 77.0%) (8.9%, 41.6%)	96.72%	CoC	Polarized
HD 6	Thanedar Whitmer	40.8% 35.9%	(36.3%, 45.6%) (30.2%, 41.6%)	86.96%	No CoC	El-Sayed Whitmer	52.3% 31.8%	(35.3%, 69.0%) (15.8%, 49.3%)	89.38%	No CoC	No CoCs
HD 7	Thanedar Whitmer	42.9% 37.3%	(39.0%, 46.8%) (33.7%, 40.4%)	95.33%	CoC	Thanedar Whitmer	34.8% 34.5%	(11.5%, 59.5%) (14.4%, 60.9%)	51.54%	No CoC	No White CoC
HD 8	Whitmer Thanedar	40.5% 38.1%	(37.5%, 43.2%) (35.3%, 41.1%)	81.51%	No CoC	El-Sayed Thanedar	38.4% 32.6%	(18.7%, 60.0%) (13.3%, 58.4%)	63.91%	No CoC	No CoCs
HD 9	Thanedar Whitmer	50.1% 38.3%	(46.7%, 53.3%) (34.7%, 41.8%)	100.00%	CoC	El-Sayed Whitmer	73.5% 14.9%	(62.7%, 83.3%) (7.3%, 24.4%)	100.00%	CoC	Polarized
HD 10	Whitmer Thanedar	41.7% 39.2%	(37.0%, 46.1%) (35.3%, 42.9%)	75.20%	No CoC	Whitmer El-Sayed	54.3% 28.8%	(33.1%, 73.3%) (12.3%, 47.4%)	90.59%	No CoC	No CoCs
HD 11	Thanedar Whitmer	54.5% 29.8%	(44.1%, 65.5%) (18.9%, 41.5%)	99.14%	CoC	El-Sayed Whitmer	48.9% 45.0%	(37.2%, 61.1%) (32.3%, 57.3%)	60.77%	No CoC	No White CoC
HD 12	Whitmer Thanedar	43.8% 33.1%	(29.8%, 56.5%) (22.9%, 43.4%)	83.47%	No CoC	Whitmer El-Sayed	65.9% 19.2%	(49.4%, 80.3%) (9.1%, 32.7%)	99.91%	CoC	No Black CoC
HD 13	Whitmer El-Sayed	42.1% 34.6%	(18.4%, 66.5%) (15.1%, 57.1%)	62.22%	No CoC	Whitmer El-Sayed	55.2% 37.7%	(41.9%, 68.2%) (25.8%, 50.8%)	90.05%	No CoC	No CoCs

HD 14	Whitmer El-Sayed	42.8% 40.5%	(19.1%, 68.6%) (16.6%, 65.2%)	53.97%	No CoC	Whitmer El-Sayed	63.7% 28.6%	(53.7%, 73.0%) (19.5%, 38.6%)	100.00%	CoC	No Black CoC
HD 15	Whitmer El-Sayed	45.5% 37.0%	(22.7%, 68.0%) (15.6%, 60.7%)	64.81%	No CoC	El-Sayed Whitmer	65.7% 31.8%	(60.7%, 70.8%) (26.7%, 36.8%)	100.00%	CoC	No Black CoC
HD 16	Whitmer Thanedar	37.2% 35.0%	(15.4%, 63.5%) (15.2%, 57.5%)	52.93%	No CoC	Whitmer El-Sayed	74.6% 14.0%	(63.9%, 83.8%) (6.7%, 22.9%)	100.00%	CoC	No Black CoC
HD 17	Whitmer El-Sayed	49.2% 25.8%	(21.9%, 71.1%) (6.9%, 48.5%)	86.10%	No CoC	Whitmer El-Sayed	72.3% 17.9%	(57.5%, 85.1%) (6.6%, 30.6%)	100.00%	CoC	No Black CoC
HD 19	Whitmer El-Sayed	47.2% 28.3%	(23.0%, 70.9%) (9.6%, 51.8%)	80.22%	No CoC	Whitmer El-Sayed	77.4% 19.3%	(69.2%, 84.5%) (12.3%, 27.8%)	100.00%	CoC	No Black CoC
HD 20	El-Sayed Whitmer	43.0% 35.2%	(17.2%, 69.4%) (13.2%, 61.4%)	61.90%	No CoC	Whitmer El-Sayed	69.7% 27.0%	(63.9%, 75.6%) (21.0%, 33.1%)	100.00%	CoC	No Black CoC
HD 21	Whitmer Thanedar	51.9% 24.1%	(29.5%, 70.0%) (11.7%, 39.1%)	95.13%	CoC	Whitmer El-Sayed	76.7% 15.4%	(61.1%, 86.6%) (7.2%, 28.6%)	100.00%	CoC	Same CoC
HD 23	Whitmer El-Sayed	51.2% 29.4%	(22.2%, 77.4%) (10.1%, 55.6%)	80.32%	No CoC	Whitmer El-Sayed	78.7% 16.1%	(70.9%, 84.7%) (10.7%, 23.2%)	100.00%	CoC	No Black CoC

Table 7: RPV Analyses for 2018 Gubernatorial Primary in Prior Senate Districts

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
SD 1	Thanedar Whitmer	43.5% 33.8%	(40.9%, 46.1%) (30.9%, 36.7%)	100.00%	CoC	Whitmer El-Sayed	66.3% 27.8%	(60.4%, 72.1%) (21.7%, 33.6%)	100.00%	CoC	Polarized
SD 2	Thanedar Whitmer	49.6% 38.6%	(46.8%, 52.2%) (35.9%, 41.3%)	100.00%	CoC	Whitmer El-Sayed	53.1% 43.1%	(48.9%, 57.2%) (38.8%, 47.2%)	99.38%	CoC	Polarized
SD 3	Thanedar Whitmer	51.6% 37.7%	(49.6%, 53.7%) (35.5%, 40.1%)	100.00%	CoC	El-Sayed Whitmer	66.6% 29.7%	(63.5%, 70.0%) (26.5%, 32.9%)	100.00%	CoC	Polarized
SD 4	Thanedar Whitmer	41.9% 37.2%	(40.0%, 43.7%) (35.1%, 39.2%)	99.75%	CoC	Whitmer El-Sayed	72.8% 19.6%	(64.6%, 80.1%) (12.6%, 28.2%)	100.00%	CoC	Polarized
SD 5	Thanedar Whitmer	40.4% 39.2%	(38.7%, 42.0%) (37.1%, 41.3%)	78.03%	No CoC	El-Sayed Whitmer	49.9% 44.1%	(40.6%, 58.1%) (35.6%, 52.7%)	75.27%	No CoC	No CoCs
SD 6	Thanedar Whitmer	38.9% 37.7%	(28.9%, 48.8%) (25.9%, 49.5%)	53.70%	No CoC	Whitmer El-Sayed	76.6% 14.5%	(70.1%, 82.2%) (9.7%, 20.5%)	100.00%	CoC	No Black CoC
SD 7	El-Sayed Thanedar	35.8% 34.3%	(15.6%, 56.9%) (18.5%, 55.3%)	53.59%	No CoC	Whitmer El-Sayed	74.5% 22.5%	(69.2%, 79.1%) (17.5%, 28.1%)	100.00%	CoC	No Black CoC

Table 8: RPV Analyses for Prior House Districts, 2014

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
HD 1	Banks*	68.5%	(60.7%, 75.3%)	100.00%	CoC	Thompson	54.6%	(45.9%, 62.2%)	100.00%	CoC	Polarized
	Thompson	21.1%	(14.1%, 29.0%)			Koester	23.7%	(18.5%, 29.1%)			
HD 2	Talabi*	93.2%	(90.9%, 95.2%)	100.00%	CoC	Casazza	78.2%	(69.1%, 85.8%)	100.00%	CoC	Polarized
	Casazza	3.7%	(2.2%, 5.5%)			Talabi*	16.4%	(8.5%, 25.8%)			
HD 3	Byrd*	31.0%	(26.0%, 35.9%)	99.03%	CoC	Gayles	31.0%	(15.9%, 45.5%)	88.96%	No CoC	No White CoC
	Gayles	20.7%	(15.3%, 26.2%)			Pinkins	18.1%	(7.8%, 29.4%)			
HD 4	Robinson*	93.5%	(90.7%, 95.8%)	100.00%	CoC	Robinson*	74.5%	(56.4%, 87.6%)	99.47%	CoC	Same CoC
	Hassan	6.5%	(4.2%, 9.3%)			Hassan	25.5%	(12.4%, 43.6%)			
HD 5	Durhal*	57.2%	(53.2%, 61.2%)	100.00%	CoC	Durhal*	31.6%	(16.4%, 47.8%)	67.36%	No CoC	No White CoC
	Johnson	32.9%	(29.0%, 36.9%)			Johnson	25.3%	(12.6%, 39.9%)			
HD 6	Chang*	51.9%	(45.3%, 57.8%)	97.99%	CoC	Chang*	53.3%	(35.9%, 68.7%)	98.51%	CoC	Same CoC
	Carter	39.2%	(34.0%, 44.9%)			Carter	21.3%	(10.1%, 34.2%)			
HD 7	Garrett*	41.4%	(38.2%, 44.2%)	90.42%	No CoC	Cole	22.3%	(10.2%, 38.0%)	59.52%	No CoC	No CoCs
	Stallworth	38.2%	(35.4%, 40.8%)			Garrett*	19.9%	(8.5%, 34.9%)			
HD 8	Gay-Dagnogo*	54.0%	(50.2%, 57.7%)	100.00%	CoC	Pugh	33.1%	(16.3%, 50.7%)	60.29%	No CoC	No White CoC
	Pugh	28.3%	(24.6%, 32.1%)			Gay-Dagnogo*	28.9%	(13.8%, 46.3%)			
HD 9	Santana*	85.6%	(81.9%, 89.4%)	100.00%	CoC	Berry	55.5%	(35.8%, 74.7%)	70.20%	No CoC	No White CoC
	Berry	14.4%	(10.6%, 18.1%)			Santana*	44.5%	(25.3%, 64.2%)			
HD 10	Love*	45.8%	(42.7%, 49.0%)	100.00%	CoC	Johnson	69.6%	(57.9%, 79.7%)	100.00%	CoC	Polarized
	McCalister	35.5%	(32.6%, 38.4%)			Love*	10.9%	(4.4%, 18.8%)			

* indicates the winning candidate.

Table 9: RPV Analyses for Prior House Districts, 2016

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
HD 1	Banks*	75.2%	(69.4%, 80.6%)	100.00%	CoC	Sossi	81.6%	(74.9%, 87.2%)	100.00%	CoC	Polarized
	Youson	10.3%	(7.3%, 13.4%)			Banks*	9.4%	(4.2%, 15.7%)			
HD 2	Scott*	42.6%	(39.1%, 46.2%)	99.99%	CoC	Henner	59.3%	(53.2%, 65.3%)	100.00%	CoC	Polarized
	Tinsley-Smith	31.9%	(28.2%, 35.6%)			Tate	18.6%	(13.0%, 24.4%)			
HD 3	Byrd*	53.3%	(47.4%, 59.0%)	100.00%	CoC	Byrd*	35.3%	(15.2%, 53.9%)	72.32%	No CoC	No White CoC
	Williams	18.8%	(13.8%, 23.3%)			Williams	24.8%	(10.3%, 42.7%)			
HD 4	Robinson*	64.7%	(60.6%, 68.9%)	100.00%	CoC	Robinson*	43.1%	(26.1%, 58.5%)	96.50%	CoC	Same CoC
	Jones	22.6%	(19.1%, 26.2%)			Jones	18.8%	(8.9%, 30.9%)			
HD 5	Durhal*	59.5%	(55.6%, 63.7%)	100.00%	CoC	Johnson	52.4%	(28.5%, 75.2%)	58.26%	No CoC	No White CoC
	Johnson	40.5%	(36.3%, 44.4%)			Durhal*	47.6%	(24.8%, 71.5%)			
HD 6	Chang*	79.9%	(77.1%, 82.5%)	100.00%	CoC	Chang*	54.1%	(35.8%, 69.2%)	99.98%	CoC	Same CoC
	Black	7.0%	(5.5%, 8.6%)			Jackson	10.7%	(4.9%, 18.0%)			
HD 7	Garrett*	93.7%	(91.0%, 95.8%)	100.00%	CoC	Garrett*	60.0%	(33.3%, 82.8%)	78.26%	No CoC	No White CoC
	Thompson	6.3%	(4.2%, 9.0%)			Thompson	40.0%	(17.2%, 66.7%)			
HD 9	Santana*	54.1%	(50.8%, 57.2%)	100.00%	CoC	Pollard	38.6%	(26.3%, 50.4%)	93.93%	No CoC	No White CoC
	Pollard	33.8%	(30.8%, 36.6%)			Santana*	17.8%	(6.7%, 34.1%)			
HD 10	Love*	83.9%	(79.0%, 88.4%)	100.00%	CoC	Love*	51.8%	(32.5%, 69.7%)	91.39%	No CoC	No White CoC
	Cavanagh	11.6%	(7.2%, 16.7%)			Cavanagh	28.4%	(14.3%, 44.6%)			

* indicates the winning candidate.

Table 10: RPV Analyses for Prior House Districts, 2018

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
HD 1	Yancey* Maloy	93.9% 6.1%	(90.3%, 96.7%) (3.3%, 9.7%)	100.00%	CoC	Yancey* Maloy	79.5% 20.5%	(70.7%, 86.4%) (13.6%, 29.3%)	100.00%	CoC	Same CoC
HD 2	Tinsley-Smith Banks	23.6% 21.6%	(20.1%, 27.0%) (18.8%, 24.2%)	77.07%	No CoC	Tate* Johnson	68.0% 12.6%	(62.2%, 73.4%) (7.7%, 17.6%)	100.00%	CoC	No Black CoC
HD 3	Byrd* Cochran	69.3% 12.5%	(64.3%, 73.8%) (8.6%, 16.6%)	100.00%	CoC	Byrd* Cochran	36.3% 27.2%	(18.4%, 54.1%) (11.8%, 43.1%)	71.44%	No CoC	No White CoC
HD 4	Robinson* Jones	39.8% 13.0%	(36.7%, 43.0%) (11.1%, 15.0%)	100.00%	CoC	Almasmari Oberholtzer	40.2% 24.5%	(32.2%, 47.4%) (17.4%, 31.3%)	98.96%	CoC	Polarized
HD 5	Johnson* Ross	40.9% 37.4%	(38.0%, 43.9%) (34.4%, 40.4%)	90.38%	No CoC	Ross Johnson*	34.5% 22.3%	(17.7%, 52.1%) (10.1%, 37.5%)	79.36%	No CoC	No CoCs
HD 6	Carter* Wilson	35.5% 20.3%	(32.9%, 38.2%) (17.3%, 23.1%)	100.00%	CoC	Carter* Edevbie	28.9% 15.0%	(23.1%, 35.5%) (8.2%, 22.0%)	99.54%	CoC	Same CoC
HD 7	Garrett* Harvey-Quinn	92.1% 2.8%	(90.4%, 93.6%) (1.7%, 4.1%)	100.00%	CoC	Garrett* Harvey-Quinn	44.3% 19.3%	(19.8%, 65.5%) (7.4%, 37.5%)	89.66%	No CoC	No White CoC
HD 8	Gay-Dagnogo* Henry	76.0% 8.5%	(73.1%, 78.8%) (6.2%, 11.0%)	100.00%	CoC	Gay-Dagnogo* Henry	26.9% 23.7%	(12.3%, 44.3%) (11.0%, 39.1%)	58.73%	No CoC	No White CoC
HD 9	Whitsett* Pollard	59.9% 36.1%	(56.3%, 63.2%) (32.8%, 39.7%)	100.00%	CoC	Whitsett* Pollard	53.6% 32.8%	(40.7%, 65.9%) (21.7%, 44.4%)	95.82%	CoC	Same CoC
HD 10	Love* Barley	82.7% 11.8%	(79.4%, 85.9%) (9.1%, 14.7%)	100.00%	CoC	Love* Barley	58.8% 38.4%	(44.6%, 70.4%) (27.5%, 51.7%)	93.72%	No CoC	No White CoC
HD 11	Jones* Walker	90.0% 7.5%	(83.3%, 95.2%) (2.9%, 14.0%)	100.00%	CoC	Walker Jones*	61.9% 35.7%	(53.2%, 69.8%) (28.1%, 44.8%)	99.77%	CoC	Polarized

* indicates the winning candidate.

Table 11: RPV Analyses for Prior House Districts, 2020

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
HD 2	Tate* Harrell	66.4% 33.6%	(61.6%, 70.6%) (29.4%, 38.4%)	100.00%	CoC	Tate* Harrell	88.3% 11.7%	(82.9%, 92.8%) (7.2%, 17.1%)	100.00%	CoC	Same CoC
HD 3	Thanedar* McKinney	39.5% 19.4%	(36.2%, 43.2%) (16.1%, 22.6%)	100.00%	CoC	McKinney Thanedar*	26.9% 24.0%	(13.5%, 40.2%) (9.9%, 39.0%)	59.62%	No CoC	No White CoC
HD 4	Aiyash* Szczepkowski	22.6% 18.6%	(20.2%, 24.8%) (16.2%, 21.0%)	99.24%	CoC	Collins Simpson	69.6% 12.3%	(63.2%, 75.6%) (7.4%, 17.2%)	100.00%	CoC	Polarized
HD 5	Johnson* Ross	70.0% 27.1%	(66.9%, 73.1%) (24.2%, 30.0%)	100.00%	CoC	Johnson* Ross	57.3% 28.9%	(33.1%, 77.3%) (11.5%, 49.6%)	90.03%	No CoC	No White CoC
HD 6	Carter* Neal	75.3% 16.2%	(71.0%, 79.7%) (12.3%, 20.0%)	100.00%	CoC	Carter* Palmer	50.3% 26.2%	(34.7%, 66.3%) (15.3%, 39.0%)	96.99%	CoC	Same CoC
HD 7	Scott* Thornton	41.2% 19.0%	(38.8%, 43.4%) (16.8%, 21.0%)	100.00%	CoC	Scott* Thompson	21.6% 17.2%	(7.6%, 38.4%) (6.1%, 30.6%)	64.64%	No CoC	No White CoC
HD 8	Young* Davis	48.9% 32.3%	(46.2%, 51.3%) (29.3%, 34.8%)	100.00%	CoC	Young* Davis	35.3% 26.5%	(16.0%, 57.4%) (10.9%, 45.1%)	67.93%	No CoC	No White CoC
HD 9	Whitsett* Ogburn	48.9% 30.5%	(45.6%, 51.8%) (27.4%, 33.4%)	100.00%	CoC	Ogburn Whitsett*	37.1% 30.4%	(20.5%, 54.9%) (15.0%, 47.3%)	65.88%	No CoC	No White CoC
HD 10	Ruffin Harris	28.8% 24.7%	(26.2%, 31.2%) (22.0%, 27.3%)	97.67%	CoC	Cavanagh* Harris	61.8% 11.5%	(51.8%, 71.1%) (5.1%, 19.5%)	100.00%	CoC	Polarized

* indicates the winning candidate.

Table 12: RPV Analyses for Hickory House Districts, 2022

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
HD 1	Carter*	90.6%	(86.1%, 94.1%)	100.00%	CoC	Carter*	66.6%	(43.9%, 83.7%)	92.98%	No CoC	No White CoC
	Tobey	9.4%	(5.9%, 13.9%)			Tobey	33.4%	(16.3%, 56.1%)			
HD 3	Farhat*	69.6%	(60.8%, 78.1%)	100.00%	CoC	Farhat*	61.3%	(53.2%, 69.2%)	99.98%	CoC	Same CoC
	Othman	18.2%	(11.1%, 26.4%)			Luqman	29.6%	(21.5%, 37.7%)			
HD 4	Whitsett*	65.9%	(63.0%, 69.0%)	100.00%	CoC	Tarraf	81.0%	(70.4%, 89.7%)	100.00%	CoC	Polarized
	Turner	32.3%	(29.1%, 35.2%)			Whitsett*	12.2%	(4.7%, 22.0%)			
HD 5	Davis	62.4%	(58.9%, 65.5%)	100.00%	CoC	Price*	63.1%	(57.1%, 69.1%)	100.00%	CoC	Polarized
	Hughes	15.6%	(13.2%, 17.9%)			Wooddell	22.5%	(17.8%, 27.4%)			
HD 6	Weiss*	46.1%	(41.8%, 50.1%)	100.00%	CoC	Weiss*	91.5%	(88.8%, 93.7%)	100.00%	CoC	Same CoC
	Hall	25.9%	(22.7%, 28.9%)			Jones	3.8%	(2.1%, 5.9%)			
HD 7	Scott*	90.4%	(86.9%, 93.3%)	100.00%	CoC	Macey	62.6%	(57.6%, 67.7%)	100.00%	CoC	Polarized
	Macey	7.3%	(4.5%, 11.0%)			Scott*	33.7%	(28.2%, 38.8%)			
HD 8	Little	34.5%	(29.9%, 39.3%)	62.34%	No CoC	McFall*	54.0%	(43.8%, 62.0%)	99.30%	CoC	No Black CoC
	Douglas	33.2%	(28.0%, 38.5%)			Soltis	29.8%	(23.5%, 37.4%)			
HD 9	Aiyash*	49.6%	(43.7%, 55.5%)	100.00%	CoC	Aiyash*	69.1%	(50.5%, 82.7%)	99.99%	CoC	Same CoC
	Gardner	28.7%	(24.5%, 32.9%)			Gardner	10.8%	(4.2%, 21.5%)			
HD 10	Tate*	88.1%	(81.9%, 92.9%)	100.00%	CoC	Tate*	93.3%	(89.8%, 96.2%)	100.00%	CoC	Same CoC
	Mua	11.9%	(7.1%, 18.1%)			Mua	6.7%	(3.8%, 10.2%)			
HD 11	Williams	23.9%	(19.2%, 28.8%)	64.74%	No CoC	Paiz*	31.2%	(24.1%, 37.6%)	97.68%	CoC	No Black CoC
	White	22.4%	(17.4%, 27.7%)			Manwell	20.9%	(14.9%, 26.7%)			
HD 12	Edwards*	80.8%	(69.5%, 90.1%)	100.00%	CoC	Steenland	62.8%	(38.5%, 84.0%)	84.25%	No CoC	No White CoC
	Steenland	19.2%	(9.9%, 30.5%)			Edwards*	37.2%	(16.0%, 61.5%)			
HD 13	Stone*	50.2%	(38.8%, 60.6%)	51.87%	No CoC	Stone*	87.3%	(77.3%, 94.7%)	100.00%	CoC	No Black CoC
	Miller	49.8%	(39.4%, 61.2%)			Miller	12.7%	(5.3%, 22.7%)			
HD 14	McKinney*	85.1%	(79.4%, 90.2%)	100.00%	CoC	McKinney*	44.4%	(25.7%, 63.0%)	68.92%	No CoC	No White CoC
	Lodovisi	10.1%	(5.7%, 15.7%)			Lodovisi	35.5%	(18.9%, 52.6%)			
HD 16	Young*	94.5%	(92.4%, 96.3%)	100.00%	CoC	Young*	92.8%	(87.8%, 96.5%)	100.00%	CoC	Same CoC
	Terry	5.5%	(3.7%, 7.6%)			Terry	7.2%	(3.5%, 12.2%)			
HD 18	Hoskins*	53.6%	(47.2%, 59.6%)	87.40%	No CoC	Hoskins*	67.6%	(48.7%, 83.6%)	96.65%	CoC	No Black CoC
	Jackson	46.4%	(40.4%, 52.8%)			Jackson	32.4%	(16.4%, 51.3%)			
HD 26	Chisholm	54.4%	(47.6%, 61.6%)	100.00%	CoC	Wegela*	79.2%	(71.4%, 86.7%)	100.00%	CoC	Polarized
	Wilson	29.3%	(21.8%, 35.4%)			Wilson	9.3%	(4.0%, 15.9%)			

* indicates the winning candidate.

Table 13: RPV Analyses for Prior Senate Districts, 2014

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
SD 2	Johnson*	66.2%	(62.3%, 69.5%)	100.00%	CoC	Johnson*	74.1%	(69.2%, 78.7%)	100.00%	CoC	Same CoC
	Olumba	23.2%	(20.2%, 26.5%)			Olumba	14.5%	(10.7%, 19.0%)			
SD 4	Smith*	64.9%	(62.4%, 67.3%)	100.00%	CoC	Tlaib	54.9%	(44.8%, 64.9%)	99.55%	CoC	Polarized
	Tlaib	33.0%	(30.5%, 35.4%)			Smith*	31.4%	(22.4%, 40.5%)			
SD 5	Jackson	35.6%	(34.6%, 36.8%)	100.00%	CoC	Knezek*	85.7%	(82.9%, 88.2%)	100.00%	CoC	Polarized
	Nathan	30.6%	(29.6%, 31.6%)			O'Connor	3.5%	(2.3%, 4.9%)			
SD 11	Gregory*	62.3%	(57.7%, 66.7%)	100.00%	CoC	Lipton	44.1%	(38.3%, 49.4%)	55.91%	No CoC	No White CoC
	Lipton	20.2%	(16.6%, 23.8%)			Barnett	43.3%	(36.8%, 49.9%)			

* indicates the winning candidate.

Table 14: RPV Analyses for Linden Senate Districts, 2022

District	Black Voters					White Voters					Result
	Cand.	Est.	95% CI	Pr(c1>c2)	Status	Cand.	Est.	95% CI	Pr(c1>c2)	Status	
SD 1	Sanders	43.9%	(41.7%, 46.1%)	100.00%	CoC	Liberati	46.7%	(42.9%, 51.0%)	83.58%	No CoC	No White CoC
	Geiss*	18.5%	(15.5%, 20.9%)			Geiss*	42.6%	(38.0%, 46.6%)			
SD 3	Chang*	80.9%	(77.6%, 84.1%)	100.00%	CoC	Chang*	93.6%	(91.4%, 95.7%)	100.00%	CoC	Same CoC
	Reeves	19.1%	(15.9%, 22.4%)			Reeves	6.4%	(4.3%, 8.6%)			
SD 6	Cavanagh*	48.5%	(44.9%, 52.1%)	99.86%	CoC	Barnett	49.7%	(43.9%, 55.5%)	73.40%	No CoC	No White CoC
	Brown	38.7%	(35.6%, 41.8%)			Cavanagh*	46.2%	(40.3%, 52.0%)			
SD 7	Moss*	91.6%	(88.9%, 93.8%)	100.00%	CoC	Moss*	93.6%	(91.0%, 95.7%)	100.00%	CoC	Same CoC
	Foster	8.4%	(6.2%, 11.1%)			Foster	6.4%	(4.3%, 9.0%)			
SD 8	Bullock	80.1%	(75.9%, 83.6%)	100.00%	CoC	McMorrow*	96.2%	(94.7%, 97.3%)	100.00%	CoC	Polarized
	McMorrow*	19.9%	(16.4%, 24.1%)			Bullock	3.8%	(2.7%, 5.3%)			
SD 11	Owens	54.7%	(43.0%, 66.3%)	78.47%	No CoC	Klinefelt*	80.2%	(74.1%, 86.0%)	100.00%	CoC	No Black CoC
	Klinefelt*	45.3%	(33.7%, 57.0%)			Owens	19.8%	(14.0%, 25.9%)			

* indicates the winning candidate.

Ecological Inference, 1st House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Brian Banks	23.87%	12.59%	36.24%
Paul Fillmore	9.51%	3.88%	16.07%
Corey J. Gilchrist	5.75%	2.38%	9.98%
Taryn Jones	5.37%	2.08%	9.84%
Michael Koester	25.89%	12.20%	39.95%
Harry Scott	3.61%	1.32%	6.86%
Rebecca Thompson	26.00%	13.12%	39.31%
Black			
Brian Banks	68.46%	60.66%	75.34%
Paul Fillmore	1.09%	0.52%	1.93%
Corey J. Gilchrist	1.09%	0.52%	1.82%
Taryn Jones	3.20%	1.63%	4.96%
Michael Koester	3.26%	1.34%	5.80%
Harry Scott	1.82%	1.06%	2.75%
Rebecca Thompson	21.07%	14.15%	29.02%
Hispanic			
Brian Banks	21.72%	10.43%	35.33%
Paul Fillmore	4.73%	2.05%	8.51%
Corey J. Gilchrist	3.67%	1.47%	6.94%
Taryn Jones	9.05%	4.26%	14.83%
Michael Koester	6.13%	2.61%	11.22%
Harry Scott	7.12%	3.52%	11.58%
Rebecca Thompson	47.58%	33.10%	61.06%
NH White			
Brian Banks	13.98%	6.99%	22.56%
Paul Fillmore	1.83%	0.62%	3.33%
Corey J. Gilchrist	1.61%	0.77%	2.71%
Taryn Jones	2.81%	1.30%	4.74%
Michael Koester	23.72%	18.55%	29.12%
Harry Scott	1.47%	0.72%	2.46%
Rebecca Thompson	54.58%	45.93%	62.20%

Ecological Inference, 2nd House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Andrew Casazza	32.51%	14.57%	52.32%
Bill Miller	20.24%	8.97%	33.17%
Alberta Tinsley Talabi	47.25%	28.43%	65.40%
Black			
Andrew Casazza	3.71%	2.25%	5.47%
Bill Miller	3.07%	1.73%	4.61%
Alberta Tinsley Talabi	93.22%	90.91%	95.23%
Hispanic			
Andrew Casazza	29.08%	11.62%	49.22%
Bill Miller	22.60%	10.60%	40.29%
Alberta Tinsley Talabi	48.32%	24.67%	69.82%
NH White			
Andrew Casazza	78.15%	69.10%	85.84%
Bill Miller	5.40%	2.71%	8.69%
Alberta Tinsley Talabi	16.45%	8.46%	25.80%

Ecological Inference, 3rd House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Wendell Byrd	15.67%	5.36%	29.26%
Jermaine Davis	8.11%	2.44%	16.07%
Clarence Gayles	13.29%	3.78%	28.29%
Melia Howard	11.21%	3.32%	22.43%
Steven Lett	19.18%	5.80%	33.90%
Simpson Vanessa	11.46%	3.71%	22.10%
Carron Pinkins	10.94%	2.88%	22.23%
Dorthea Thomas	10.14%	3.42%	19.79%
Black			
Wendell Byrd	30.97%	25.99%	35.94%
Jermaine Davis	2.44%	1.53%	3.66%
Clarence Gayles	20.72%	15.31%	26.19%
Melia Howard	2.82%	1.73%	4.24%
Steven Lett	12.51%	8.85%	16.60%
Simpson Vanessa	7.10%	4.73%	9.65%
Carron Pinkins	18.64%	14.08%	23.38%
Dorthea Thomas	4.80%	3.14%	6.78%
Hispanic			
Wendell Byrd	16.29%	6.67%	29.54%
Jermaine Davis	7.41%	2.45%	14.29%
Clarence Gayles	13.70%	3.17%	25.61%
Melia Howard	9.34%	3.15%	18.01%
Steven Lett	15.19%	4.90%	28.84%
Simpson Vanessa	11.51%	4.47%	20.81%
Carron Pinkins	14.22%	4.22%	27.49%
Dorthea Thomas	12.35%	4.97%	22.58%
NH White			
Wendell Byrd	16.57%	7.42%	27.09%
Jermaine Davis	3.88%	1.98%	6.57%
Clarence Gayles	30.97%	15.94%	45.47%
Melia Howard	4.37%	1.99%	8.05%
Steven Lett	11.90%	4.41%	21.04%
Simpson Vanessa	9.06%	4.26%	15.11%
Carron Pinkins	18.13%	7.79%	29.40%
Dorthea Thomas	5.11%	2.57%	9.03%

Ecological Inference, 4th House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Mohammed Hassan	28.13%	11.68%	50.88%
Rose Mary C. Robinson	71.87%	49.12%	88.32%
Black			
Mohammed Hassan	6.55%	4.23%	9.34%
Rose Mary C. Robinson	93.45%	90.66%	95.77%
Hispanic			
Mohammed Hassan	36.66%	17.90%	60.65%
Rose Mary C. Robinson	63.34%	39.35%	82.10%
NH White			
Mohammed Hassan	25.47%	12.40%	43.60%
Rose Mary C. Robinson	74.53%	56.40%	87.60%

Ecological Inference, 5th House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Ja'Meka Armstrong	13.33%	5.72%	22.86%
Fred Durhal	22.16%	9.92%	36.29%
Cynthia Johnson	27.90%	14.28%	41.91%
William Phillips	12.08%	4.78%	21.23%
Ishmael Terry	11.07%	4.00%	20.43%
Tonya Wells	13.47%	5.82%	22.86%
Black			
Ja'Meka Armstrong	1.60%	0.91%	2.45%
Fred Durhal	57.23%	53.20%	61.20%
Cynthia Johnson	32.94%	28.98%	36.87%
William Phillips	1.57%	0.92%	2.38%
Ishmael Terry	4.64%	2.95%	6.49%
Tonya Wells	2.01%	1.19%	2.97%
Hispanic			
Ja'Meka Armstrong	9.90%	4.93%	16.96%
Fred Durhal	34.32%	18.67%	51.67%
Cynthia Johnson	24.61%	12.03%	39.24%
William Phillips	8.58%	4.06%	14.75%
Ishmael Terry	11.90%	5.61%	20.18%
Tonya Wells	10.70%	5.37%	17.55%
NH White			
Ja'Meka Armstrong	7.25%	3.22%	12.72%
Fred Durhal	31.55%	16.37%	47.78%
Cynthia Johnson	25.34%	12.64%	39.94%
William Phillips	8.59%	4.31%	14.23%
Ishmael Terry	19.02%	9.38%	30.47%
Tonya Wells	8.25%	3.74%	14.29%

