EXHIBIT 1

Expert Report of Blakeman B. Esselstyn

I. INTRODUCTION

A. Qualifications

1. My name is Blakeman B. Esselstyn. I am the founder and principal of a consultancy called Mapfigure Consulting, which provides expert services in the areas of redistricting, demographics, and geographic information systems (GIS). For more specific information about the qualifications and credentials in the paragraphs below, please see my Curriculum Vitae, provided as **Attachment A**.

2. I have previously served as a consulting expert in two redistricting cases, and as a testifying expert in three cases related to other topics.

3. I have developed 15 redistricting plans that have been enacted for use in elections by jurisdictions at various levels of government.

4. I earned a bachelor's degree in Geology & Geophysics and International Studies from Yale University and a master's degree in Computer and Information Technology from the University of Pennsylvania. I have professional certifications both as a Geographic Information Systems Professional (GISP) and as a member of the American Institute of Certified Planners (AICP).

5. I have taught graduate-level semester courses in Geographic Information Systems (GIS) and have presented on redistricting at conferences at Harvard University, Duke University, the University of North Carolina at Chapel Hill, the University of Texas, and several other universities. I have also presented at events organized by the

National Conference of State Legislatures (NCSL), the Urban and Regional Information Systems Association (URISA), and the American Planning Association (APA).

6. In addition to speaking engagements, my work and opinions related to redistricting have often been cited in media outlets, and some of my related writings have been published or cited in national publications. Again, for details, please see **Attachment A**.

7. I am being compensated at a rate of $325 per hour. No part of my compensation is dependent upon the conclusions that I reach or the opinions that I offer.

B. About this report

8. Plaintiffs' counsel has asked me to determine whether there are areas in the State of Georgia where the Black population is "sufficiently large and geographically compact"[1] to enable the creation of additional majority-Black legislative districts relative to the number of such districts provided in the enacted State Senate and State House of Representatives redistricting plans from 2021.

9. The Georgia General Assembly has two chambers, each with distinct redistricting plans that I will consider individually. Following a demographic overview of the state that will be relevant for both chambers, the report will provide separate sections addressing each chamber's districts: first the State Senate, then the House of Representatives. For each chamber, I will briefly review the enacted plan, present an

[1] *Thornburg v. Gingles*, 478 U.S. 30, 50 (1986).

alternative illustrative plan, and supply some analysis of selected characteristics of the plans.

10. Unless otherwise specified, all map images in the report are ones that I created (though they may be maps showing redistricting plans I did not create).[2]

11. More detailed information about the sources of data, the software, and my methodology can be found in **Attachment B**.

C. Summary of conclusions

12. It is possible to create three additional majority-Black districts in the State Senate plan and five additional majority-Black districts in the State House plan while still adhering to other traditional redistricting principles.

II. Statewide Demographic Overview

A. Georgia and the 2020 Census

13. Georgia's population increased by more than one million people between the 2010 and 2020 censuses, from 9,687,653 to 10,711,908—an increase of approximately 10.6%.[3]

[2] Some maps deliberately do not show the State of Georgia in its entirety, as districts in large areas of the northern and southern parts of the state are unchanged in the illustrative plans. Focusing in on affected portions of the State's geography allows for more clarity and higher level of detail in the map figures.

[3] All demographic analysis is based on statistics obtained from the U.S. Census Bureau website, https://www.census.gov. For URLs of specific census resources used, please consult Attachment B.

14. According to the 2020 census, 33.0% of Georgia's population (essentially one-third) identified as "Black or African American alone or in combination."[4] The 2010–2020 population increase in this group outpaced the growth in the state as a whole, increasing by approximately 15.8%.

15. By contrast, the state's population identifying as White and neither Hispanic nor multi-racial *decreased* by 1.0% between 2010 and 2020. This non-Hispanic White population still constitutes a majority of the state population, but only barely, at 50.1%. In 2010, this group constituted 55.9% of Georgia's population.

16. The *voting age* population identifying as Black increased 21.8% from 2010 to 2020. In 2020 this group (sometimes abbreviated as BVAP for the Black voting age population) made up 31.7% of the voting age population, an increase from 29.7% in 2010. The non-Hispanic single-race White voting age population, however, has decreased from 59.0% of the voting age population to 52.8%.

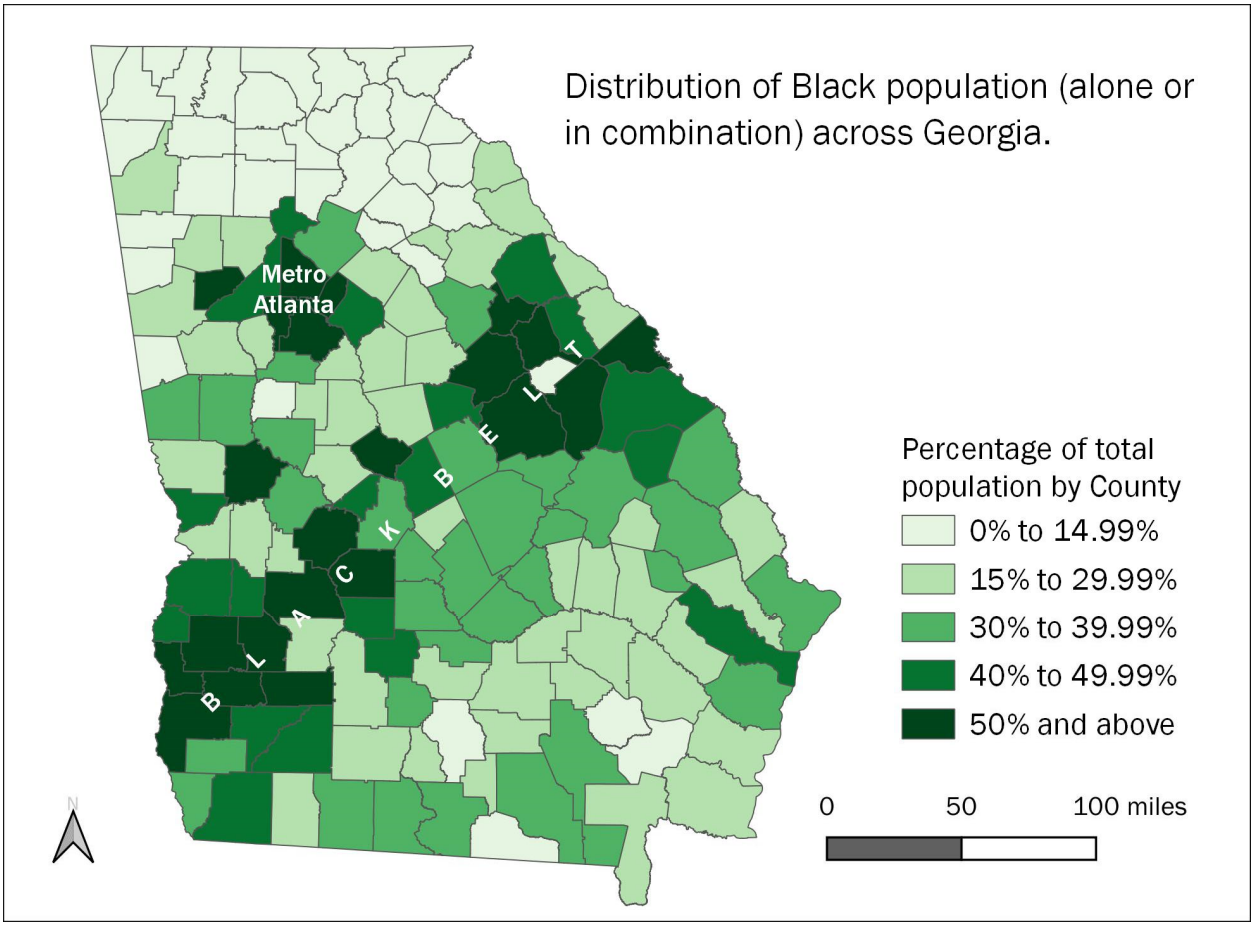
B. Geographic distribution of the Black population

17. Just about half of Georgia's Black population lives in six of the state's 159 counties, all of which are in the Metro Atlanta region. These six counties are, in order of decreasing Black population, Fulton, DeKalb, Gwinnett, Cobb, Clayton, and Henry.

