

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

CONSOLIDATED DOCKET NOS.

464 MD 2021 and 465 MD 2021

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WILLIAM TUNG, ROSEANNE MILAZZO, BURT SIEGEL, SUSAN
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GUTTMAN, MAYA FONKEU, BRADY HILL, MARY ELLEN BALCHUNIS,
TOM DEWALL, STEPHANIE MMCNULTY and JANET TEMIN,
Petitioners,

v.

LEIGH M. CHAPMAN, in her official capacity as the Acting Secretary of the
Commonwealth of Pennsylvania, JESSICA MATHIS, in her official capacity as
Director of the Pennsylvania Bureau of Election Services and Notaries,
Respondents.

v.

PHILIP T. GRESSMAN, RON Y. DONAGI, KRISTOPHER R. TAPP, PAMELA
GORKIN, DAVID P. MARSH, JAMES L. ROSENBERGER, AMY MYERS,
EUGENE BOMAN, GARY GORDON, LIZ MCMAHON, TIMOTHY G.
FREEMAN and GARTH ISAAK,
Petitioners,

v.

LEIGH M. CHAPMAN, in her official capacity as the Acting Secretary of the
Commonwealth of Pennsylvania, JESSICA MATHIS, in her official capacity as
Director of the Pennsylvania Bureau of Election Services and Notaries,
Respondents.

**SENATE DEMOCRATIC CAUCUS' BRIEF IN SUPPORT OF SENATE
DEMOCRATS' CAUCUS' PROPOSED REDISTRICTING PLAN**

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**SENATE DEMOCRATIC CAUCUS’ BRIEF IN SUPPORT OF SENATE
DEMOCRATIC CAUCUS’ PROPOSED REDISTRICTING PLANS**

AND NOW come Intervenors Senator Jay Costa, et al. (the “Senate Democratic Caucus”), by and through the undersigned counsel, and file this Brief in Support of Senate Democratic Caucus’ Proposed Redistricting Plans, and offer the following:

BACKGROUND

This action arises from Petitioners’ December 17, 2021 petitions for review alleging that, in light of the 2020 Census, Pennsylvania’s existing Congressional districting plan is malapportioned and illegal. Petitioners further allege that the General Assembly and Governor will not be able to enact a redistricting plan that is properly apportioned in time for the 2022 elections. Petitioners seek relief in the form of, *inter alia*, this Honorable Court’s adoption of a remedial redistricting plan that is properly apportioned. *Accord Mellow v. Mitchell*, 607 A.2d 204 (Pa. 1992) (adjudicating a similar claim and granting similar relief).

After Petitioners filed their petitions for review, the Senate Democratic Caucus and numerous others sought and obtained intervention.¹ Additionally,

¹ Initially, two separate groups of members of the Democratic Caucus sought intervention: (1) Senators Maria Collett, Katie J. Muth, Sharif Street, and Anthony Williams, whom this Honorable Court referred to as “Proposed Democratic Senator Intervenors”; and (2) Senators Jay Costa, Vincent Hughes, Wayne Fontana, Judy Schwank, Lisa Boscola, James Brewster, Amanda Cappelletti, Carolyn Comitta, Marty Flynn, Art Haywood, John Kane, Tim Kearney, Steve Santarsiero, Nikil Saval, Christine Tartaglione, and Lindsey Williams, whom this Honorable Court referred to as “Proposed Senate Democratic Caucus Intervenors.” *See* Application for Intervention

because the existing plan cannot be used in the upcoming election, absent the legislative adoption of a redistricting plan, it will only remain for this Honorable Court to adopt a remedial plan.² Accordingly, on January 14, 2022, this Honorable Court entered an order directing parties to, *inter alia*, submit at least one but not more than two proposed plans, together with any supporting expert report and/or brief, by today, January 24, 2022, at 5 p.m. *See* Order, 1/14/22, unpaginated at 2-3. Consistent with this Honorable Court’s order, the Senate Democratic Caucus now files its Proposed Redistricting Plan (“Plan 1”), attached hereto as Exhibit A; and a Second Proposed Redistricting Plan (“Plan 2”), attached hereto as Exhibit B;³ a supporting expert report authored by Dr. Devin Caughey, attached hereto as Exhibit C, the Declaration of Lora Schoenberg, attached hereto as Exhibit D, the Analysis of Michael Lamb, attached hereto as Exhibit E, and this Brief in Support of Senate Democratic Caucus’ Proposed Redistricting Plans.

12/28/21; Application for Intervention, 12/30/21. However, the former group subsequently merged into the latter. *See generally* Notice of Amendment and Joinder from Senate Democratic Caucus Intervenors and Proposed Democratic Senator Intervenors, 1/6/22; Order, 1/14/22.

² In a January 14, 2022 order, this Honorable Court anticipated addressing whether it may be necessary to order modifications to the 2022 election calendar. *See generally* Order, 1/14/22, unpaginated, at 3-4. At present, absent timely legislative adoption of a redistricting plan, the Senate Democratic Caucus believes it will be necessary to order such modifications, and although it does not yet express a view as to the precise contours thereof, it reserves the right to do so at the appropriate juncture.

³ The Senate Democratic Caucus attaches here PDF files containing both maps. Per the Court’s instructions, the Caucus will make the data and shape files available to the other participants in the litigation.