Ecological Inference, 6th House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Tyrone Carter	31.87%	20.74%	42.57%
Stephanie Chang	30.03%	17.94%	42.71%
Eze Ejelonu	5.18%	2.37%	8.44%
Elena Herrada	13.74%	7.36%	20.94%
Casondria Keith	8.08%	3.98%	12.58%
Patrick O'Connell	6.39%	3.20%	10.32%
Verl Pittman	4.72%	2.20%	7.75%
Black			
Tyrone Carter	39.20%	33.99%	44.91%
Stephanie Chang	51.91%	45.32%	57.76%
Eze Ejelonu	1.11%	0.61%	1.72%
Elena Herrada	3.56%	1.90%	5.52%
Casondria Keith	1.90%	1.10%	2.86%
Patrick O'Connell	1.51%	0.83%	2.31%
Verl Pittman	0.82%	0.39%	1.39%
Hispanic			
Tyrone Carter	23.48%	12.35%	37.16%
Stephanie Chang	39.17%	22.72%	55.37%
Eze Ejelonu	4.08%	1.94%	7.19%
Elena Herrada	16.28%	8.47%	25.73%
Casondria Keith	6.12%	2.80%	10.85%
Patrick O'Connell	7.21%	3.71%	11.87%
Verl Pittman	3.66%	1.71%	6.66%
NH White			
Tyrone Carter	21.27%	10.09%	34.17%
Stephanie Chang	53.33%	35.92%	68.75%
Eze Ejelonu	3.01%	1.41%	5.21%
Elena Herrada	11.20%	5.47%	19.24%
Casondria Keith	4.37%	2.06%	7.50%
Patrick O'Connell	4.32%	2.07%	7.29%
Verl Pittman	2.51%	1.10%	4.75%

Ecological Inference, 7th House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
James Cole	20.56%	6.14%	41.48%
LaTanya Garrett	21.87%	6.24%	43.28%
Nicole Stallworth	21.56%	6.13%	43.63%
Kurt Swanson	9.42%	2.93%	19.78%
Bernard Thompson	14.26%	3.11%	30.81%
Jeanette Williams	12.35%	2.82%	28.13%
Black			
James Cole	11.04%	8.03%	14.21%
LaTanya Garrett	41.40%	38.20%	44.19%
Nicole Stallworth	38.20%	35.38%	40.82%
Kurt Swanson	1.61%	1.04%	2.33%
Bernard Thompson	4.40%	3.16%	6.01%
Jeanette Williams	3.34%	2.26%	4.64%
Hispanic			
James Cole	21.44%	7.90%	37.41%
LaTanya Garrett	15.28%	4.05%	29.02%
Nicole Stallworth	15.14%	5.31%	31.87%
Kurt Swanson	13.54%	5.68%	22.64%
Bernard Thompson	15.24%	5.79%	27.78%
Jeanette Williams	19.37%	6.98%	33.13%
NH White			
James Cole	22.32%	10.16%	37.99%
LaTanya Garrett	19.93%	8.54%	34.87%
Nicole Stallworth	18.79%	8.07%	34.22%
Kurt Swanson	14.74%	7.56%	23.81%
Bernard Thompson	14.55%	5.70%	26.87%
Jeanette Williams	9.66%	3.77%	20.22%

Ecological Inference, 8th House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Sherry Gay-Dagnogo	19.82%	7.99%	31.92%
Mia Grillier	13.14%	5.43%	23.51%
Nichole Hampton	17.32%	7.61%	28.76%
Muhsin Muhammad	15.88%	6.68%	26.18%
Stacy Pugh	20.07%	8.45%	33.24%
Cyrus Wheeler	13.76%	5.86%	23.69%
Black			
Sherry Gay-Dagnogo	54.00%	50.21%	57.74%
Mia Grillier	3.76%	2.56%	5.21%
Nichole Hampton	5.15%	3.76%	6.80%
Muhsin Muhammad	7.52%	6.14%	8.90%
Stacy Pugh	28.32%	24.63%	32.12%
Cyrus Wheeler	1.24%	0.75%	1.82%
Hispanic			
Sherry Gay-Dagnogo	25.36%	12.46%	39.53%
Mia Grillier	12.65%	5.99%	21.04%
Nichole Hampton	15.15%	6.68%	24.64%
Muhsin Muhammad	11.48%	4.98%	18.87%
Stacy Pugh	28.29%	15.15%	43.24%
Cyrus Wheeler	7.08%	2.76%	12.42%
NH White			
Sherry Gay-Dagnogo	28.93%	13.82%	46.34%
Mia Grillier	11.50%	5.96%	19.40%
Nichole Hampton	10.37%	5.04%	18.08%
Muhsin Muhammad	11.49%	6.11%	18.39%
Stacy Pugh	33.11%	16.28%	50.74%
Cyrus Wheeler	4.61%	2.25%	7.83%

Ecological Inference, 9th House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Hussein Berry	61.05%	33.72%	83.87%
Harvey Santana	38.95%	16.13%	66.28%
Black			
Hussein Berry	14.43%	10.58%	18.13%
Harvey Santana	85.57%	81.87%	89.42%
Hispanic			
Hussein Berry	27.83%	11.15%	51.85%
Harvey Santana	72.17%	48.15%	88.85%
NH White			
Hussein Berry	55.53%	35.78%	74.66%
Harvey Santana	44.47%	25.34%	64.22%

Ecological Inference, 10th House District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Ronald Cole	10.35%	2.94%	20.60%
Brandon Jessup	20.81%	7.33%	40.41%
Jay Johnson	24.88%	8.09%	48.66%
Leslie Love	20.10%	5.55%	39.57%
Roy McCalister, Jr.	23.86%	7.70%	44.17%
Black			
Ronald Cole	1.99%	1.19%	2.87%
Brandon Jessup	10.61%	8.23%	12.94%
Jay Johnson	6.13%	3.49%	9.52%
Leslie Love	45.77%	42.67%	48.97%
Roy McCalister, Jr.	35.51%	32.60%	38.44%
Hispanic			
Ronald Cole	7.88%	3.38%	15.13%
Brandon Jessup	14.75%	5.44%	28.36%
Jay Johnson	41.27%	18.76%	61.41%
Leslie Love	18.36%	6.24%	36.91%
Roy McCalister, Jr.	17.74%	7.10%	33.41%
NH White			
Ronald Cole	4.31%	2.00%	7.36%
Brandon Jessup	8.60%	3.75%	15.27%
Jay Johnson	69.64%	57.90%	79.69%
Leslie Love	10.95%	4.37%	18.76%
Roy McCalister, Jr.	6.51%	2.67%	11.89%

Ecological Inference, 2nd Senate District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Bert Johnson	41.85%	27.02%	56.39%
Georgia Lemmons	19.29%	11.48%	29.28%
Taras Nykoriak	16.10%	9.95%	23.65%
John Olumba	22.76%	13.52%	33.24%
Black			
Bert Johnson	66.15%	62.31%	69.52%
Georgia Lemmons	8.66%	6.88%	10.67%
Taras Nykoriak	1.96%	1.38%	2.63%
John Olumba	23.23%	20.24%	26.50%
Hispanic			
Bert Johnson	34.11%	23.42%	45.01%
Georgia Lemmons	22.94%	15.44%	32.04%
Taras Nykoriak	17.41%	11.68%	24.18%
John Olumba	25.54%	16.87%	35.52%
NH White			
Bert Johnson	74.12%	69.18%	78.69%
Georgia Lemmons	7.13%	4.99%	9.72%
Taras Nykoriak	4.21%	2.90%	5.64%
John Olumba	14.53%	10.67%	19.04%

Ecological Inference, 4th Senate District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Virgil Smith	36.46%	13.10%	56.66%
Rashida Tlaib	39.12%	18.98%	60.51%
Howard Worthy	24.42%	11.32%	43.34%
Black			
Virgil Smith	64.88%	62.38%	67.33%
Rashida Tlaib	32.98%	30.51%	35.42%
Howard Worthy	2.14%	1.59%	2.77%
Hispanic			
Virgil Smith	31.14%	19.88%	44.09%
Rashida Tlaib	44.85%	30.18%	59.98%
Howard Worthy	24.01%	14.73%	36.36%
NH White			
Virgil Smith	31.35%	22.36%	40.47%
Rashida Tlaib	54.92%	44.79%	64.91%
Howard Worthy	13.72%	9.05%	18.94%

Ecological Inference, 5th Senate District Primary, 2014			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Shanelle Jackson	7.90%	3.11%	14.68%
David Knezek	50.54%	30.98%	66.81%
David Nathan	10.35%	4.62%	18.99%
Carrie O'Connor	14.45%	5.86%	26.39%
Thomas Stallworth	6.70%	2.98%	13.30%
Frank Tomcsik	10.06%	4.77%	17.50%
Black			
Shanelle Jackson	35.63%	34.55%	36.76%
David Knezek	7.51%	5.84%	9.13%
David Nathan	30.57%	29.58%	31.56%
Carrie O'Connor	1.61%	1.14%	2.18%
Thomas Stallworth	23.91%	23.07%	24.78%
Frank Tomcsik	0.77%	0.55%	1.00%
Hispanic			
Shanelle Jackson	6.18%	2.93%	11.28%
David Knezek	53.93%	29.79%	72.13%
David Nathan	6.58%	3.37%	11.35%
Carrie O'Connor	20.04%	8.75%	36.12%
Thomas Stallworth	5.78%	2.89%	10.67%
Frank Tomcsik	7.50%	3.65%	13.11%
NH White			
Shanelle Jackson	2.88%	1.88%	4.17%
David Knezek	85.72%	82.91%	88.19%
David Nathan	3.02%	1.91%	4.36%
Carrie O'Connor	3.46%	2.28%	4.88%
Thomas Stallworth	2.08%	1.32%	3.02%
Frank Tomcsik	2.84%	1.92%	3.77%

Ecological Inference, 11th Senate District Primary, 2014			
Party	**Estimate**	**Lower 95%**	**Upper 95%**
Asian			
Vicki Barnett	75.81%	65.40%	84.06%
Vincent Gregory	12.63%	7.47%	19.57%
Ellen Lipton	11.56%	6.82%	18.34%
Black			
Vicki Barnett	17.52%	13.45%	21.94%
Vincent Gregory	62.30%	57.67%	66.65%
Ellen Lipton	20.18%	16.57%	23.78%
Hispanic			
Vicki Barnett	35.98%	17.53%	54.33%
Vincent Gregory	26.26%	13.27%	43.57%
Ellen Lipton	37.76%	21.40%	58.71%
NH White			
Vicki Barnett	43.31%	36.82%	49.90%
Vincent Gregory	12.62%	8.33%	17.40%
Ellen Lipton	44.06%	38.34%	49.38%

Ecological Inference, 1st House District Primary, 2016			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Kameshea Amos	4.09%	1.22%	8.78%
Brian R. Banks	28.75%	10.18%	48.11%
Corey J. Gilchrist	9.82%	3.82%	18.34%
Keith Hollowell	12.76%	4.02%	26.56%
Pamela Sossi	37.54%	16.55%	59.26%
Washington Youson	7.03%	2.60%	14.04%
Black			
Kameshea Amos	2.72%	1.49%	4.13%
Brian R. Banks	75.21%	69.37%	80.60%
Corey J. Gilchrist	2.04%	0.96%	3.50%
Keith Hollowell	2.96%	1.74%	4.58%
Pamela Sossi	6.82%	2.45%	12.38%
Washington Youson	10.26%	7.28%	13.40%
Hispanic			
Kameshea Amos	5.83%	2.08%	11.75%
Brian R. Banks	35.86%	14.03%	56.46%
Corey J. Gilchrist	8.37%	2.91%	16.79%
Keith Hollowell	19.27%	7.90%	32.77%
Pamela Sossi	21.30%	7.57%	39.71%
Washington Youson	9.37%	3.03%	18.35%
NH White			
Kameshea Amos	1.78%	0.80%	3.01%
Brian R. Banks	9.39%	4.25%	15.67%
Corey J. Gilchrist	1.58%	0.79%	2.65%
Keith Hollowell	2.85%	1.25%	4.93%
Pamela Sossi	81.61%	74.93%	87.20%
Washington Youson	2.79%	1.23%	4.83%

Ecological Inference, 2nd House District Primary, 2016			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Willie Bell	25.26%	9.99%	43.12%
Jeremy Henner	11.05%	3.72%	22.24%
Angles Hunt	2.59%	0.91%	5.19%
E. Regina Jones	3.49%	1.39%	6.95%
Bettie Cook Scott	8.29%	2.77%	16.25%
Joe Tate	36.38%	17.76%	54.55%
Carla Tinsely-Smith	12.93%	4.03%	24.67%
Black			
Willie Bell	17.50%	13.52%	21.05%
Jeremy Henner	0.97%	0.54%	1.53%
Angles Hunt	1.44%	0.84%	2.13%
E. Regina Jones	2.30%	1.43%	3.27%
Bettie Cook Scott	42.60%	39.08%	46.23%
Joe Tate	3.32%	1.64%	5.34%
Carla Tinsely-Smith	31.88%	28.20%	35.56%
Hispanic			
Willie Bell	28.47%	11.41%	50.66%
Jeremy Henner	5.89%	2.35%	11.56%
Angles Hunt	4.79%	2.16%	8.97%
E. Regina Jones	5.18%	2.17%	9.94%
Bettie Cook Scott	5.25%	1.76%	15.29%
Joe Tate	25.69%	9.92%	44.67%
Carla Tinsely-Smith	24.72%	9.01%	42.66%
NH White			
Willie Bell	9.92%	4.83%	16.28%
Jeremy Henner	59.32%	53.22%	65.31%
Angles Hunt	1.71%	0.88%	2.77%
E. Regina Jones	1.64%	0.83%	2.70%
Bettie Cook Scott	3.92%	1.82%	6.88%
Joe Tate	18.58%	12.98%	24.43%
Carla Tinsely-Smith	4.90%	2.02%	8.87%

Ecological Inference, 3rd House District Primary, 2016			
Party	Estimate	Lower 95%	Upper 95%
Asian			
April Bonner-Archer	15.30%	5.77%	28.02%
Wendell Byrd	27.74%	10.94%	47.73%
Burgess Foster	10.52%	3.96%	19.70%
Donavan McKinney	20.66%	7.80%	35.81%
Damian Christian Mitchell	7.01%	2.58%	14.35%
Lee Qualls	7.44%	2.33%	14.84%
Al Williams	11.34%	3.34%	23.27%
Black			
April Bonner-Archer	6.12%	3.72%	8.95%
Wendell Byrd	53.33%	47.42%	59.01%
Burgess Foster	3.15%	1.74%	4.64%
Donavan McKinney	15.55%	12.55%	18.83%
Damian Christian Mitchell	1.89%	1.25%	2.63%
Lee Qualls	1.18%	0.65%	1.76%
Al Williams	18.78%	13.80%	23.27%
Hispanic			
April Bonner-Archer	14.74%	5.16%	29.57%
Wendell Byrd	31.74%	13.54%	51.64%
Burgess Foster	8.53%	3.25%	17.16%
Donavan McKinney	19.45%	7.17%	35.05%
Damian Christian Mitchell	6.56%	2.41%	12.74%
Lee Qualls	6.05%	2.25%	11.80%
Al Williams	12.93%	4.09%	24.75%
NH White			
April Bonner-Archer	13.62%	6.51%	22.68%
Wendell Byrd	35.30%	15.16%	53.95%
Burgess Foster	8.54%	3.60%	15.26%
Donavan McKinney	11.10%	4.76%	20.35%
Damian Christian Mitchell	3.28%	1.56%	5.78%
Lee Qualls	3.34%	1.69%	5.72%
Al Williams	24.83%	10.29%	42.74%

Ecological Inference, 4th House District Primary, 2016			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Charles A. Bell	6.62%	2.81%	12.07%
Mohammed Hassan	16.71%	7.16%	29.16%
Quincy Jones	13.31%	5.35%	24.69%
Jumar Motley	3.67%	1.52%	7.15%
Rose Mary C. Robinson	49.75%	29.23%	66.86%
Tracy Russell	5.81%	2.33%	11.16%
Abraham Shaw	4.13%	1.62%	7.92%
Black			
Charles A. Bell	4.40%	2.84%	6.11%
Mohammed Hassan	1.73%	1.03%	2.67%
Quincy Jones	22.62%	19.08%	26.21%
Jumar Motley	2.28%	1.41%	3.22%
Rose Mary C. Robinson	64.74%	60.56%	68.89%
Tracy Russell	3.37%	2.05%	4.75%
Abraham Shaw	0.88%	0.50%	1.34%
Hispanic			
Charles A. Bell	13.99%	5.35%	24.55%
Mohammed Hassan	9.25%	3.71%	17.03%
Quincy Jones	22.01%	7.80%	38.95%
Jumar Motley	4.39%	1.94%	8.01%
Rose Mary C. Robinson	40.18%	19.21%	60.48%
Tracy Russell	7.24%	1.93%	15.95%
Abraham Shaw	2.94%	1.33%	5.72%
NH White			
Charles A. Bell	9.54%	4.81%	16.07%
Mohammed Hassan	10.73%	4.86%	18.30%
Quincy Jones	18.76%	8.88%	30.91%
Jumar Motley	5.50%	2.53%	9.59%
Rose Mary C. Robinson	43.05%	26.12%	58.52%
Tracy Russell	8.84%	4.16%	15.31%
Abraham Shaw	3.58%	1.74%	6.14%

Ecological Inference, 5th House District Primary, 2016			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Fred Durhal	46.43%	16.45%	80.18%
Cynthia Johnson	53.57%	19.82%	83.55%
Black			
Fred Durhal	59.48%	55.65%	63.74%
Cynthia Johnson	40.52%	36.26%	44.35%
Hispanic			
Fred Durhal	53.60%	28.51%	77.26%
Cynthia Johnson	46.40%	22.74%	71.49%
NH White			
Fred Durhal	47.60%	24.78%	71.49%
Cynthia Johnson	52.40%	28.51%	75.22%

Ecological Inference, 6th House District Primary, 2016			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Dennis Black	12.95%	4.77%	23.79%
Stephanie Chang	38.70%	17.30%	59.30%
Deirdre Jackson	22.06%	9.61%	37.88%
Donnie Malone	3.66%	1.19%	8.07%
Dwayne Redding	5.09%	2.02%	9.60%
David Sanchez	8.56%	2.76%	17.24%
Casondria Walker-Keith	8.99%	2.75%	18.30%
Black			
Dennis Black	7.01%	5.54%	8.58%
Stephanie Chang	79.90%	77.10%	82.52%
Deirdre Jackson	4.69%	3.25%	6.37%
Donnie Malone	0.91%	0.52%	1.37%
Dwayne Redding	1.15%	0.72%	1.69%
David Sanchez	2.80%	1.67%	4.05%
Casondria Walker-Keith	3.54%	2.40%	4.74%
Hispanic			
Dennis Black	8.10%	3.88%	14.25%
Stephanie Chang	35.28%	18.75%	51.66%
Deirdre Jackson	9.11%	4.12%	15.68%
Donnie Malone	4.48%	2.07%	7.90%
Dwayne Redding	5.56%	2.80%	9.41%
David Sanchez	28.46%	17.05%	41.08%
Casondria Walker-Keith	9.03%	4.34%	15.69%
NH White			
Dennis Black	10.37%	4.55%	18.69%
Stephanie Chang	54.11%	35.84%	69.17%
Deirdre Jackson	10.69%	4.90%	18.02%
Donnie Malone	3.16%	1.48%	5.51%
Dwayne Redding	3.67%	1.80%	6.33%
David Sanchez	10.07%	4.63%	17.42%
Casondria Walker-Keith	7.92%	3.76%	13.82%

Ecological Inference, 7th House District Primary, 2016			
Party	Estimate	Lower 95%	Upper 95%
Asian			
LaTanya Garrett	68.05%	35.90%	90.46%
Bernard Thompson	31.95%	9.54%	64.10%
Black			
LaTanya Garrett	93.68%	91.01%	95.84%
Bernard Thompson	6.32%	4.16%	8.99%
Hispanic			
LaTanya Garrett	50.21%	19.84%	82.67%
Bernard Thompson	49.79%	17.33%	80.16%
NH White			
LaTanya Garrett	59.97%	33.34%	82.77%
Bernard Thompson	40.03%	17.23%	66.66%

Ecological Inference, 9th House District Primary, 2016			
Party	**Estimate**	**Lower 95%**	**Upper 95%**
Asian			
Annie Carter	9.83%	2.98%	18.87%
Tijuana Morris	9.75%	3.12%	20.00%
Alicia Murphy	13.16%	4.03%	26.32%
William Phillips	6.82%	1.89%	15.06%
Gary S. Pollard	21.40%	5.78%	41.31%
Regina Ross	13.16%	3.99%	26.60%
Sylvia Santana	25.88%	8.20%	46.54%
Black			
Annie Carter	1.68%	1.09%	2.28%
Tijuana Morris	2.04%	1.28%	2.88%
Alicia Murphy	1.89%	1.09%	2.80%
William Phillips	0.65%	0.33%	1.04%
Gary S. Pollard	33.80%	30.76%	36.64%
Regina Ross	5.84%	4.07%	7.76%
Sylvia Santana	54.10%	50.77%	57.24%
Hispanic			
Annie Carter	7.83%	3.45%	14.33%
Tijuana Morris	6.79%	2.46%	13.09%
Alicia Murphy	12.02%	5.57%	21.45%
William Phillips	5.66%	2.50%	10.52%
Gary S. Pollard	15.67%	6.14%	30.05%
Regina Ross	14.35%	6.17%	26.60%
Sylvia Santana	37.67%	17.70%	58.79%
NH White			
Annie Carter	6.51%	3.13%	10.94%
Tijuana Morris	7.79%	4.00%	12.63%
Alicia Murphy	8.29%	4.13%	13.74%
William Phillips	8.56%	4.00%	13.49%
Gary S. Pollard	38.57%	26.31%	50.43%
Regina Ross	12.46%	4.66%	21.31%
Sylvia Santana	17.81%	6.75%	34.08%

Ecological Inference, 10th House District Primary, 2016			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Mary Cavanagh	27.44%	8.61%	56.59%
Elizabeth Jefferson	10.91%	3.39%	22.62%
Leslie Love	34.32%	11.36%	59.53%
Mary Mazur	27.33%	8.42%	48.11%
Black			
Mary Cavanagh	11.56%	7.16%	16.74%
Elizabeth Jefferson	2.29%	1.38%	3.25%
Leslie Love	83.95%	78.95%	88.40%
Mary Mazur	2.20%	1.17%	3.48%
Hispanic			
Mary Cavanagh	44.86%	22.40%	66.51%
Elizabeth Jefferson	8.12%	3.12%	15.85%
Leslie Love	33.25%	12.44%	56.49%
Mary Mazur	13.77%	4.92%	25.89%
NH White			
Mary Cavanagh	28.44%	14.28%	44.65%
Elizabeth Jefferson	6.85%	3.19%	12.38%
Leslie Love	51.84%	32.46%	69.74%
Mary Mazur	12.87%	6.06%	22.39%

Ecological Inference, 1st House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Tenisha Yancey	77.41%	51.58%	93.19%
Shaun Maloy	22.59%	6.81%	48.42%
Black			
Tenisha Yancey	93.91%	90.26%	96.74%
Shaun Maloy	6.09%	3.26%	9.74%
Hispanic			
Tenisha Yancey	56.15%	18.61%	85.28%
Shaun Maloy	43.85%	14.72%	81.39%
NH White			
Tenisha Yancey	79.48%	70.69%	86.41%
Shaun Maloy	20.52%	13.59%	29.31%

Ecological Inference, 2nd House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Joe Tate	20.48%	6.70%	37.50%
Carla Tinsley-Smith	20.18%	7.20%	36.80%
Latisha Johnson	18.62%	5.78%	36.89%
Carol Banks	14.08%	4.69%	27.23%
Willie Bell	10.05%	2.78%	19.71%
Regina Jones	9.87%	3.68%	17.63%
Kinda Makini Anderson	4.92%	1.61%	10.03%
Black			
Joe Tate	9.16%	6.79%	11.79%
Carla Tinsley-Smith	23.55%	20.15%	27.03%
Latisha Johnson	18.37%	15.37%	21.30%
Carol Banks	21.60%	18.78%	24.25%
Willie Bell	18.09%	15.78%	20.36%
Regina Jones	4.75%	3.89%	5.69%
Kinda Makini Anderson	4.07%	3.16%	5.05%
Hispanic			
Joe Tate	21.31%	7.63%	41.23%
Carla Tinsley-Smith	24.04%	8.61%	41.42%
Latisha Johnson	16.54%	5.49%	31.67%
Carol Banks	18.31%	3.32%	32.65%
Willie Bell	10.25%	1.46%	20.45%
Regina Jones	5.72%	2.15%	10.64%
Kinda Makini Anderson	2.49%	0.81%	7.62%
NH White			
Joe Tate	67.97%	62.18%	73.37%
Carla Tinsley-Smith	8.01%	4.46%	12.93%
Latisha Johnson	12.57%	7.68%	17.58%
Carol Banks	3.84%	1.82%	6.70%
Willie Bell	2.73%	1.25%	4.93%
Regina Jones	3.09%	1.92%	4.37%
Kinda Makini Anderson	1.30%	0.65%	2.12%

Ecological Inference, 3rd House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Wendell Byrd	24.77%	8.67%	44.24%
China Cochran	22.14%	5.62%	41.35%
John Cromer	24.48%	9.87%	41.42%
Omar Proctor	13.72%	4.19%	26.75%
Christopher Owens	14.88%	5.01%	30.70%
Black			
Wendell Byrd	69.33%	64.30%	73.84%
China Cochran	12.52%	8.60%	16.65%
John Cromer	9.04%	6.66%	11.81%
Omar Proctor	5.91%	3.90%	7.95%
Christopher Owens	3.20%	2.07%	4.56%
Hispanic			
Wendell Byrd	25.39%	9.23%	46.42%
China Cochran	22.99%	9.13%	40.87%
John Cromer	17.71%	6.46%	35.65%
Omar Proctor	16.07%	6.25%	28.95%
Christopher Owens	17.83%	5.93%	34.42%
NH White			
Wendell Byrd	36.28%	18.36%	54.07%
China Cochran	27.20%	11.78%	43.14%
John Cromer	14.65%	6.43%	25.26%
Omar Proctor	13.47%	6.18%	23.13%
Christopher Owens	8.40%	4.22%	14.05%

Ecological Inference, 4th House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Isaac Robinson	5.92%	2.46%	10.35%
Christopher Collins	1.43%	0.65%	2.53%
Ernest Little	0.78%	0.30%	1.50%
MD Rabbi Alam	3.61%	1.69%	6.01%
Derek Boston	0.66%	0.29%	1.20%
Justin Jessop	0.77%	0.29%	1.44%
Saad Almasmari	21.83%	8.41%	34.46%
Michele Oberholtzer	9.63%	3.37%	17.92%
Rico Razo	5.15%	2.48%	8.32%
Syed Rob	41.04%	31.31%	51.05%
Myya Jones	1.91%	0.80%	3.58%
Diane McMillan	2.93%	1.36%	5.07%
Jeffrey Nolish	1.86%	0.54%	3.78%
Matt Friedrichs	2.47%	0.89%	4.54%
Black			
Isaac Robinson	59.76%	36.74%	82.96%
Christopher Collins	3.37%	2.45%	4.32%
Ernest Little	2.70%	1.92%	3.51%
MD Rabbi Alam	0.74%	0.43%	1.16%
Derek Boston	0.73%	0.41%	1.08%
Justin Jessop	0.68%	0.41%	1.00%
Saad Almasmari	1.73%	0.98%	2.77%
Michele Oberholtzer	9.43%	6.12%	12.83%
Rico Razo	12.27%	9.75%	14.80%
Syed Rob	0.94%	0.49%	1.56%
Myya Jones	13.04%	11.13%	15.00%
Diane McMillan	8.44%	6.77%	10.13%
Jeffrey Nolish	4.49%	2.68%	6.45%
Matt Friedrichs	1.68%	0.97%	2.59%
Hispanic			
Isaac Robinson	9.70%	2.96%	19.54%
Christopher Collins	3.69%	1.36%	7.58%
Ernest Little	3.53%	1.26%	6.93%
MD Rabbi Alam	1.54%	0.59%	3.05%
Derek Boston	1.38%	0.58%	2.78%
Justin Jessop	1.22%	0.48%	2.47%
Saad Almasmari	3.49%	1.00%	7.30%
Michele Oberholtzer	17.84%	7.26%	31.93%
Rico Razo	16.89%	6.62%	29.09%
Syed Rob	2.19%	0.85%	4.21%
Myya Jones	8.33%	3.05%	15.78%
Diane McMillan	7.84%	2.81%	15.10%
Jeffrey Nolish	12.19%	4.36%	21.48%
Matt Friedrichs	10.18%	4.92%	16.19%
NH White			
Isaac Robinson	4.24%	1.85%	7.49%
Christopher Collins	1.88%	1.02%	2.98%
Ernest Little	1.69%	0.89%	2.66%
MD Rabbi Alam	1.80%	0.80%	3.04%
Derek Boston	0.80%	0.42%	1.25%
Justin Jessop	0.76%	0.39%	1.25%
Saad Almasmari	40.20%	32.18%	47.37%
Michele Oberholtzer	24.49%	17.42%	31.30%
Rico Razo	5.68%	2.93%	9.17%
Syed Rob	5.88%	2.20%	11.11%
Myya Jones	2.94%	1.51%	4.88%
Diane McMillan	2.50%	1.23%	4.24%
Jeffrey Nolish	4.57%	2.61%	6.81%
Matt Friedrichs	2.59%	1.30%	4.26%

Ecological Inference, 5th House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Cynthia Johnson	17.57%	5.18%	34.98%
Rita Ross	21.77%	6.41%	41.39%
Mark Payne	17.85%	5.43%	37.51%
Cliff Woodwards	9.32%	2.72%	19.40%
Mark Murphy	13.64%	3.75%	28.91%
Jermaine Tobey	13.85%	3.62%	27.61%
Black			
Cynthia Johnson	40.94%	38.03%	43.86%
Rita Ross	37.40%	34.38%	40.40%
Mark Payne	10.85%	8.54%	13.05%
Cliff Woodwards	5.35%	4.18%	6.50%
Mark Murphy	3.87%	2.64%	5.17%
Jermaine Tobey	1.03%	0.61%	1.53%
Hispanic			
Cynthia Johnson	22.65%	10.05%	37.77%
Rita Ross	30.13%	14.65%	46.79%
Mark Payne	16.90%	7.79%	28.34%
Cliff Woodwards	8.16%	3.79%	13.86%
Mark Murphy	8.15%	3.50%	14.27%
Jermaine Tobey	9.53%	3.87%	16.80%
NH White			
Cynthia Johnson	22.29%	10.14%	37.53%
Rita Ross	34.54%	17.69%	52.06%
Mark Payne	13.90%	5.79%	24.79%
Cliff Woodwards	5.79%	2.51%	10.75%
Mark Murphy	8.06%	3.47%	15.09%
Jermaine Tobey	11.12%	5.32%	18.96%

Ecological Inference, 6th House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Tyrone Carter	7.76%	2.36%	15.23%
Tom Choske	10.03%	4.09%	16.50%
Charlesetta Wilson	20.38%	8.23%	33.57%
Terra DeFoe	9.01%	3.24%	16.00%
Aghogho Edevbie	17.82%	7.02%	29.30%
Willie Burton	7.22%	2.56%	14.47%
Ricardo White	8.76%	3.42%	15.52%
David Sanchez	5.37%	2.05%	9.63%
Paula Humphries	8.34%	3.00%	14.46%
Samantha Magdaleno	5.32%	1.64%	10.05%
Black			
Tyrone Carter	35.49%	32.87%	38.24%
Tom Choske	1.85%	1.00%	2.80%
Charlesetta Wilson	20.33%	17.28%	23.09%
Terra DeFoe	12.11%	10.13%	14.03%
Aghogho Edevbie	7.64%	5.25%	10.22%
Willie Burton	9.49%	7.62%	11.28%
Ricardo White	5.34%	3.93%	6.84%
David Sanchez	1.88%	1.06%	2.90%
Paula Humphries	3.94%	2.96%	5.04%
Samantha Magdaleno	1.93%	1.14%	2.91%
Hispanic			
Tyrone Carter	9.80%	4.00%	18.42%
Tom Choske	6.59%	3.09%	10.93%
Charlesetta Wilson	9.54%	4.24%	16.80%
Terra DeFoe	6.68%	2.94%	12.56%
Aghogho Edevbie	10.98%	4.26%	19.24%
Willie Burton	3.54%	1.48%	6.47%
Ricardo White	6.06%	2.87%	10.66%
David Sanchez	30.26%	18.70%	40.32%
Paula Humphries	3.71%	1.65%	6.65%
Samantha Magdaleno	12.85%	7.18%	19.51%
NH White			
Tyrone Carter	28.93%	23.07%	35.49%
Tom Choske	6.04%	3.35%	9.30%
Charlesetta Wilson	11.42%	5.24%	19.17%
Terra DeFoe	7.81%	3.74%	12.29%
Aghogho Edevbie	15.04%	8.21%	22.01%
Willie Burton	6.99%	3.11%	11.68%
Ricardo White	6.36%	3.44%	9.80%
David Sanchez	6.55%	3.24%	10.86%
Paula Humphries	4.64%	2.31%	7.56%
Samantha Magdaleno	6.22%	3.47%	9.85%