[4] The Census Bureau classification "Black or African American alone or in combination," sometimes stated as "any part Black," will be the measure of the Black population that I use most frequently in this report. Unless otherwise stated, in the text that follows, "Black" can be taken to indicate "alone or in combination." This measure includes Black residents who also identify as Hispanic. In the understanding of this author, the "alone or in combination" designation is the appropriate measure for most Voting Rights Act Section 2 considerations.

18. The counties in Georgia where the percentage of Black residents generally tends to be highest can be grouped into two main categories: the aforementioned Metro Atlanta region and the so-called "Black Belt" of Georgia. Though some accounts say the origin of the term "Black Belt" in the American South stems from descriptions of the soil, modern classifications of which counties are in this region can hinge on the percentage of the population that is Black.[5] In Georgia, this belt of mostly rural counties constitutes a wide band from the southwest corner of the state to the central part of the South Carolina border near Richmond County. See Figure 1.

Figure 1: Statewide map showing percentages of Black population across counties



[5] See, e.g., *Southeastern Geographer* article at https://www.jstor.org/stable/26225503

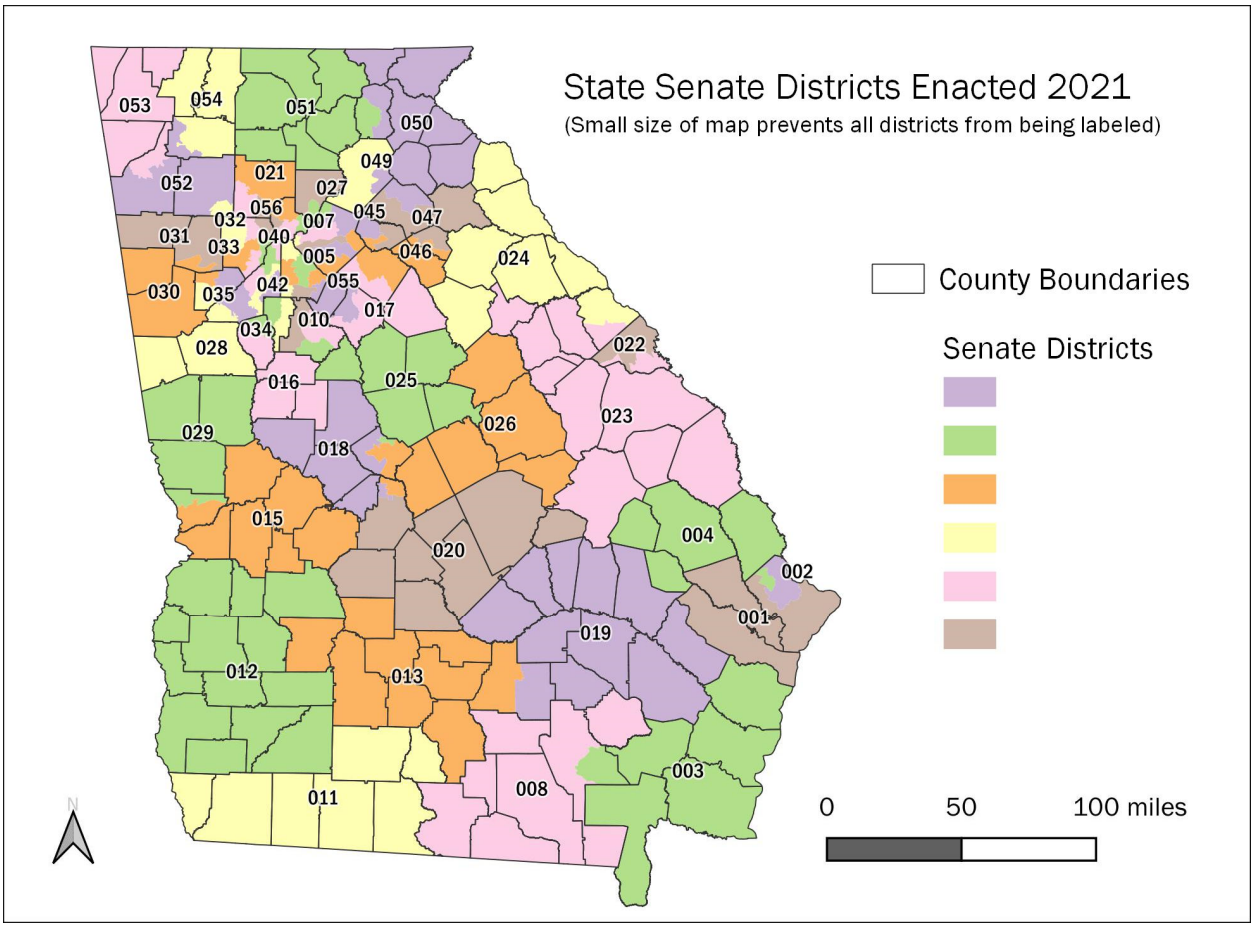
19. For a table showing demographic statistics from the 2020 census for Georgia's counties, please see **Attachment C**.

III. Georgia State Senate redistricting plan

A. Review of enacted State Senate plan

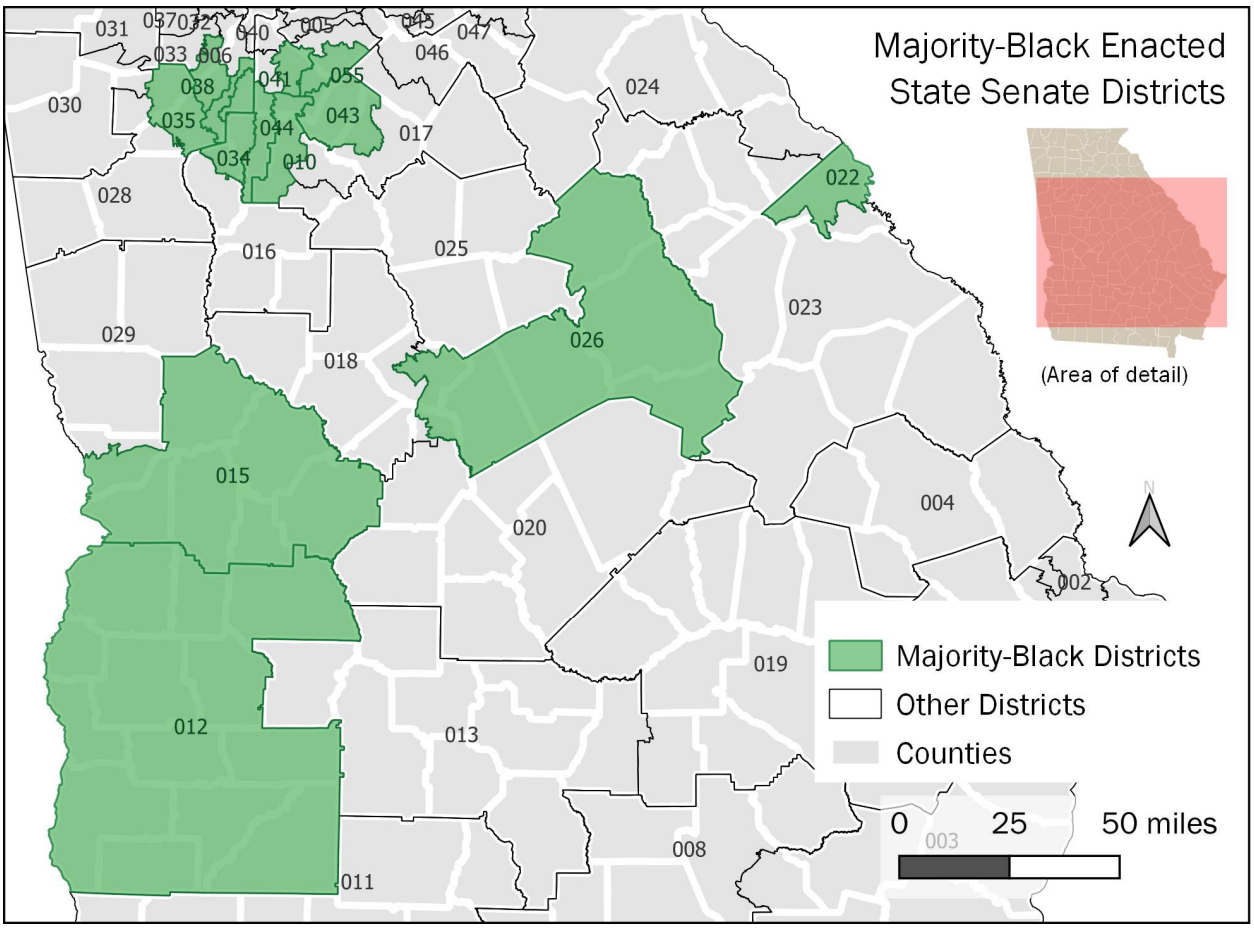
20. On December 30, 2021, Georgia Governor Brian Kemp signed new State Senate districts into law. With districts for 56 senators in this enacted plan, each district is designed to have a population near 191,284, or one-fifty-sixth of Georgia's total population. See Figure 2.