SUMMARY OF ARGUMENT

In Pennsylvania, a Congressional redistricting plan must comply with federal constitutional law requiring districts of absolutely equal population and the provisions of the federal Voting Rights Act governing the mandatory creation of majority-minority districts. It must also comply with the Free and Equal Elections Clause of the Pennsylvania Constitution by employing certain traditional redistricting criteria in a way that avoids vote dilution: it may neither subordinate those criteria to the goal of partisan advantage nor facially employ them, but nevertheless dilute votes for partisan advantage. *See generally League of Women Voters v. Commonwealth*, 178 A.3d 737 (Pa. 2018).

The Senate Democratic Caucus' Proposed Redistricting Plans comply with all of the foregoing: they create districts of absolutely equal population; they comply with the Voting Rights Act by preserving Pennsylvania's mandatory majority-minority district and further create a minority-coalition district and an emerging minority-coalition district; and they employ traditional redistricting criteria in a way that avoids vote dilution, creating districts that optimize Pennsylvanians' rights to translate their votes into representation. The Caucus' Plans propose two different conceptions of the aforementioned minority coalition districts. Accordingly, in the event there is no legislative adoption of a redistricting plan, this Honorable Court should adopt one of the Senate Democratic Caucus' proposed Plans.

In crafting the proposed maps, the Senate Democratic Caucus has used the Pennsylvania Supreme Court’s 2018 Map as a baseline. In reliance on the extensive expert testimony and fact-finding in that case, the Senate Democratic Caucus has attempted to adjust the existing map to compensate for the reduction in Pennsylvania’s Congressional delegation by one seat. In doing so, the Senate Democratic Caucus maintains communities of interest, preserves the lack of vote dilution in the existing map, and makes adjustments to account for population changes and trends.

ARGUMENT

- I. ***In Pennsylvania, a Congressional redistricting plan must comply with federal constitutional law requiring districts of absolutely equal population, the provisions of the federal Voting Rights Act governing the mandatory creation of majority-minority districts, and state constitutional law requiring employment of specific traditional redistricting criteria in a way that avoids vote dilution.***

The legal standard governing Congressional redistricting plans was most recently and comprehensively discussed by our Supreme Court in *League of Women Voters v. Commonwealth*, 178 A.3d 737 (Pa. 2018). In that case, historically Democratic voters asserted, *inter alia*, that the 2011 Congressional redistricting plan amounted to a Republican partisan gerrymander that violated the Free and Equal Elections Clause of the Pennsylvania Constitution⁴ by diluting the power of their

⁴ See Pa. Const. art. I, § 5 (“Elections shall be free and equal; and no power, civil or military, shall at any time interfere to prevent the free exercise of the right of suffrage.”)

votes for Democratic candidates. *See infra*, Section I(C). Ultimately, our high Court agreed, providing a thorough discussion of the Commonwealth’s unfortunate history of dominant political factions’ use of election laws to further entrench their power by disenfranchising their opponents, as well as the Clause’s adoption as a means to end that practice, including the practice of partisan gerrymandering, and finding that the 2011 plan violated the Clause, entrenching Republican power by drawing districts that diluted Democrats’ votes. *See id.* Along the way, the Court cogently laid out Pennsylvania law’s requirements for a Congressional redistricting plan.

A. *A Congressional redistricting plan must comply with federal constitutional law requiring districts of absolutely equal population.*

First, a Congressional redistricting plan must comply with federal constitutional law. *See id.* at 817 n.72 (noting that reference to state-law requirements was not “intended to suggest that congressional district maps must not also comply with federal law”). Article I, Section 2 of the United States Constitution, in turn, requires that a Congressional redistricting plan have absolutely equal population. *See generally Wesberry v. Sanders*, 376 U.S. 1 (1964); *Karcher v. Daggett*, 462 U.S. 725, 732-33 (1983) (“[W]e have required that absolute population equality be the paramount objective in . . . the case of congressional districts[.]”).⁵

⁵ Obviously, in states where the number of districts is not a mathematical factor of the total population, a district-to-district deviation of a single voter is mathematically necessary.

B. A Congressional redistricting plan must comply with the provisions of the Voting Rights Act governing the creation of mandatory majority-minority districts.

Again, a Congressional redistricting plan must comply with federal law, which includes the Voting Rights Act of 1965 (“VRA”). *League of Women Voters*, 178 A.3d at 817 n.72. Congress enacted the VRA to allow all citizens, regardless of race, to exercise their right to vote, and took as its principal stated purpose “[t]o enforce the fifteenth amendment to the Constitution of the United States.” Voting Rights Act of 1965, Pub. L. 89-110, 79 Stat. 437 (1965); *see also Voinovich v. Quilter*, 507 U.S. 146, 152 (1993) (explaining that the VRA was enacted “to help effectuate the Fifteenth Amendment’s guarantee that no citizen’s right to vote shall ‘be denied or abridged . . . on account of race, color, or previous condition or servitude.’”).

A state violates Section 2 of the VRA, if, based on the totality of the circumstances, a petitioner shows the nomination or election in a State or political subdivision are not “equally open to participation by members of a class of citizens protected by [Section 2 of the VRA] in that its members have less opportunity than other members of the electorate to participate in the political process and elect representatives of their choice.” 52 U.S.C. § 10301(b).

In practice, Section 2 requires drawing a majority-minority district where such a district is possible because the members of a particular minority who are of voting age are a compact and politically cohesive group and, thus, if included in the same district, will have the opportunity to elect their candidate of choice. *See generally Thornburg v. Gingles*, 478 U.S. 30 (1986).

Additionally, caselaw on the VRA contemplates the drawing of “coalition” districts, in which members of a minority group or of several minority groups can potentially form political coalitions with sympathetic members of a majority group. Such a coalition may lead to the election of minority groups’ candidates of choice. *See generally Bartlett v. Strickland*, 556 U.S. 1 (2009).