Ecological Inference, 7th House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
LaTanya Garrett	41.68%	14.01%	66.60%
Najanava Harvey-Quinn	23.70%	7.38%	45.94%
Jeff Jones	19.26%	6.04%	40.71%
Elene Robinson	15.36%	3.86%	31.56%
Black			
LaTanya Garrett	92.07%	90.42%	93.61%
Najanava Harvey-Quinn	2.81%	1.67%	4.11%
Jeff Jones	2.59%	1.74%	3.60%
Elene Robinson	2.52%	1.77%	3.36%
Hispanic			
LaTanya Garrett	33.86%	12.59%	54.98%
Najanava Harvey-Quinn	25.11%	8.07%	44.57%
Jeff Jones	23.88%	8.13%	41.21%
Elene Robinson	17.15%	5.64%	32.43%
NH White			
LaTanya Garrett	44.25%	19.80%	65.51%
Najanava Harvey-Quinn	19.31%	7.42%	37.50%
Jeff Jones	18.03%	8.04%	34.66%
Elene Robinson	18.41%	5.98%	36.17%

Ecological Inference, 8th House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Sherry Gay-Dagnogo	18.70%	4.64%	40.20%
Jasmine Henry	19.81%	6.57%	38.44%
George Etheridge	20.46%	6.24%	42.28%
LaSonya Beaver	20.77%	6.04%	39.90%
Seydi Starr	20.26%	5.85%	38.25%
Black			
Sherry Gay-Dagnogo	76.04%	73.09%	78.75%
Jasmine Henry	8.50%	6.15%	10.95%
George Etheridge	8.36%	6.33%	10.45%
LaSonya Beaver	4.16%	3.01%	5.48%
Seydi Starr	2.93%	1.98%	4.01%
Hispanic			
Sherry Gay-Dagnogo	26.60%	8.21%	46.53%
Jasmine Henry	21.89%	7.46%	40.06%
George Etheridge	15.60%	5.79%	29.51%
LaSonya Beaver	20.53%	7.42%	36.54%
Seydi Starr	15.38%	5.51%	29.85%
NH White			
Sherry Gay-Dagnogo	26.93%	12.33%	44.31%
Jasmine Henry	23.73%	11.01%	39.10%
George Etheridge	17.89%	8.66%	29.74%
LaSonya Beaver	14.71%	6.73%	25.26%
Seydi Starr	16.74%	7.12%	27.89%

Ecological Inference, 9th House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Karen Whitsett	33.54%	9.68%	62.44%
Gary Pollard	35.13%	9.94%	62.48%
Donald L. Stuckey	22.37%	7.16%	44.20%
Black			
Karen Whitsett	59.87%	56.30%	63.24%
Gary Pollard	36.15%	32.80%	39.75%
Donald L. Stuckey	3.53%	2.33%	5.14%
Hispanic			
Karen Whitsett	44.53%	20.64%	66.30%
Gary Pollard	28.44%	11.82%	50.12%
Donald L. Stuckey	22.75%	9.39%	41.66%
NH White			
Karen Whitsett	53.56%	40.69%	65.90%
Gary Pollard	32.83%	21.66%	44.39%
Donald L. Stuckey	10.59%	5.28%	17.45%

Ecological Inference, 10th House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Leslie Love	85.85%	72.10%	94.54%
Rhonda Barley	7.40%	1.68%	17.69%
James Brenner	3.54%	0.99%	8.82%
Tyson Kelley	3.21%	1.12%	7.36%
Black			
Leslie Love	82.66%	79.44%	85.86%
Rhonda Barley	11.83%	9.10%	14.74%
James Brenner	3.38%	2.50%	4.22%
Tyson Kelley	2.13%	1.45%	2.85%
Hispanic			
Leslie Love	83.68%	63.92%	93.46%
Rhonda Barley	9.59%	3.03%	23.53%
James Brenner	3.85%	1.24%	9.28%
Tyson Kelley	2.88%	0.88%	7.06%
NH White			
Leslie Love	58.83%	44.63%	70.36%
Rhonda Barley	38.36%	27.50%	51.69%
James Brenner	1.37%	0.52%	2.63%
Tyson Kelley	1.43%	0.54%	2.94%

Ecological Inference, 11th House District Primary, 2018			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Jewell Jones	63.26%	33.38%	86.81%
Randy Walker	32.98%	9.90%	61.92%
Black			
Jewell Jones	90.05%	83.32%	95.20%
Randy Walker	7.49%	2.87%	14.01%
Hispanic			
Jewell Jones	64.53%	38.08%	84.39%
Randy Walker	33.12%	13.26%	59.73%
NH White			
Jewell Jones	35.67%	28.06%	44.81%
Randy Walker	61.95%	53.15%	69.83%

Ecological Inference, 2nd House District Primary, 2020			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Taylor Harrell	56.09%	20.74%	82.74%
Joe Tate	43.91%	17.26%	79.26%
Black			
Taylor Harrell	33.59%	29.38%	38.38%
Joe Tate	66.41%	61.62%	70.62%
Hispanic			
Taylor Harrell	55.74%	22.61%	85.37%
Joe Tate	44.26%	14.63%	77.39%
NH White			
Taylor Harrell	11.71%	7.16%	17.11%
Joe Tate	88.29%	82.89%	92.84%

Ecological Inference, 3rd House District Primary, 2020			
Party	Estimate	Lower 95%	Upper 95%
Asian			
China Cochran	16.56%	5.74%	31.81%
John Cromer	9.96%	3.33%	19.34%
Steven Lett	4.18%	1.39%	8.48%
Donavan McKinney	16.89%	4.40%	33.60%
Keith McMurty	9.29%	2.99%	17.47%
Shri Thanedar	18.24%	5.74%	34.58%
Art Tyus	14.60%	4.60%	26.75%
Al Williams	10.26%	3.03%	21.29%
Black			
China Cochran	16.53%	13.74%	19.32%
John Cromer	2.47%	1.74%	3.20%
Steven Lett	0.53%	0.31%	0.79%
Donavan McKinney	19.39%	16.09%	22.63%
Keith McMurty	2.17%	1.10%	3.00%
Shri Thanedar	39.48%	36.18%	43.18%
Art Tyus	2.21%	1.62%	2.88%
Al Williams	17.22%	14.59%	19.75%
Hispanic			
China Cochran	17.20%	5.33%	35.28%
John Cromer	11.86%	4.10%	21.52%
Steven Lett	4.13%	1.85%	7.45%
Donavan McKinney	19.16%	6.26%	34.38%
Keith McMurty	7.04%	2.25%	14.79%
Shri Thanedar	21.05%	6.65%	40.94%
Art Tyus	7.37%	1.37%	16.89%
Al Williams	12.20%	2.80%	24.10%
NH White			
China Cochran	17.57%	6.55%	30.35%
John Cromer	3.03%	1.45%	5.88%
Steven Lett	1.60%	0.84%	2.65%
Donavan McKinney	26.87%	13.49%	40.25%
Keith McMurty	7.00%	2.99%	12.92%
Shri Thanedar	23.95%	9.85%	39.02%
Art Tyus	3.27%	1.61%	5.64%
Al Williams	16.70%	6.25%	29.83%

Ecological Inference, 4th House District Primary, 2020			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Shabab Hamid	31.01%	20.21%	41.98%
Abraham Aiyash	2.79%	1.12%	5.22%
Anthony Ali	2.91%	1.12%	5.29%
Christopher Collins	34.12%	17.11%	50.03%
Delorean Holmes	2.64%	1.14%	4.54%
Frazier Kempton	2.40%	1.00%	4.67%
Gregory Reyner	2.64%	0.99%	5.35%
Michele Oberholtzer	2.32%	0.78%	5.07%
Tonya Myers Phillips	1.30%	0.52%	2.54%
Tawanna Simpson	14.71%	5.77%	25.21%
Sigmunt Szczepkowski	3.16%	1.23%	5.92%
Black			
Shabab Hamid	1.92%	1.22%	2.80%
Abraham Aiyash	22.59%	20.23%	24.85%
Anthony Ali	0.72%	0.41%	1.11%
Christopher Collins	13.89%	9.33%	18.66%
Delorean Holmes	0.92%	0.60%	1.28%
Frazier Kempton	7.66%	6.17%	9.14%
Gregory Reyner	12.36%	10.37%	14.31%
Michele Oberholtzer	6.85%	5.41%	8.26%
Tonya Myers Phillips	0.57%	0.30%	0.92%
Tawanna Simpson	13.95%	10.86%	16.74%
Sigmunt Szczepkowski	18.58%	16.22%	20.95%
Hispanic			
Shabab Hamid	4.09%	1.60%	8.16%
Abraham Aiyash	7.30%	2.27%	15.07%
Anthony Ali	2.02%	0.91%	3.77%
Christopher Collins	21.25%	7.71%	36.65%
Delorean Holmes	2.53%	1.08%	4.70%
Frazier Kempton	8.39%	2.53%	15.96%
Gregory Reyner	11.55%	3.68%	21.80%
Michele Oberholtzer	4.10%	0.99%	9.54%
Tonya Myers Phillips	2.00%	0.90%	3.62%
Tawanna Simpson	22.23%	7.23%	37.45%
Sigmunt Szczepkowski	14.53%	6.12%	26.50%
NH White			
Shabab Hamid	3.90%	1.56%	7.14%
Abraham Aiyash	2.20%	1.04%	4.04%
Anthony Ali	1.07%	0.50%	1.75%
Christopher Collins	69.61%	63.22%	75.64%
Delorean Holmes	0.92%	0.45%	1.57%
Frazier Kempton	1.83%	0.93%	3.12%
Gregory Reyner	2.45%	1.19%	4.11%
Michele Oberholtzer	2.18%	0.84%	3.83%
Tonya Myers Phillips	0.67%	0.34%	1.11%
Tawanna Simpson	12.33%	7.43%	17.17%
Sigmunt Szczepkowski	2.84%	1.30%	5.05%

Ecological Inference, 5th House District Primary, 2020			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Cynthia Johnson	36.84%	11.60%	67.66%
Rita Ross	33.55%	9.99%	62.18%
Jermaine Tobey	29.61%	9.24%	56.94%
Black			
Cynthia Johnson	70.00%	66.86%	73.06%
Rita Ross	27.12%	24.17%	29.99%
Jermaine Tobey	2.87%	1.65%	4.35%
Hispanic			
Cynthia Johnson	49.59%	23.45%	71.02%
Rita Ross	36.18%	17.59%	58.14%
Jermaine Tobey	14.23%	5.59%	26.66%
NH White			
Cynthia Johnson	57.30%	33.08%	77.28%
Rita Ross	28.89%	11.47%	49.64%
Jermaine Tobey	13.81%	5.25%	27.08%

Ecological Inference, 6th House District Primary, 2020			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Tyrone Carter	41.38%	8.35%	69.28%
Ivy Nichole Neal	32.30%	11.16%	60.14%
David Palmer	26.32%	8.09%	49.72%
Black			
Tyrone Carter	75.34%	71.00%	79.66%
Ivy Nichole Neal	16.20%	12.32%	19.95%
David Palmer	8.47%	5.44%	11.86%
Hispanic			
Tyrone Carter	36.89%	19.16%	56.44%
Ivy Nichole Neal	26.10%	13.58%	41.86%
David Palmer	37.01%	18.99%	56.40%
NH White			
Tyrone Carter	50.33%	34.66%	66.32%
Ivy Nichole Neal	23.52%	12.43%	37.94%
David Palmer	26.15%	15.31%	38.97%

Ecological Inference, 7th House District Primary, 2020			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Nyia Bentley	8.95%	1.98%	18.79%
Elene Robinson	12.02%	3.60%	24.36%
Helena Scott	18.70%	5.16%	36.51%
Anistia Thomas	16.24%	4.98%	32.12%
Bernard Thompson	15.58%	3.98%	31.33%
Cynthia Thornton	15.35%	3.78%	31.66%
Lee Yancy	13.16%	2.93%	28.10%
Black			
Nyia Bentley	2.60%	1.83%	3.33%
Elene Robinson	2.67%	1.79%	3.64%
Helena Scott	41.15%	38.75%	43.36%
Anistia Thomas	8.65%	6.41%	10.56%
Bernard Thompson	15.25%	13.35%	16.98%
Cynthia Thornton	18.98%	16.82%	21.00%
Lee Yancy	10.70%	9.30%	11.95%
Hispanic			
Nyia Bentley	10.36%	3.92%	19.54%
Elene Robinson	11.46%	3.25%	21.97%
Helena Scott	17.09%	5.65%	35.46%
Anistia Thomas	19.05%	6.94%	33.29%
Bernard Thompson	16.46%	5.61%	32.37%
Cynthia Thornton	14.70%	5.04%	28.34%
Lee Yancy	10.88%	3.58%	22.43%
NH White			
Nyia Bentley	8.34%	2.59%	16.09%
Elene Robinson	13.25%	4.87%	24.67%
Helena Scott	21.59%	7.60%	38.38%
Anistia Thomas	11.68%	2.35%	32.25%
Bernard Thompson	17.16%	6.10%	30.62%
Cynthia Thornton	16.83%	6.20%	32.55%
Lee Yancy	11.14%	4.55%	21.61%

Ecological Inference, 9th House District Primary, 2020			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Marc Cummings	23.84%	7.09%	47.11%
Nicole Elock	20.32%	5.15%	41.60%
Roslyn Ogburn	27.00%	8.45%	55.38%
Karen Whitsett	28.83%	9.11%	56.71%
Black			
Marc Cummings	17.64%	15.32%	19.71%
Nicole Elock	3.00%	1.92%	4.27%
Roslyn Ogburn	30.49%	27.36%	33.39%
Karen Whitsett	48.86%	45.64%	51.76%
Hispanic			
Marc Cummings	25.99%	10.45%	45.13%
Nicole Elock	10.80%	4.19%	21.68%
Roslyn Ogburn	28.28%	11.46%	49.16%
Karen Whitsett	34.93%	15.53%	57.66%
NH White			
Marc Cummings	19.67%	9.49%	33.23%
Nicole Elock	12.86%	6.22%	23.15%
Roslyn Ogburn	37.09%	20.50%	54.85%
Karen Whitsett	30.38%	15.03%	47.26%

Ecological Inference, 10th House District Primary, 2020			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Mary Cavanagh	16.59%	4.93%	32.80%
Brenda Hill	10.87%	3.16%	22.78%
Kevin Lamont Harris	16.11%	4.72%	33.56%
Diajah Ruffin	15.63%	4.79%	30.16%
Tyson Kelley	9.45%	2.67%	19.97%
Marcus Cummings	11.36%	3.12%	23.31%
Steele Huhges	14.33%	3.80%	29.52%
Valli Smith	5.65%	1.92%	11.38%
Black			
Mary Cavanagh	21.72%	18.69%	24.95%
Brenda Hill	5.54%	4.06%	6.92%
Kevin Lamont Harris	24.71%	22.03%	27.28%
Diajah Ruffin	28.76%	26.22%	31.23%
Tyson Kelley	4.37%	3.66%	5.12%
Marcus Cummings	9.03%	7.82%	10.21%
Steele Huhges	5.03%	3.29%	6.92%
Valli Smith	0.84%	0.52%	1.19%
Hispanic			
Mary Cavanagh	26.12%	9.63%	44.31%
Brenda Hill	8.22%	2.44%	17.50%
Kevin Lamont Harris	15.09%	4.14%	29.78%
Diajah Ruffin	18.78%	6.11%	33.81%
Tyson Kelley	5.64%	1.86%	11.30%
Marcus Cummings	6.87%	2.18%	13.70%
Steele Huhges	17.40%	5.14%	33.51%
Valli Smith	1.87%	0.72%	4.37%
NH White			
Mary Cavanagh	61.81%	51.84%	71.12%
Brenda Hill	4.71%	2.03%	7.93%
Kevin Lamont Harris	11.46%	5.13%	19.51%
Diajah Ruffin	7.82%	3.13%	13.77%
Tyson Kelley	2.35%	1.03%	4.07%
Marcus Cummings	2.37%	0.79%	4.82%
Steele Huhges	8.47%	3.53%	13.77%
Valli Smith	1.01%	0.49%	1.69%

Ecological Inference, 1st House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Tyrone Carter	57.61%	26.07%	85.88%
Jermaine Tobey	42.39%	14.12%	73.93%
Black			
Tyrone Carter	90.61%	86.15%	94.08%
Jermaine Tobey	9.39%	5.92%	13.85%
Hispanic			
Tyrone Carter	65.31%	44.67%	82.97%
Jermaine Tobey	34.69%	17.03%	55.33%
NH White			
Tyrone Carter	66.63%	43.88%	83.67%
Jermaine Tobey	33.37%	16.33%	56.12%

Ecological Inference, 3rd House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Alabas Farhat	51.06%	25.43%	72.12%
Sam Luqman	34.87%	15.31%	57.49%
Khalil Othman	14.07%	5.41%	26.75%
Black			
Alabas Farhat	69.61%	60.83%	78.09%
Sam Luqman	12.20%	6.66%	19.12%
Khalil Othman	18.19%	11.14%	26.36%
Hispanic			
Alabas Farhat	42.98%	20.60%	65.71%
Sam Luqman	36.64%	16.31%	61.76%
Khalil Othman	20.39%	7.93%	38.25%
NH White			
Alabas Farhat	61.26%	53.16%	69.18%
Sam Luqman	29.64%	21.52%	37.67%
Khalil Othman	9.11%	4.53%	14.49%

Ecological Inference, 4th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Karen Whitsett	34.45%	11.21%	65.49%
Lori L.Turner	19.55%	5.48%	44.04%
Gus Tarraf	46.00%	13.62%	72.03%
Black			
Karen Whitsett	65.87%	62.99%	69.00%
Lori L.Turner	32.30%	29.14%	35.20%
Gus Tarraf	1.82%	1.00%	2.84%
Hispanic			
Karen Whitsett	51.28%	26.60%	72.40%
Lori L.Turner	29.97%	10.87%	49.45%
Gus Tarraf	18.76%	7.39%	34.25%
NH White			
Karen Whitsett	12.20%	4.74%	21.97%
Lori L.Turner	6.76%	3.13%	11.96%
Gus Tarraf	81.04%	70.43%	89.66%

Ecological Inference, 5th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Reggie Davis	19.55%	5.72%	38.09%
Steele Hughes	20.47%	6.35%	38.44%
Ksenia Milstein	9.81%	2.93%	18.76%
Natalie Price	25.79%	8.45%	46.80%
Michelle Wooddell	24.39%	7.75%	43.55%
Black			
Reggie Davis	62.35%	58.91%	65.51%
Steele Hughes	15.60%	13.23%	17.90%
Ksenia Milstein	1.52%	0.79%	2.42%
Natalie Price	13.08%	9.60%	17.00%
Michelle Wooddell	7.45%	4.96%	10.11%
Hispanic			
Reggie Davis	17.93%	5.85%	33.88%
Steele Hughes	14.45%	3.84%	28.07%
Ksenia Milstein	8.74%	3.05%	16.96%
Natalie Price	28.25%	10.39%	49.54%
Michelle Wooddell	30.63%	12.54%	52.63%
NH White			
Reggie Davis	6.38%	2.71%	11.03%
Steele Hughes	5.25%	2.47%	8.63%
Ksenia Milstein	2.73%	1.21%	4.53%
Natalie Price	63.10%	57.10%	69.06%
Michelle Wooddell	22.54%	17.82%	27.44%

Ecological Inference, 6th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Danielle Hall	26.42%	8.71%	45.22%
Myya Jones	26.35%	9.28%	46.99%
Mark Murphy	5.48%	1.62%	12.22%
Regina Weiss	41.75%	15.57%	65.13%
Black			
Danielle Hall	25.90%	22.71%	28.92%
Myya Jones	20.97%	17.53%	24.16%
Mark Murphy	7.08%	4.25%	9.67%
Regina Weiss	46.05%	41.82%	50.11%
Hispanic			
Danielle Hall	20.89%	7.27%	39.63%
Myya Jones	23.30%	4.63%	43.48%
Mark Murphy	25.11%	9.72%	43.73%
Regina Weiss	30.70%	10.87%	54.23%
NH White			
Danielle Hall	2.77%	1.46%	4.46%
Myya Jones	3.80%	2.09%	5.87%
Mark Murphy	1.94%	0.82%	3.27%
Regina Weiss	91.49%	88.84%	93.75%

Ecological Inference, 7th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Helena Scott	45.32%	16.60%	71.99%
Melanie Macey	29.46%	8.86%	56.54%
Grant Rivet	25.22%	9.03%	44.40%
Black			
Helena Scott	90.44%	86.87%	93.30%
Melanie Macey	7.29%	4.47%	10.95%
Grant Rivet	2.27%	1.29%	3.62%
Hispanic			
Helena Scott	52.83%	23.24%	82.76%
Melanie Macey	33.43%	11.89%	55.51%
Grant Rivet	13.73%	2.28%	35.91%
NH White			
Helena Scott	33.66%	28.21%	38.82%
Melanie Macey	62.61%	57.56%	67.75%
Grant Rivet	3.73%	2.26%	5.33%

Ecological Inference, 8th House District Primary, 2022			
Party	**Estimate**	**Lower 95%**	**Upper 95%**
Asian			
Mike McFall	26.16%	8.42%	48.87%
Durrel Douglas	22.97%	8.02%	44.76%
Ernest Little	14.60%	4.61%	28.88%
Ryan Nelson	15.41%	5.83%	29.48%
Dave Soltis	20.86%	5.67%	41.84%
Black			
Mike McFall	23.07%	16.79%	29.08%
Durrel Douglas	33.17%	28.02%	38.47%
Ernest Little	34.45%	29.85%	39.35%
Ryan Nelson	5.45%	2.96%	8.43%
Dave Soltis	3.85%	2.22%	6.09%
Hispanic			
Mike McFall	39.05%	18.47%	60.24%
Durrel Douglas	22.52%	8.01%	40.83%
Ernest Little	8.81%	3.11%	17.55%
Ryan Nelson	18.27%	6.03%	35.24%
Dave Soltis	11.36%	3.89%	22.51%
NH White			
Mike McFall	54.01%	43.77%	62.00%
Durrel Douglas	7.61%	3.29%	13.48%
Ernest Little	4.73%	2.15%	8.36%
Ryan Nelson	3.82%	1.66%	6.67%
Dave Soltis	29.83%	23.54%	37.39%

Ecological Inference, 9th House District Primary, 2022			
Party	**Estimate**	**Lower 95%**	**Upper 95%**
Asian			
Abraham Aiyash	74.21%	52.84%	87.02%
Darnell Gardner	7.21%	2.08%	16.22%
Abraham Shaw	6.31%	1.98%	14.06%
William Phillips	5.37%	1.60%	11.74%
Paul Smith	6.90%	2.12%	14.78%
Black			
Abraham Aiyash	49.59%	43.71%	55.47%
Darnell Gardner	28.70%	24.53%	32.87%
Abraham Shaw	11.90%	9.37%	14.65%
William Phillips	5.62%	3.41%	7.93%
Paul Smith	4.18%	2.78%	5.75%
Hispanic			
Abraham Aiyash	37.77%	18.07%	60.31%
Darnell Gardner	19.27%	6.64%	35.24%
Abraham Shaw	14.38%	5.41%	25.05%
William Phillips	15.55%	6.14%	28.06%
Paul Smith	13.03%	3.76%	24.22%
NH White			
Abraham Aiyash	69.10%	50.54%	82.69%
Darnell Gardner	10.85%	4.16%	21.51%
Abraham Shaw	7.08%	2.87%	13.44%
William Phillips	6.12%	2.58%	11.65%
Paul Smith	6.85%	2.96%	12.61%

Ecological Inference, 10th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Toni Mua	43.50%	16.56%	75.88%
Joe Tate	56.50%	24.12%	83.44%
Black			
Toni Mua	11.88%	7.07%	18.09%
Joe Tate	88.12%	81.91%	92.93%
Hispanic			
Toni Mua	75.99%	46.60%	92.66%
Joe Tate	24.01%	7.34%	53.40%
NH White			
Toni Mua	6.69%	3.82%	10.24%
Joe Tate	93.31%	89.76%	96.18%

Ecological Inference, 11th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Patrick Biange	7.13%	2.38%	14.42%
Marvin Cotton, Jr.	6.92%	2.09%	14.03%
Paul Robert Francis	8.60%	2.15%	17.81%
Alex Manwell	13.82%	3.63%	27.77%
David Maynard	9.60%	2.76%	19.35%
Veronica Paiz	14.71%	4.88%	27.52%
Athena Lynn Thornton	10.92%	2.77%	21.80%
Ricardo White	15.28%	4.84%	30.60%
Regina L. Williams	13.01%	4.00%	25.63%
Black			
Patrick Biange	1.35%	0.64%	2.29%
Marvin Cotton, Jr.	17.61%	14.06%	21.12%
Paul Robert Francis	1.53%	0.77%	2.50%
Alex Manwell	5.38%	2.83%	8.59%
David Maynard	1.82%	0.93%	2.95%
Veronica Paiz	7.23%	3.23%	12.36%
Athena Lynn Thornton	18.79%	14.56%	22.85%
Ricardo White	22.39%	17.37%	27.69%
Regina L. Williams	23.89%	19.22%	28.81%
Hispanic			
Patrick Biange	5.14%	1.65%	10.54%
Marvin Cotton, Jr.	4.96%	1.33%	10.59%
Paul Robert Francis	6.72%	1.68%	13.68%
Alex Manwell	15.51%	4.95%	28.42%
David Maynard	10.43%	3.45%	19.21%
Veronica Paiz	18.53%	6.60%	32.27%
Athena Lynn Thornton	9.66%	3.20%	18.60%
Ricardo White	15.79%	4.86%	29.80%
Regina L. Williams	13.27%	4.26%	25.74%
NH White			
Patrick Biange	4.22%	2.42%	6.19%
Marvin Cotton, Jr.	3.58%	1.45%	6.55%
Paul Robert Francis	6.59%	4.25%	9.13%
Alex Manwell	20.92%	14.87%	26.72%
David Maynard	9.56%	6.40%	12.72%
Veronica Paiz	31.17%	24.11%	37.59%
Athena Lynn Thornton	3.55%	1.37%	6.58%
Ricardo White	14.40%	7.24%	21.08%
Regina L. Williams	6.01%	2.77%	10.57%

Ecological Inference, 12th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Kimberly Edwards	44.83%	16.90%	74.34%
Richard Steenland	55.17%	25.66%	83.10%
Black			
Kimberly Edwards	80.79%	69.50%	90.15%
Richard Steenland	19.21%	9.85%	30.50%
Hispanic			
Kimberly Edwards	38.94%	13.47%	69.79%
Richard Steenland	61.06%	30.21%	86.53%
NH White			
Kimberly Edwards	37.16%	16.02%	61.53%
Richard Steenland	62.84%	38.47%	83.98%

Ecological Inference, 13th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Lori Stone	84.91%	70.39%	94.71%
Myles W. Miller	15.09%	5.29%	29.61%
Black			
Lori Stone	50.17%	38.83%	60.64%
Myles W. Miller	49.83%	39.36%	61.17%
Hispanic			
Lori Stone	68.79%	38.44%	88.25%
Myles W. Miller	31.21%	11.75%	61.56%
NH White			
Lori Stone	87.32%	77.25%	94.66%
Myles W. Miller	12.68%	5.34%	22.75%

Ecological Inference, 14th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Aaron Delikta	13.94%	6.29%	24.61%
Kristina Lodovisi	35.90%	19.16%	53.19%
Donovan McKinney	50.16%	30.52%	67.94%
Black			
Aaron Delikta	4.73%	2.55%	7.51%
Kristina Lodovisi	10.14%	5.66%	15.68%
Donovan McKinney	85.13%	79.39%	90.19%
Hispanic			
Aaron Delikta	21.87%	7.67%	40.11%
Kristina Lodovisi	41.07%	17.13%	65.97%
Donovan McKinney	37.05%	13.71%	61.66%
NH White			
Aaron Delikta	20.09%	8.41%	34.34%
Kristina Lodovisi	35.53%	18.87%	52.63%
Donovan McKinney	44.38%	25.71%	62.99%

Ecological Inference, 16th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Ishmail Terry	41.77%	16.30%	75.15%
Stephanie A. Young	58.23%	24.85%	83.70%
Black			
Ishmail Terry	5.51%	3.67%	7.56%
Stephanie A. Young	94.49%	92.44%	96.33%
Hispanic			
Ishmail Terry	36.15%	15.50%	64.13%
Stephanie A. Young	63.85%	35.87%	84.50%
NH White			
Ishmail Terry	7.25%	3.48%	12.16%
Stephanie A. Young	92.75%	87.84%	96.52%

Ecological Inference, 18th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Jason Hoskins	46.54%	15.63%	77.91%
Caprice Jackson	53.46%	22.09%	84.37%
Black			
Jason Hoskins	53.57%	47.21%	59.65%
Caprice Jackson	46.43%	40.35%	52.79%
Hispanic			
Jason Hoskins	46.46%	12.69%	77.48%
Caprice Jackson	53.54%	22.52%	87.31%
NH White			
Jason Hoskins	67.58%	48.68%	83.60%
Caprice Jackson	32.42%	16.40%	51.32%

Ecological Inference, 26th House District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Steven Chisholm	33.44%	12.26%	55.02%
Stephen Patterson	18.34%	6.62%	34.46%
Dylan Wegela	25.63%	10.09%	45.89%
Allen Wilson	22.59%	8.12%	41.24%
Black			
Steven Chisholm	54.44%	47.61%	61.63%
Stephen Patterson	5.42%	2.86%	8.43%
Dylan Wegela	10.83%	6.06%	17.09%
Allen Wilson	29.30%	21.79%	35.41%
Hispanic			
Steven Chisholm	22.86%	8.78%	39.25%
Stephen Patterson	23.80%	10.87%	38.89%
Dylan Wegela	37.68%	17.26%	58.23%
Allen Wilson	15.67%	5.19%	29.40%
NH White			
Steven Chisholm	7.09%	3.12%	12.36%
Stephen Patterson	4.37%	2.22%	7.05%
Dylan Wegela	79.23%	71.36%	86.69%
Allen Wilson	9.31%	4.02%	15.94%

Ecological Inference, 1st Senate District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Shellee Brooks	7.55%	3.44%	13.63%
Erika Geiss	59.08%	45.05%	71.26%
Frank Liberati	9.79%	3.79%	18.69%
Ricardo Moore	5.42%	2.49%	9.80%
Brenda Sanders	12.95%	5.47%	23.22%
Carl Schwartz	5.21%	2.66%	9.07%
Black			
Shellee Brooks	16.06%	14.66%	17.44%
Erika Geiss	18.46%	15.52%	20.95%
Frank Liberati	4.08%	3.14%	5.10%
Ricardo Moore	14.70%	13.53%	15.88%
Brenda Sanders	43.86%	41.67%	46.14%
Carl Schwartz	2.83%	2.11%	3.57%
Hispanic			
Shellee Brooks	14.51%	8.82%	21.21%
Erika Geiss	27.16%	16.65%	37.45%
Frank Liberati	20.04%	12.42%	28.87%
Ricardo Moore	8.93%	5.95%	12.53%
Brenda Sanders	18.51%	12.06%	26.81%
Carl Schwartz	10.85%	6.96%	15.62%
NH White			
Shellee Brooks	2.88%	1.97%	3.92%
Erika Geiss	42.57%	37.99%	46.56%
Frank Liberati	46.72%	42.91%	50.97%
Ricardo Moore	1.70%	1.11%	2.47%
Brenda Sanders	4.20%	2.72%	5.90%
Carl Schwartz	1.94%	1.30%	2.66%

Ecological Inference, 3rd Senate District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Stephanie Chang	70.18%	54.29%	83.59%
Toinu Reeves	29.82%	16.41%	45.71%
Black			
Stephanie Chang	80.86%	77.59%	84.11%
Toinu Reeves	19.14%	15.89%	22.41%
Hispanic			
Stephanie Chang	57.63%	41.80%	72.97%
Toinu Reeves	42.37%	27.03%	58.20%
NH White			
Stephanie Chang	93.61%	91.42%	95.67%
Toinu Reeves	6.39%	4.33%	8.58%

Ecological Inference, 6th Senate District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Vicki Barnett	69.05%	49.34%	81.85%
Darryl Brown	13.23%	6.26%	23.98%
Mary Cavanagh	17.72%	8.30%	31.73%
Black			
Vicki Barnett	12.80%	9.51%	16.06%
Darryl Brown	38.71%	35.59%	41.77%
Mary Cavanagh	48.48%	44.90%	52.11%
Hispanic			
Vicki Barnett	38.25%	17.37%	60.74%
Darryl Brown	24.06%	12.48%	40.58%
Mary Cavanagh	37.70%	17.38%	63.70%
NH White			
Vicki Barnett	49.73%	43.92%	55.53%
Darryl Brown	4.06%	2.54%	5.91%
Mary Cavanagh	46.21%	40.32%	52.03%

Ecological Inference, 7th Senate District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Jeremy Moss	56.55%	30.19%	77.67%
Ryan Foster	43.45%	22.33%	69.81%
Black			
Jeremy Moss	91.55%	88.88%	93.78%
Ryan Foster	8.45%	6.22%	11.12%
Hispanic			
Jeremy Moss	56.86%	37.81%	74.86%
Ryan Foster	43.14%	25.14%	62.19%
NH White			
Jeremy Moss	93.57%	90.98%	95.69%
Ryan Foster	6.43%	4.31%	9.02%

Ecological Inference, 8th Senate District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Mallory McMorrow	65.61%	34.84%	89.51%
Marshall Bullock	34.39%	10.49%	65.16%
Black			
Mallory McMorrow	19.90%	16.39%	24.13%
Marshall Bullock	80.10%	75.87%	83.61%
Hispanic			
Mallory McMorrow	51.44%	28.04%	77.91%
Marshall Bullock	48.56%	22.09%	71.96%
NH White			
Mallory McMorrow	96.15%	94.66%	97.34%
Marshall Bullock	3.85%	2.66%	5.34%

Ecological Inference, 11th Senate District Primary, 2022			
Party	Estimate	Lower 95%	Upper 95%
Asian			
Veronica Klinefelt	45.85%	24.35%	68.29%
Monique Owens	54.15%	31.71%	75.65%
Black			
Veronica Klinefelt	45.34%	33.70%	56.96%
Monique Owens	54.66%	43.04%	66.30%
Hispanic			
Veronica Klinefelt	40.22%	23.66%	59.68%
Monique Owens	59.78%	40.32%	76.34%
NH White			
Veronica Klinefelt	80.24%	74.13%	85.96%
Monique Owens	19.76%	14.04%	25.87%

Maxwell Palmer

CONTACT

Department of Political Science
Boston University
232 Bay State Road
Boston, MA 02215

E-mail: mbpalmer@bu.edu
Website: www.maxwellpalmer.com
Phone: (617) 358-2654

APPOINTMENTS

Boston University, Boston, Massachusetts

Associate Professor, Department of Political Science, 2021–Present

Director of Advanced Programs, Dept. of Political Science, 2020–Present

Civic Tech Fellow, Faculty of Computing & Data Sciences, 2021–Present

Faculty Fellow, Initiative on Cities, 2019–Present

Assistant Professor, Department of Political Science, 2014–2021

Junior Faculty Fellow, Hariri Institute for Computing, 2017–2020

EDUCATION

Harvard University, Cambridge, Massachusetts

Ph.D., Political Science, May 2014.