Figure 2: Map of all districts in enacted State Senate plan



21. Of the 56 districts in the enacted plan, 14 are majority-Black.[6] Ten of those are in the Metro Atlanta area and four are in the Black Belt. These districts are highlighted in Figure 3 below.

Figure 3: Map indicating majority-Black districts in enacted State Senate plan



22. For more maps and statistics related to the enacted State Senate districts, please see **Attachment D**.

[6] Per convention in Section 2 cases, "majority-Black" is taken to indicate that the district's *voting age* population that identifies as Black (alone or in combination) constitutes more than 50% of the district's voting age population.

B. Illustrative State Senate plan

23. The illustrative plan that I created, like the enacted plan, has 56 districts, all designed to have populations near 191,284. Because the illustrative plan used the enacted plan as a starting point, many of the districts are the same. In fact, just 22 of the districts were modified, leaving the other 34 unchanged.

24. The illustrative plan includes three additional majority-Black State Senate districts compared to the enacted plan, for a total of 17. Specifically, Senate Districts 23, 25, and 28 are not majority-Black in the enacted plan but are majority-Black in the illustrative plan. See Figure 4 and Table 1.

Figure 4: Map of majority-Black districts in the illustrative State Senate plan.

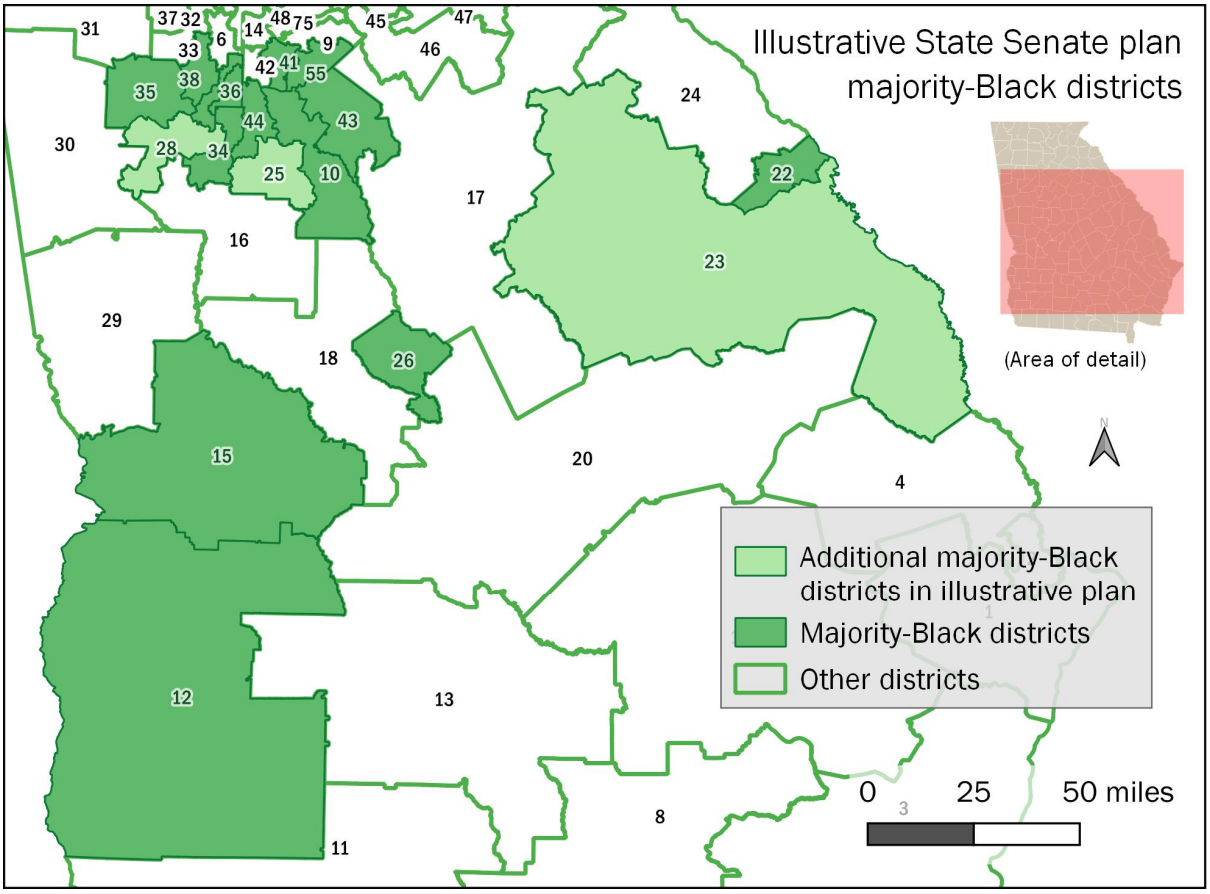


Table 1: Illustrative Senate plan majority-Black districts with BVAP percentages

District	BVAP%	District	BVAP%	District	BVAP%
10	61.10%	26	52.84%	39	60.21%
12	57.97%	28	57.28%	41	62.61%
15	54.00%	34	60.19%	43	58.52%
22	50.84%	35	54.05%	44	71.52%
23	50.43%	36	51.34%	55	65.97%
25	58.93%	38	66.36%		

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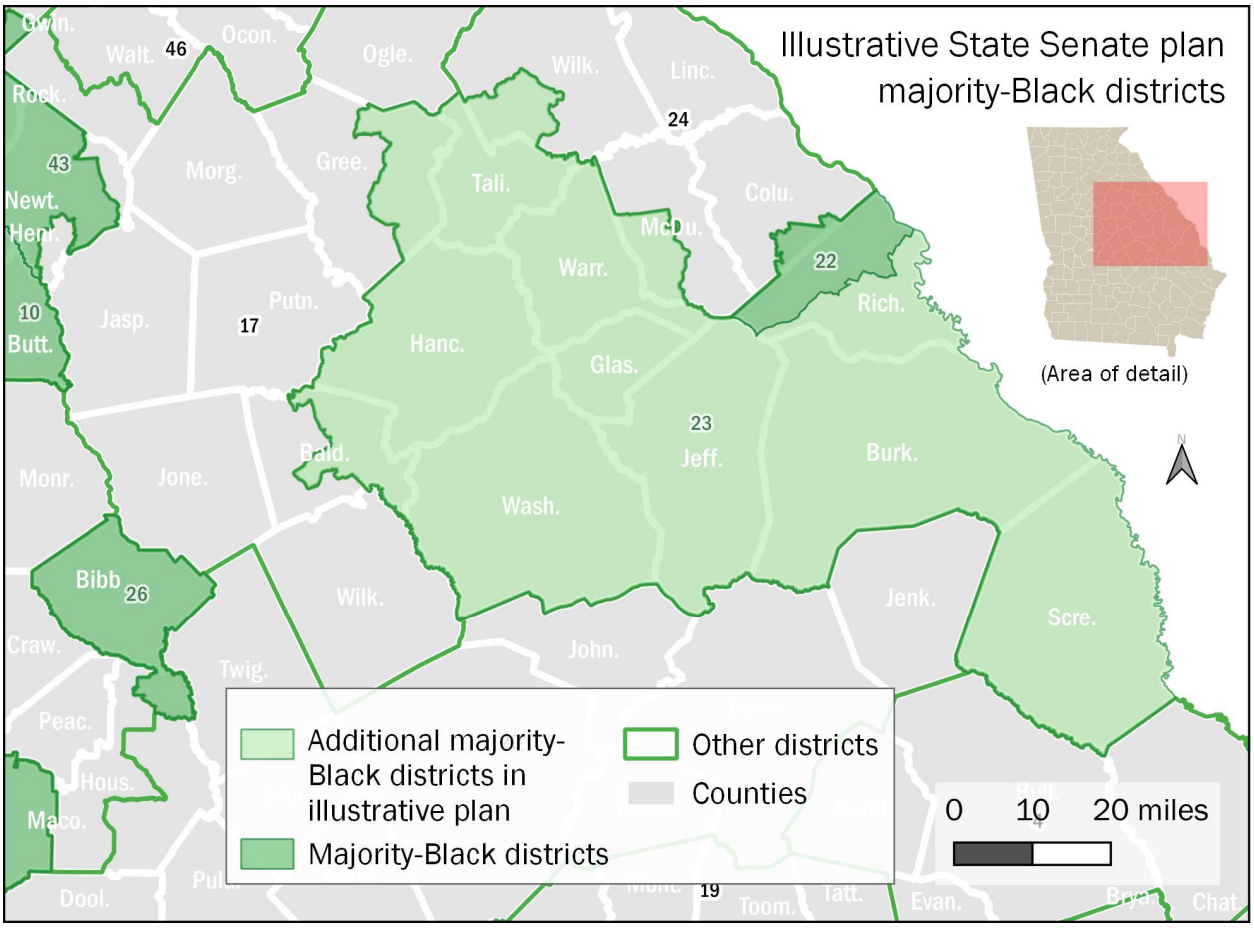
25. The additional majority-Black State Senate district in the eastern Black Belt area (District 23) includes all of Burke, Glascock, Hancock, Jefferson, Screven, Taliaferro, Warren, and Washington Counties and parts of Baldwin, Greene, McDuffie, Richmond, and Wilkes. See Figure 5.[7]