C. A Congressional redistricting plan must comply with the Free and Equal Elections Clause of the Pennsylvania Constitution by employing specific traditional redistricting criteria in a way that avoids vote dilution.

Once a redistricting plan complies with federal law, it must comply with the Free and Equal Elections Clause’s prohibition on partisan gerrymandering and vote dilution. Returning to *League*, in interpreting the proper scope of the Clause, our Supreme Court first noted that the Clause’s language requiring that all elections be “equal,” at its core, prohibits vote dilution: “the actual and plain language of [the Clause] mandates that all voters have an equal opportunity to translate their votes into representation.” *Id.* at 804. Noting that “a diluted vote is not an equal vote,” the Court singled out partisan gerrymandering as “dilut[ing] the votes of those who in

prior elections voted for the party not in power to give the party in power a lasting electoral advantage.” *Id.* at 814. The Court reviewed the history of the Clause’s adoption and its intent as a means to end the practice of vote dilution, including via partisan gerrymandering, “once and for all.” *Id.* at 808; *see also id.* at 804-08.

The Court went on to explain that this prohibition on vote dilution was consistent with its application of the clause in its body of precedent. *See id.* at 809-13 (citing, *inter alia*, *Patterson v. Barlow*, 60 Pa. 564 (Pa. 1869); *Winston v. Moore*, 91 A. 520 (Pa. 1914); *In re: New Britain Borough Sch. Dist.*, 145 A. 597 (Pa. 1929)). It also explained its salutary effects: enforcing this ban on partisan vote dilution serves not only to avoid partisan takeovers of the levers of state government without voter consent, but also to reinforce the fundamental legitimacy of our state government and promote citizens’ confidence in and engagement in our representative democracy. *See id.* at 813-14.

Having identified the Clause’s chief end – the avoidance of violating Pennsylvanians’ constitutional rights by diluting their votes – our Supreme Court went on to articulate means to that vindicating end. *See id.* at 814-18. First, the Court explained that a plan that subordinates traditional redistricting criteria – specifically, “compactness, contiguity, and the maintenance of the integrity of the boundaries of political subdivisions” except to achieve equal population of districts – “to extraneous considerations” such as partisan advantage violates the Clause by

diluting votes. *Id.* at 815-817.⁶ Successful maps, then, should avoid dividing political subdivisions and wards as much as possible; they should keep communities of interest together; and they should avoid districts that “sprawl” or create “isthmuses” and “tentacles” for partisan advantage. *See League*, 178 A.3d at 819.

Importantly, however, the Court did *not* hold that the use of traditional redistricting principles by itself insulates a map from being found unconstitutional. *See id.* at 817. Indeed, the Court imagined that a plan that utilized those traditional factors well might nevertheless violate the Clause by diluting Pennsylvanians’ votes, which is the overarching, paramount inquiry. *See id.* The Court noted that “there exists the possibility that . . . mapmakers, in the future, [could] engineer [C]ongressional districting maps, which, although minimally comporting with these neutral ‘floor’ criteria, nevertheless operate to unfairly dilute the power of a particular group’s vote for a [C]ongressional representative.” *Id.*

Thus, although a political faction violates the Clause when it draws districts that sprawl geographically throughout the Commonwealth, unnecessarily divide political subdivisions, and thereby minimize an opposing faction’s ability to translate votes into representation, it is not the meandering, but the minimization,

⁶ The Court went on to explain that the 2011 Plan did, in fact, subordinate these traditional redistricting criteria to the extraneous consideration of Republican partisan advantage, noting, *inter alia*, expert testimony demonstrating that the 2011 Plan was so far outside the distribution of random maps using those criteria that it could not have primarily considered, much less prioritized, those criteria over partisan advantage. *See League*, 178 A.3d at 818-21.

that is the violation. Even facially compact, contiguous districts which preserve political subdivisions may lead to the vote dilution *League* seeks to avoid. In other words, following *League*, a Congressional redistricting plan must not only employ traditional redistricting criteria, but employ them in an effort to *avoid* vote dilution.

II. The Senate Democratic Caucus' Proposed Redistricting Plan 1 complies with all of the foregoing: it creates districts of equal population; it maintains a majority-minority district; and it employs traditional redistricting criteria to avoid vote dilution.

A. The Senate Democratic Caucus' Proposed Redistricting Plan 1

A copy of the Senate Democratic Caucus' Plan 1 is attached hereto as Exhibit

A.

B. The Senate Democrats' Proposed Redistricting Plan 1 Creates Districts of Equal Population.

The Senate Democratic Caucus' Plan 1 satisfies federal law by creating districts of absolutely equal population: Districts 1, 3, 5, 8, 9, 11, 12, 13, 14, 15, 16, and 17 have populations of 764,865; and Districts 2, 4, 6, 7, and 10 have populations of 764,864. Declaration of Lora Schoenberg at ¶¶ 43-44.

C. The Senate Democratic Caucus' Plan 1 Creates a VRA-Mandated Majority-Minority District and Creates Minority-Coalition Districts.

The Senate Democratic Caucus' Plan 1 complies with Section 2 of the VRA and provides minorities with equal opportunity to elect their candidates of choice. Specifically, it preserves District 3, which includes portions of Philadelphia County, as a majority-minority district because African-Americans make up 52.0% of the

voting-age population. Schoenberg Decl. ¶ 45. The proposed district is geographically compact and does not unnecessarily split any political subdivisions.⁷ Therefore, the VRA mandates the creation of a majority-minority district here.