A.M., Political Science, May 2012.

Bowdoin College, Brunswick, Maine

A.B., Mathematics & Government and Legal Studies, May 2008.

BOOK

Neighborhood Defenders: Participatory Politics and America's Housing Crisis (with Katherine Levine Einstein and David M. Glick). 2019. New York, NY: Cambridge University Press.

- Selected chapters republished in *Political Science Quarterly*.
- Reviewed in *Perspectives on Politics*, *Political Science Quarterly*, *Economics 21*, *Public Books*, and *City Journal*.
- Covered in Vox's "The Weeds" podcast, CityLab, Slate's "Gabfest," Curbed, Brookings Institution Up Front.

REFEREED ARTICLES

Einstein, Katherine Levine, Joseph Ornstein, and Maxwell Palmer. 2022. "Who Represents the Renters?" *Housing Policy Debate*.

Einstein, Katherine Levine, David Glick, and Maxwell Palmer. 2022. "Developing a pro-housing movement? Public distrust of developers, fractured coalitions, and the challenges of measuring political power." *Interest Groups & Advocacy* 11:189–-208.

Einstein, Katherine Levine, David Glick, Luisa Godinez Puig, and Maxwell Palmer. 2022. "Still Muted: The Limited Participatory Democracy of Zoom Public Meetings." *Urban Affairs Review*.

Glick, David M. and Maxwell Palmer. 2022. "County Over Party: How Governors Prioritized Geography Not Particularism in the Distribution of Opportunity Zones." *British Journal of Political Science* 52(4): 1902–1910.

de Benedictis-Kessner, Justin and Maxwell Palmer. 2021. "Driving Turnout: The Effect of Car Ownership on Electoral Participation." *Political Science Research and Methods*.

Einstein, Katherine Levine and Maxwell Palmer. 2021. "Land of the Freeholder: How Property Rights Make Voting Rights." *Journal of Historical Political Economy* 1(4): 499–530.

Godinez Puig, Luisa, Katharine Lusk, David Glick, Katherine L. Einstein, Maxwell Palmer, Stacy Fox, and Monica L. Wang. 2020. "Perceptions of Public Health Priorities and Accountability Among US Mayors." *Public Health Reports* (October 2020).

Einstein, Katherine Levine, David M. Glick, and Maxwell Palmer. 2020. "Can Mayors Lead on Climate Change? Evidence from Six Years of Surveys." *The Forum* 18(1).

Ban, Pamela, Maxwell Palmer, and Benjamin Schneer. 2019. "From the Halls of Congress to K Street: Government Experience and its Value for Lobbying." *Legislative Studies Quarterly* 44(4): 713–752.

Palmer, Maxwell and Benjamin Schneer. 2019. "Postpolitical Careers: How Politicians Capitalize on Public Office." *Journal of Politics* 81(2): 670–675.

Einstein, Katherine Levine, Maxwell Palmer, and David M. Glick. 2019. "Who Participates in Local Government? Evidence from Meeting Minutes." *Perspectives on Politics* 17(1): 28–46.

- Winner of the Heinz Eulau Award, American Political Science Association, 2020.

Einstein, Katherine Levine, David M. Glick, and Maxwell Palmer. 2019. "City Learning: Evidence of Policy Information Diffusion From a Survey of U.S. Mayors." *Political Research Quarterly* 72(1): 243–258.

Einstein, Katherine Levine, David M. Glick, Maxwell Palmer, and Robert Pressel. 2018. "Do Mayors Run for Higher Office? New Evidence on Progressive Ambition." *American Politics Research* 48(1) 197–221.

Ansolabehere, Stephen, Maxwell Palmer and Benjamin Schneer. 2018. "Divided Government and Significant Legislation, A History of Congress from 1789-2010." *Social Science History* 42(1): 81–108.

Edwards, Barry, Michael Crespin, Ryan D. Williamson, and Maxwell Palmer. 2017. "Institutional Control of Redistricting and the Geography of Representation." *Journal of Politics* 79(2): 722–726.

Palmer, Maxwell. 2016. "Does the Chief Justice Make Partisan Appointments to Special Courts and Panels?" *Journal of Empirical Legal Studies* 13(1): 153–177.

Palmer, Maxwell and Benjamin Schneer. 2016. "Capitol Gains: The Returns to Elected Office from Corporate Board Directorships." *Journal of Politics* 78(1): 181–196.

Gerring, John, Maxwell Palmer, Jan Teorell, and Dominic Zarecki. 2015. "Demography and Democracy: A Global, District-level Analysis of Electoral Contestation." *American Political Science Review* 109(3): 574–591.

Other Publications

Einstein, Katherine Levine, David M. Glick and Maxwell Palmer. 2020. "Neighborhood Defenders: Participatory Politics and America's Housing Crisis." *Political Science Quarterly* 135(2): 281–312.

Ansolabehere, Stephen and Maxwell Palmer. 2016. "A Two Hundred-Year Statistical History of the Gerrymander." *Ohio State Law Journal* 77(4): 741–762.

Ansolabehere, Stephen, Maxwell Palmer, and Benjamin Schneer. 2016. "What Has Congress Done?" in *Governing in a Polarized Age: Elections, Parties, and Political Representation in America*, eds. Alan Gerber and Eric Schickler. New York, NY: Cambridge University Press.

Policy Reports

Glick, David M., Katherine Levine Einstein, and Maxwell Palmer. 2023. 2022 Menino Survey of Mayors: Mayors and the Climate Crisis. Research Report. Boston University Initiative on Cities.

Einstein, Katherine Levine and Maxwell Palmer. 2022. Greater Boston Housing Report Card 2022, Special Topic: Who Can Win the Lottery? Moving Toward Equity in Subsidized Housing. Research Report. The Boston Foundation.

Glick, David M., Katherine Levine Einstein, and Maxwell Palmer. 2022. Looking back on ARPA and America's Cities: A Menino Survey Reflection. Research Report. Boston University Initiative on Cities.

Einstein, Katherine Levine and Maxwell Palmer. 2022. Representation in the

Housing Process: Best Practices for Improving Racial Equity. Research Report. The Boston Foundation.

Glick, David M., Katherine Levine Einstein, and Maxwell Palmer. 2022. 2021 Menino Survey of Mayors: Closing the Racial Wealth Gap. Research Report. Boston University Initiative on Cities.

Glick, David M., Katherine Levine Einstein, and Maxwell Palmer. 2021. 2021 Menino Survey of Mayors: Building Back Better. Research Report. Boston University Initiative on Cities.

Glick, David M., Katherine Levine Einstein, Maxwell Palmer, Stacy Fox, Katharine Lusk, Nicholas Henninger, and Songhyun Park. 2021. 2020 Menino Survey of Mayors: Policing and Protests. Research Report. Boston University Initiative on Cities.

Glick, David M., Katherine Levine Einstein, Maxwell Palmer, and Stacy Fox. 2020. 2020 Menino Survey of Mayors: COVID-19 Recovery and the Future of Cities. Research Report. Boston University Initiative on Cities.

de Benedictis-Kessner, Justin and Maxwell Palmer. 2020. Got Wheels? How Having Access to a Car Impacts Voting. *Democracy Docket*.

Palmer, Maxwell, Katherine Levine Einstein, and David Glick. 2020. Counting the City: Mayoral Views on the 2020 Census. Research Report. Boston University Initiative on Cities.

Einstein, Katherine Levine, Maxwell Palmer, Stacy Fox, Marina Berardino, Noah Fischer, Jackson Moore-Otto, Aislinn O'Brien, Marilyn Rutecki and Benjamin Wuesthoff. 2020. COVID-19 Housing Policy. Research Report. Boston University Initiative on Cities.

Einstein, Katherine Levine, Maxwell Palmer, David Glick, and Stacy Fox. 2020. Mayoral Views on Cities' Legislators: How Representative are City Councils? Research Report. Boston University Initiative on Cities.

Einstein, Katherine Levine and Maxwell Palmer. 2020. "Newton and other communities must reform housing approval process." *The Boston Globe*.

Einstein, Katherine Levine, David Glick, Maxwell Palmer and Stacy Fox. 2020. "2019 Menino Survey of Mayors." Research Report. Boston University Initiative on Cities.

Palmer, Maxwell, Katherine Levine Einstein, David Glick, and Stacy Fox. 2019. Mayoral Views on Housing Production: Do Planning Goals Match Reality? Re-

search Report. Boston University Initiative on Cities.

Wilson, Graham, David Glick, Katherine Levine Einstein, Maxwell Palmer, and Stacy Fox. 2019. Mayoral Views on Economic Incentives: Valuable Tools or a Bad Use of Resources?. Research Report. Boston University Initiative on Cities

Einstein, Katherine Levine, David Glick, Maxwell Palmer and Stacy Fox. 2019. "2018 Menino Survey of Mayors." Research Report. Boston University Initiative on Cities.

Einstein, Katherine Levine, Katharine Lusk, David Glick, Maxwell Palmer, Christiana McFarland, Leon Andrews, Aliza Wasserman, and Chelsea Jones. 2018. "Mayoral Views on Racism and Discrimination." National League of Cities and Boston University Initiative on Cities.

Einstein, Katherine Levine, David Glick, and Maxwell Palmer. 2018. "As the Trump administration retreats on climate change, US cities are moving forward." The Conversation.

Einstein, Katherine Levine, David M. Glick, Maxwell Palmer, and Robert Pressel. 2018. "Few big-city mayors see running for higher office as appealing." LSE United States Politics and Policy Blog.

Einstein, Katherine Levine, David Glick, and Maxwell Palmer. 2018. "2017 Menino Survey of Mayors." Research Report. Boston University Initiative on Cities.

Williamson, Ryan D., Michael Crespin, Maxwell Palmer, and Barry C. Edwards. 2017. "This is how to get rid of gerrymandered districts." *The Washington Post*, Monkey Cage Blog.

Palmer, Maxwell and Benjamin Schneer. 2015. "How and why retired politicians get lucrative appointments on corporate boards. " *The Washington Post*, Monkey Cage Blog.

Current Projects

"A Partisan Solution to Partisan Gerrymandering: The Define-Combine Procedure" (with Benjamin Schneer and Kevin DeLuca).

- Covered in *Fast Company*

"Descended from Immigrants and Revolutionists: How Family Immigration History Shapes Legislative Behavior in Congress" (with James Feigenbaum and Benjamin Schneer).

"Developing a Pro-Housing Movement? How Public Distrust of Developers Stops New Housing and Fractures Coalitions" (with Katherine Levine Einstein and David

Glick).

"The Gender Pay Gap in Congressional Offices" (with Joshua McCrain).

"Racial Disparities in Local Elections" (with Katherine Levine Einstein).

"Renters in an Ownership Society: Property Rights, Voting Rights, and the Making of American Citizenship." Book Project. With Katherine Levine Einstein.

"Menino Survey of Mayors 2021." Co-principal investigator with David M. Glick and Katherine Levine Einstein.

Grants and Awards

The Boston Foundation Grant. "2022 Greater Boston Housing Report Card" (Co-principal investigator). 2022. $70,000.

The Rockefeller Foundation, "Menino Survey of Mayors" (Co-principal investigator). 2021. $355,000.

American Political Science Association, Heinz Eulau Award, for the best article published in *Perspectives on Politics* during the previous calendar year, for "Who Participates in Local Government? Evidence from Meeting Minutes." (with Katherine Levine Einstein and David M. Glick). 2020.

Boston University Initiative on Cities, COVID-19 Research to Action Seed Grant. "How Are Cities Responding to the COVID-19 Housing Crisis?" 2020. $8,000.

The Rockefeller Foundation, "Menino Survey of Mayors" (Co-principal investigator). 2017. $325,000.

Hariri Institute for Computing, Boston University. Junior Faculty Fellow. 2017–2020. $10,000.

The Rockefeller Foundation, "2017 Menino Survey of Mayors" (Co-principal investigator). 2017. $100,000.

The Center for Finance, Law, and Policy, Boston University, Research Grant for "From the Capitol to the Boardroom: The Returns to Office from Corporate Board Directorships," 2015.

Senator Charles Sumner Prize, Dept. of Government, Harvard University. 2014.

> *Awarded to the best dissertation "from the legal, political, historical, economic, social or ethnic approach, dealing with means or measures tending toward the prevention of war and the establishment of universal peace."*

The Center for American Political Studies, Dissertation Research Fellowship on the Study of the American Republic, 2013–2014.

The Tobin Project, Democracy and Markets Graduate Student Fellowship, 2013–2014.

The Dirksen Congressional Center, Congressional Research Award, 2013.

The Institute for Quantitative Social Science, Conference Travel Grant, 2014.

The Center for American Political Studies, Graduate Seed Grant for "Capitol Gains: The Returns to Elected Office from Corporate Board Directorships," 2014.

The Institute for Quantitative Social Science, Research Grant, 2013.

Bowdoin College: High Honors in Government and Legal Studies; Philo Sherman Bennett Prize for Best Honors Thesis in the Department of Government, 2008.

Selected Presentations

"A Partisan Solution to Partisan Gerrymandering: The Define-Combine Procedure." MIT Election Data and Science Lab, 2020.

"Who Represents the Renters?" Local Political Economy Conference, Washington, D.C., 2019.

"Housing and Climate Politics," Sustainable Urban Systems Conference, Boston University 2019.

"Redistricting and Gerrymandering," American Studies Summer Institute, John F. Kennedy Presidential Library and Museum, 2019.

"The Participatory Politics of Housing," Government Accountability Office Seminar, 2018.

"Descended from Immigrants and Revolutionists: How Immigrant Experience Shapes Immigration Votes in Congress," Congress and History Conference, Princeton University, 2018.

"Identifying Gerrymanders at the Micro- and Macro-Level." Hariri Institute for Computing, Boston University, 2018.

"How Institutions Enable NIMBYism and Obstruct Development," Boston Area Research Initiative Spring Conference, Northeastern University, 2017.

"Congressional Gridlock," American Studies Summer Institute, John F. Kennedy

Presidential Library and Museum, 2016.

"Capitol Gains: The Returns to Elected Office from Corporate Board Directorships," Microeconomics Seminar, Department of Economics, Boston University, 2015.

"A Two Hundred-Year Statistical History of the Gerrymander," Congress and History Conference, Vanderbilt University, 2015.

"A New (Old) Standard for Geographic Gerrymandering," Harvard Ash Center Workshop: How Data is Helping Us Understand Voting Rights After Shelby County, 2015.

"Capitol Gains: The Returns to Elected Office from Corporate Board Directorships," Boston University Center for Finance, Law, and Policy, 2015.

"Capitol Gains: The Returns to Elected Office from Corporate Board Directorships," Bowdoin College, 2014.

American Political Science Association: 2013, 2014, 2015, 2016, 2018, 2019, 2020, 2022
Midwestern Political Science Association: 2012, 2013, 2014, 2017, 2019
Southern Political Science Association: 2015, 2018
European Political Science Association: 2015

Expert Testimony and Consulting

Bethune-Hill v. Virginia (3:14-cv-00852-REP-AWA-BMK), U.S. District Court for the Eastern District of Virginia. Prepared expert reports and testified on racial predominance and racially polarized voting in selected districts of the 2011 Virginia House of Delegates map. (2017)

Thomas v. Bryant (3:18-CV-441-CWR-FKB), U.S. District Court for the Southern District of Mississippi. Prepared expert reports and testified on racially polarized voting in a district of the 2012 Mississippi State Senate map. (2018–2019)

Chestnut v. Merrill (2:18-cv-00907-KOB), U.S. District Court for the Northern District of Alabama. Prepared expert reports and testified on racially polarized voting in selected districts of the 2011 Alabama congressional district map. (2019)

Dwight v. Raffensperger (No. 1:18-cv-2869-RWS), U.S. District Court for the Northern District of Georgia. Prepared expert reports and testified on racially polarized voting in selected districts of the 2011 Georgia congressional district map. (2019)

Bruni, et al. v. Hughs (No. 5:20-cv-35), U.S. District Court for the Southern Dis-

trict of Texas. Prepared expert reports and testified on the use of straight-ticket voting by race and racially polarized voting in Texas. (2020)

Caster v. Merrill (No. 2:21-cv-1536-AMM), U.S. District Court for the Northern District of Alabama. Prepared expert report and testified on racially polarized voting in selected districts of the 2021 Alabama congressional district map. (2022)

Pendergrass v. Raffensperger (1:21-CV-05339-SCJ), U.S. District Court for the Northern District of Georgia. Prepared expert reports and testified on racially polarized voting in selected districts of the 2021 Georgia congressional district map. (2022)

Grant v. Raffensperger (1:22-CV-00122-SCJ), U.S. District Court for the Northern District of Georgia. Prepared expert reports and testified on racially polarized voting in selected districts of the 2021 Georgia state legislative district maps. (2022)

Galmon, et al. v. Ardoin (3:22-cv-00214-SDD-SDJ), U.S. District Court for the Middle District of Louisiana. Prepared expert reports and testified on racially polarized voting for the 2021 Louisiana congressional district map. (2022)

Racially Polarized Voting Consultant, Virginia Redistricting Commission, August 2021.

The General Court of the Commonwealth of Massachusetts, Joint Committee on Housing, Hearing on Housing Production Legislation. May 14, 2019. Testified on the role of public meetings in housing production.

Teaching

Boston University

- *Introduction to American Politics* (PO 111; Fall 2014, Fall 2015, Fall 2016, Fall 2017, Spring 2019, Fall 2019, Fall 2020)
- *Congress and Its Critics* (PO 302; Fall 2014, Spring 2015, Spring 2017, Spring 2019)
- *Data Science for Politics* (PO 399; Spring 2020, Spring 2021, Fall 2021, Fall 2022)
- *Formal Political Theory* (PO 501; Spring 2015, Spring 2017, Fall 2019, Fall 2020)
- *American Political Institutions in Transition* (PO 505; Spring 2021, Fall 2021)
- *Prohibition* (PO 540; Fall 2015, Fall 2022)
- *Political Analysis (Graduate Seminar)* (PO 840; Fall 2016, Fall 2017)
- *Graduate Research Workshop* (PO 903/4; Fall 2019, Spring 2020)
- *Spark! Civic Tech Research Design Workshop* (CDS DS 290; Spring 2023)

- *Spark! Civic Tech Toolkit Workshop* (CDS DS 292; Spring 2023)

Service

Boston University

- Research Computing Governance Committee, 2021–.
- Initiative on Cities Faculty Advisory Board, 2020–2022.
- Undergraduate Assessment Working Group, 2020-2021.
- College of Arts and Sciences
  - Search Committee for the Faculty Director of the Initiative on Cities, 2020–2021.
  - General Education Curriculum Committee, 2017–2018.
- Department of Political Science
  - Director of Advanced Programs (Honors & B.A./M.A.). 2020–.
  - Political Methodology Search Committee, 2021.
  - Delegate, Chair Selection Advisory Process, 2021.
  - Comprehensive Exam Committee, American Politics, 2019.
  - Comprehensive Exam Committee, Political Methodology, 2016, 2017, 2021.
  - Co-organizer, Research in American Politics Workshop, 2016–2018.
  - American Politics Search Committee, 2017.
  - American Politics Search Committee, 2016.
  - Graduate Program Committee, 2014–2015, 2018–2019, 2020–2021.

Co-organizer, *Boston University Local Political Economy Conference*, August 29, 2018.

Editorial Board Member, *Legislative Studies Quarterly*, 2020–2023

Malcolm Jewell Best Graduate Student Paper Award Committee, Southern Political Science Association, 2019.

Reviewer: *American Journal of Political Science*; *American Political Science Review*; *Journal of Politics*; *Quarterly Journal of Political Science*; *Science*; *Political Analysis*; *Legislative Studies Quarterly*; *Public Choice*; *Political Science Research and Methods*; *Journal of Law, Economics and Organization*; *Election Law Journal*; *Journal of Empirical Legal Studies*; *Urban Affairs Review*; *Applied Geography*; *PS: Political Science & Politics*; Cambridge University Press; Oxford University Press.

Elected Town Meeting Member, Town of Arlington, Mass., Precinct 2. April 2021–Present.

Arlington Election Reform Committee Member, August 2019–April 2022.

Coordinator, Harvard Election Data Archive, 2011–2014.

Other Experience

Charles River Associates, Boston, Massachusetts 2008–2010

Associate, Energy & Environment Practice
Economic consulting in the energy sector for electric and gas utilities, private equity, and electric generation owners. Specialized in Financial Modeling, Resource Planning, Regulatory Support, Price Forecasting, and Policy Analysis.

Updated February 16, 2023

Donald Agee, Jr., et al. v. Jocelyn Benson, et al.

Case No. 1:22-cv-00272

United States District Court for the Western District of Michigan

Expert Report of Jonathan Rodden, Ph.D.

Jonathan Rodden

March 8, 2023

I. INTRODUCTION AND SUMMARY OF FINDINGS

I have been asked by the Michigan Independent Redistricting Commission (MICRC) and its Commissioners (collectively, "Commission") to examine the expert report of Mr. Sean Trende in the matter of *Donald Agee, Jr., et al. v. Jocelyn Benson*. Specifically, I have been asked to evaluate his claim that race was the predominant motive in the crafting of the Detroit-area districts of the enacted redistricting plan for the Michigan House of Representatives—known as the "Hickory Plan"—and the enacted redistricting plan for the Michigan Senate—known as the "Linden Plan."

My analysis proceeds in several steps. First, drawing on my academic research and experience with redistricting, I explain the nature of the task that confronted the Commission as it endeavored to fulfill the requirements of Article IV, Section 6 of the Michigan Constitution. Specifically, I explain the implications of the Commission's charge in provision 13d, which stipulates that "districts shall not provide a disproportionate advantage to any political party. A disproportionate advantage shall be determined using accepted measures of partisan fairness." While Mr. Trende's report largely ignores this provision, it is not possible to assess the racial characteristics of the enacted districts without considering the constraints imposed by this requirement.

Specifically, I demonstrate that in drawing plans for both the Michigan House of Representatives and the Senate, relative to an ensemble of computer-generated districts drawn without regard for party or race, and relative to the previously enacted plans, the Commissioners needed to trim the size of Democratic majorities in the most Democratic urban districts to achieve substantial improvements in partisan fairness scores.

In practice, this implies reductions in the Black voting-age population shares of the districts in the urban areas with the largest Black populations relative to an ensemble of computer-generated plans. If the Commission would have reproduced the distribution of Black voters across districts associated with an ensemble of party- and race-blind computer simulations, it could not have claimed to have met its Constitutional obligation to pursue partisan fairness. The paucity of Black urban Republicans made it impossible to reduce the magnitude of lopsided Democratic victories without also creating more racially heterogeneous urban districts.

Next, I respond to each of the four claims made by Mr. Trende in support of his conclusion that race was the predominant motive in drawing the Hickory and Linden plans.

First, Mr. Trende mobilizes visualizations and a narrative discussion to argue that relative to the previous 2011 redistricting plans—which were characterized by their own architects as partisan gerrymanders—the Commission's plans "divvy up" Detroit-area voters by race. In fact, his maps show the opposite. Whereas the previous redistricting plans often placed boundaries precisely along the lines of residential racial segregation, the Commission's plans do not. For reasons that are unclear, Mr. Trende seems to imply that racially and politically heterogeneous districts should

be viewed as a fingerprint of racial gerrymandering. However, he also includes his own proposal for Michigan Senate districts that, like the Commission's plan, crosses county boundaries and combines majority-Black and majority-white neighborhoods, so it is very difficult to discern what exactly Mr. Trende is claiming about how to identify racial predominance.

Second, Mr. Trende makes two arguments about compactness. In doing so, Mr. Trende ignores the Commission's requirement to facilitate partisan fairness, the tension between compactness and partisan fairness, and the fact that Article 4, Section 6(13) of the Michigan Constitution ranks political fairness and community-of-interest preservation above compactness and county/city preservation. He begins by contrasting the compactness of the Commission's Detroit-area districts with the previous enacted 2011 redistricting plans. He concludes that the Commission's *House* districts are relatively non-compact, but that the Commission's *Senate* districts are relatively compact. Mr. Trende does not explain 1) why the reader should make conclusions about racial predominance by comparing compactness scores to a prior plan that was drawn with the intent to produce partisan unfairness, or 2) why the inferences drawn from such a comparison should be equal and opposite for the House of Representatives and the Senate.

An additional claim about compactness is that a negative relationship between the Black voting-age population (BVAP) and the compactness of districts is indicative of racial predominance. He demonstrates that such a relationship exists in the Commission's Hickory Plan. However, he also demonstrates that this relationship is not present in the Commission's Linden Plan, but that it *is* present in the 2011 Senate plan, which he treats throughout the report as a comparison plan that should not be understood as a racial gerrymander. Moreover, a significant negative relationship between BVAP and compactness can also be found in Mr. Trende's race-blind ensemble of computer-generated plans, indicating that this relationship cannot possibly be interpreted as an indicator of racial predominance.

Third, Mr. Trende argues that an additional indicator of racial predominance is the fact that the counts of county splits in the Commission's plans are higher than in the previously enacted plans. This ignores the difficult trade-off between the minimization of county splits and the pursuit of partisan fairness, which had been exploited by the architects of the previous plan, as well as the fact that Article 4, Section 6(13) of Michigan's Constitution clearly ranks partisan fairness above the preservation of counties, and does not require strict minimization of county splits. Mr. Trende does not explain why the Commission's county splits should be understood as stemming from the pursuit of racial goals rather than efforts to achieve partisan fairness. Moreover, Mr. Trende produced ensembles of 50,000 computer-generated redistricting plans for both the House and Senate that did not attempt to strictly minimize the number of county splits. The Commission's plans produce fewer county splits than the entire distribution of Mr. Trende's computer-drawn plans, suggesting that the Commissioners indeed paid attention to county splits.

Finally, Mr. Trende uses ensembles of alternative computer-drawn redistricting plans and argues that because the distribution of Black voters across the Commission's districts deviates from that of the ensembles, race must have been the predominant motive in the construction of the districts. It is important to note that Mr. Trende's party- and race-blind ensembles pay no attention to the Michigan Constitution, and due to the relative concentration of Democratic voters in urban neighborhoods, the plans in these ensembles produce levels of partisan unfairness that are far beyond those of the Commission's plans. The Commission's adherence to the Michigan Constitution's partisan fairness requirement, which required the Commission to avoid drawing extremely politically homogeneous districts, could very well result in a distribution of Black voters across districts that differs from the distribution of Black voters seen in Mr. Trende's simulations. A difference between the racial distributions of his simulations and those of the enacted plans cannot, however, be interpreted as evidence of racial predominance.

Moreover, Mr. Trende's comparison of ensembles with specific plans simply does not work as an approach to measuring racial predominance. If we apply his approach to the previously enacted Senate plan and to his own proposed Senate plan, we must conclude that race was the predominant consideration in the construction of those plans as well. However, we cannot draw this conclusion about any of the plans. As with the Commission's plan, deviations of district-level BVAP shares from race- and party-blind computer simulations could occur for other reasons, including the desire to enhance or reduce partisan fairness.

II. QUALIFICATIONS AND EXPERIENCE

I am currently a tenured Professor of Political Science at Stanford University and the founder and director of the Stanford Spatial Social Science Lab—a center for research and teaching with a focus on the analysis of geo-spatial data in the social sciences. I am engaged in a variety of research projects involving large, fine-grained geo-spatial data sets including ballots and election results at the level of polling places, individual records of registered voters, census data, and survey responses. I am also a senior fellow at the Stanford Institute for Economic Policy Research and the Hoover Institution. Prior to my employment at Stanford, I was the Ford Professor of Political Science at the Massachusetts Institute of Technology. I received my Ph.D. from Yale University and my B.A. from the University of Michigan, Ann Arbor, both in political science. A copy of my current C.V. is included as Exhibit A.

In my current academic work, I conduct research on voting, demographics, geography, and aspects of election administration, including registration, the structure of precincts, redistricting, and methods of voting. Recent papers and books focus on the relationship between the patterns of political representation, geographic location of demographic and partisan groups, and the drawing of electoral districts. I have published papers using statistical methods to assess political geography, balloting, and representation in a variety of academic journals including *Statistics and Public Policy, Proceedings of the National Academy of Science, Science Advances*, *American Economic Review Papers and Proceedings*, the *Journal of Economic Perspectives*, the *Virginia*

Law Review, the *American Journal of Political Science*, the *British Journal of Political Science*, the *Annual Review of Political Science*, and the *Journal of Politics.* One of these papers was selected by the American Political Science Association as the winner of the Michael Wallerstein Award for the best paper on political economy, and another received an award from the American Political Science Association section on social networks.

In 2021, I received a John Simon Guggenheim Memorial Foundation Fellowship, and received the Martha Derthick Award of the American Political Science Association for "the best book published at least ten years ago that has made a lasting contribution to the study of federalism and intergovernmental relations."

I have recently written a series of papers, along with my co-authors, using automated redistricting algorithms to assess partisan gerrymandering. This work has been published in the *Quarterly Journal of Political Science*, *Election Law Journal*, and *Political Analysis*, and it has been featured in more popular publications like the *Wall Street Journal*, the *New York Times*, and *Boston Review*. I recently authored a book, published by *Basic Books* in June of 2019, on the relationship between political districts, the residential geography of social groups, and their political representation in the United States and other countries that use winner-take-all electoral districts. The book was reviewed in *The New York Times*, *The New York Review of Books*, *Wall Street Journal*, *The Economist*, and *The Atlantic*, among others.

I have expertise in the use of large data sets and geographic information systems (GIS) and conduct research and teaching in the area of applied statistics related to elections. I frequently work with geo-coded voter files and other large administrative data sets, including in recent papers published in the *Annals of Internal Medicine* and *The New England Journal of Medicine.* I have developed a national data set of geo-coded precinct-level election results that has been used extensively in policy-oriented research related to redistricting and representation.

I have been accepted and testified as an expert witness in a number of election law and redistricting cases: *Romo v. Detzner,* No. 2012-CA-000412 (Fla. Cir. Ct. 2012); *Mo. State Conference of the NAACP* v. *Ferguson-Florissant Sch. Dist.,* No. 4:2014-CV-02077 (E.D. Mo. 2014); *Lee v. Va. State Bd. of Elections,* No. 3:15-CV-00357 (E.D. Va. 2015); *Democratic Nat'l Committee et al. v. Hobbs et al.*, No. 16-1065-PHX-DLR (D. Ariz. 2016); *Bethune-Hill v. Virginia State Board of Elections*, No. 3:14-cv-00852-REP-AWA-BMK (E.D. Va. 2014); and *Jacobson et al. v. Lee*, No. 4:18-cv-00262 (N.D. Fla. 2018), *Rivera v. Schwab*, No. 2022-cv-89 (Kan. Dist. Ct. 2022), *Carter v. Chapman*, No. 464 MD 2021, 465 MD 2021 (Pa. Commw. Ct. 2021); *Bennet v. Ohio Redistricting Comm'n*, No. 2021-1198 (Ohio 2021); *Adams v. DeWine*, No. 2021-1428 (Ohio 2021); *Neiman v. LaRose*, No. 2022-0298 (Ohio 2022). I also worked with a coalition of academics to file Amicus Briefs in the Supreme Court in *Gill v. Whitford*, No. 16-1161, and *Rucho v. Common Cause*, No. 18-422. Much of the testimony in these cases had to do with geography, electoral districts, voting, ballots, and election administration.