Figure 5: Map of eastern Black Belt region of illustrative plan with majority-Black State Senate districts indicated.



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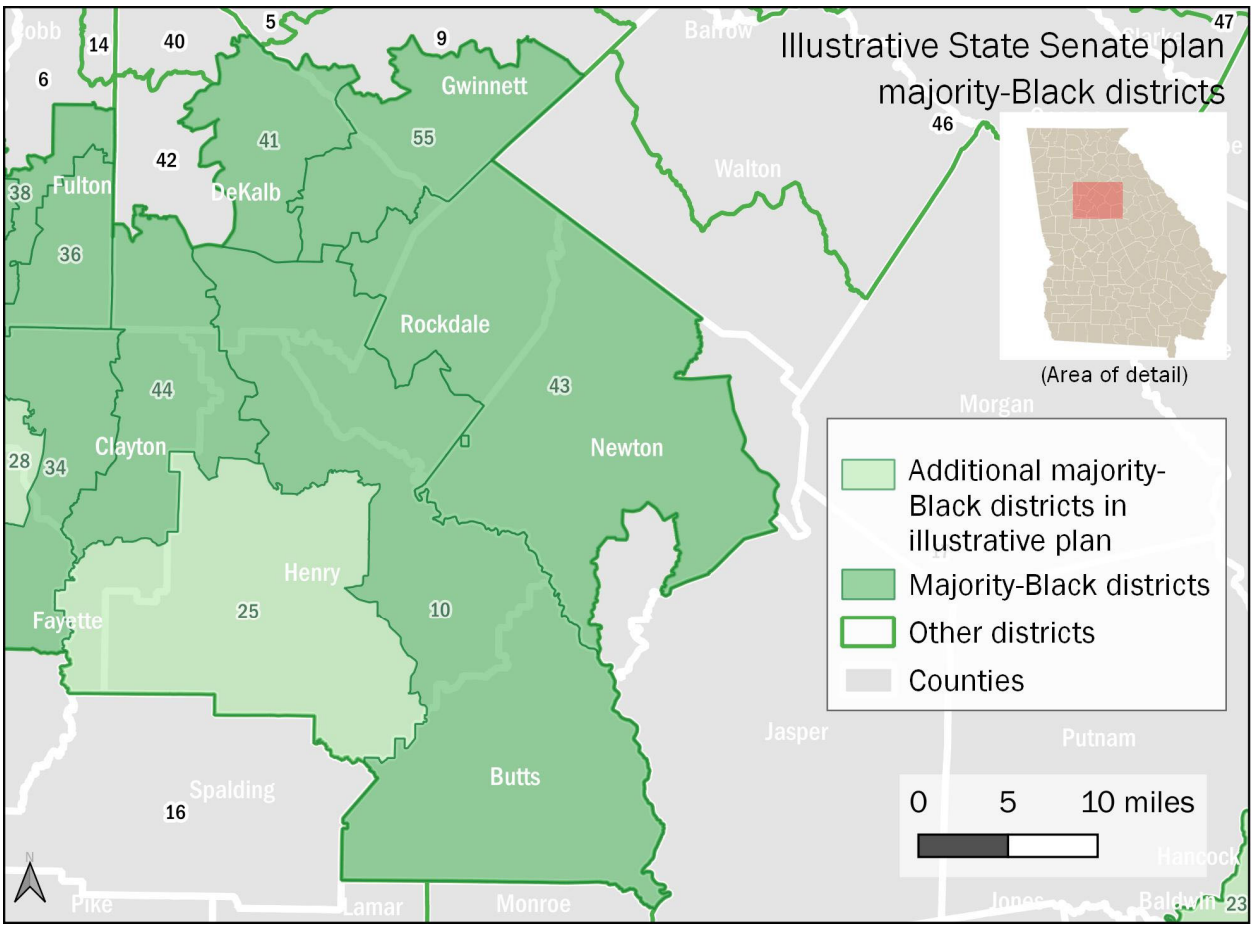
[7] Incidentally, in the illustrative plan, Bibb County is no longer divided; all of Bibb County is in the same district, and it is a majority-Black district (District 26).

26. The additional majority-Black State Senate district in the southeastern Metro Atlanta area (District 25) is composed of portions of Fayette and Henry Counties. See Figure 6.

Figure 6: Map of eastern Metro Atlanta area of illustrative plan with majority-Black State Senate districts indicated.



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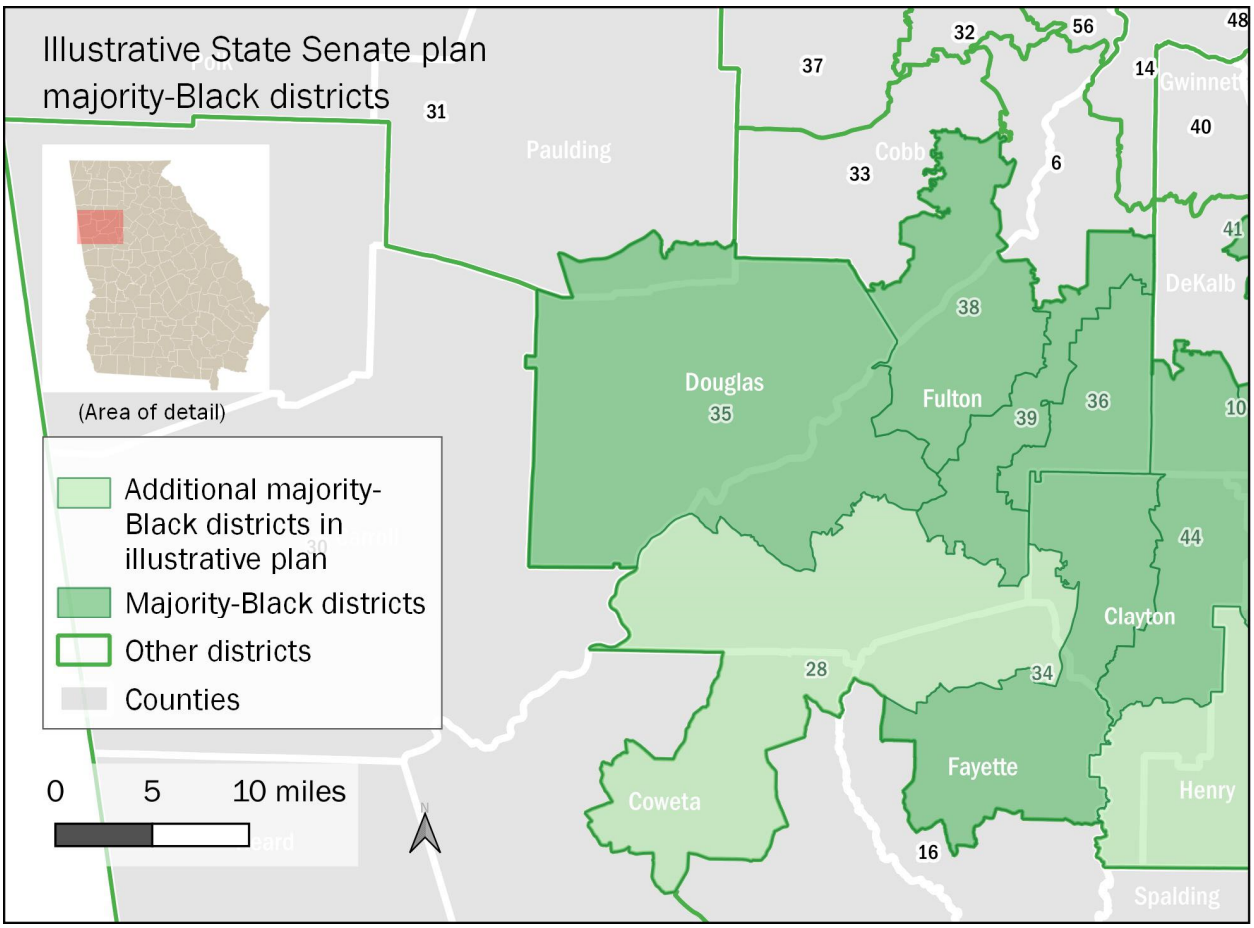
27. The additional majority-Black State Senate district in the southwestern Metro Atlanta area (District 28) is composed of portions of Clayton, Coweta, Fayette, and Fulton Counties. See Figure 7.[8]