The Senate Democratic Caucus' Plan 1 also creates a number of potential coalition districts to increase the voices of minorities. District 2, which includes portions of Philadelphia and Bucks Counties, contains 20.6% Latino/a voters, 18.5% African-American voters, and 9.7% Asian voters. Schoenberg Decl. ¶ 46. District 5, which includes portions of Philadelphia and Delaware Counties, 4.9% Latino/a voters, 25.9% African-American voters, and 9.7% Asian voters. Schoenberg Decl. ¶ 47. In addition, Districts 12 and 17 constitute potential coalition districts between minority and sympathetic majority voters, given the recent success of, for example, Mayor Ed Gainey in the City of Pittsburgh.

D. The Senate Democratic Caucus' Plan 1 Employs Traditional Redistricting Criteria to Avoid Vote Dilution.

The Senate Democratic Caucus' Plan 1 employs compact, contiguous districts with minimal political subdivision splits in an effort to avoid vote dilution. The map creates districts which are facially reasonably compact and contiguous, and which contain few political subdivision splits: 17 counties split and 19 county splits; 19 municipalities split and 20 municipality splits; 18 wards split with 18 ward splits;

⁷ Admittedly, the district splits Philadelphia, but this "split" owes to the fact that Philadelphia is so populated that no single district can contain its entire population.

and 16 precincts split with 16 precinct splits; for a total of 70 political subdivisions split with 73 political-subdivision splits.⁸ Schoenberg Decl. ¶¶38-42. Although both Senate Democratic Caucus Plans split the City of Pittsburgh, they do so in a way so as to preserve communities of interest. For a discussion of the relevant communities, see the Analysis of Pittsburgh City Controller Michael Lamb, attached hereto as Exhibit E.

Additionally, and more importantly, the plan's employment of traditional redistricting criteria avoids partisan vote dilution. As illustrated by the expert report of Massachusetts Institute of Technology Professor Devin Caughey, attached hereto as Exhibit C, the plan, scored on four different metrics, creates districts that optimize Pennsylvanians' rights to translate their votes into representation. *See* Report at 11-14. First, applying a partisan bias metric,⁹ Professor Caughey concludes that this map has a slight Republican bias of 1.8%, meaning that in a 50-50 statewide vote, Republicans would be expected to win 51.8% of the House seats. *See id.* at 14. Second, applying an efficiency gap metric,¹⁰ the efficiency gap of this map is 2.3%,

⁸ It bears noting that some of the political-subdivision splits derive from the impossibility of including highly populated political subdivisions, such as Philadelphia, into a single Congressional district.

⁹ The partisan bias metric considers representational outcomes in the event of an evenly split statewide vote. *See* Report at 11..

¹⁰ The efficiency gap metric considers each party's relative percentage of "wasted votes" for candidates who either do not prevail or do not need them to prevail. *See* Report at 11.

meaning that Republicans “waste” 2.3% fewer votes than Democrats on candidates who have already prevailed or who will not prevail. *See id.* Third, applying a mean-median difference metric,¹¹ the mean-median district of this map is 0.7%, which indicates that the median district favors Republicans by 0.7%. *See id.* Finally, applying a declination metric,¹² the declination of the Senate Democratic Caucus’ Plan 1 is 0.06, indicating a small degree of “packing” and “cracking” of Democratic voters, which will slightly favor Republicans in future elections as well. *See id.* Professor Caughey concludes, based on these metrics, that the Senate Democratic Caucus map “mildly favors the Republican party” but is “unusually fair” as compared to other maps in that it virtually neutralizes vote dilution entirely. *See id.*

In service of that conclusion, Dr. Caughey compares the plan’s scores to those of the redistricting plan passed by the State House of Representatives, which has 6.3% partisan bias towards Republicans; an efficiency gap of 6.6%; a mean-median difference of 2.3% in favor of the Republican Party; and a declination of 0.19, the

¹¹ The mean-median difference metric considers the difference in outcome between a statistically average district and the median district. *See* Report at 11.

¹² The declination metric considers a party’s average vote share in districts in which it has prevailed to determine whether it is unusually high or close to, but less than, 50%, in an effort to determine whether the plan “packs” the party’s voters into single districts it is sure to win and/or “cracks” them into different districts in which they will lose where they would otherwise have won. *See, e.g.,* Gregory S. Warrington, “Quantifying gerrymandering using the vote distribution,” 17 Elec. L. J. 39-57 (2018).

highest Republican skew of all the proposed maps. *See id.* at 18. The Senate Democratic Caucus Plan 1 is superior across every metric in avoiding vote dilution.

Finally, the number of competitive districts in the Senate Democratic Caucus' proposed map demonstrates that it avoids partisan vote dilution. The proposed map creates four competitive districts: District 1 (49.3% D to 48.5% R), District 7 (50.1% D to 47.3% R), District 8 (49.4% D to 47.9% R), and District 10 (47% D to 50.4% R). The map in this regard might reasonably be regarded as providing an additional layer of protection against vote dilution by maximizing the number of Pennsylvanian voters who reside in districts in which their votes have meaningful impact upon the ultimate electoral outcomes. The creation of such districts also creates malleability in the event of wide swings of popular support in future elections or as it pertains to particular candidates: in a year in which Democrats or Republicans carry a 10-point advantage, they are likely to gain *all* competitive seats; in a year with a closer contest, there is likely to be a mixed result. Thus, all other things being equal, creating districts focused on competitiveness represents a more flexible way to accommodate changing political winds in terms of representation as the years proceed.