I am being compensated at the rate of $550 per hour for my work on this case. My compensation is not dependent upon the outcome of the case or the opinions that I express.

III. DATA SOURCES

I was provided with the data and computer code used to produce Mr. Trende's report. Part of my report is based on reanalysis of his data. In addition, I consulted several files downloaded from the Commission's web page (https://www.michigan.gov/micrc) and from the State of Michigan Open Data Portal (https://data.michigan.gov). Additionally, I consulted data from U.S. Census, obtained from the National Historical GIS (http://nhgis.org), and from the Redistricting Data Hub (https://redistrictingdatahub.org).

IV. GEOGRAPHY, PARTISAN FAIRNESS, AND REDISTRICTING IN MICHIGAN

Before assessing the specific claims made in Mr. Trende's report, it is necessary to clarify some basic features of Michigan's political and racial geography. This geographic starting point structured the task confronting the Commission when it started drawing maps to comply with Article IV, Section 6 of the Michigan Constitution. It is not possible to draw conclusions about the role of race in redistricting without first comprehending the interaction of partisanship, race, and the requirements of the Michigan Constitution.

The Geography of Partisanship in Michigan

Above all, Democratic voters are far more geographically concentrated than Republican voters in Michigan. I have written a series of academic articles and a book about this phenomenon in the United States and other industrialized countries around the world.[1] I have demonstrated that especially in countries like the United States with a two-party system, an urban-rural electoral divide first emerged in the era of heavy industry and strong labor unions. This was also the case in Michigan, where the Democratic Party gained strength in industrial cities like Detroit, Grand Rapids, and Flint.

Thereafter, even as the class cleavage and the power of labor unions faded, when political groups pushed parties to take positions on additional issues, like civil rights, abortion, immigration, and free trade, the Democratic Party ended up adopting the interests of urban groups, and the Republican Party increasingly took up the interests of rural groups. As a result, a stark urban-rural

[1] Jonathan Rodden, 2019, *Why Cities Lose: The Deep Roots of the Urban-Rural Political Divide* (New York: Basic Book), Jowei Chen and Jonathan Rodden, 2013, "Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures," *Quarterly Journal of Political Science* 8: 239-269; Jonathan Rodden and Thomas Weighill, 2022, "Political Geography and Representation: A Case Study of Districting in Pennsylvania, in *Political Geometry*, edited by Moon Duchin and Olivia Walch (London: Springer).

divide in voting behavior has gained strength from the middle of the 20th century to the current day. Michigan is a classic example.

This divide has important implications for representation in legislatures. Geographic polarization has unfolded in such a way that densely populated areas in the urban core vote overwhelmingly for the Democratic Party in the United States. As a result, to the extent that the districts are compact and contiguous, voters in the legislative districts drawn in the urban core will inevitably be overwhelmingly Democratic. At the other end of the spectrum are rural and exurban districts that are safely Republican. However, in part because they include scattered unionized public sector workers, colleges and universities, and vestiges of past mining and industry, these districts are often far more politically heterogeneous than urban districts. As a result, Democrats tend to run up large numbers of "surplus" votes beyond the threshold of victory in the urban districts they win, while also "wasting" a substantial number of votes in the rural and exurban districts they typically lose.

In other words, support for Democratic candidates is inefficiently distributed in space, and as a result, they routinely end up with a seat share that falls well short of their vote share. Again, Michigan is a classic example. Even without any efforts at gerrymandering, the transformation of votes to seats will favor the Republican Party if state House and Senate districts are drawn according to traditional redistricting criteria, meaning that they are drawn to be compact and contiguous, while attempting, where possible, to keep counties and municipalities together.

To focus on the role of political geography in explaining the transformation of votes to seats as distinct from any possible motives of those drawing the districts, it is useful to train a computer algorithm to draw an ensemble of alternative districting plans, ignoring partisan data and assembling groups of vote tabulation districts (VTDs) into districts by focusing only on traditional redistricting criteria like geographic contiguity and compactness.

Mr. Trende has included some simulations of this kind in his report. Using his code and data, I have generated 500,000 redistricting plans for the Michigan House of Representatives, which has 110 seats. Associated with each of the underlying VTDs—the building blocks for drawing districts—are vote totals for a variety of past elections, and these can be combined into measures of partisanship for each simulated district in each plan. To produce these Democratic vote shares, I apply the same formula used by the Commission, relying on precinct-level results of the following 13 elections: President and U.S. Senate in 2020; U.S. Senate, Governor, Attorney General, and Secretary of State in 2018; President in 2016; U.S. Senate, Governor, Attorney General, Secretary of State in 2014; and President and U.S. Senate in 2012.

Adding up all the statewide votes for these elections, it is evident that Michigan is a competitive but Democratic-leaning state, with an overall Democratic vote share of 52.4 percent. However, on average, the simulated plans produce around 52 Democratic seats out of 110, or 47 percent.[2]

To understand how a party with 52.4 percent of the votes can receive only 47 percent of the seats, it is useful to examine a plot like those contained in Mr. Trende's report. First, I rank the districts in each simulated plan from the most Republican to the most Democratic. In Figure 1, on the horizontal axis, the plans are placed into 110 bins based on these rankings, and the vertical axis plots the Democratic vote share of all the simulated plans in each bin. When a simulated plan produces a majority-Democratic district, it is portrayed in blue; and when it produces a Republican district, the data marker is red. The yellow dots provide average Democratic vote shares associated with each bin.

Figure 1: Ensemble of Simulated Michigan House Districts by Partisanship

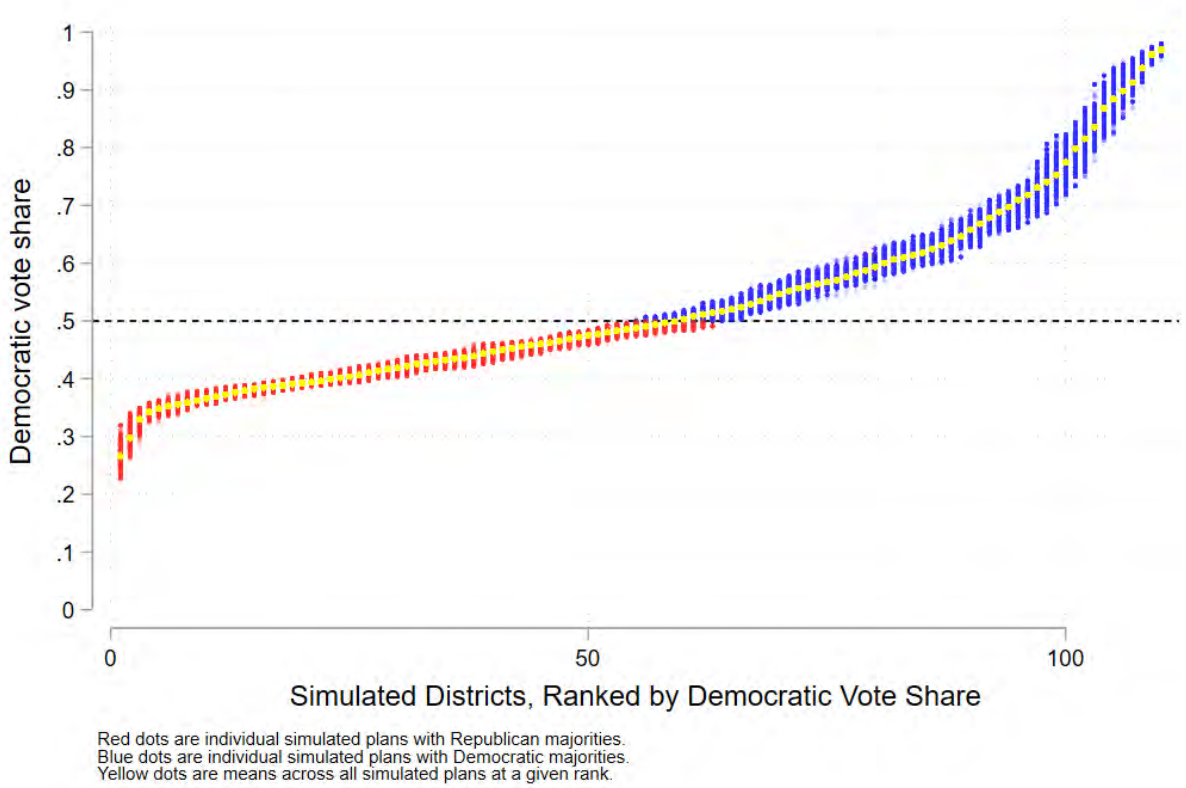


Figure 1 demonstrates that Democratic votes are highly concentrated in the most Democratic districts on the right-hand side of the plot. Note, for instance, that the simulations produce 16

[2] Using the same technique, I have also generated an ensemble of 500,000 redistricting plans for the Michigan Senate. Here again, the average plan had a Democratic seat share of around 47 percent (18 or 38 seats).

districts where the average Democratic vote share is 70 percent or higher. All of them are urban. However, on the left-hand side of the graph, there are only two rural districts where the Republican vote share is above 70 percent. Because Democrats are so concentrated in the districts they win by very lopsided margins, fewer of the state's Democratic voters are available to contribute to majorities in the pivotal districts in the middle of the plot. In sum, Figure 1 demonstrates that even when the districts are drawn by a non-partisan computer algorithm, Democrats tend to win their districts by much larger majorities, while Republicans tend to win their districts by smaller but still mostly comfortable majorities.

Social scientists have given considerable attention to the task of quantifying this phenomenon. One approach is to create an *index of lopsided margins* by measuring the average winning vote share of seats won by the Democrats and in seats won by Republicans and subtract the latter from the former. This quantity tells us how much more "packed" Democrats are in districts they win by relatively large margins than are the Republicans. We can calculate this index for each of the simulated plans in the ensemble and take an average of 7.4 percent, which indicates that Democrats tend to win their districts by more lopsided margins than do the Republicans.

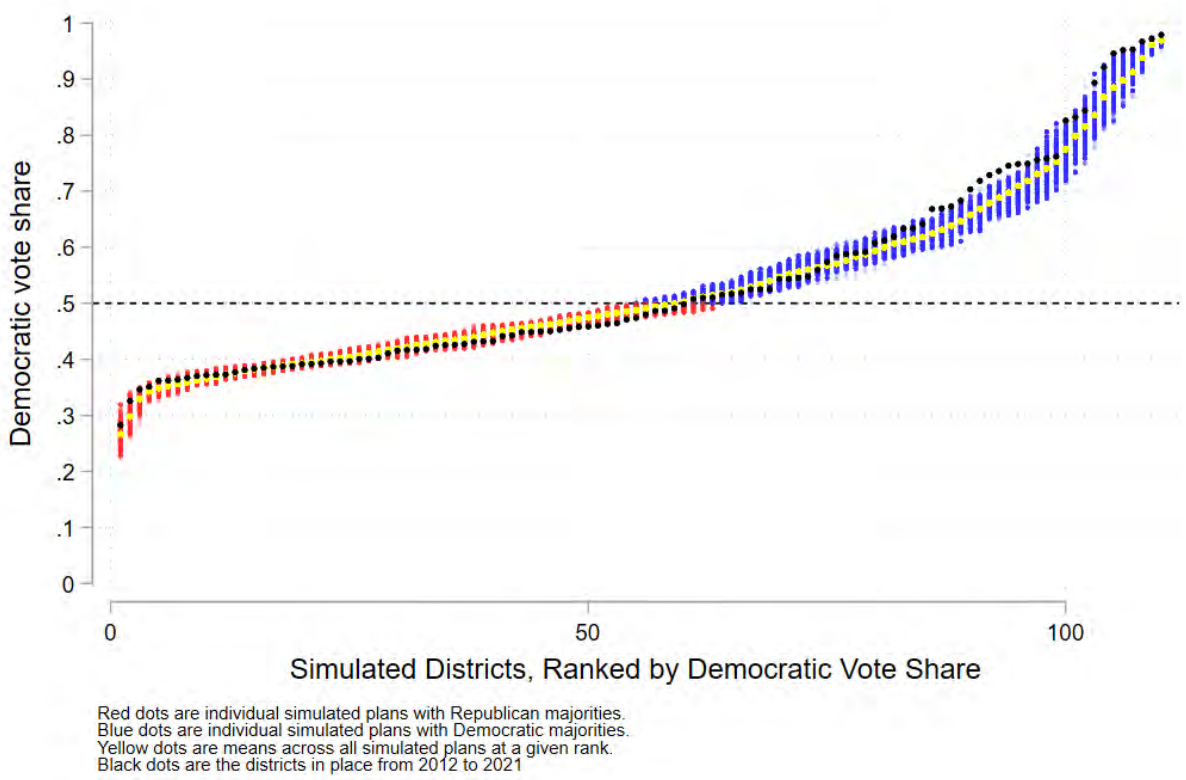
A second approach is to calculate the average Democratic vote share across all the districts, as well as the median Democratic vote share, and subtract latter from the former. The *mean median difference* is larger when the average district is more Democratic than the median district. As Democratic votes are more concentrated in the tail of the cross-district distribution, this quantity will be larger. If we calculate this for all the House of Representatives plans in the ensemble, the average difference is 4.1 percent, which again indicates that Democratic voters are less efficiently distributed across simulated districts than are Republican voters.

A third approach has become known as the *efficiency gap*. In each district, for each party, we can calculate the number of "surplus" votes received in districts that it wins, as well as the number of "lost" votes received in districts the party loses. We can calculate the share of all votes received by each party that are either surplus or lost, and subtract the Republican share from the Democratic share, giving us another measure that gets larger as the distribution of votes for Democrats is relatively less efficient than that of Republicans. Using this measure, the average across the ensemble of simulated plans is 12.9 percent.

In sum, each of these measures tells the same story about the neutral ensemble of simulated redistricting plans: Democrats are more "packed" than Republicans, which allows Republicans to win a greater share of seats than their share of votes. However, redistricting plans in the real world are not typically drawn by computer algorithms. In the United States, they are sometimes drawn by strategic incumbent partisans who wish to give an advantage to specific political parties or incumbents. Again, Michigan is a classic case. In a series of interviews, Jeff Timmer, former executive director of the Michigan Republican Party and one of the authors of the Michigan

redistricting plans that were put in place in 2012, revealed that he drew the districts with the primary goal of increasing the representation of Republicans.[3] In an internal email that became public when Michigan's redistricting plans were challenged as partisan gerrymanders in court, another map-drawer discussed efforts to "cram ALL the Dem garbage" into four Southeast Michigan districts and the "obvious objective—putting dems in a dem district and reps in a GOP district."[4]

Figure 2: Ensemble of Simulated Michigan House Districts by Partisanship and the Partisanship of the "Benchmark" House Plan in Place from 2012 to 2021



To see how this "cramming" looks in practice, Figure 2 reproduces Figure 1, but adds the partisanship of these gerrymandered districts using black dots. Note that on the right-hand side of the plot, the black dots are mostly outside the range of the simulations, meaning that a key strategy of those drawing the districts was to make urban districts even *more* Democratic than the very lopsided districts that emerged from the simulations. This makes even *fewer* Democrats available to contribute to Democratic victories in more pivotal suburban districts, creating extra seats for Republicans. Note that throughout the middle of Figure 2, the black dots appear below the yellow

[3] "Two Authorities on Gerrymandering Weigh in on Michigan's Redistricting Commission," *wdet.org*, October 14, 2021.
[4] "GOP Gerrymanderer: My Maps Fueled Toxic Politics," *Bridge Michigan*, January 7, 2021.

dots, meaning that in more competitive districts, Republican vote shares are higher than the average of the simulations.

These efforts to pack Democrats even beyond what would happen in party-blind simulations are also captured by the indices of partisan fairness. While the average index of lopsided margins was 7.4 percent in the ensemble, in the enacted map of 2012 it was 10 percent. While the average mean-median difference in the simulations was 4.1 percent, in the enacted map of 2012 it was 6 percent. And while the average efficiency gap in the simulations was 12.9 percent, in the enacted plan of 2012 it was 18.7 percent (see Table 1 below).

Just as it is possible to draw districts with the intention of packing Democrats even further than the simulations, it is also possible to make efforts to "unpack" them. In fact, Article IV, Section 6 of the Michigan Constitution requires it in provision 13d, which stipulates that "districts shall not provide a disproportionate advantage to any political party." This provision is not ambiguous. In addition to respecting traditional redistricting principles and the Voting Rights Act, the Commission is tasked with the goal of creating districts that are as fair as possible to the two parties. Provision 13d continues: "A disproportionate advantage shall be determined using accepted measures of partisan fairness." In going about its work, the Commission elected to examine each of the partisan fairness indicators discussed above.

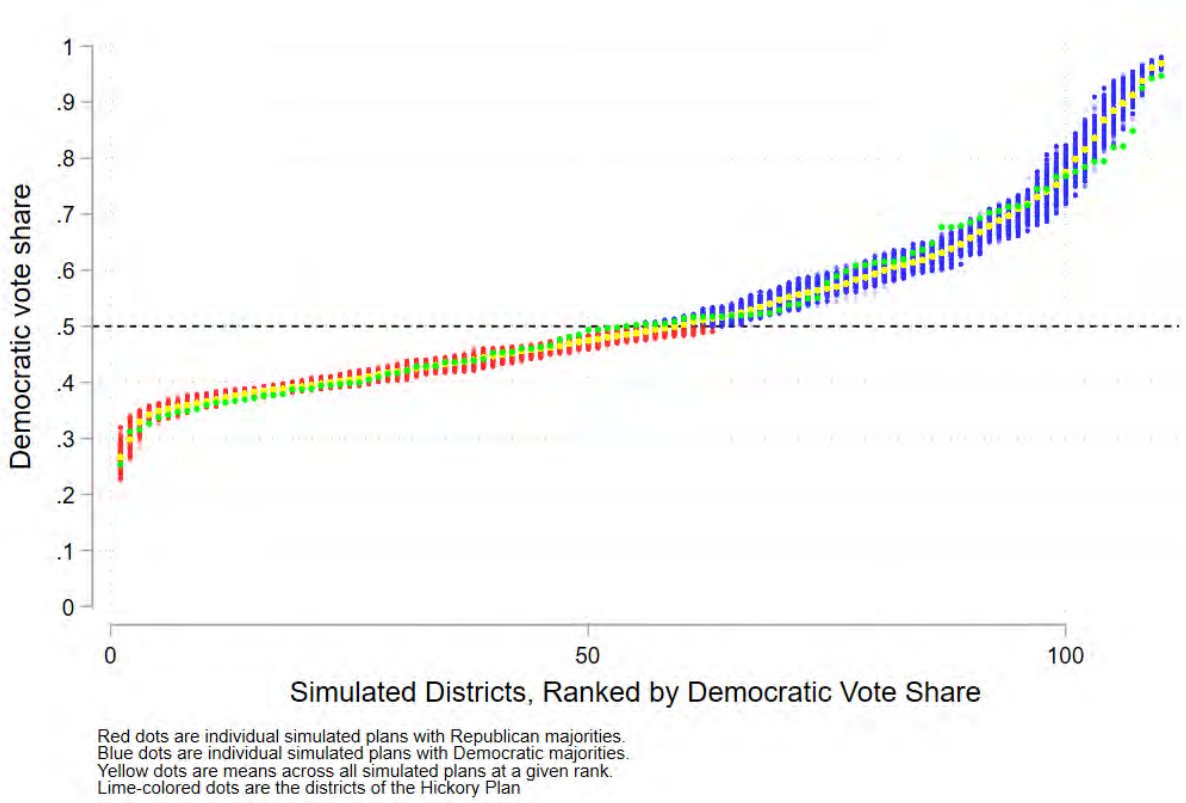
As a practical matter, this means that as Commissioners went about their work and explored various configurations of districts in urban areas and then consulted measures of partisan fairness, they would have noticed that the most compact configurations of urban districts—the kind that emerge most naturally from the type of simulations explored above—would have produced measures of partisan fairness indicating a substantial advantage for Republicans. Since their Constitutional marching orders were to reduce this type of unfairness, they would have then been forced to seek a different configuration—one that made these urban districts less overwhelmingly Democratic.

This is precisely what the Commissioners did. Figure 3 is the same plot as Figures 1 and 2, but it includes in lime green the districts of the enacted 2022 House of Representatives Plan, known as the Hickory Plan. We can see that Democratic vote shares in the 10 most Democratic districts are lower in the Commission's plan than those produced by the simulations. In other words, the Commission appears to have "unpacked" some of the most lopsided urban districts.

Moreover, in the middle of the distribution, by comparing the yellow and lime-colored dots, we can see that relative to the average of the simulations, the Commission's districts are systematically more Democratic in the Republican-leaning districts, and more Republican in the Democratic-leaning districts. By making elections more competitive in a wide range of districts, the Commission was able to reduce the index of lopsided margins, the mean-median difference, and

the efficiency gap. While the average index of lopsided margins was 7.4 percent in the ensemble, in the Commission's map it was 5.3 percent. While the average mean-median difference in the simulations was 4.1 percent, in the Commission's map it was 2.7 percent. And while the average efficiency gap in the simulations was 12.9 percent, in the Commission's map it was only 4.3 percent (see Table 1 below).

Figure 3: Ensemble of Simulated Michigan House Districts by Partisanship and the Partisanship of the Hickory Plan



If we sum up the Democratic and Republican vote shares in the districts of the Hickory Plan, we see that the Commission achieved an exact tie: there were 55 Democratic-leaning seats and 55 Republican-leaning seats. Recall that the average simulation result was 52 Democratic seats, and that the partisan index used by the Commission indicated a statewide Democratic vote share of 52.4 percent.

The story is similar with the Michigan Senate. Relative to the previous plan, and relative to the party-blind simulations, by reducing the "packing" of Democratic voters in the most lopsided Democratic districts, with its Linden Plan, the Commission was able to create districts with better partisan fairness metrics. These metrics indicate slightly less pro-Republican bias than the Commission's House plan, and using the Commission's partisan index, the Linden Plan produces 20 districts with Democratic majorities (52.6 percent). Recall that according to the Commission's

index, the average statewide Democratic vote share was 52.4 percent, so the partisanship of the plan corresponds closely to that of the state.

Table 1: Measures of Partisan Fairness

	Lopsided Margins Index	Mean-Median Difference	Efficiency Gap	Estimated Democratic Seats
Michigan House of Representatives				
Previous plan (2012-2021)	10	6	18.7	50
Average of 50,000 simulations	7.4	4.1	12.9	52
Hickory plan (current enacted)	5.3	2.7	4.3	55
Michigan Senate				
Previous plan (2012-2021)	8.6	5.1	17.3	17
Average of 50,000 simulations	6.9	3.7	12.5	18
Linden plan (current enacted)	4.5	1.2	3.3	20

In sum, by "unpacking" some of the most Democratic urban districts and creating more competitive suburban districts, the Commission was able to pursue its constitutional obligation and improve significantly on measures of partisan fairness compared with the prior districts, which were deemed by their own creators as partisan gerrymanders, and relative to non-partisan computer simulations. However, since the concentration of Democrats in urban neighborhoods is so extreme, they were not able to bring measures of partisan fairness all the way to the neutral point, especially in the House of Representatives, so that the Hickory Plan, and to a lesser extent the Linden Plan, still exhibit a mild advantage for Republicans.

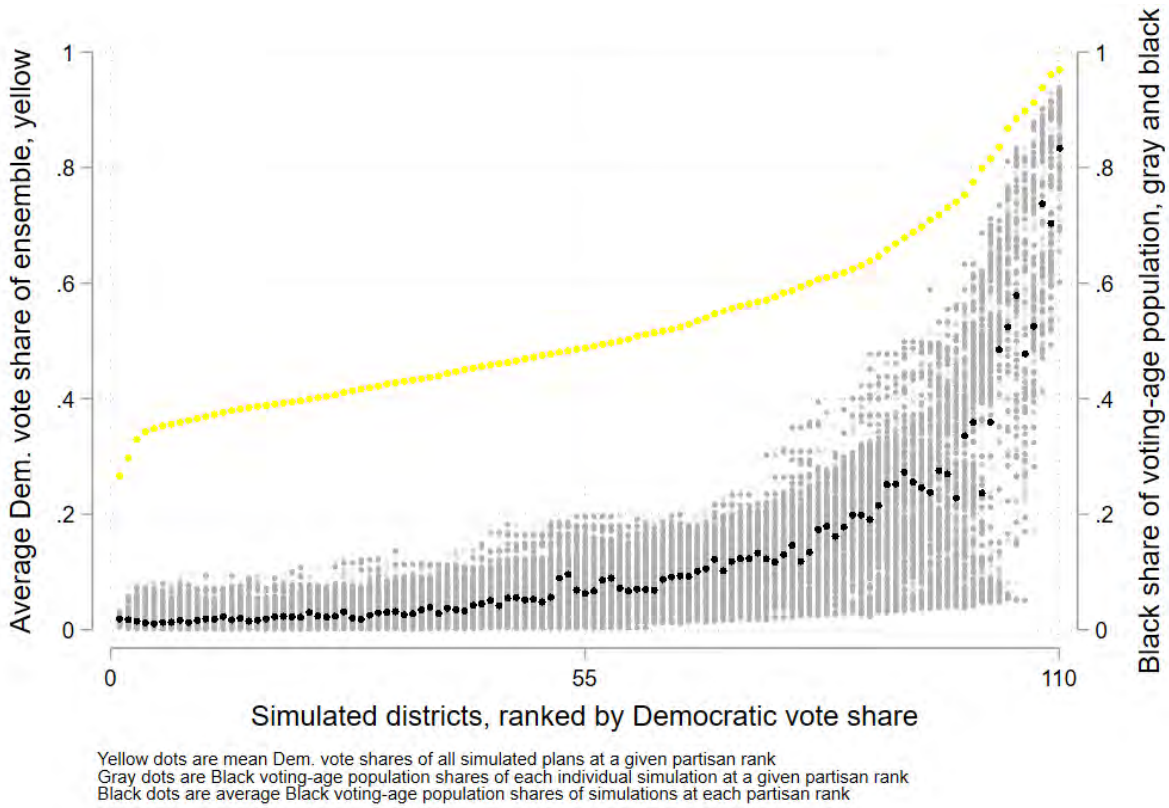
The Geography of Race in Michigan

As in many other parts of the United States, race is highly correlated with partisanship in Michigan. In particular, some of the most overwhelmingly Democratic neighborhoods in the urban core of Detroit also have very large Black majorities. To see the implications of this, let us revisit the ensemble of 50,000 simulated Michigan House of Representative districts once more. In Figure 4, I reproduce the same yellow dots as in all the previous plots. Once again, on the horizontal axis is the rank from 1 to 110 of the Democratic vote share of the simulated districts, and as before, on the left-hand vertical axis is the average Democratic vote share over all the 50,000 simulations, which is represented with yellow data markers for each rank. But now, in addition, instead of plotting the range of partisan outcomes at each partisan rank, as in the previous plots, I display the

Black voting-age population (BVAP) share of each simulation at each partisan rank in gray, and the average BVAP across simulations at each partisan rank in black, which are indicated on the right-hand vertical axis.

Figure 4 shows that when the simulations inevitably produce compact, extremely Democratic districts in the urban core of Detroit, on the right side of the plot, these simulated districts typically also have very high Black voting-age population shares—an average of over 70 percent in the three most Democratic ranked-districts. To achieve the Commission's mandated goal of improving measures of partisan fairness, it was necessary to trim the size of Democratic majorities in these districts relative to the non-partisan simulations. As a practical matter, Figure 4 suggests that this was not possible without altering the distribution of race across districts. There were simply no proximate precincts with large numbers of Black Republicans that would have made it possible to improve partisan fairness scores without reducing the Black voting-age population shares of the most Democratic districts. Had the Commission simply reproduced the distribution of racial groups across districts from the party- and race-blind simulations, it could not have claimed to have pursued its Constitutional mandate.

Figure 4: Ensemble of Simulated Michigan House of Representatives Districts by Partisanship and Race



The Commission had no countervailing mandate to preserve the racial distribution of simulations that are blind as to party and race—that is to say, it had no mandate to produce a set of urban districts where the voting-age population is in the range of 70 or 80 percent Black. Yet it is worth noting that the Commission's plan still produced 7 districts where Black Michiganders made up over 50 percent of the voting-age population. If we take either the mean or the median of the 50,000 simulations, we find that the simulations also tended to produce the same number of majority-Black districts: 7.

Figure 5: Ensemble of Simulated Michigan Senate Districts by Partisanship and Race

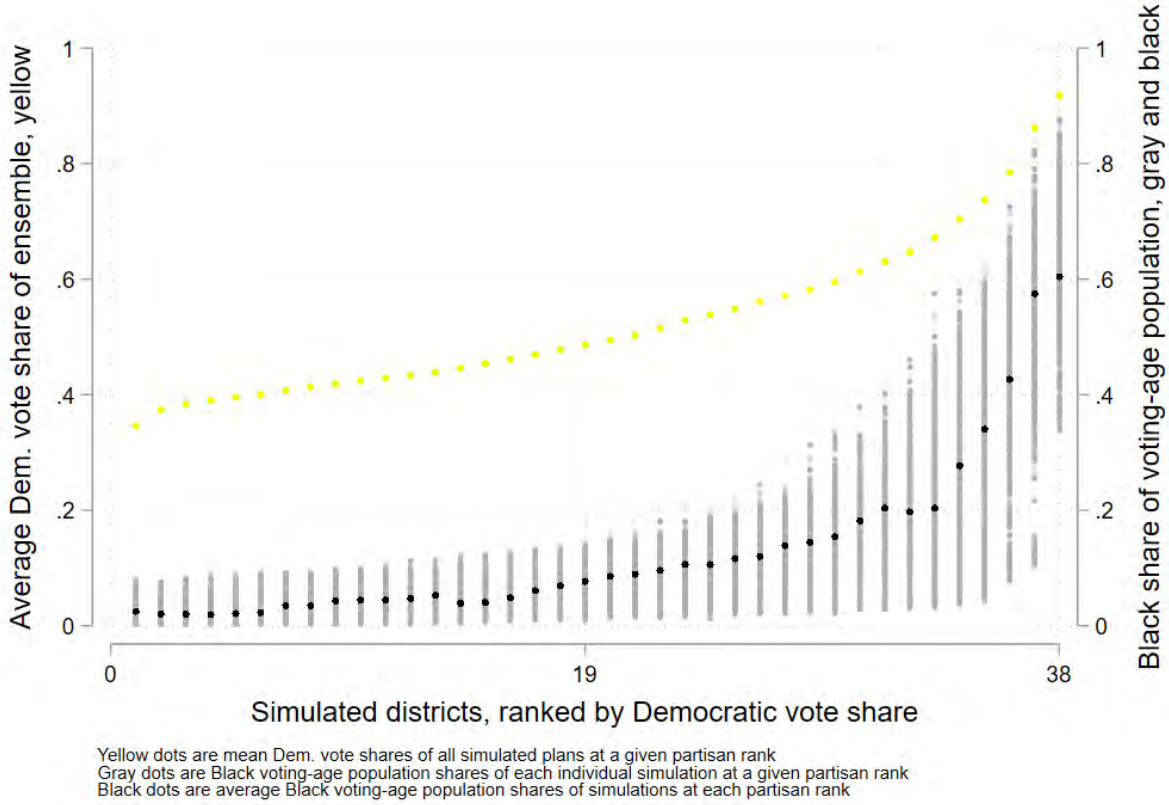


Figure 5 provides a similar plot for the Michigan Senate. Here as well, by drawing compact districts without regard for partisanship, the simulations produce some extremely Democratic districts, represented with yellow dots on the right side of the graph. For instance, on average, the simulations produce five districts with a Democratic vote share above 70 percent, and not a single district on the left side where the Republican vote share is above 70 percent. There are two districts where the simulations would produce Democratic vote shares well above 80 percent. Again, in order to reduce the lopsided margins index, the mean-median difference, and the efficiency gap, the Commission had no choice but to reduce the Democratic vote shares of these urban districts. And again, the gray and black dots show that especially in the two most Democratic districts, the Black voting-age population share in the simulations was very high, and it is difficult to see how the Commission could have fulfilled its obligation to Article IV, Section 6 of the Michigan

Constitution while drawing districts where the black voting-age population would be at or above the average of the simulations.

In the Commission's "Linden Plan," the Democratic vote shares were substantially lower in the two most Democratic districts—districts 3 and 7—than in the simulations. As we have seen in Table 1 above, this had the effect of bringing the partisan fairness scores closer to neutrality. And as a result, the Black voting-age population share in the two most Democratic districts ended up on the lower end of the range of the simulations: 42 percent in District 3, and 46 percent in District 7.

In sum, in drawing plans for both the House of Representatives and the Senate, the Commissioners needed to trim the size of Democratic majorities in the most Democratic urban districts in order to achieve substantial improvements in partisan fairness scores relative to the previous districts or the simulated districts, and in practice, this implied reductions in the Black voting-age populations of the districts in the urban areas with the largest Black populations.

V. VISUAL ANALYSIS AND NARRATIVE

With these basic facts in hand, let us now evaluate Mr. Trende's efforts to explain the Commission's redistricting plans as having been predominantly motivated by race. In the parts of his report dealing with the House and Senate plans, there are sections entitled "Racial Predominance." Both sections proceed in the same way. First, there is a visual inspection of maps and a narrative that attempts to portray the district lines as having been motivated by racial considerations. Second, Mr. Trende makes some arguments about the compactness of districts. Third, he discusses county splits. And fourth, he uses redistricting simulations to calculate a novel measure of what he calls "racial gerrymandering." I will consider each in turn.