Figure 7: Map of western Metro Atlanta area of illustrative plan with majority-Black State Senate districts indicated.



28. For more demographic statistics related to the illustrative State Senate districts, please see **Attachment E**.

[8] Incidentally, the illustrative map also includes all of Douglas County in one majority-Black State Senate district, rather than dividing it between two districts as it is in the enacted plan.

C. Comparative characteristics

29. In undertaking the creation of a new redistricting plan for the State Senate, the Senate Reapportionment Committee adopted the "2021-2022 Senate Reapportionment Committee Guidelines," a full copy of which is appended to this report as **Attachment F**. Within this document is a section called "GENERAL PRINCIPLES FOR DRAFTING PLANS," which contains a list of principles. The illustrative plan was drawn to comply with and balance these principles. The level of adherence for most of the principles can be viewed as a yes/no (e.g., "All plans adopted by the Committee will comply with the United States and Georgia Constitutions"), but for three of the principles where quantitative analysis can help illustrate adherence, an explanation and some summary statistics are provided below.

30. The guidelines provide that "[e]ach legislative district of the General Assembly should be drawn to achieve a total population that is substantially equal as practicable, considering the principles listed below." Noting that adherence to other principles can be in tension with population equality, both the enacted plan and the illustrative plan get substantially closer to population equality than the permissible threshold of ±5%. In both plans, most district populations are within ±1% of the ideal, and a small minority are within between ± 1 and 2%. None has a deviation of more than 2%. For the enacted plan, the relative average deviation is 0.53%, and for the illustrative plan the relative average deviation is 0.68%.

31. One of the guidelines states that "[c]ompactness" "should [be] consider[ed]." Numerous measures exist for quantifying compactness of districts, and a selection of

some of the most commonly used measures in redistricting are shown in Table 2 below—both for the enacted plan and the illustrative plan. One can see that the average compactness measures for the plans are almost identical, if not identical. An explanation of the five compactness metrics is provided as **Attachment G**.

Table 2: Compactness measures for enacted and illustrative State Senate plans.

	Reock (average)	Schwartzberg (average)	Polsby-Popper (average)	Area/Convex Hull (average)	Number of Cut Edges
Enacted	0.42	1.75	0.29	0.76	11,005
Illustrative	0.41	1.76	0.29	0.75	10,998

32. Another guideline states that "[t]he boundaries of counties and precincts" "should [be] consider[ed]." In redistricting in the United States, consideration of such boundaries is generally taken to mean that counties and precincts should be kept intact to the extent possible (i.e., not split among multiple districts). While the Reapportionment Committee's language regarding this guideline is not explicit, the table below (Table 3) provides numbers of counties and VTDs (the Census "Voting District" used by redistricting software as a proxy for precincts) split in both the enacted and illustrative State Senate plans.

Table 3: Political subdivision splits for enacted and illustrative State Senate Plans

	Intact Counties	Split Counties	Split VTDs
Enacted	130	29	47
Illustrative	125	34	49

33. While the creation of three additional majority-Black State Senate districts involved the division of additional counties and VTDs, the differences are marginal.

34. For more detailed statistics and reports on the above characteristics, please see **Attachment H**.

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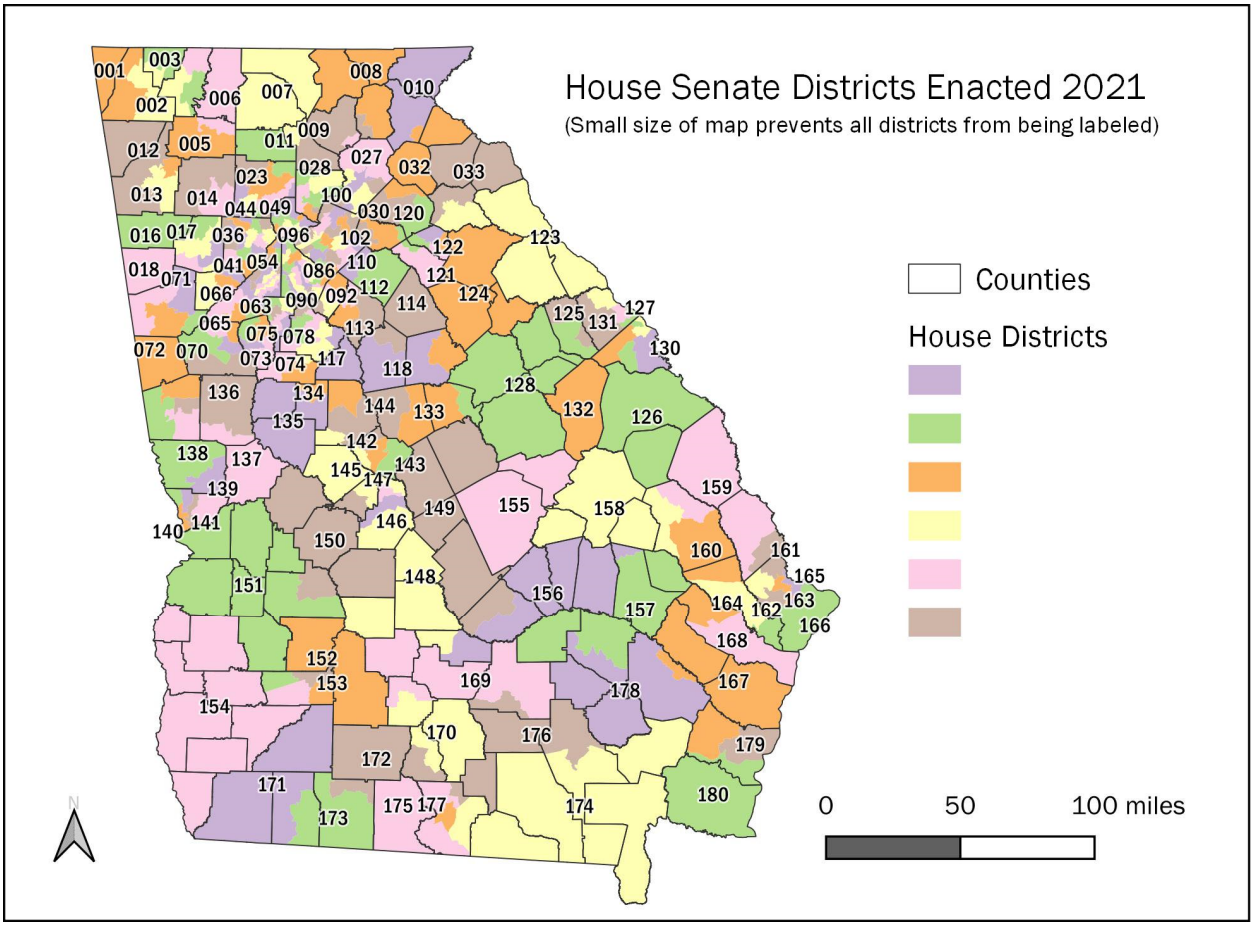
IV. Georgia House redistricting plan