III. The Senate Democratic Caucus' Plan 2 Prioritizes Greater Minority Representation in District 2.

As noted *supra*, the Senate Democratic Caucus has also submitted Plan 2, attached as Exhibit B. This plan, too, complies with federal law, by creating districts with equal population: Districts 2, 4, 7, 8, 9, 10, 12, 13, 14, 15, 16, and 17 have populations of 764,865; and Districts 1, 3, 5, 6, and 11 have populations of 764,854. Schoenberg Decl. ¶¶ 53-54. Plan 2 complies with Section 2 of the VRA by preserving District 3 as a majority-minority district, with a BVAP of 51.0%. *Id.* at ¶ 55.

The principal difference between Plan 1 and Plan 2 is one of minority representation: Plan 2 provides an example of a map that creates an expanded minority coalition in District 2. Like Plan 1, Plan 2 employs traditional redistricting criteria to avoid partisan vote dilution. Plan 2 also creates districts which are facially compact and contiguous, and which contain few political subdivision splits: 16 counties split and 18 county splits; 16 municipalities split and 17 municipality splits; 14 wards split with 14 ward splits, and 16 precincts split with 16 precinct splits; for a total of 62 political subdivisions split with 65 political-subdivision splits. Schoenberg Decl. ¶¶ 48-52. Additionally, like Plan 1, Plan 2 scores well on all four of the aforementioned metrics: it has a Republican partisan bias of 1.5%, a Republican-favoring efficiency gap of 2.4%, a Republican-friendly mean-median difference of 0.5%, and a declination of 0.07. Report at 17.

Thus, to the degree this Honorable Court is inclined to join in the prioritization of implementing an expanded coalition district in Philadelphia, Plan 2 provides an opportunity to do so.

CONCLUSION

At bottom, a redistricting plan must be fair and must create a legislature that accurately reflects the will of Pennsylvania's voters. The Senate Democratic Caucus' Proposed Redistricting Plans create such a map by drawing compact and contiguous districts that minimize county splits, all while avoiding vote dilution, as evidenced by the analysis conducted by Professor Caughey. Accordingly, in light of all the foregoing, Senate Democrats respectfully request that this Honorable Court adopt one or the other of their proposed redistricting plans.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing document was

served via PACfile, this 24th day of January, 2022, upon the following parties
and in the manner indicated below:

By PACFile eService:

All counsel of record as set forth in the PACfile proof of service filed
herewith.