Mr. Trende begins his discussion of racial predominance by displaying maps of the Detroit area. In Figure 6 below, I have provided maps of the same parts of the Detroit metro area that were discussed in Mr. Trende's report. Like Mr. Trende, I include dot density maps displaying the racial geography of the Detroit area. In Figure 6, each red dot corresponds to 30 non-Hispanic white voting-age individuals, and each black dot corresponds to 30 non-Hispanic black voting-age individuals. I include the boundaries of the districts in place from 2012 to 2021, the districts of the plaintiffs' demonstration maps that were presented in Mr. Trende's report, as well as the districts of the currently enacted map known as the "Hickory Plan."

Much of Mr. Trende's analysis of Michigan House districts is a discussion of the virtues of the prior map that was in place from 2012 to 2021, which I will refer to as the 2011 Plan. He describes it as follows: "the districts… rarely crossed county lines. Instead, they were often reasonably compact districts that conformed to political boundaries and rarely included appendages and arms" (page 43).

As discussed above, those responsible for drawing the 2011 plans for the Michigan House of Representatives and Senate in the previous round of redistricting were very clear about their partisan goals. They were also very clear about the fact that those goals were well-served by drawing compact districts that observed jurisdictional boundaries. According to one of the map-drawers, Mr. Timmer, "There were two main keys to gerrymandering in Michigan when I sat down to draw maps 10 and 20 years ago. Relying on county and city or township geography, keeping those intact, helps Republicans. The other thing that helped Republicans was the Voting Rights Act — packing those districts, those majority minority districts, into cities like Detroit."[5]

In other words, it was possible to achieve levels of partisan unfairness well beyond the non-partisan simulations by packing Black voters into districts with extremely high Black voting-age population shares. As can be seen in Figure 6a, the stark racial segregation around county boundaries—especially Wayne County—was helpful in this endeavor.

[5] https://wdet.org/2021/10/14/two-authorities-on-gerrymandering-weigh-in-on-michigans-redistricting-commission/

Figure 6a: Race and Boundaries of Michigan House of Representatives Districts: 2011 Plan

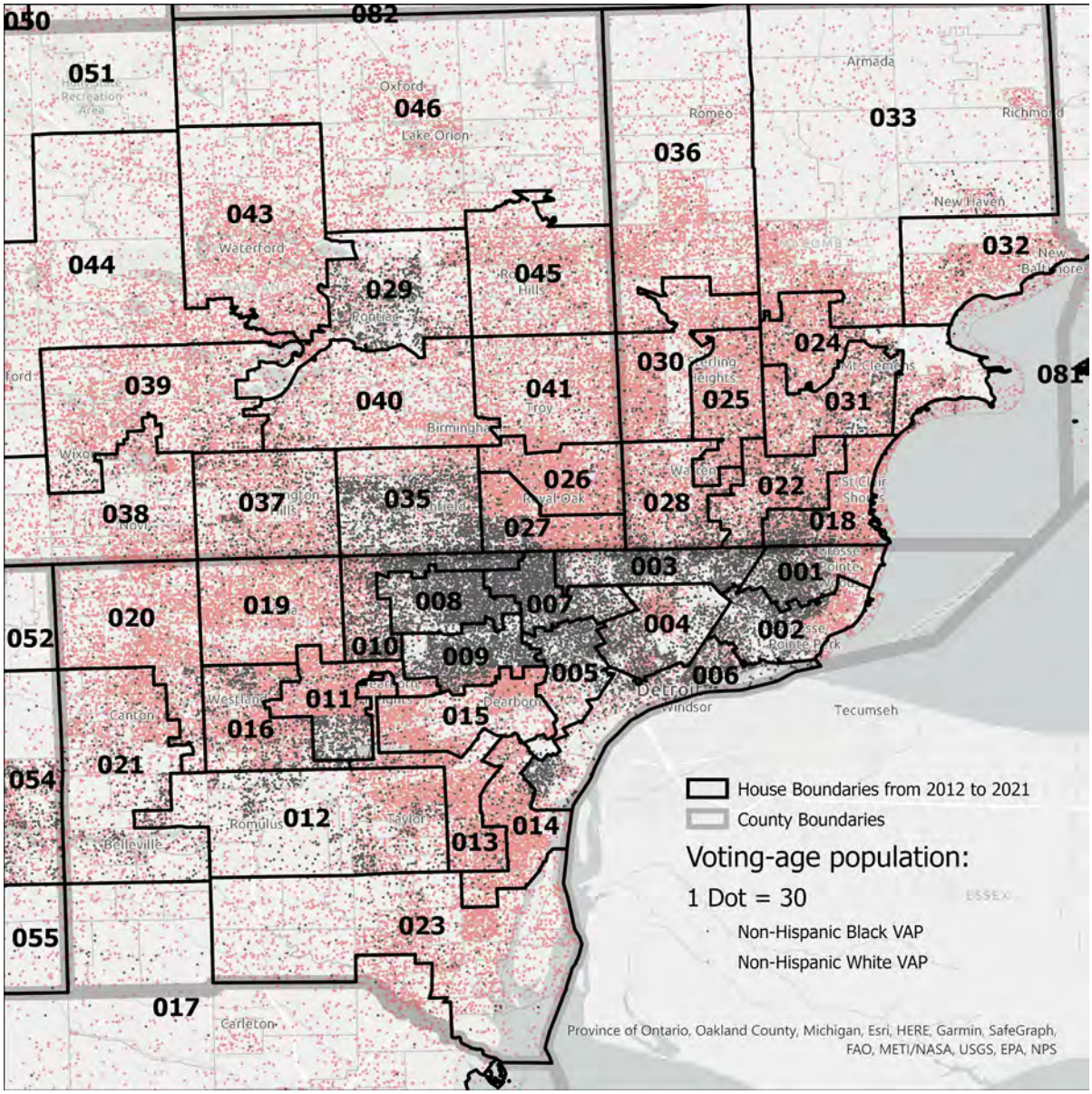


Figure 6b: Race and Boundaries of Michigan House of Representatives Districts: Plaintiffs' Demonstration Map

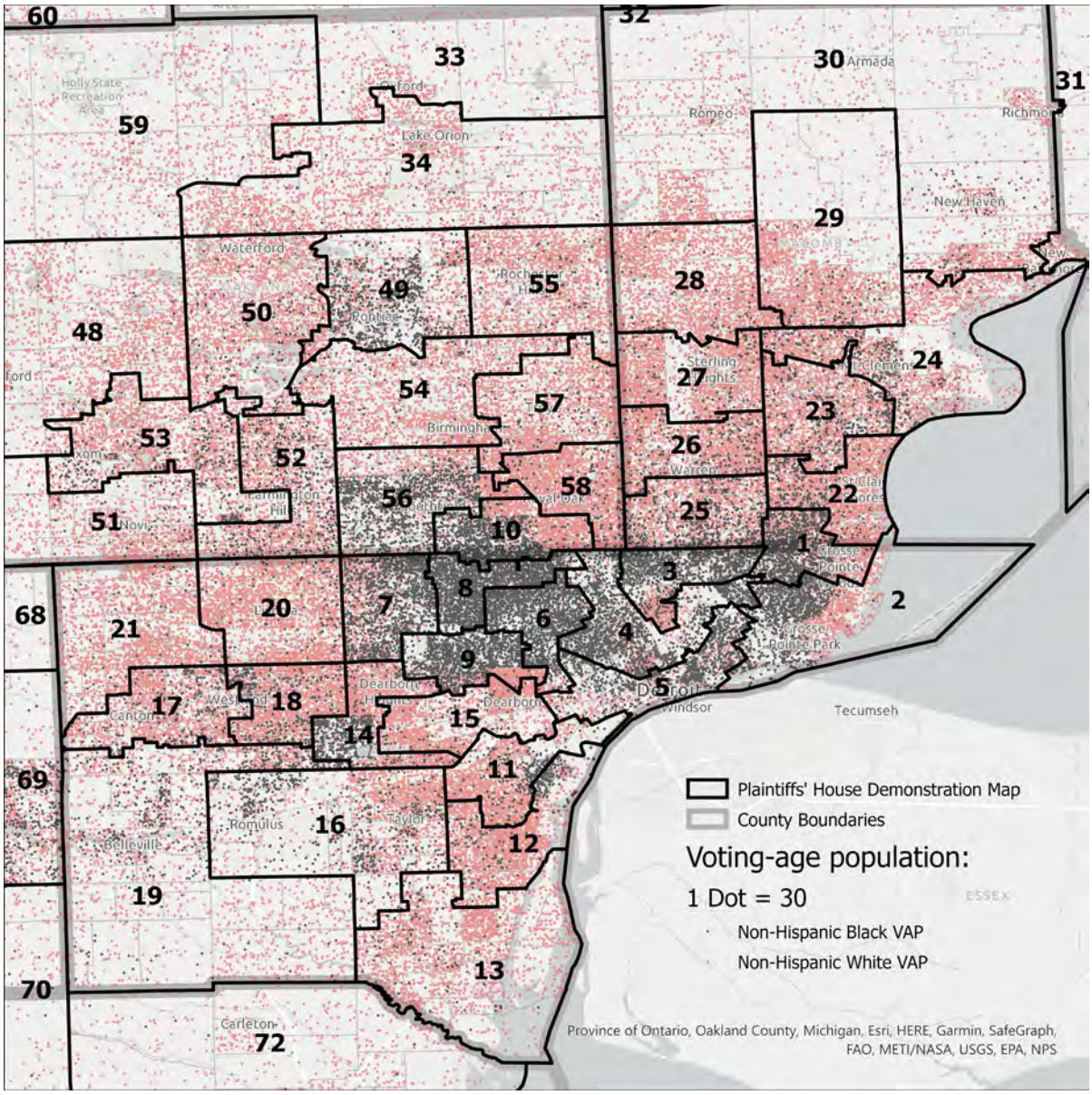
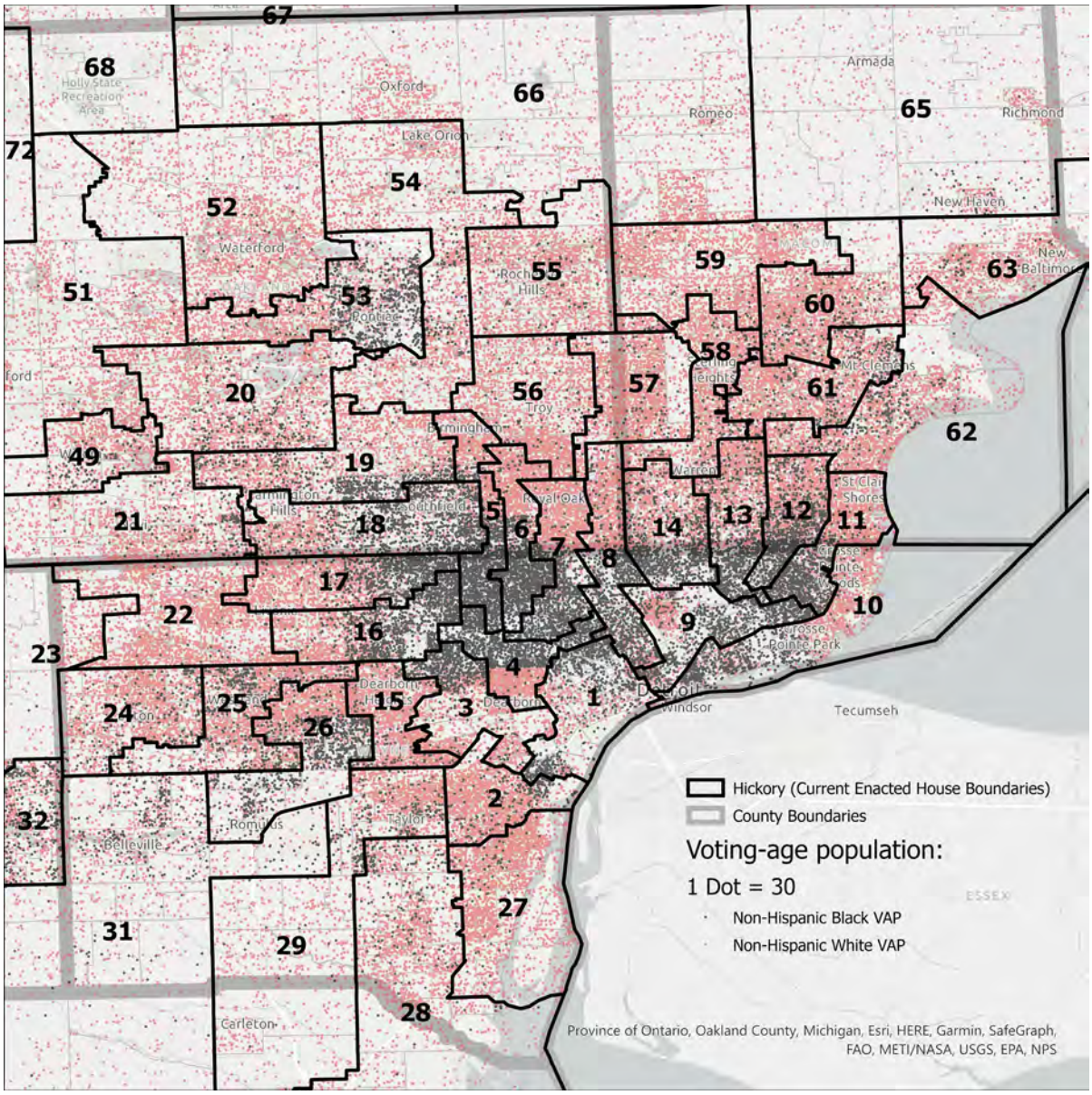


Figure 6c: Race and Boundaries of Michigan House of Representatives Districts: Currently Enacted Districts (Hickory Plan)



In past litigation related to racial gerrymandering, courts have relied on testimony demonstrating that district-drawers carefully followed the geographic dividing lines between racial groups, using district boundaries to segregate voters by race.[6] Note that in the 2011 House plan, the effort to pack Democratic voters often involved drawing district boundaries that followed racial dividing lines in residential geography. Something very similar can be seen in the Plaintiffs' Demonstration House Plan.

To see this more clearly, it is helpful to zoom in on some geographic areas and examine the plans side by side. Figure 7 is centered on the intersection of Wayne, Oakland, and Macomb Counties. It reproduces the dot density map of race, such that each dot represents 10 voting-age individuals, and includes maps of the boundaries of the 2011 Plan (upper left), the Plaintiffs' Demonstration Plan (upper right), and the Hickory Plan (bottom).

In both the 2011 Plan and the Plaintiffs' Demonstration Plan, with some exceptions, the district lines follow rather closely along the lines of residential segregation. In the Plaintiffs' Demonstration map, when District 1 crosses the Wayne County boundary, for example, it does so in a way that follows the lines of racial segregation. To see how these lines also packed Democrats into extremely homogeneous districts, see Figure 8, which displays the same area, but instead of using dots to represent racial groups, it uses dots to represent voters in the 2020 election, such that each blue dot represents 10 Biden voters, and each red dot represents 10 Trump voters. Comparing Figures 7 and 8, we can see that by following lines of racial segregation, the 2011 Plan and the Plaintiffs' Demonstration Plan created very homogeneous Democratic districts.

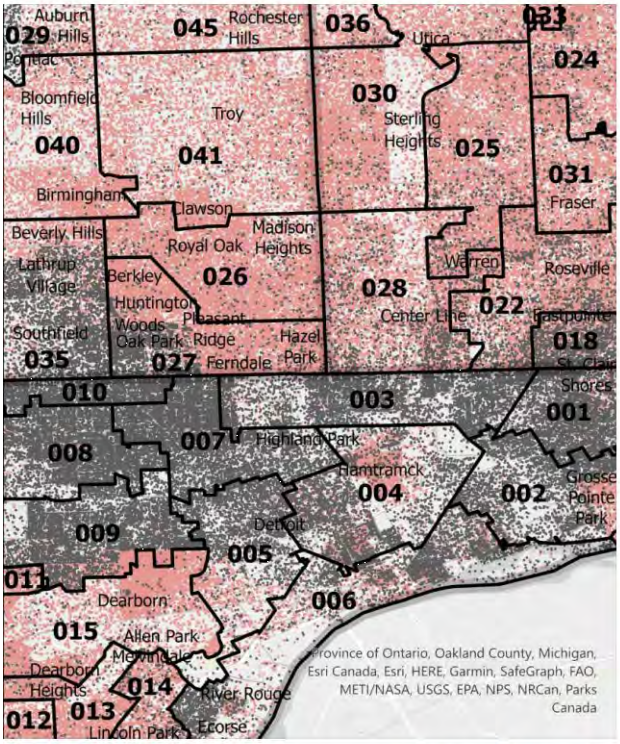
The Hickory Plan does something quite different. It creates districts that are more racially and politically heterogeneous than those in the other two plans. The lines of residential segregation are often found *within* the districts, rather than at the boundaries between the districts. By "unpacking" Democratic voters in this way, as explained above, the Commission was able to reduce the partisan unfairness of the previous map. Visually, in Figure 8 we can see a greater mixing of red and blue dots within districts in the Hickory Plan, which has the effect of improving partisan fairness scores.

Figures 9 and 10 are identical, but they zoom in a little further West, centered on Livonia. Again, in Figure 9 we can see that with some exceptions, the boundaries of the 2011 Plan followed the lines of residential segregation. In Figure 10 we can see that in doing so, they also segregated partisans. And in the bottom maps in Figures 9 and 10—the Hickory Plan—we can see that the Commission drew districts running West to East that were more racially heterogeneous, and as a result, more heterogeneous with respect to partisanship.

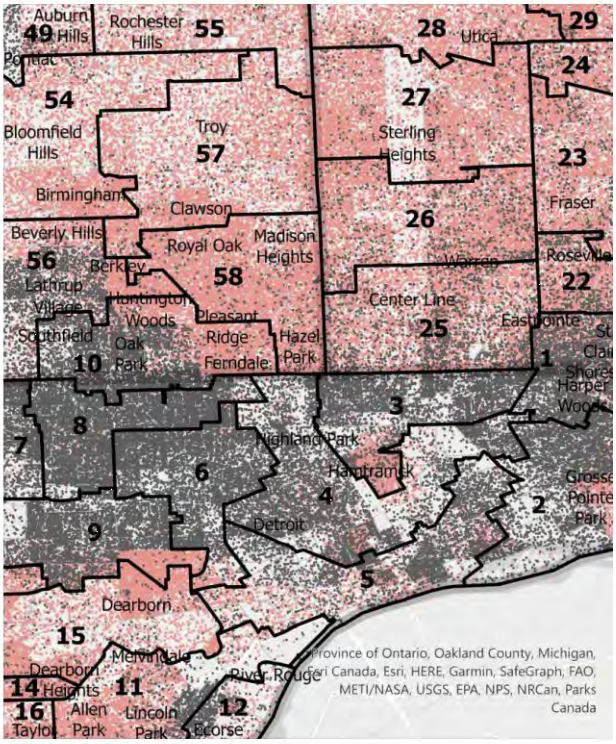
[6] *See* Amended Report of Jonathan Rodden, Ph.D. in support of Plaintiffs, August 30, 2017, *Bethune-Hill v. Virginia St. Bd. of Elec.*, Case No. 3:14-cv-852 (E.D. Va.) (Exhibit P-069); *Bethune-Hill v. Virginia St. Bd. of Elec.*, 326 F. Supp. 3d 128, 145–46 (E.D. Va. 2018) (crediting this analysis).

Figure 7: Race and Boundaries of Michigan House of Representatives Districts, Three Alternative Plans, Zoom at the Intersection of Wayne, Oakland, and Macomb Counties

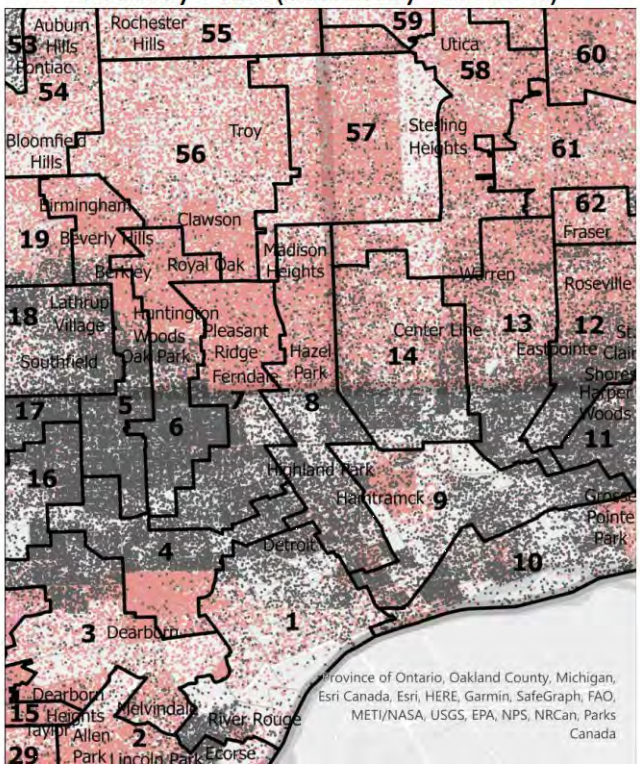
2011 Plan (In place from 2012-2021)



Plaintiffs' Demonstration Plan



Hickory Plan (currently enacted)

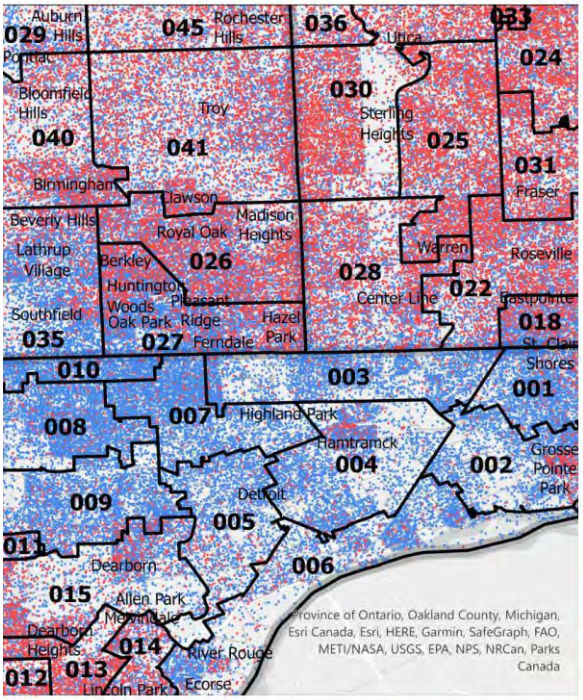


Each red dot represents 10 voting-age white residents

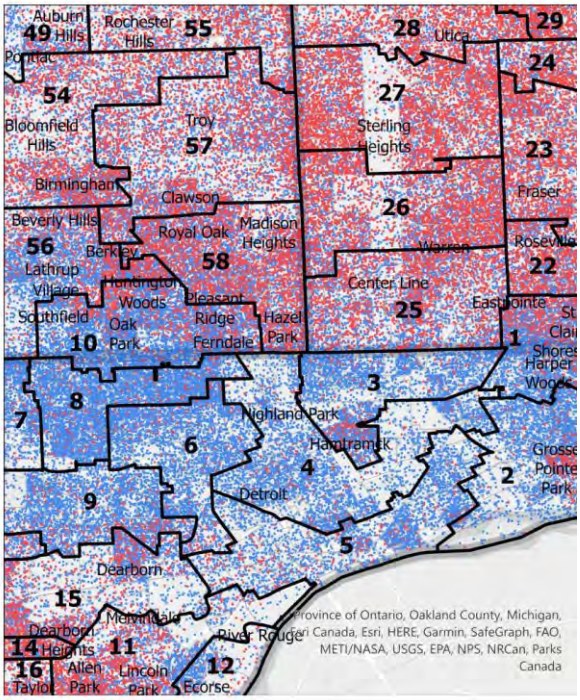
Each black dot represents 10 voting-age Black residents

Figure 8: 2022 Presidential Election Results and Boundaries of Michigan House of Representatives Districts, Three Alternative Plans, Zoom at the Intersection of Wayne, Oakland, and Macomb Counties

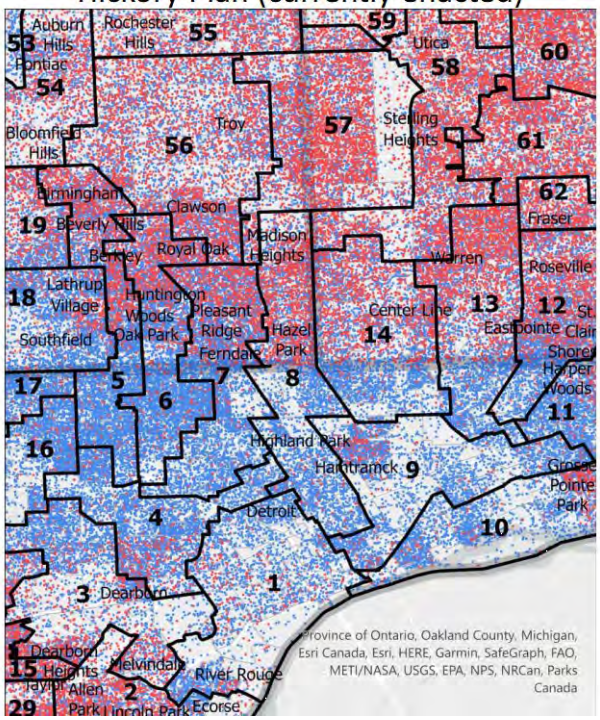
2011 Plan (In place from 2012-2021)



Plaintiffs' Demonstration Plan



Hickory Plan (currently enacted)

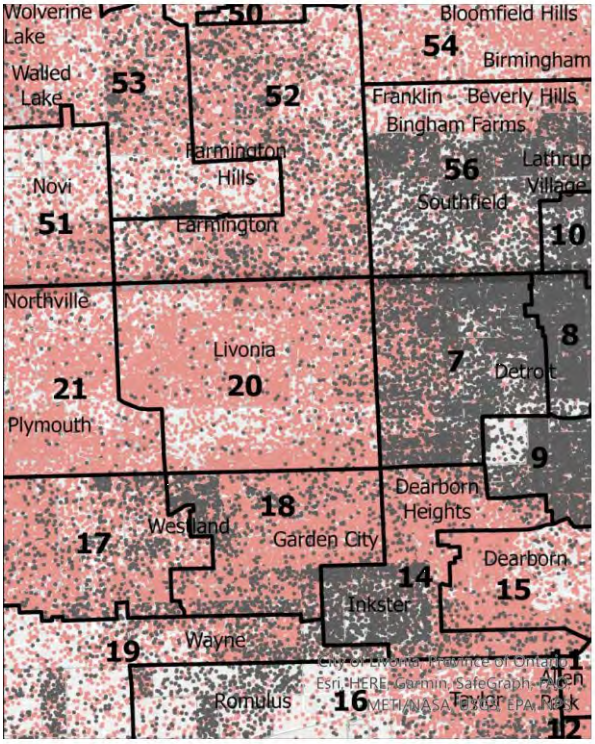


Each red dot represents 10 Trump voters in 2020

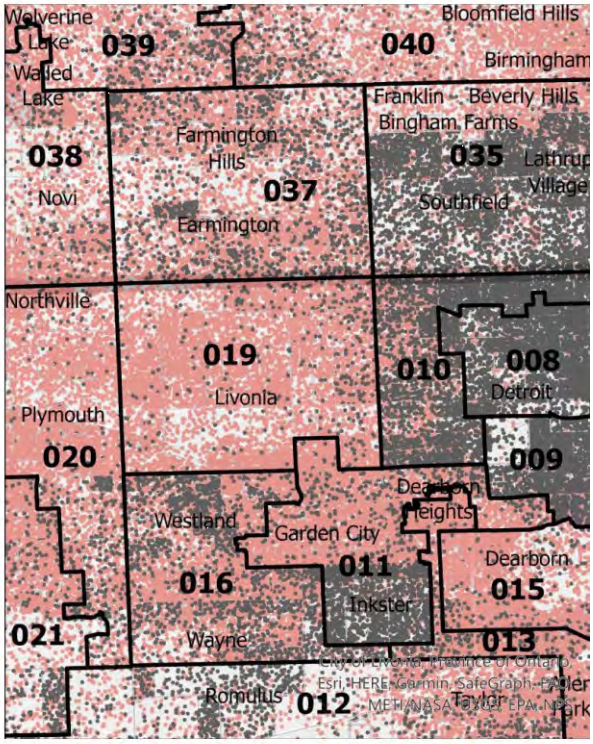
Each blue dot represents 10 Biden voters in 2020

Figure 9: Race and Boundaries of Michigan House of Representatives Districts, Three Alternative Plans, Zoom Centered on Livonia

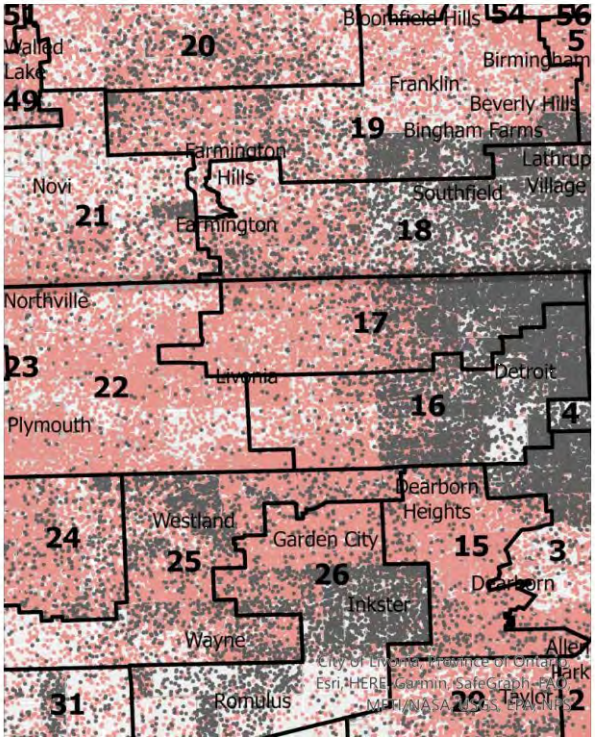
2011 Plan (In place from 2012-2021)



Plaintiffs' Demonstration Plan



Hickory Plan (currently enacted)

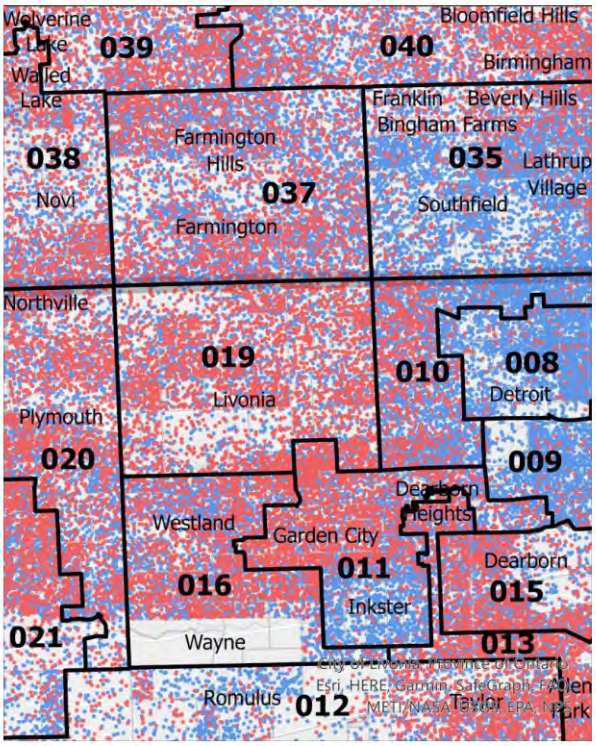


Each red dot represents 10 white voting-age residents

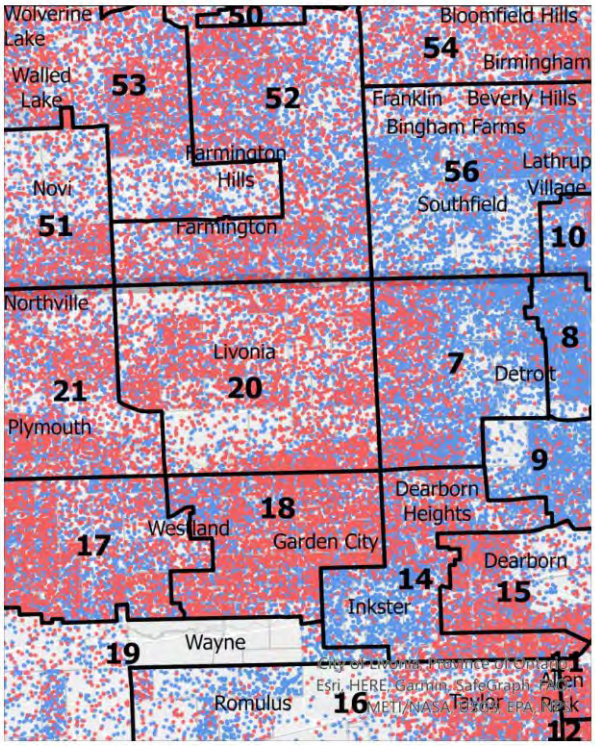
Each black dot represents 10 Black voting-age residents

Figure 10: 2022 Presidential Election Results and Boundaries of Michigan House of Representatives Districts, Three Alternative Plans, Zoom Centered on Livonia

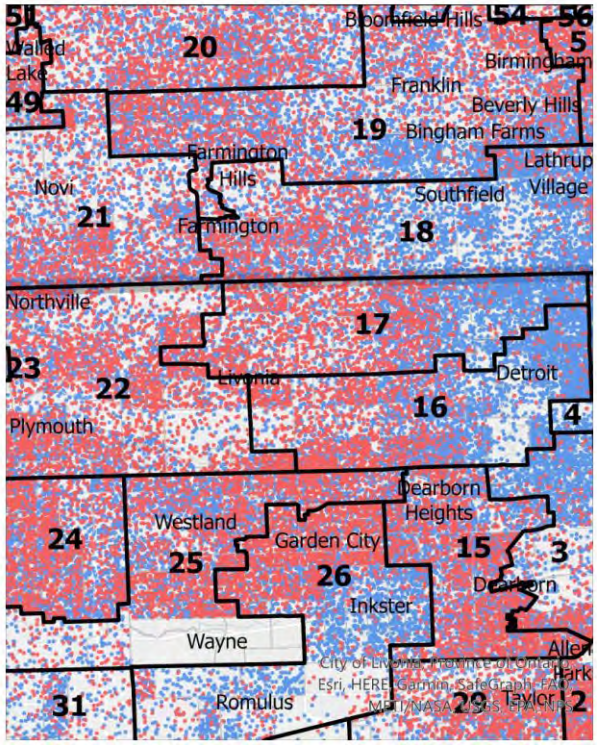
2011 Plan (In place from 2012-2021)



Plaintiffs' Demonstration Plan



Hickory Plan (currently enacted)



Each red dot represents 10 Trump voters in 2020

Each blue dot represents 10 Biden voters in 2020

Describing some of the Commission's Detroit-area districts that cross racial boundaries, Mr. Trende argues that "these features do not exist to improve the partisan performance of the map, as almost all of these precincts are at least Democratic leaning" (page 48). This claim is mistaken for two reasons. First, Mr. Trende seems not to recognize that all the partisan fairness scores considered by the Commission are driven by the prevalence of lopsided districts, and efforts to reduce the number of lopsided districts would be found precisely in the most lopsided districts. Second, Mr. Trende fails to recognize that decisions made in one part of the map have knock-on effects for other parts of the map. Decisions made about boundaries in the middle-ring suburbs have implications for the competitiveness of the out-ring suburbs, for example, and as seen above, the Commission's decisions ended up reducing the lopsided margins in the most non-competitive districts of the urban core, while also creating more competitive districts in the middle- and outer-ring suburbs.