A. Review of enacted House plan

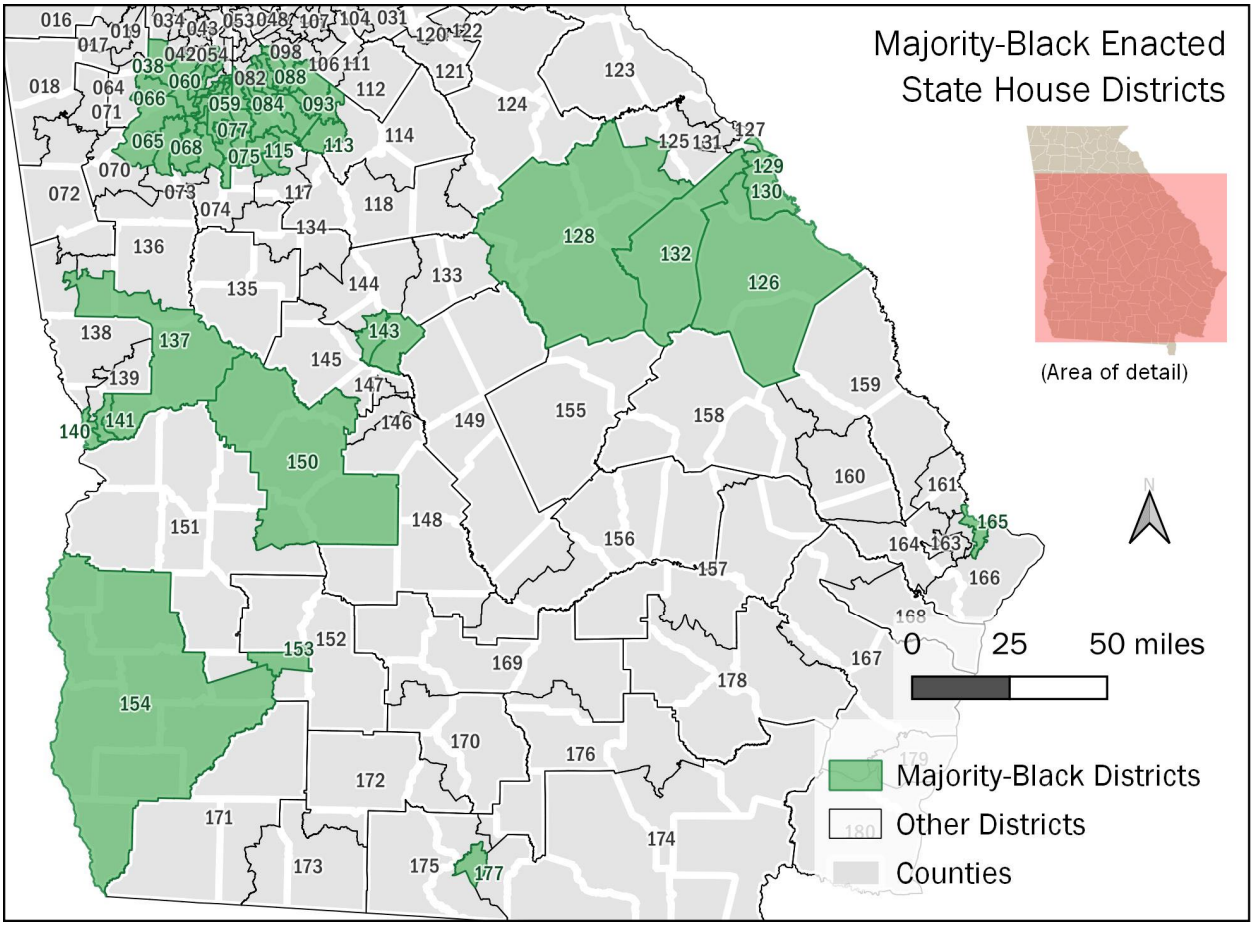
35. On December 30, 2021, Governor Kemp signed new House of Representatives districts into law. With districts for 180 Representatives in this enacted plan, each district is designed to have a population near 59,511, or one-one-hundred-eightieth of Georgia's total population. See Figure 8.

Figure 8: Map of all districts in enacted House plan



36. Of the 180 districts in the enacted plan, 49 are majority-Black. Thirty-four of those are in the Metro Atlanta area, 13 are in the Black Belt, and two small districts are within Chatham (anchored in Savannah) and Lowndes Counties (anchored in Valdosta) in the southeastern part of the state. These districts are highlighted in Figure 9 below.

Figure 9: Map indicating majority-Black districts in enacted House plan



37. For more maps and statistics related to the enacted House districts, please see **Attachment I**.

B. Illustrative House plan

38. The illustrative plan that I created, like the enacted plan, has 180 districts, all designed to have populations near 59,511. Because the illustrative plan used the enacted plan as a starting point, many of the districts are the same. In fact, just 26 of the districts were modified, leaving the other 154 unchanged.

39. The illustrative plan includes five additional majority-Black House districts compared to the enacted plan, for a total of 54. Specifically, House Districts 64, 74, 117, 145, and 149 are not majority-Black in the enacted plan but are majority-Black in the illustrative plan. See Figure 10 and Table 4.

Figure 10: Map of majority-Black districts in the illustrative House plan.