Dated: January 24, 2022

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EXHIBIT A
MAP 1

SENATE DEMOCRATIC CONGRESSIONAL PLAN #1

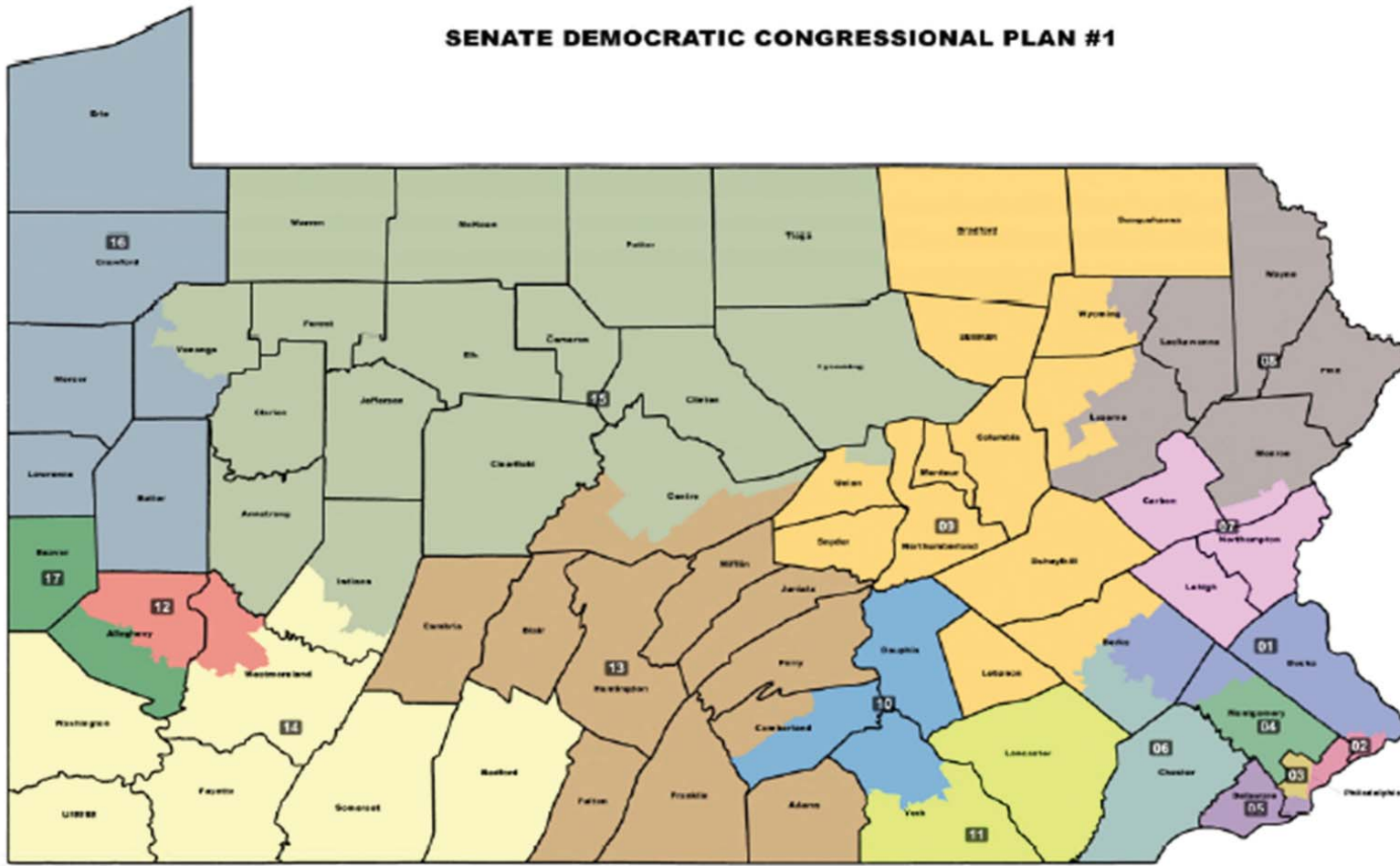


EXHIBIT B
MAP 2

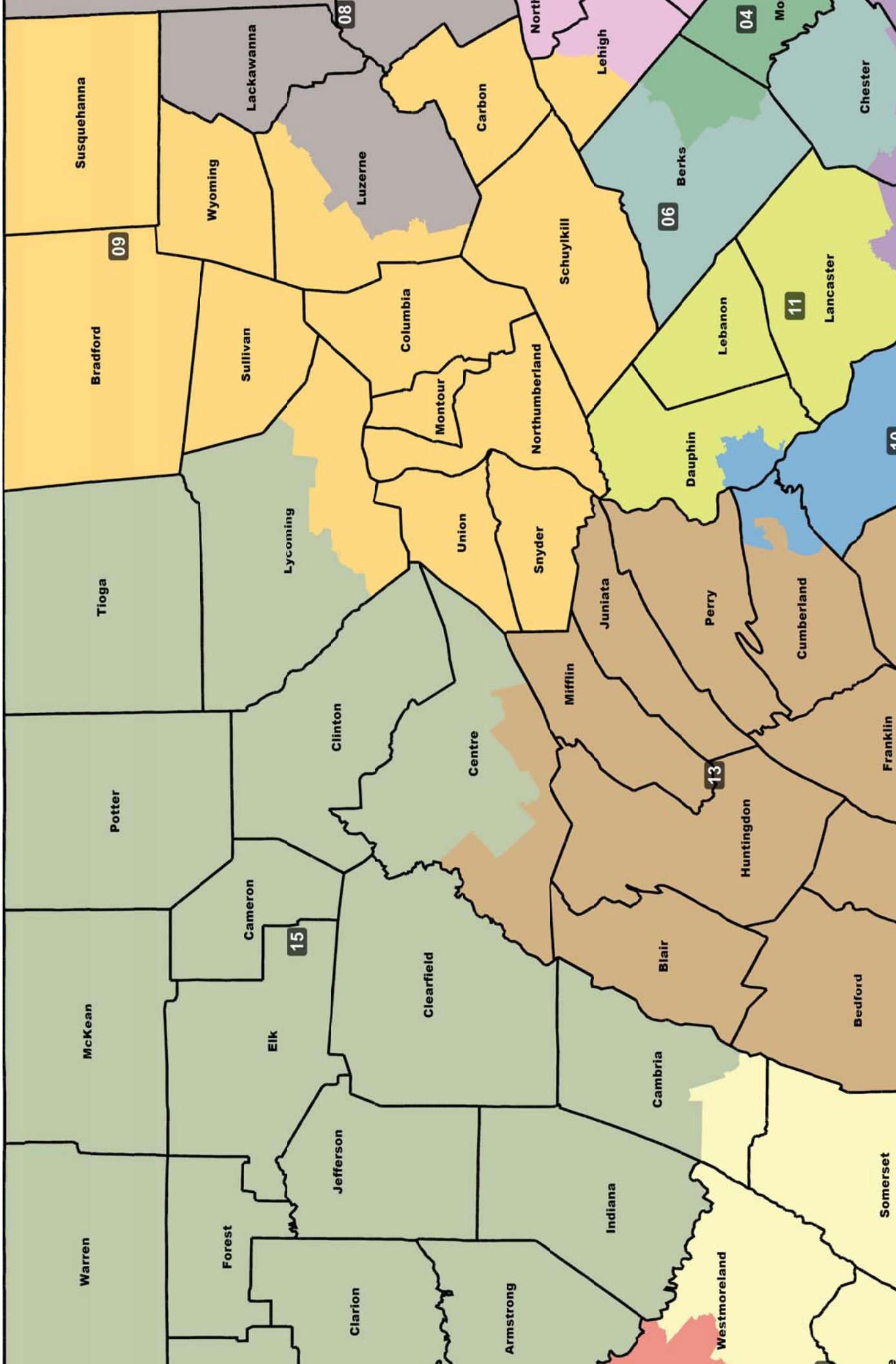


EXHIBIT C
CAUGHEY REPORT

Evaluation of Pennsylvania US House Maps

Current (2018–2020), Governor’s, Republican, and two Democratic Plans

Devin Caughey*

January 24, 2022

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1 Summary

This report analyzes the partisan fairness of the following Pennsylvania US House maps:

- The current (2018–2020) map (18 districts)
- Governor Wolf’s proposed map (17 districts)
- The map proposed by PA House Republicans (17 districts)
- Two maps proposed by PA Senate Democrats (17 districts)

According to all metrics of partisan fairness, all five maps favor the Republican Party (see Section 4, Tables 5 and 6). The Republican proposal is by far the least fair. The partisan bias in the other maps is substantially smaller, with the Senate Democratic proposals scoring as the most fair.