In the next sentence, Mr. Trende goes on to say that the Commission's Detroit-area districts "divvy up the voters by race, combining Black precincts in Detroit with White precincts in the suburbs" (page 48). This is a curious sentence, as the first clause is negated by the second. It is not clear how a map that ignored some of the lines of racial residential segregation and combined different racial groups in the same districts can be described as "divvying them up" by race. Racial gerrymandering is typically understood as placing voters within or outside a district predominantly on the basis of race. Mr. Trende's style of qualitative analysis is to present maps showing that district boundaries do not follow the lines of residential racial segregation. The reader is evidently expected to interpret this as evidence that racial groups have been intentionally "cracked", presumably to undermine their influence. However, it is not clear why the mere presence of racially heterogeneous districts is evidence that the Commission was assigning voters in or out of districts on the basis of race. Racially heterogeneous districts can easily emerge when the district-drawer is *not* paying attention to race or is attempting to achieve a goal that is orthogonal to race, such as preserving a geographic community of interest or facilitating partisan fairness.

In the section of his report focusing on the Michigan Senate, Mr. Trende makes the same arguments. Again, he praises the compactness and respect for county boundaries associated with the 2011 Plan and criticizes the Commission's plan for crossing the Wayne County boundary and combining Black and white voters in districts that are more racially and politically heterogeneous. Again, he provides no discussion of the Commission's mandate to reduce partisan unfairness by creating more competitive districts in the urban core and suburbs. He merely returns to the curious assertion that the districts "divvy up the voters by race" (page 97).

Figures 11 and 12 below demonstrate that, as with the 2011 House of Representatives Plan, the 2011 Senate Plan packs urban Democratic voters into overwhelmingly Democratic districts. It also demonstrates that the Commission's Linden plan created Senate districts that were more racially and politically heterogeneous.

A surprising omission in Mr. Trende's discussion is any mention of his proposed Senate redistricting plan, which is introduced and discussed elsewhere in the report as a "demonstration map." This plan is depicted in Figure 11b and 12b. This plan is quite similar to the Linden Plan (Figure 11c and 12c) in that its districts traverse most of the northern boundary of Wayne County. Moreover, in crossing county and municipal boundaries, Mr. Trende's proposed districts also combine white and Black neighborhoods.

The main claim in the narrative accompanying Mr. Trende's maps seems to be that when districts combine urban majority-Black neighborhoods with more suburban, majority-white neighborhoods, for reasons that are unclear, this constitutes evidence of racial predominance. As argued above, the logic of this claim is faulty. But if we accept it, we must also conclude that race was the predominant factor in creating *his own* Senate districts. Again, it is very difficult to understand how Mr. Trende conceptualizes racial predominance. I will return to this issue below when discussing Mr. Trende's attempt to quantify racial gerrymandering.

Figure 11a: Race and Boundaries of Senate Districts: 2011 Plan

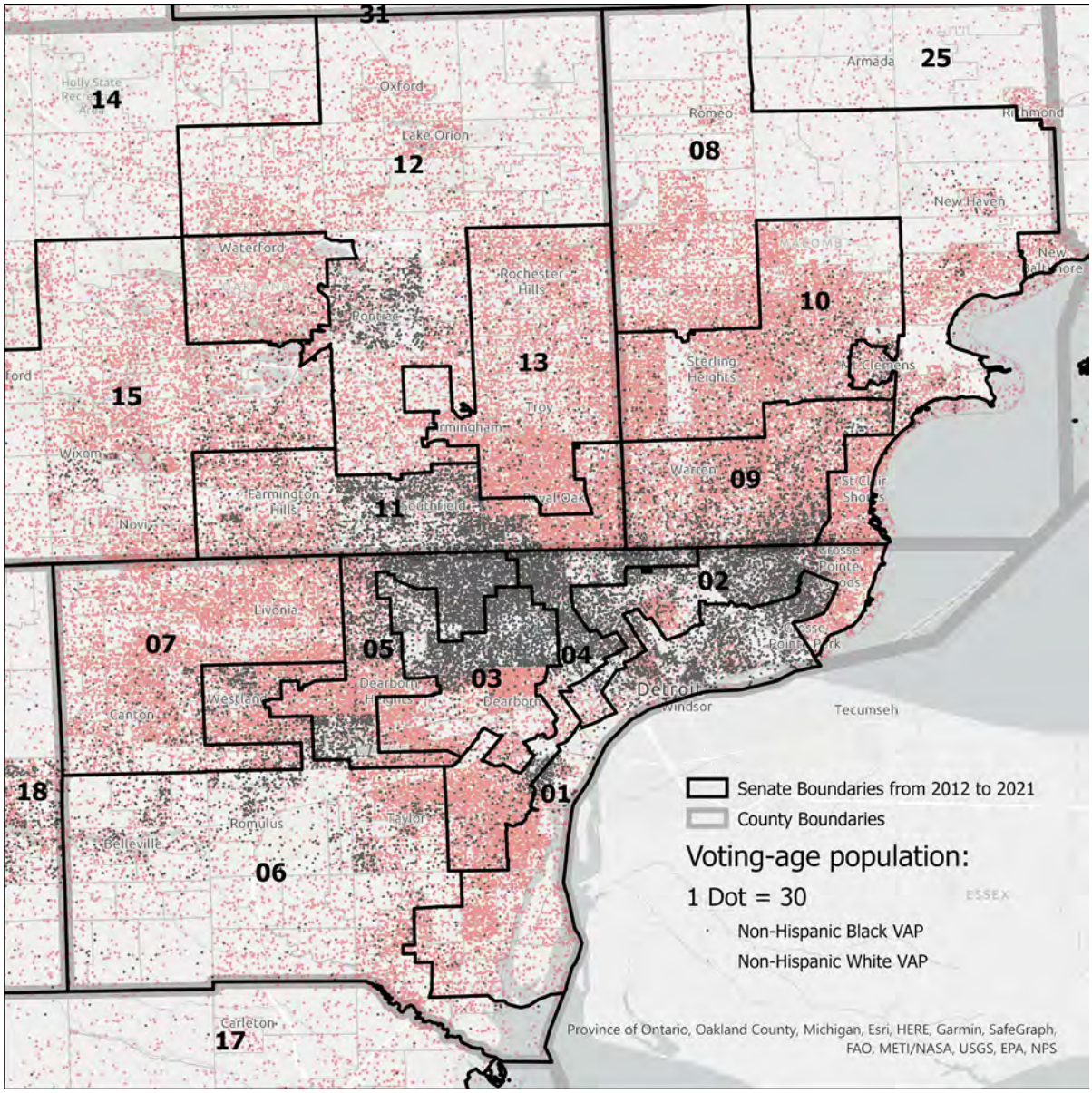


Figure 11b: Race and Boundaries of Senate Districts: Plaintiffs' Demonstration Map

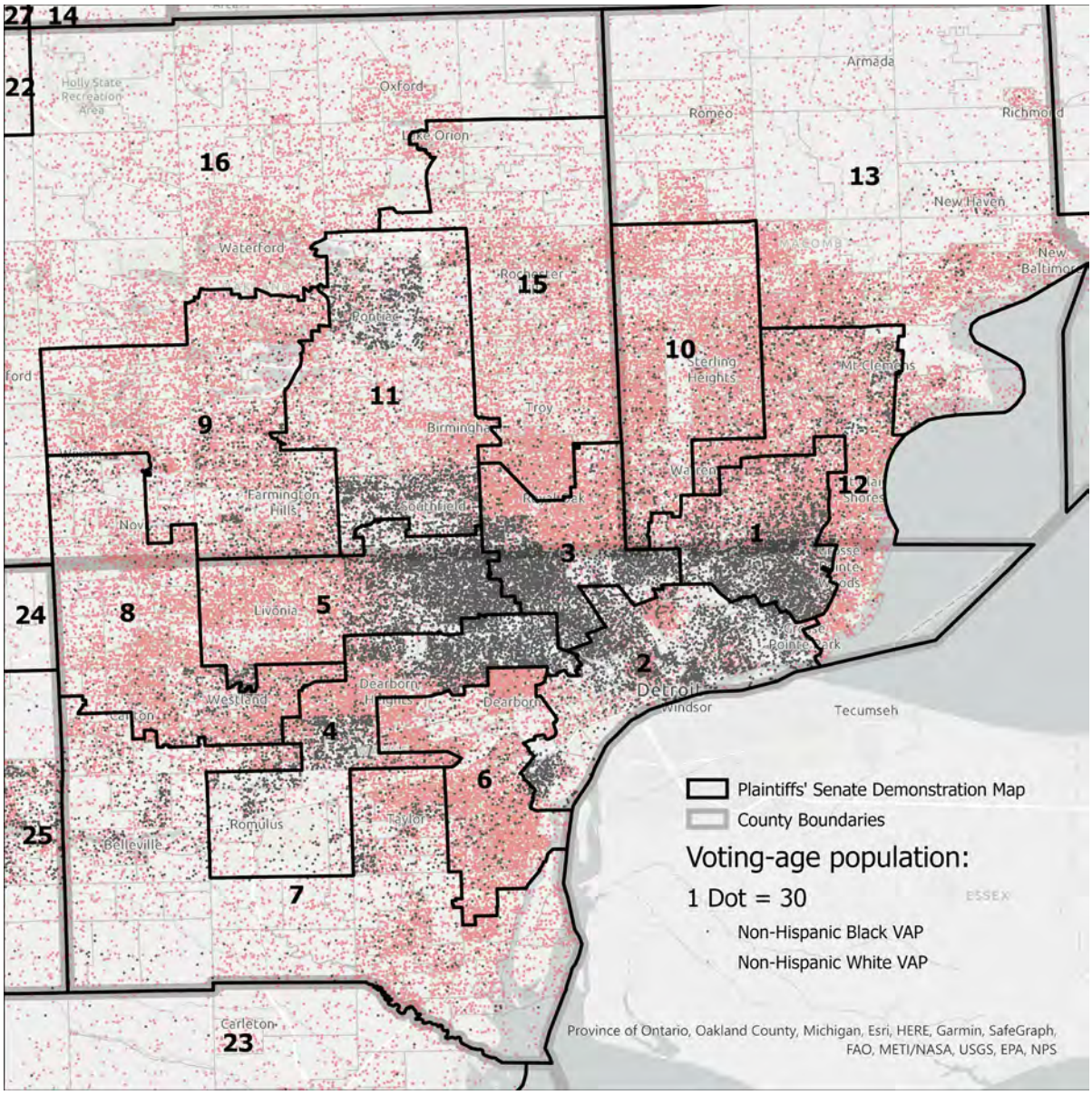


Figure 11c: Race and Boundaries of Senate Districts: Currently Enacted Map (Linden Plan)

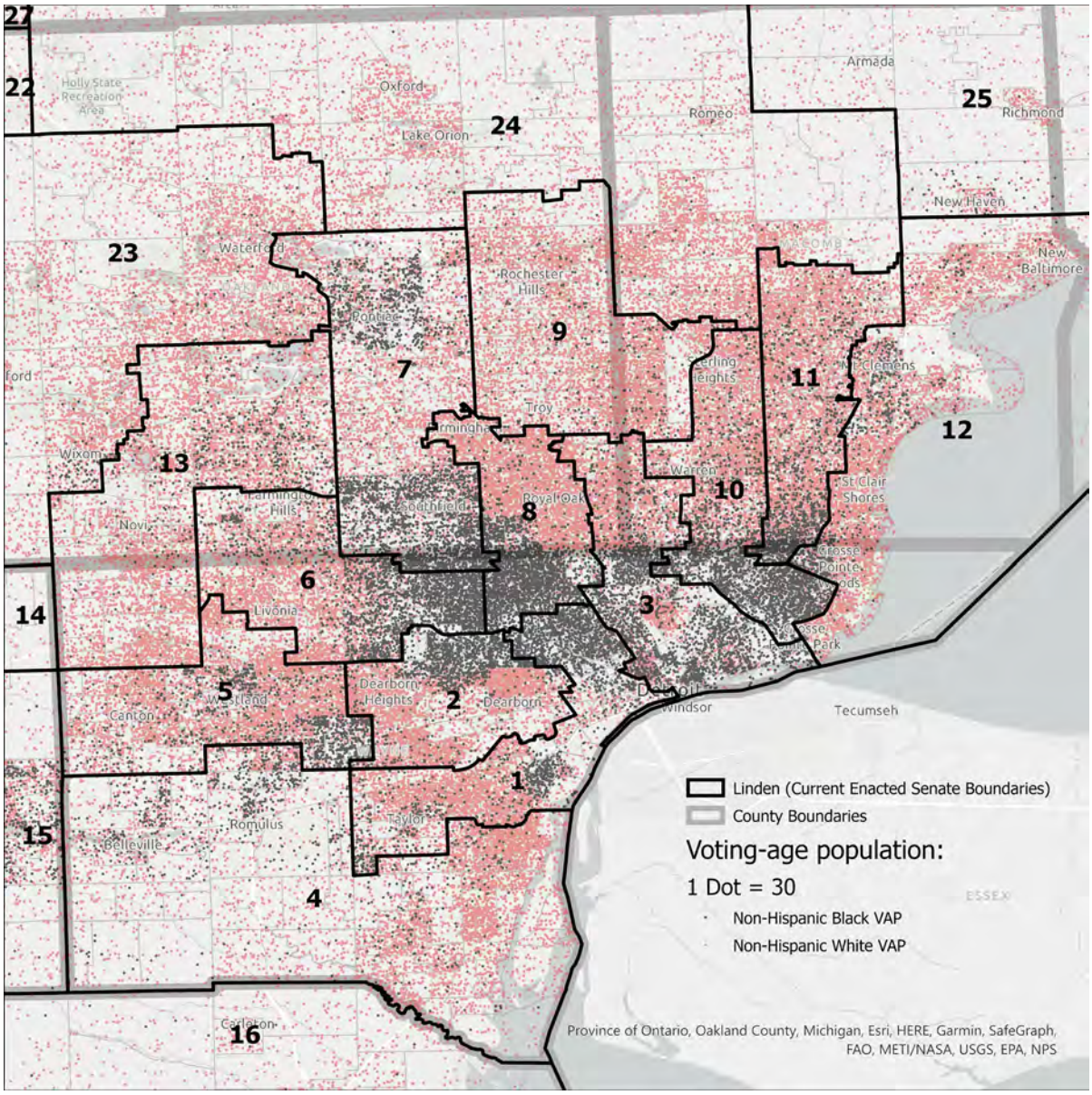


Figure 12a: Partisanship and Boundaries of Senate Districts: 2011 Plan

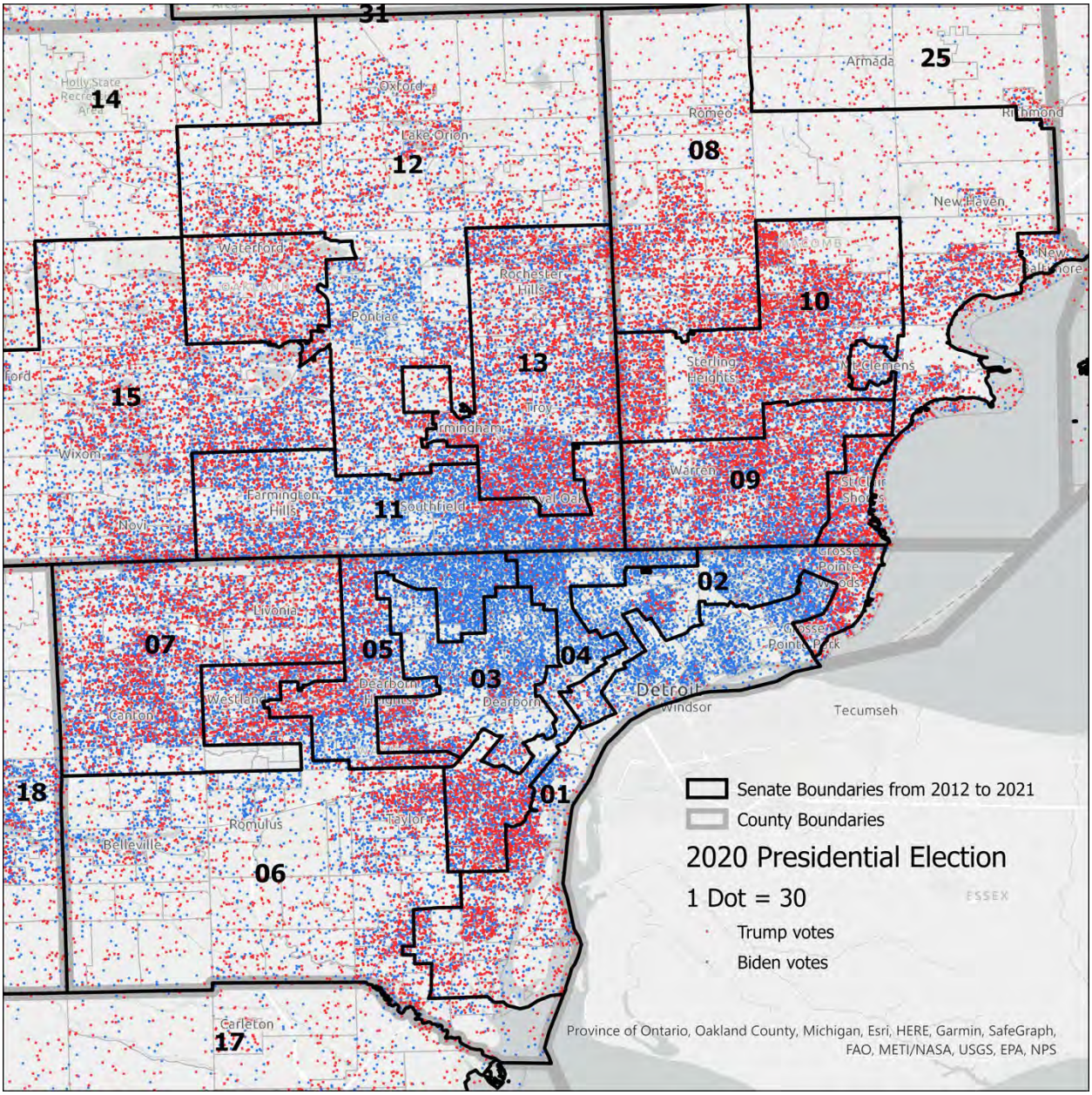


Figure 12b: Partisanship and Boundaries of Senate Districts: Plaintiffs' Demonstration Map

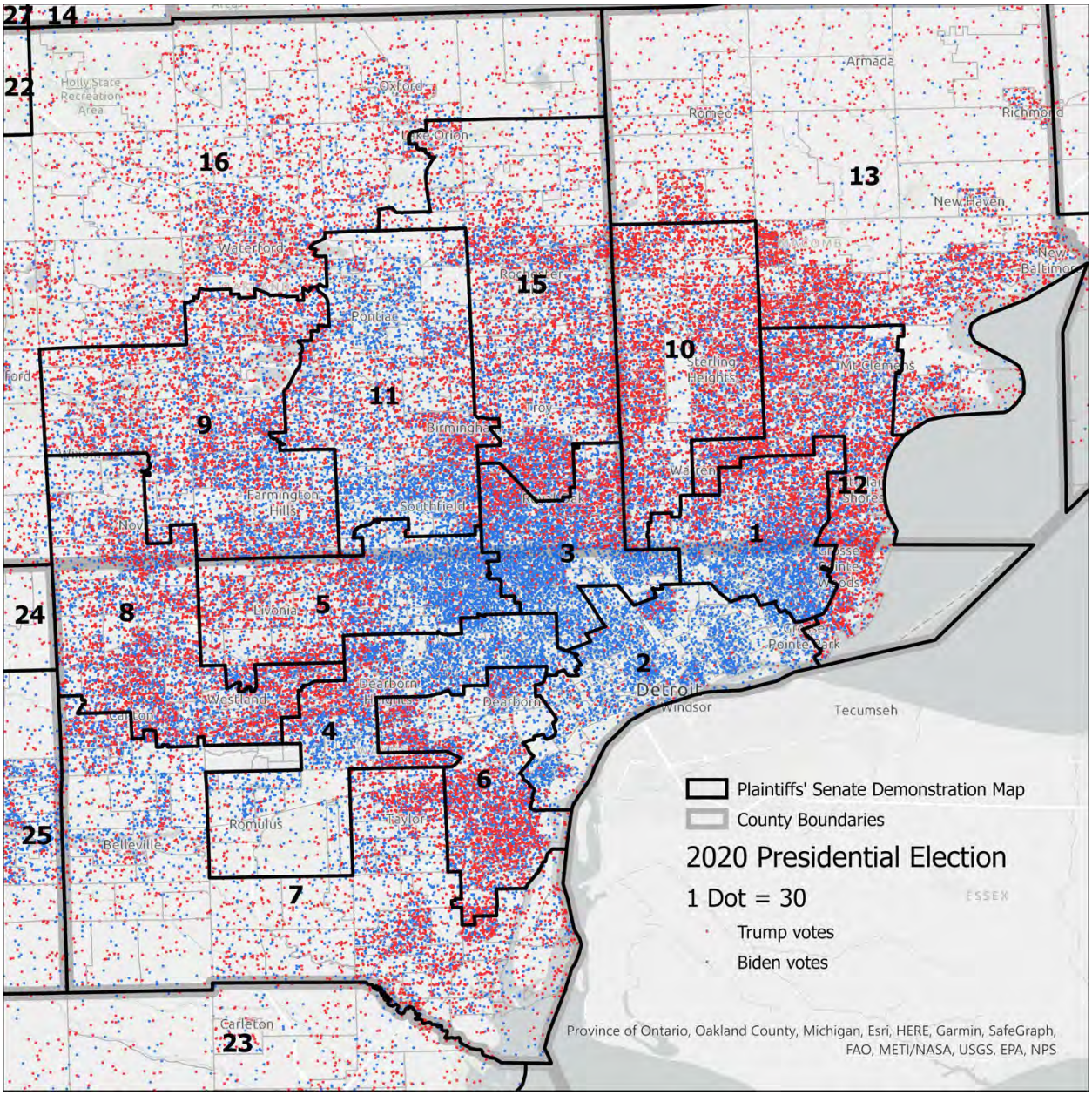
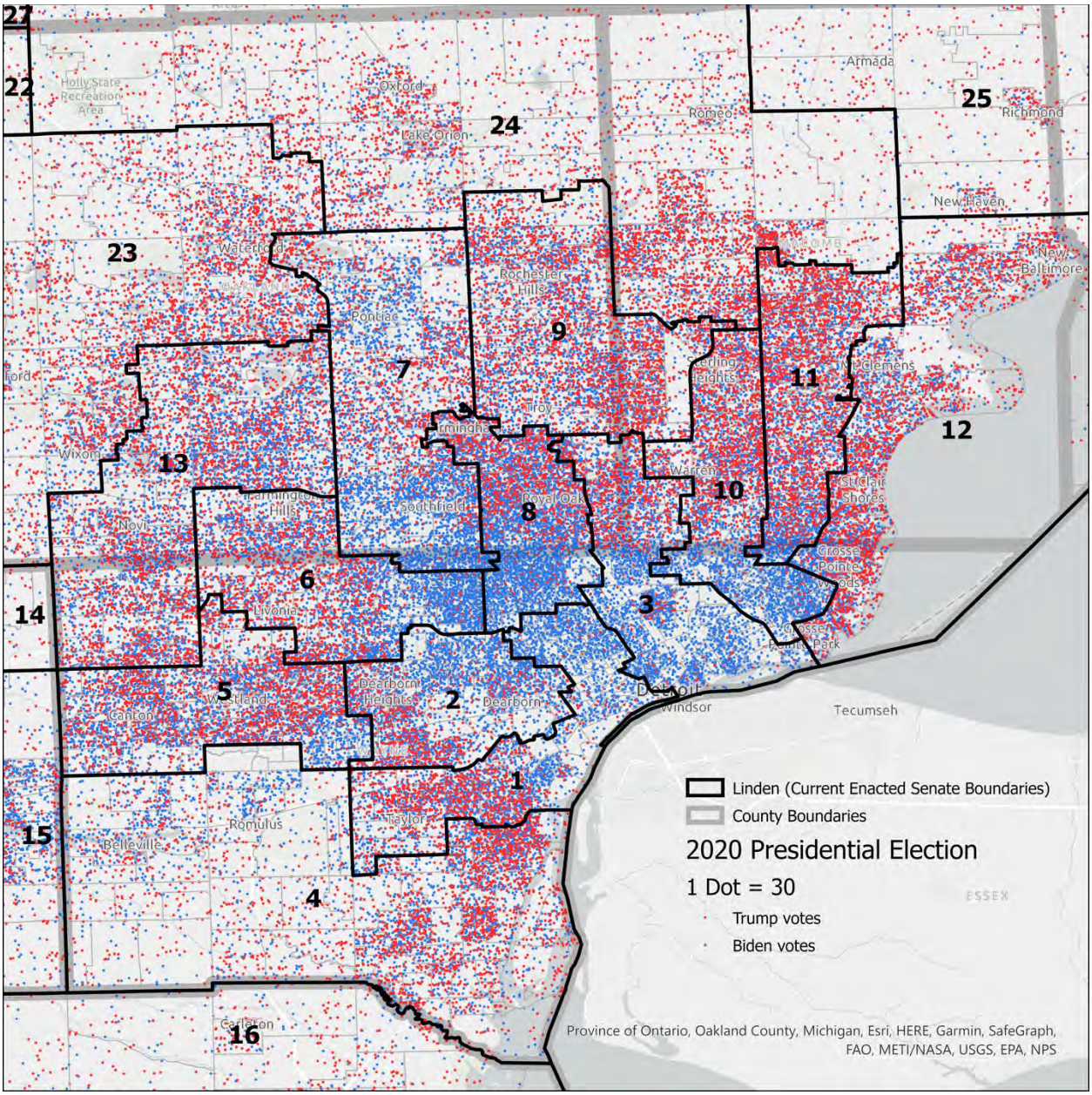


Figure 12c: Partisanship and Boundaries of Senate Districts: Currently Enacted Map (Linden Plan)



VI. COMPACTNESS

Mr. Trende's overall argument about compactness and racial predominance is somewhat difficult to discern. On page 49, he seems to argue that the Hickory Plan compares unfavorably to the 2011 House of Representatives Plan because the districts of the latter were more compact in the Detroit area. He seems to suggest that *non-compact* urban districts are a fingerprint of racial predominance.

However, he goes on to point out on page 106 that the districts in the 2011 Senate plan were *less* compact than those of the Linden Senate plan. Here, without mobilizing any evidence, and in spite of the stated partisan goals of the architects of the 2011 Plan, he surmises that the non-compact districts in the 2011 Plan "likely reflect a desire to comply with the VRA",[7] and that "the more compact districts under the Linden Plan reflect a lack of concern with this." The argument appears to have shifted 180 degrees. Now, the claim seems be that *compact* districts should arouse suspicion.

Mr. Trende does not explain 1) why the reader should make conclusions about racial predominance by comparing compactness scores exclusively to a prior plan that was drawn with partisan intent, or 2) why the inferences drawn from such a comparison should be equal and opposite for the House of Representatives and the Senate.

Moreover, Mr. Trende ignores the fact that compactness is ranked below partisan fairness in the provisions of Article 4, Section 6(13) of the Michigan Constitution. Likewise, he fails to consider the fact that compact districts can help exacerbate partisan unfairness in Michigan. By drawing relatively compact House of Representatives districts, the architects of the 2011 Plan were able to facilitate a very pronounced pro-Republican bias.

Moving beyond Mr. Trende's general discussion of compactness, he also makes a specific claim that compactness was "subordinated" to race in the Commission's plans. The evidence for this is a series of regressions in which Mr. Trende demonstrates a negative and statistically significant relationship between the Black voting-age population share of a district and the district's compactness score in the Hickory Plan for the House of Representatives. Curiously, he also demonstrates that there this relationship does *not* exist among the districts of the Linden Plan for Senate.

He does not explain why a negative relationship between district compactness and BVAP should be understood as evidence of racial predominance or anything else nefarious. In fact, in each of his House of Representatives regressions, he could have substituted the Democratic vote share for Black voting-age population share and gotten a similar result: as districts become more Democratic, they become less compact. Had he presented these regressions, Mr. Trende's logic would lead to the conclusion that compactness was "subordinated" to partisanship rather than race. In short, it is not possible to draw any conclusions about the specific role of race in generating the correlations that Mr. Trende highlights in the Hickory Plan.

[7] He also makes a curious suggestion on page 106 that the "benchmark" Senate plan should be seen as an attempt to produce "five Black VRA districts." He does not explain how he determined this or how he defines a "Black VRA district."

Once again, it is not clear what to make of Mr. Trende's comparison of the Commission's plans to the 2011 Plans. In Table 11, which estimates these regressions for the 2011 House plan, the coefficients are also negative, as with the Commission's House districts, but not quite statistically significant. In Table 26, where he displays the results of regressions for the 2011 Senate Plan, the negative coefficients are larger than those in the other tables, and consistently statistically significant, while this is not the case for the Linden Plan (Table 27), where there is no consistent relationship.

It is very difficult to extract any consistent story from this pattern of results. In most of his regressions, whether they examine the Commission's plans or the 2011 Plans, the coefficients are negative, but they are sometimes statistically significant and sometimes not, depending on the Plan in question or the measure used. This raises the possibility that there is simply something structural about the geography of Michigan whereby districts with larger Black voting-age population will tend to be less compact for reasons having nothing to do with racial or partisan motivations of the mapmakers.

To see whether this is the case, we can run Mr. Trende's regressions on the ensemble of 50,000 simulated plans that did not take party or race into account. If a significant relationship between compactness and BVAP can be found in the ensemble, it cannot possibly be interpreted as a fingerprint of racial predominance. I conduct this exercise by regressing the Polsby-Popper score of each simulated district on its BVAP. The regression includes fixed effects for each individual plan in the ensemble, meaning that the results are driven by variation across districts within each plan. When I run this regression for the ensemble of House plans, the coefficient for *Black Voting-Age Population* is -.06, and it is highly statistically significant, with a p-value less than .001. For the Senate, the coefficient is -.03, also with a p-value less than .001. These results indicate that there is something structural about Michigan's geography that produces a negative correlation between district BVAP and compactness.

In sum, Mr. Trende's analysis of compactness allows us to draw no inferences whatsoever about the role of race in redistricting.

VII. COUNTY SPLITS

Next, Mr. Trende observes that the Commission's plans included more county splits than the 2011 Plan. He does not explain why this is relevant for drawing inferences about racial predominance, or why the previous redistricting plan is a useful comparison. Recall the observation of one of that plan's architects, Mr. Timmer: "Relying on county and city or township geography, keeping those intact, helps Republicans." If Mr. Timmer's observation is correct, the Commission would have found it difficult to fulfill its Constitutional obligation to facilitate partisan fairness while strictly minimizing county splits. And it is important to note that Article 4, Section 6(13) of the Michigan

Constitution does not compel the Commissioners to strictly minimize county or municipal splits, and this criterion is placed near the bottom of the list, below the partisan fairness criterion.