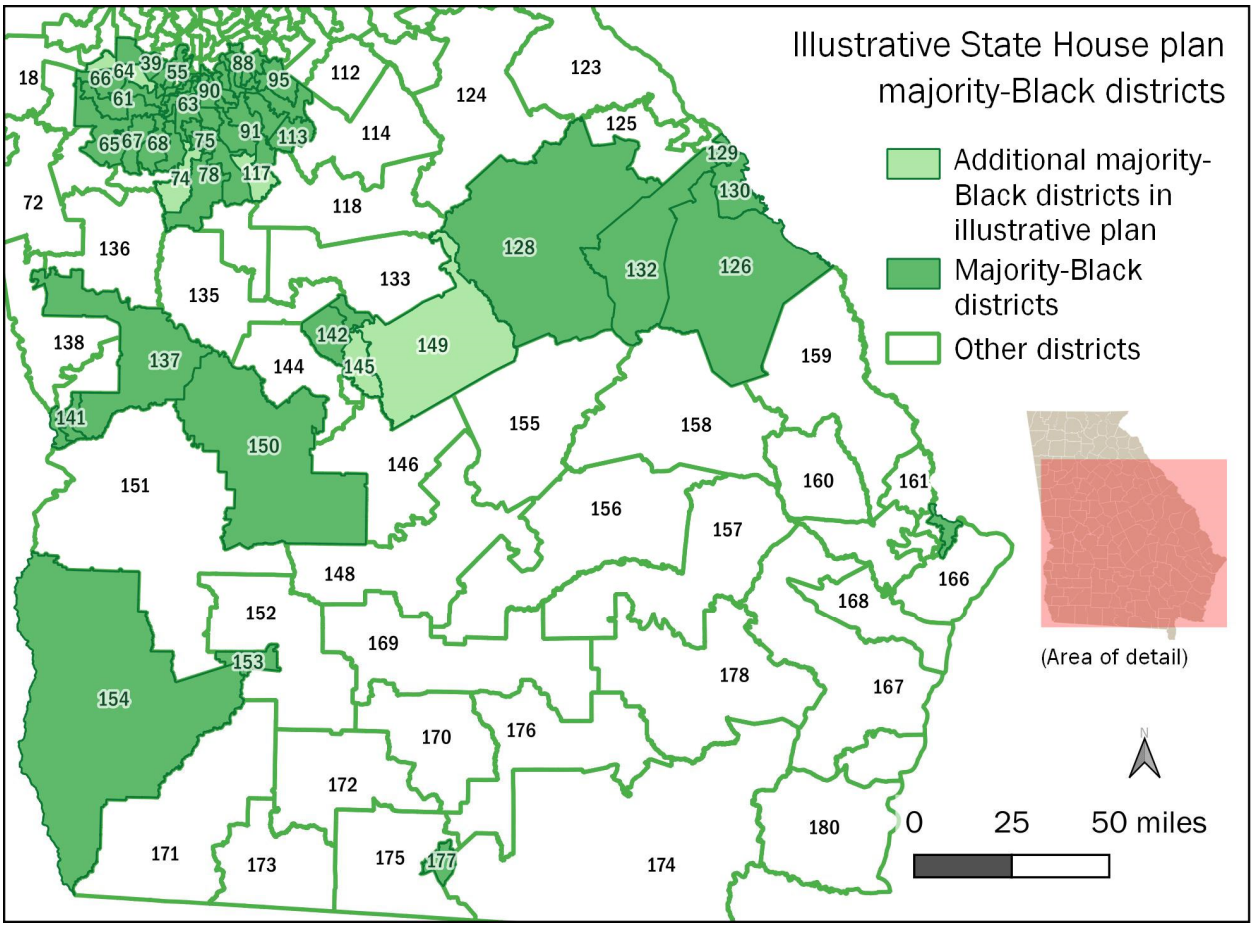


Table 4: Illustrative House plan majority-Black districts with BVAP percentages

District	BVAP%	District	BVAP%	District	BVAP%	District	BVAP%
38	54.23%	69	62.73%	91	60.01%	137	52.13%
39	55.29%	74	53.94%	92	68.79%	140	57.63%
55	55.38%	75	66.89%	93	65.36%	141	57.46%
58	63.04%	76	67.23%	94	69.04%	142	50.14%
59	70.09%	77	76.13%	95	67.15%	143	50.64%
60	63.88%	78	51.03%	113	59.53%	145	50.38%
61	64.87%	79	71.59%	115	53.77%	149	50.02%
62	72.26%	84	73.66%	116	51.95%	150	53.56%
63	69.33%	85	62.71%	117	51.56%	153	67.95%
64	50.24%	86	75.05%	126	54.47%	154	54.82%
65	55.32%	87	73.08%	128	50.40%	165	50.33%
66	50.64%	88	63.35%	129	54.87%	177	53.88%
67	58.92%	89	62.54%	130	59.91%		
68	55.75%	90	58.49%	132	52.34%		

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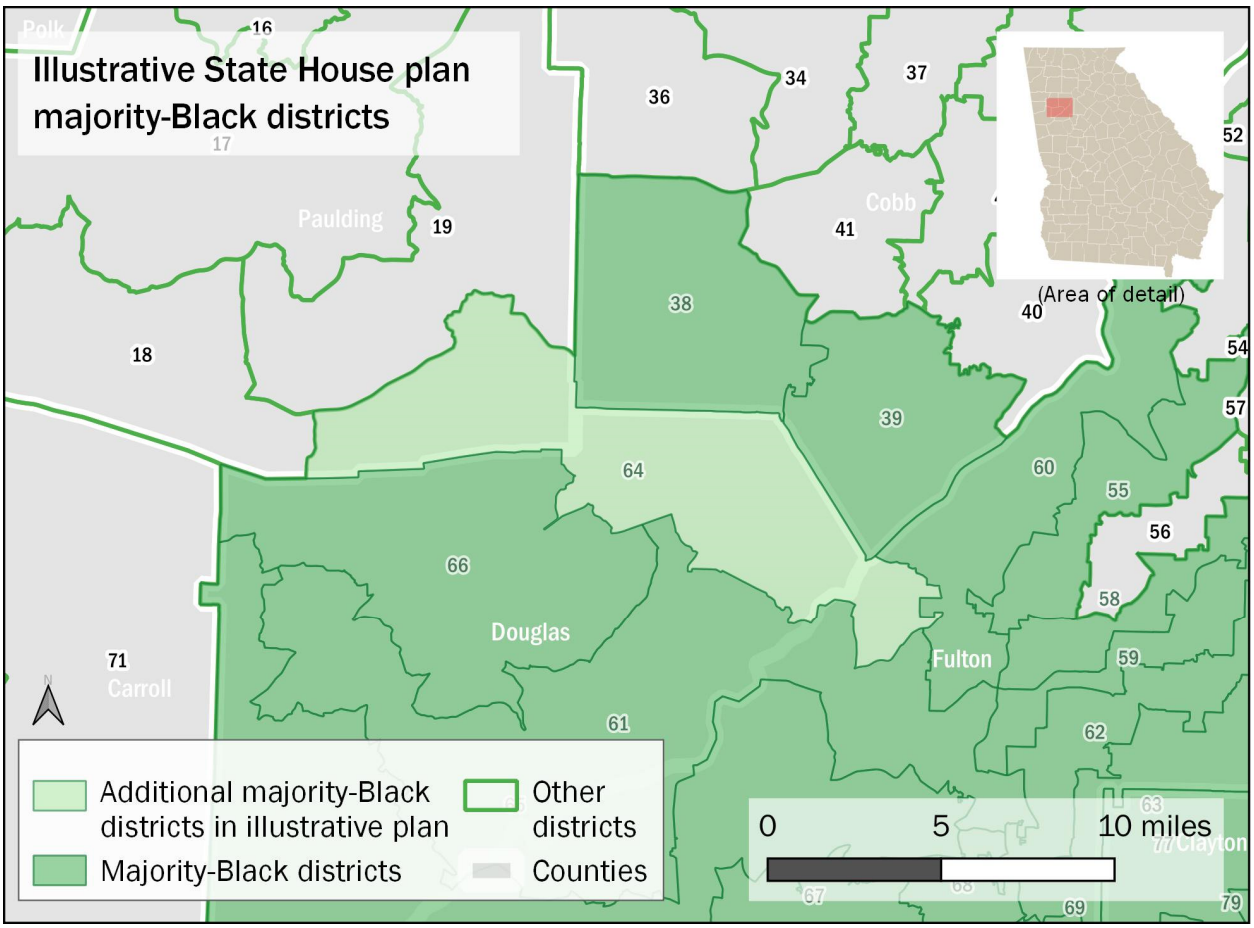
40. The additional majority-Black House district in the western Metro Atlanta area (District 64) is composed of portions of Douglas, Fulton, and Paulding Counties. See Figure 11.

Figure 11: Map of western Metro Atlanta area of illustrative plan with majority-Black House districts indicated.



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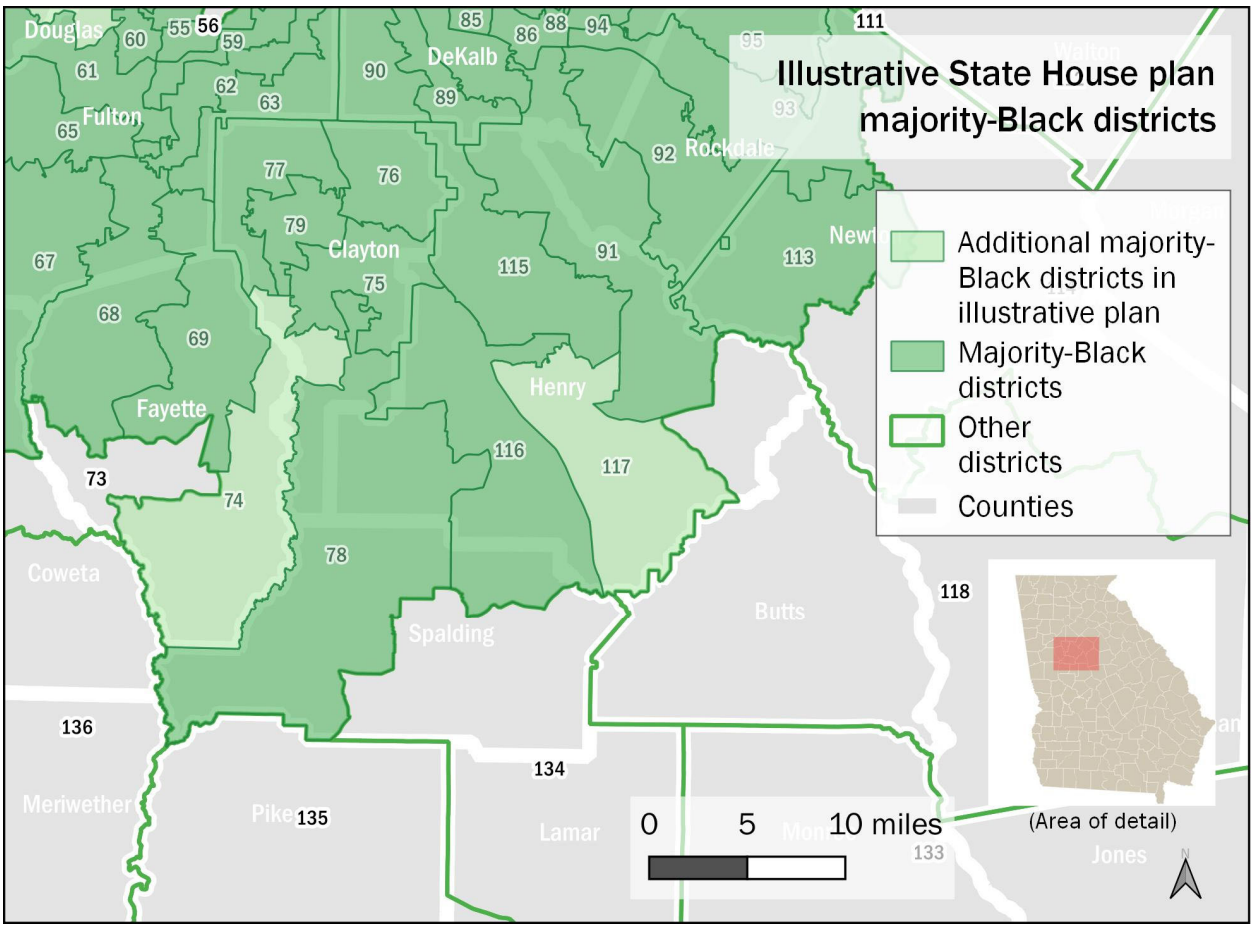
41. The additional majority-Black House districts in the southern Metro Atlanta area (Districts 74 and 117) are built from portions of Clayton, Fayette, and Henry Counties. See Figure 12.