*Associate Professor, Department of Political Science, Massachusetts Institute of Technology. The analyses and views in this report are my own and do not represent the views of MIT.

2 Data and methods used in this report

This report relies on the following sources of data:

- GIS files of the maps in question, provided to me by counsel
- Electoral predictions for and political and demographic information on proposed legislative districts, obtained and downloaded via PlanScore’s “Score a Plan” feature¹
- Estimates of the partisan bias, efficiency gap, mean–median difference, and declination of proposed plans, also obtained via PlanScore’s “Score a Plan” feature and transcribed from the web.

I also performed additional analyses and created maps, plots, and tables using the open-source statistical program R.²

3 Analysis of districting plans

3.1 Current (2018–2020) US House map

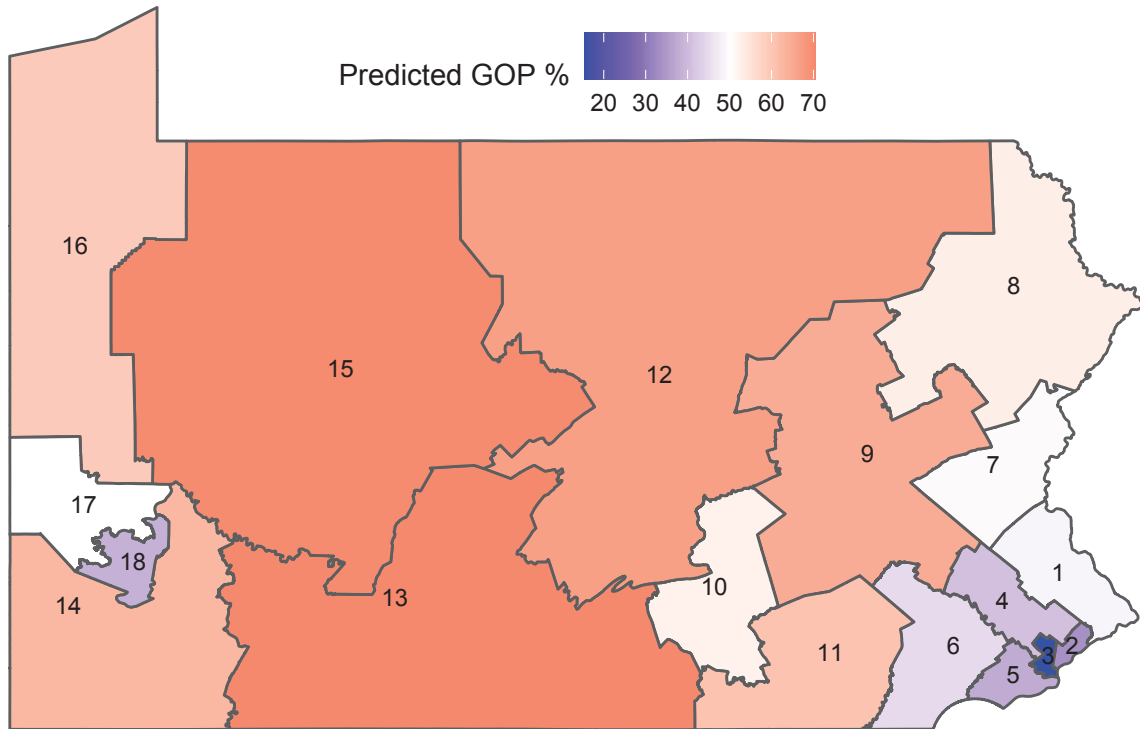
The current US House map in Pennsylvania, which contains 18 districts, has been in place since 2018. Using estimates from PlanScore’s predictive model, the map below plots the expected Republican share in each district if the current plan were used over the next decade.³

¹<https://planscore.campaignlegal.org/upload.html>. For details on PlanScore’s predictive model, see <https://planscore.campaignlegal.org/models/data/2021D/>. The predictions used in this report are based on a scenario in which no incumbents are running for reelection, which eliminates any incumbency advantage from the prediction, and use the 2020 presidential results as a baseline instead of the average across the 2012–2020 elections.