It is possible to examine Mr. Timmer's claim about the relationship between county splits and pro-Republican partisan bias more carefully by returning once again to the ensembles of alternative redistricting plans. As explained further below, the relevance of the ensembles is limited due to the fact that the entire ensemble is more biased in favor of Republicans than the Commission's plans, but even so, it might be possible to learn something by observing variation across the 50,000 plans. One of Mr. Trende's approaches to generating ensembles was to avoid constraining the algorithm to prioritize the minimization of county splits. Using this computer code, I generated 50,000 House of Representatives plans in which the number of county splits ranges from 62 to 76. For each level of county splits, I calculate averages for the three metrics of partisan fairness. I plot these averages (on the vertical axis) against the number of county splits (on the horizontal axis) in Figure 13.

Figure 13: Using Computer-Generated Redistricting Ensembles to Illuminate the Trade-off Between County Splits and Partisan Fairness Metrics

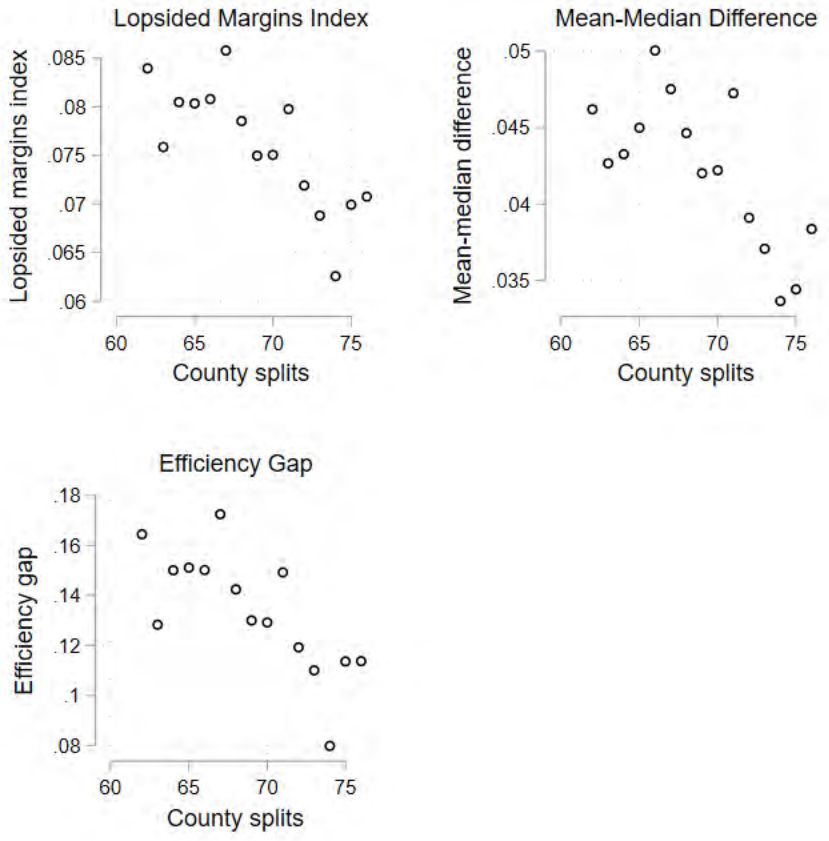


Figure 13 demonstrates that when drawing Michigan House Districts, even in an ensemble of randomly generated maps, there appears to be a trade-off between county splits and partisan fairness. As the number of county splits increases, the level of pro-Republican advantage decreases. Thus, as the Commission attempted to draw districts that adhered to the Constitution's partisan fairness standards, they likely found it difficult to simultaneously minimize county splits, and in any case, they were not required to strictly minimize those splits.

According to Mr. Trende, the number of county splits in the Hickory Plan was 60, which is fewer splits than the entire range of Mr. Trende's ensemble that did not attempt to minimize county splits. In Mr. Trende's Senate ensemble, the range of county splits was from 43 to 59, and Mr. Trende reports that the Linden plan produced 30 county splits. Thus, it appears that the Commission indeed attempted to limit its county splits while pursuing its other Constitutional requirements, even if the Commissioners did not end up in the range of the absolute minimum number of splits that could be located by a computer algorithm.[8]

In sum, as with measures of compactness, there is nothing about the number of county splits that would indicate that the Commission was focusing on race when drawing its districts.

VIII. COMPARISON OF ENACTED PLAN TO ENSEMBLE

Finally, Mr. Trende contrasts the distribution of Black voting-age population across districts in the Hickory and Linden plans with the distribution of Black voting-age population in his ensembles of computer-drawn plans. As described above, his ensembles were produced by a computer algorithm that pays no attention to racial or partisan data. It simply tries to draw compact, contiguous districts. It is important to note that other than trying to abide by the traditional redistricting criteria of compactness and contiguity, and for some simulations, the preservation of county boundaries, the algorithm pays no attention to the requirements of the Michigan constitution. Above all, it ignores the requirement to abide by the Voting Rights Act, and crucially, it ignores the partisan fairness requirement.

Mr. Trende borrows his application of redistricting ensembles from a body of work that uses such ensembles to evaluate whether partisan features of the enacted plan are outliers when contrasted with the distribution of plans in the non-partisan computer-drawn ensemble. However, he misses a crucial step in this type of analysis. To serve as a useful benchmark, the ensemble must produce plans that abide by the *same rules* that had to be followed by those drawing the districts.

[8] Mr. Trende also produced an ensemble based on an algorithm that is trained to strictly minimize county splits. The range of county splits produced in that ensemble is from 30 to 45.

Nowhere in Mr. Trende's report or in his computer code does he calculate the partisan index used by the Commission or any measures of partisan fairness, either for the 2011 districts, for his own proposed districts, the Commission's districts, or the redistricting ensembles. As described above, this algorithm produces plans that have much higher pro-Republican partisan fairness scores than the plans produced by the Commission.

Figure 14: Histograms of Partisan Fairness Scores for Ensemble of 50,000 Alternative Michigan House Redistricting Plans

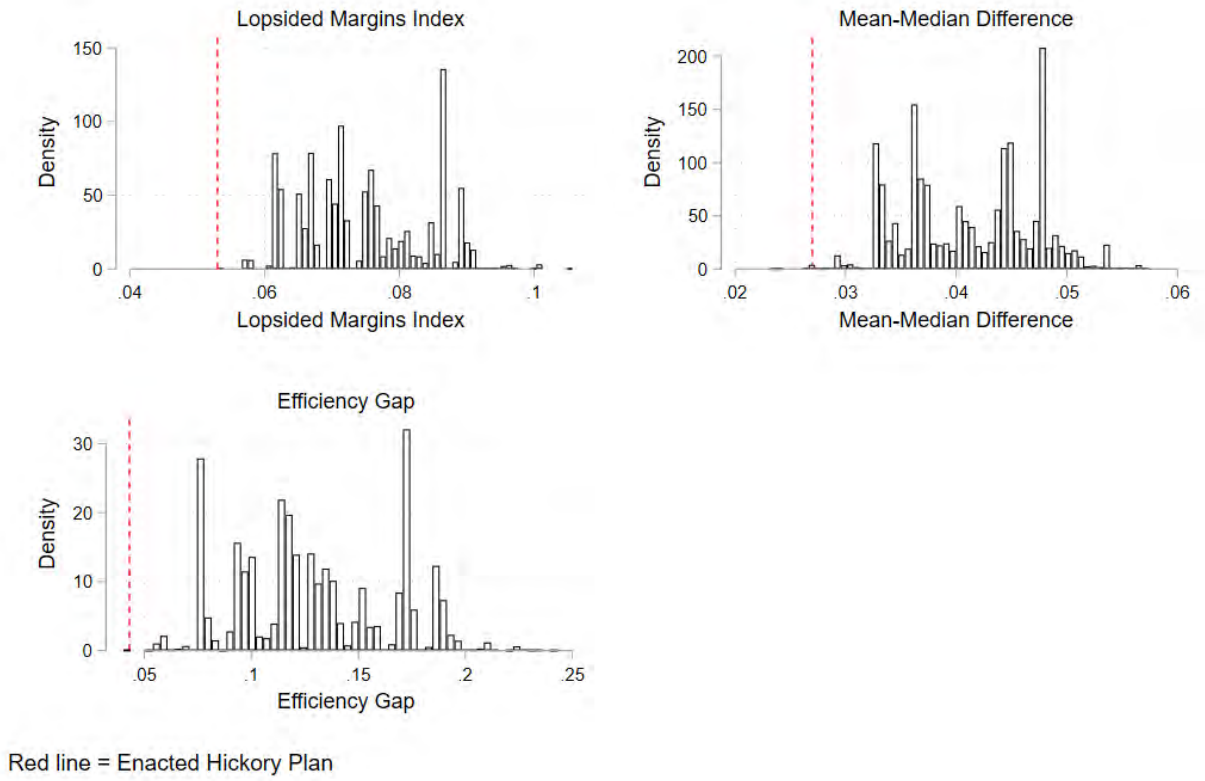


Figure 14 demonstrates the extent of this problem. It presents histograms of the distributions of the partisan fairness scores of each of the 50,000 alternative plans in the ensemble and indicates with a red line the score of the Hickory Plan. In each case, virtually the entire distribution of plans in the ensemble exhibits a higher level of pro-Republican bias than the Hickory Plan.

As explained above, in order to reduce measures of pro-Republican bias relative to the simulated plans, it was necessary for the Commission to reduce the Democratic vote shares of the districts of the urban core of Detroit, and in practice, this also involved reducing the Black voting-age population shares of those districts relative to the districts produced by the simulations.

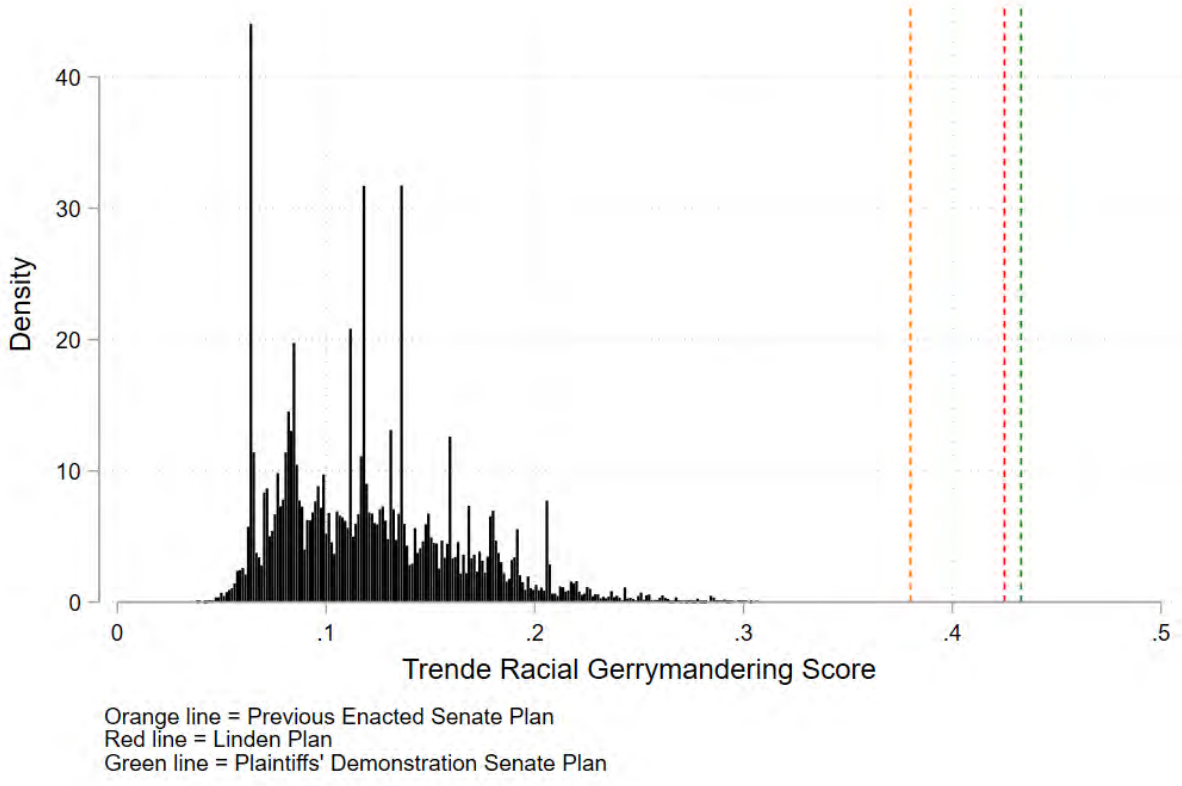
As a result, there is nothing surprising or nefarious about the fact that the distribution of Black voting-age population across districts is different in the Commission's plans than in the

simulations. Mr. Trende's measure of "racial gerrymandering" ranks the districts by race, and at each rank, calculates the deviation of the BVAP share of the enacted plan from the average of the simulated plans. If the distribution of BVAP shares do not track Mr. Trende's party- and race-blind benchmark that ignores the Michigan Constitution, he classifies it as a racial gerrymander.

With this approach, a redistricting plan that deviates from the race-blind benchmark in an effort abide by the Voting Rights Act would be classified as a racial gerrymander, as would a plan that deviates in order to pursue a goal of partisan fairness or any other goal. In other words, it is not a measure of racial predominance at all.

In fact, by Mr. Trende's standard, *all* the Senate plans considered in his report—the previous decade's plan, the Linden plan, and especially his own proposed Senate plan—are racial gerrymanders. He creates an index, which is the square root of the sum of the squared deviations from the mean BVAP at each BVAP rank. He then presents histograms for the "gerrymandering scores" of the simulations, like those using partisan fairness scores in Figure 14 above. He demonstrates that the score of the Linden plan is outside the range of the simulations.

Figure 15: Distribution of "Racial Gerrymandering Scores" for Redistricting Ensembles, Linden Plan, Previous Plan, and Plaintiffs' Demonstration Plan



He does not conduct a similar analysis for the other plans considered in the report. I do so in Figure 15.[9] According to Figure 15, the 2011 Senate plan (indicated in orange) also had a racial gerrymandering score that was well outside the range of the simulations. In other words, its distribution of BVAP shares across districts deviated from that of the average of the simulations, and the deviation was larger than that which occurred among the simulations in the ensemble. The same is true of the Linden Plan, and according to Mr. Trende's standard, the most "racially gerrymandered" Senate plan considered in the report is Mr. Trende's proposed plan.

Figure 16: Ensemble of Simulated Michigan Senate Districts by BVAP Share and BVAP Share of Previous Senate Districts and Plaintiffs' Demonstration Districts

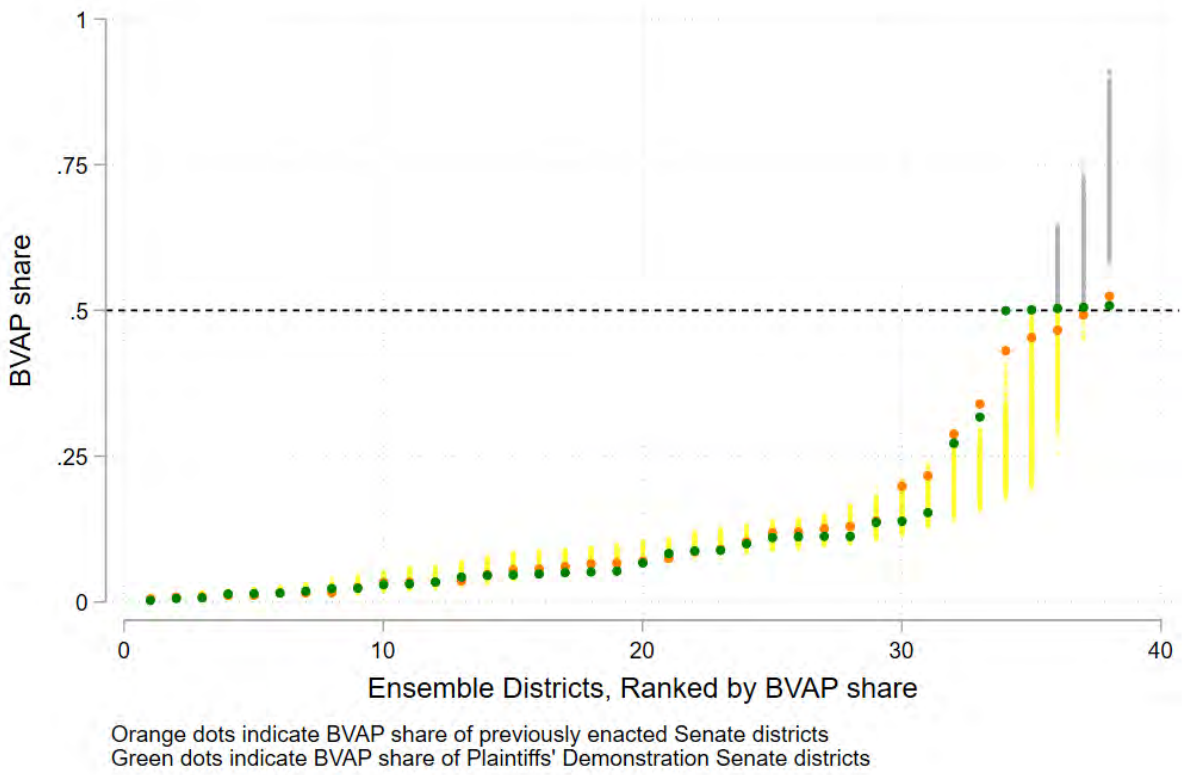


Figure 16 replicates a figure from Mr. Trende's report, but focuses on the 2011 Senate districts and the Plaintiffs' Demonstration districts rather than the Linden Plan. The horizontal axis is the rank of the district in terms of BVAP share. The vertical axis is the BVAP share of the districts in the ensemble (yellow markers for districts that do not have a BVAP majority, grey for those with a BVAP majority), and the alternative districts (orange for the previously enacted plan, and green for the Plaintiffs' Demonstration districts).

[9] In creating this ensemble, I use Mr. Trende's computer code that attempts to reduce county splits. I do so because the number of county splits produced with the unconstrained approach to Senate districts is far beyond that produced in any of the hand-drawn plans, so it appears to be far less relevant as a benchmark. In any case, a graph produced with that approach is very similar to Figure 10.

Figure 16 allows us to comprehend why these plans deviate from the simulations. In the two districts with the largest Black population, these districts have much lower BVAP shares than the simulations. In districts ranked 30 to 35 (out of 38), the previous plan placed Black voters into districts with *higher* BVAP than the simulations. This is also true of the districts ranked from 32 to 35 in Mr. Trende's proposed districts. We can also see that in districts from rank 11 to 23, the BVAP shares in both plans are on the low end of what was produced in the ensembles.

It is difficult to draw conclusions about motivations or considerations of map-drawers from these plots. For the 2011 Plan, a likely explanation is the one provided by Mr. Timmer: districts were drawn to pack urban voters into extremely Democratic districts, providing Republican candidates with an advantage in more competitive districts. As for Mr. Trende's plan, the motivations are simply not clear.

The same considerations, of course, undermine any attempt to divine racial intent from deviations of BVAP shares in the Hickory or Linden plans from the averages of the ensembles. As explained above, the deviations in the Commission's plans were necessary for the constitutional imperative to improve partisan fairness.

IX: CONCLUSIONS

As in many other U.S. states, due to their clustering in urban areas, Democrats in Michigan are more geographically concentrated than Republicans. In Michigan, Black voters in cities vote overwhelmingly for Democratic candidates. When districts are drawn by a non-partisan computer algorithm focusing on compactness, contiguity, and respect for county boundaries, the districts will provide an advantage in the transformation of votes to seats for Republican candidates. Among other goals, the Michigan Independent Redistricting Commission was tasked with drawing districts that would facilitate partisan fairness. It would have been difficult for the Commission to maximize the compactness of districts or minimize county splits while also pursuing that goal. And if the Commission was to pursue the goal of partisan fairness, it would not replicate the distribution of Black voters across districts that would be produced by an algorithm that ignores party and race.

It is not surprising, then, that the Commission's districts were less compact, or split a greater number of counties, than the previously enacted plan, which achieved a very high level of pro-Republican bias. It is also not at all surprising that the Commission's plan did not replicate the distribution of Black voters across districts that was produced by the algorithm that ignored party, race, and the requirements of the Michigan constitution. In fact, the previously enacted plan and Mr. Trende's proposed plan also did not replicate that distribution.

In sum, Mr. Trende's observations about the Commission's redistricting plans provide some indications that the Commission attempted to abide by the Constitution's partisan fairness requirements, but no indications whatsoever that race was the predominant factor in drawing districts for the state legislature.

APPENDIX A

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Education

Ph.D. Political Science, Yale University, 2000.

Fulbright Scholar, University of Leipzig, Germany, 1993–1994.

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Academic Positions

Professor, Department of Political Science, Stanford University, 2012–present.

Senior Fellow, Stanford Institute for Economic Policy Research, 2020–present.

Senior Fellow, Hoover Institution, Stanford University, 2012–present.

Director, Spatial Social Science Lab, Stanford University, 2012–present.

W. Glenn Campbell and Rita Ricardo-Campbell National Fellow, Hoover Institution, Stanford University, 2010–2012.

Associate Professor, Department of Political Science, Stanford University, 2007–2012.

Fellow, Center for Advanced Study in the Behavioral Sciences, Palo Alto, CA, 2006–2007.

Ford Career Development Associate Professor of Political Science, MIT, 2003–2006.

Visiting Scholar, Center for Basic Research in the Social Sciences, Harvard University, 2004.

Assistant Professor of Political Science, MIT, 1999–2003.

Instructor, Department of Political Science and School of Management, Yale University, 1997–1999.

Publications

Books

Why Cities Lose: The Deep Roots of the Urban-Rural Divide. Basic Books, 2019.

Decentralized Governance and Accountability: Academic Research and the Future of Donor Programming. Co-edited with Erik Wibbels, Cambridge University Press, 2019.

Hamilton's Paradox: The Promise and Peril of Fiscal Federalism, Cambridge University Press, 2006. Winner, Gregory Luebbert Award for Best Book in Comparative Politics, 2007; Martha Derthick Award for lasting contribution to the study of federalism, 2021.

Fiscal Decentralization and the Challenge of Hard Budget Constraints, MIT Press, 2003. Co-edited with Gunnar Eskeland and Jennie Litvack.

Peer Reviewed Journal Articles

How Social Context Affects Immigration Attitudes, 2022, *Journal of Politics* forthcoming (with Adam Berinsky, Christopher Karpowitz, Zeyu Chris Peng, and Cara Wong).

Homicide Deaths Among Adult Cohabitants of Handgun Owners in California, 2004 to 2016: A Cohort Study, *Annals of Internal Medicine* forthcoming 2022 (with David M. Studdert, Yifan Zhang, Erin E. Holsinger, Lea Prince, Alexander F. Holsinger, Garen J. Wintemute, and Matthew Miller).

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Viral Voting: Social Networks and Political Participation, 2020, *Quarterly Journal of Political Science* (with Nick Eubank, Guy Grossman, and Melina Platas), winner of the *Political Ties Award* for the best paper on the subject of political networks.

It Takes a Village: Peer Effects and Externalities in Technology Adoption, 2020, *American Journal of Political Science* (with Romain Ferrali, Guy Grossman, and Melina Platas). Winner, 2020 Best Conference Paper Award, American Political Science Association Network Section.

Assembly of the LongSHOT Cohort: Public Record Linkage on a Grand Scale, 2019, *Injury Prevention* (with Yifan Zhang, Erin Holsinger, Lea Prince, Sonja Swanson, Matthew Miller, Garen Wintemute, and David Studdert).

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Working Papers

Elections, Political Polarization, and Economic Uncertainty, NBER Working Paper 27961 (with Scott Baker, Aniket Baksy, Nicholas Bloom, and Steven Davis).

Federalism and Inter-regional Redistribution, Working Paper 2009/3, Institut d'Economia de Barcelona.

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Changing the Default: The Impact of Motor-Voter Reform in Colorado (with Justin Grimmer), 2022.

Chapters in Books

Political Geography and Representation: A Case Study of Districting in Pennsylvania (with Thomas Weighill), in *Political Geometry*, edited by Moon Duchin and Olivia Walch, 2022, Springer.

Keeping Your Enemies Close: Electoral Rules and Partisan Polarization, in *The New Politics of Insecurity*, edited by Frances Rosenbluth and Margaret Weir, 2022, Cambridge University Press.

Decentralized Rule and Revenue, 2019, in Jonathan Rodden and Erik Wibbels, eds., *Decentralized Governance and Accountability*, Cambridge University Press.

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Soft Budget Constraints and German Federalism (Chapter 5), 2003, in Rodden, et al, *Fiscal Decentralization and the Challenge of Hard Budget Constraints* (see above).

Federalism and Bailouts in Brazil (Chapter 7), 2003, in Rodden, et al., *Fiscal Decentralization and the Challenge of Hard Budget Constraints* (see above).

Lessons and Conclusions (Chapter 13), 2003, in Rodden, et al., *Fiscal Decentralization and the Challenge of Hard Budget Constraints* (see above).

Online Interactive Visualization

Stanford Election Atlas, 2012 (collaboration with Stephen Ansolabehere at Harvard and Jim Herries at ESRI)

Other Publications

Supporting Advanced Manufacturing in Alabama, Report to the Alabama Innovation Commission, Hoover Institution, 2021.

How America's Urban-Rural Divide has Shaped the Pandemic, 2020, *Foreign Affairs*, April 20, 2020.

An Evolutionary Path for the European Monetary Fund? A Comparative Perspective, 2017, Briefing paper for the Economic and Financial Affairs Committee of the European Parliament.

Amicus Brief in *Rucho et al. v. Common Cause*, 2019, Supreme Court of the United States, with Wesley Pegden and and Samuel Wang.

Amicus Brief in *Gill et al. v. Whitford et al.*, 2017, Supreme Court of the United States, with Jowei Chen and Wesley Pegden.

Representation and Regional Redistribution in Federations: A Research Report, 2009, in *World Report on Fiscal Federalism*, Institut d'Economia de Barcelona.

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Decentralization and the Challenge of Hard Budget Constraints, *PREM Note* 41, Poverty Reduction and Economic Management Unit, World Bank, Washington, D.C. (July).

Decentralization and Hard Budget Constraints, *APSA-CP* (Newsletter of the Organized Section in Comparative Politics, American Political Science Association) 11:1 (with Jennie Litvack).

Book Review of *The Government of Money* by Peter Johnson, *Comparative Political Studies 32,7: 897-900.*

Fellowships, Honors, and Grants

John Simon Guggenheim Memorial Foundation Fellowship, 2021.

Martha Derthick Award of the American Political Science Association for "the best book published at least ten years ago that has made a lasting contribution to the study of federalism and intergovernmental relations," 2021.

National Institutes of Health, funding for "Relationship between lawful handgun ownership and risk of homicide victimization in the home," 2021.

National Collaborative on Gun Violence Research, funding for "Cohort Study Of Firearm-Related Mortality Among Cohabitants Of Handgun Owners." 2020.

Fund for a Safer Future, Longitudinal Study of Handgun Ownership and Transfer (LongSHOT), GA004696, 2017-2018.

Stanford Institute for Innovation in Developing Economies, Innovation and Entrepreneurship research grant, 2015.

Michael Wallerstein Award for best paper in political economy, American Political Science Association, 2016.

Common Cause Gerrymandering Standard Writing Competition, 2015.

General support grant from the Hewlett Foundation for Spatial Social Science Lab, 2014.

Fellow, Institute for Research in the Social Sciences, Stanford University, 2012.

Sloan Foundation, grant for assembly of geo-referenced precinct-level electoral data set (with Stephen Ansolabehere and James Snyder), 2009-2011.

Hoagland Award Fund for Innovations in Undergraduate Teaching, Stanford University, 2009.

W. Glenn Campbell and Rita Ricardo-Campbell National Fellow, Hoover Institution, Stanford University, beginning Fall 2010.

Research Grant on Fiscal Federalism, Institut d'Economia de Barcelona, 2009.

Fellow, Institute for Research in the Social Sciences, Stanford University, 2008.

United Postal Service Foundation grant for study of the spatial distribution of income in cities, 2008.

Gregory Luebbert Award for Best Book in Comparative Politics, 2007.

Fellow, Center for Advanced Study in the Behavioral Sciences, 2006-2007.

National Science Foundation grant for assembly of cross-national provincial-level dataset on elections, public finance, and government composition, 2003-2004 (with Erik Wibbels).

MIT Dean's Fund and School of Humanities, Arts, and Social Sciences Research Funds.

Funding from DAAD (German Academic Exchange Service), MIT, and Harvard EU Center to organize the conference, "European Fiscal Federalism in Comparative Perspective," held at Harvard University, November 4, 2000.

Canadian Studies Fellowship (Canadian Federal Government), 1996-1997.

Prize Teaching Fellowship, Yale University, 1998-1999.

Fulbright Grant, University of Leipzig, Germany, 1993-1994.

Michigan Association of Governing Boards Award, one of two top graduating students at the University of Michigan, 1993.

W. J. Bryan Prize, top graduating senior in political science department at the University of Michigan, 1993.

Other Professional Activities

Selection committee, best paper award, American Journal of Political Science.

International Advisory Committee, Center for Metropolitan Studies, Sao Paulo, Brazil, 2006–2010.

Selection committee, Mancur Olson Prize awarded by the American Political Science Association Political Economy Section for the best dissertation in the field of political economy.

Selection committee, Gregory Luebbert Best Book Award.

Selection committee, William Anderson Prize, awarded by the American Political Science Association for the best dissertation in the field of federalism and intergovernmental relations.

Courses

Undergraduate

Politics, Economics, and Democracy

Introduction to Comparative Politics

Introduction to Political Science

Political Science Scope and Methods

Institutional Economics

Spatial Approaches to Social Science

Graduate

Political Economy

Political Economy of Institutions

Federalism and Fiscal Decentralization

Politics and Geography

Consulting

2017. Economic and Financial Affairs Committee of the European Parliament.

2016. Briefing paper for the World Bank on fiscal federalism in Brazil.

2013-2018: Principal Investigator, SMS for Better Governance (a collaborative project involving USAID, Social Impact, and UNICEF in Arua, Uganda).

2022. Expert witness in *Rivera v. Schwab* No. 2022-cv-89 (Kan. Dist. Ct. 2022)

2022. Drew Pennsylvania Congressional redistricting plan that was chosen by the Pennsylvania Supreme Court for implementation in *Carter v. Chapman* No. 7 MM 2022, 2022WL 549106 (Pennsylvania Supreme Court).

2022. Written expert testimony in *Benninghoff v. 2021 Legislative Reapportionment Commission* (Pennsylvania Supreme Court).

2022 Expert witness in *Bennett v. Ohio Redistricting Commission*, No. 2012-1198 (Ohio Supreme Court).

2022 Expert witness in *Adams v. DeWine* No. 2012-1428 (Ohio Supreme Court).

2022 Expert witness in *Neiman v. LaRose* No. 2022-0298 (Ohio Supreme Court)

2019: Written expert testimony in *McLemore, Holmes, Robinson, and Woullard v. Hosemann*, United States District Court, Mississippi.

2019: Expert witness in *Nancy Corola Jacobson v. Detzner*, United States District Court, Florida.

2018: Written expert testimony in *League of Women Voters of Florida v. Detzner* No. 4:18-cv-002510, United States District Court, Florida.

2018: Written expert testimony in *College Democrats of the University of Michigan, et al. v. Johnson, et al.*, United States District Court for the Eastern District of Michigan.

2017: Expert witness in *Bethune-Hill v. Virginia Board of Elections*, No. 3:14-CV-00852, United States District Court for the Eastern District of Virginia.

2017: Expert witness in *Arizona Democratic Party, et al. v. Reagan, et al.*, No. 2:16-CV-01065, United States District Court for Arizona.

2016: Expert witness in *Lee v. Virginia Board of Elections*, 3:15-cv-357, United States District Court for the Eastern District of Virginia, Richmond Division.

2016: Expert witness in *Missouri NAACP v. Ferguson-Florissant School District*, United States District Court for the Eastern District of Missouri, Eastern Division.

2014-2015: Written expert testimony in *League of Women Voters of Florida et al. v. Detzner, et al.*, 2012-CA-002842 in Florida Circuit Court, Leon County (Florida Senate redistricting case).

2013-2014: Expert witness in *Romo v Detzner*, 2012-CA-000412 in Florida Curcuit Court, Leon County (Florida Congressional redistricting case).

2011-2014: Consultation with investment groups and hedge funds on European debt crisis.

2011-2014: Lead Outcome Expert, Democracy and Governance, USAID and Social Impact.

2010: USAID, Review of USAID analysis of decentralization in Africa.

2006–2009: World Bank, Independent Evaluations Group. Undertook evaluations of World Bank decentralization and safety net programs.

2008–2011: International Monetary Fund Institute. Designed and taught course on fiscal federalism.

1998–2003: World Bank, Poverty Reduction and Economic Management Unit. Consultant for *World Development Report*, lecturer for training courses, participant in working group for assembly of decentralization data, director of multi-country study of fiscal discipline in decentralized countries, collaborator on review of subnational adjustment lending.

Last updated: February 8, 2023