Figure 12: Map of southern Metro Atlanta area of illustrative plan with majority-Black House districts indicated.



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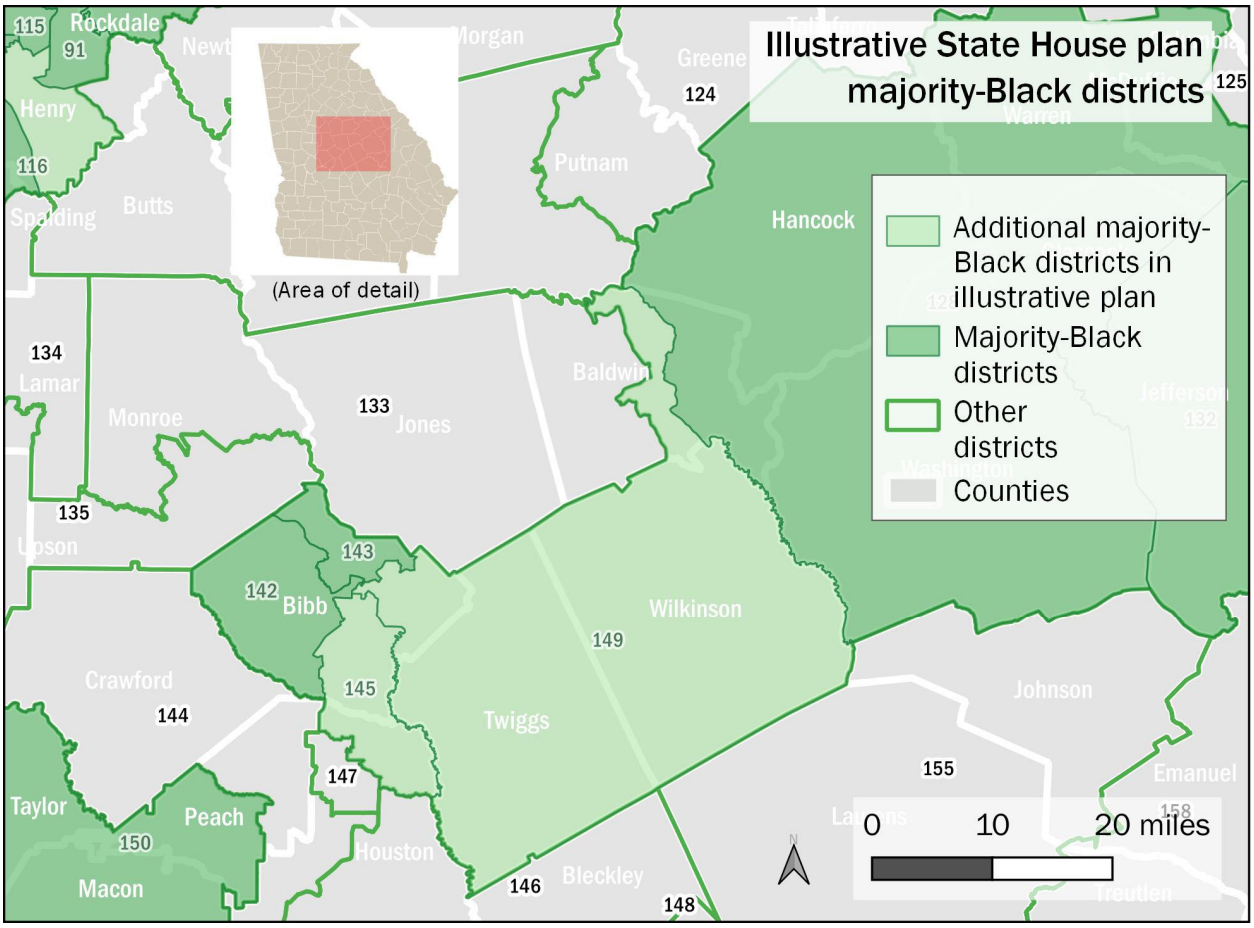
42. The two additional majority-Black House districts in the central Black Belt area (Districts 145 and 149) are built from portions of Baldwin, Bibb, and Houston Counties, as well as all of Twiggs and Wilkinson Counties. Instead of dividing Bibb County into four districts, of which three are only partially in Bibb County, as in the enacted plan, in the illustrative plan, two of the districts (Districts 142 and 143) are wholly contained in Bibb County, and only two (Districts 145 and 149) extend outside the county. See Figure 13.

Figure 13: Map of central Black Belt region of illustrative plan with majority-Black House districts indicated.



43. For more demographic statistics related to the illustrative State Senate districts, please see **Attachment J**.

C. Comparative characteristics

44. In undertaking the creation of a new redistricting plan for the House, the House Reapportionment Committee adopted the "2021-2022 House Reapportionment Committee Guidelines," a full copy of which is appended to this report as **Attachment K**. Within this document is a section called "GENERAL PRINCIPLES FOR DRAFTING PLANS," which contains a list of principles. The illustrative plan was drawn to comply with and balance these principles. As with the Senate Committee's principles discussed above, three of the principles can be quantitatively analyzed to help illustrate adherence. As with the State Senate illustrative plan, some explanatory notes and summary statistics are provided below.

45. The guidelines provide that "[e]ach legislative district of the General Assembly should be drawn to achieve a total population that is substantially equal as practicable, considering the principles listed below." As with the Senate plan, both the enacted plan and the illustrative plan get substantially closer to population equality than the permissible threshold of ±5%. In both plans, most district populations are within ±1% of the ideal, and a small minority are within between ± 1 and 2%. None has a deviation of more than 2%. For the enacted plan, the relative average deviation is 0.61%, and for the illustrative plan the relative average deviation is 0.64%.

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46. One of the guidelines states that "[c]ompactness" "should [be] consider[ed]." A selection of some of the most commonly used measures of compactness are shown in Table 5 below—both for the enacted plan and the illustrative plan. One can see that the average compactness measures for the plans are almost identical, if not identical.

Table 5: Compactness measures for enacted and illustrative House plans.

	Reock (average)	Schwartzberg (average)	Polsby-Popper (average)	Area/Convex Hull (average)	Number of Cut Edges
Enacted	0.39	1.80	0.28	0.72	22,020
Illustrative	0.39	1.82	0.28	0.72	22,475

47. Another guideline states that "[t]he boundaries of counties and precincts" "should [be] consider[ed]." The table below (Table 6) provides numbers of counties and VTDs (akin to precincts) split in both the enacted and illustrative House plans.

Table 6: Political subdivision splits for enacted and illustrative House plans.

	Intact Counties	Split Counties	Split VTDs
Enacted	90	69	185
Illustrative	89	70	192

48. While the creation of five additional majority-Black House districts involved the division of one additional county and a handful of VTDs, the differences are marginal.

49. For more detailed statistics and reports on the above characteristics, please see **Attachment L**.

V. Conclusion

50. This report has demonstrated that it is possible to create three additional majority-Black districts in the Georgia State Senate plan and five additional majority-Black districts in the Georgia House of Representatives plan while still adhering to other traditional redistricting principles.

51. I reserve the right to supplement this report in consideration of additional facts, testimony, or materials that may come to light.

Executed on January 13, 2022.

Blakeman B. Esselstyn