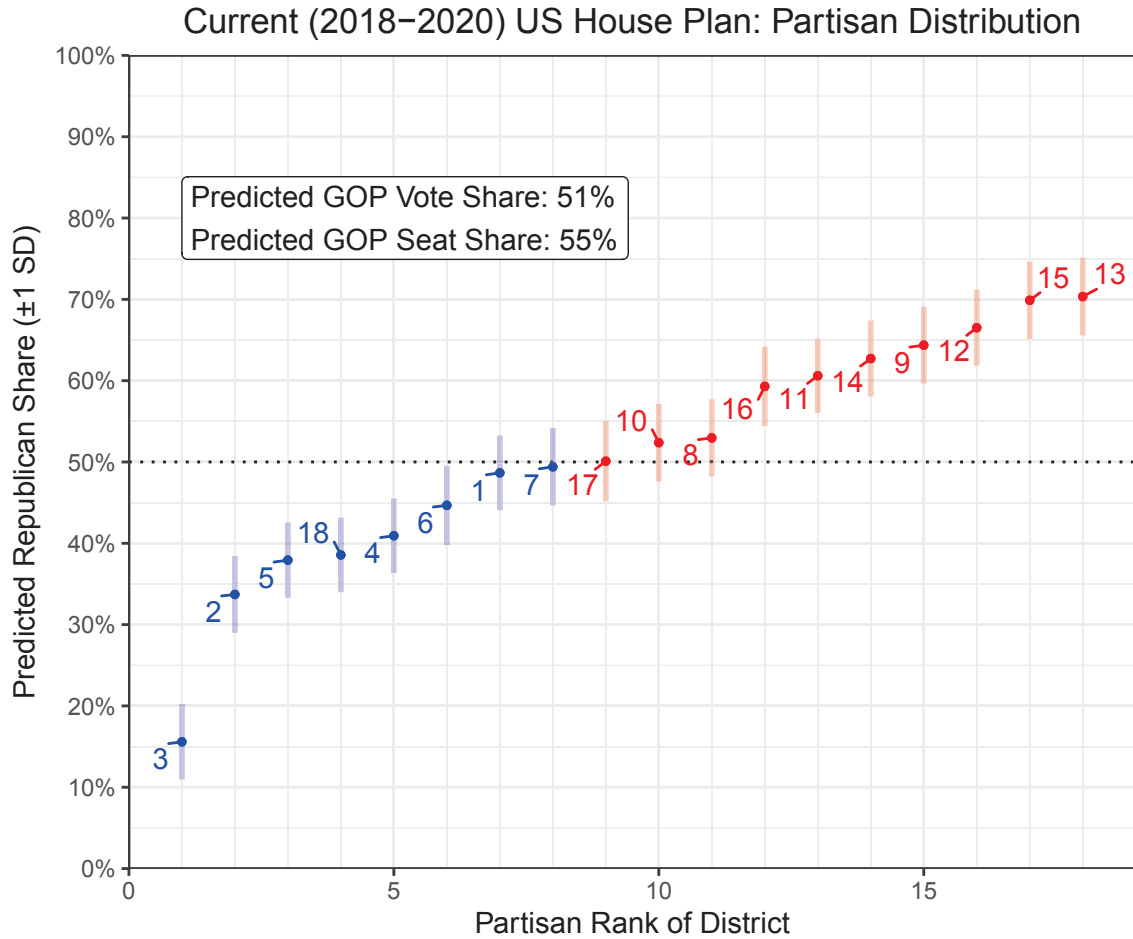
²R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>.

³The map’s PlanScore page can be accessed at <https://planscore.campaignlegal.org/plan.html?20220122T234949.357199979Z>

Current (2018–2020) US House Plan: Map



As the color range in the map’s legend suggest, under the current plan the distribution of district partisanship is asymmetric around 50% (i.e., skewed). In the least Republican district, Democrats are predicted to earn 84% of the vote, but the most Republican districts the predicted Republican share is only 70%. This long left tail of highly Democratic districts can be seen more clearly in the figure below, which plots the predicted Republican share in each district. (The vertical bars around each point indicate ± 1 standard deviation, or a 68% prediction interval, around the prediction.) Note that the skewed distribution is the product of one highly Democratic outlier (district 3).



The next figure plots the PlanScore model’s predictions for Republicans’ statewide vote share and seat share, which averages over statistical uncertainty and variation across election cycles. In the average election cycle, Republicans are predicted to win 51% of the statewide vote in Pennsylvania congressional elections and to carry 55% of US House seats.⁴

3.1.1 Formal analysis of partisan fairness

The table below summarizes the partisan fairness of the current Pennsylvania US House map according to four standard metrics. It reports each metric’s predicted value in future elections, as well as three measures of the durability and extremity of this value:

- Estimated probability that the map will favor Republicans in future elections
- Percentage of congressional and legislative districting plans in PlanScore’s historical library that are less pro-Republican than this plan
- Percentage of plans from other states and redistricting cycles that are less biased in favor of either party than this plan.

⁴Note that because the estimated seat share takes into account predictive uncertainty, it will not necessarily match the number of red (Republican) districts in the figure above, which in this case is 10 of 18, or 56%.

Table 1: Partisan fairness of current US House plan

Metric	Pred Value	Prob GOP Adv	Plans Less Pro-GOP	Plans Less Biased
Partisan Bias	2.1%	72%	64%	23%
Efficiency Gap	2.9%	70%	70%	32%
Mean–Median	0.8%	68%	62%	13%
Declination	0.08	69%	62%	35%

The **partisan bias** estimate of 2.1% implies that in an election where the two parties split the statewide vote, Republicans would be expected to win 52.1% (9.4 of 18) House seats. We can be 72% confident that the partisan bias will favor Republicans in future elections. A partisan bias of 2.1% is more pro-Republican than 64% of maps in the PlanScore library, and is larger in absolute magnitude than 23% of maps.

The **efficiency gap** estimate implies that in the typical election, Republicans would be expected to waste 2.9% fewer votes than Democrats. We can be 70% confident that the EG will favor Republicans in future elections. An EG of 2.9% is more pro-Republican than 70% of maps in the PlanScore library, and is larger in absolute magnitude than 32% of maps.

The estimated **mean–median difference** of 0.8% indicates that median district is 0.8 percentage points more Republican than the average district. We can be 68% confident that the MMD will favor Republicans in future elections. An MMD of 0.8% is more pro-Republican than 62% of maps in the PlanScore library, and is larger in absolute magnitude than 13% of maps.

Finally, the estimated **declination** is 0.08. We can be 69% confident that the declination will favor Republicans in future elections. An declination of 0.08 is more pro-Republican than 62% of maps in the PlanScore library, and is larger in absolute magnitude than 35% of maps.

In summary, all four metrics indicate that Pennsylvania’s current US House map is biased in favor of the Republican Party. Compared to maps from other states and redistricting cycles, this degree of partisan advantage is fairly small, and we can expect it to favor Republicans in only a bit over two-thirds of elections.

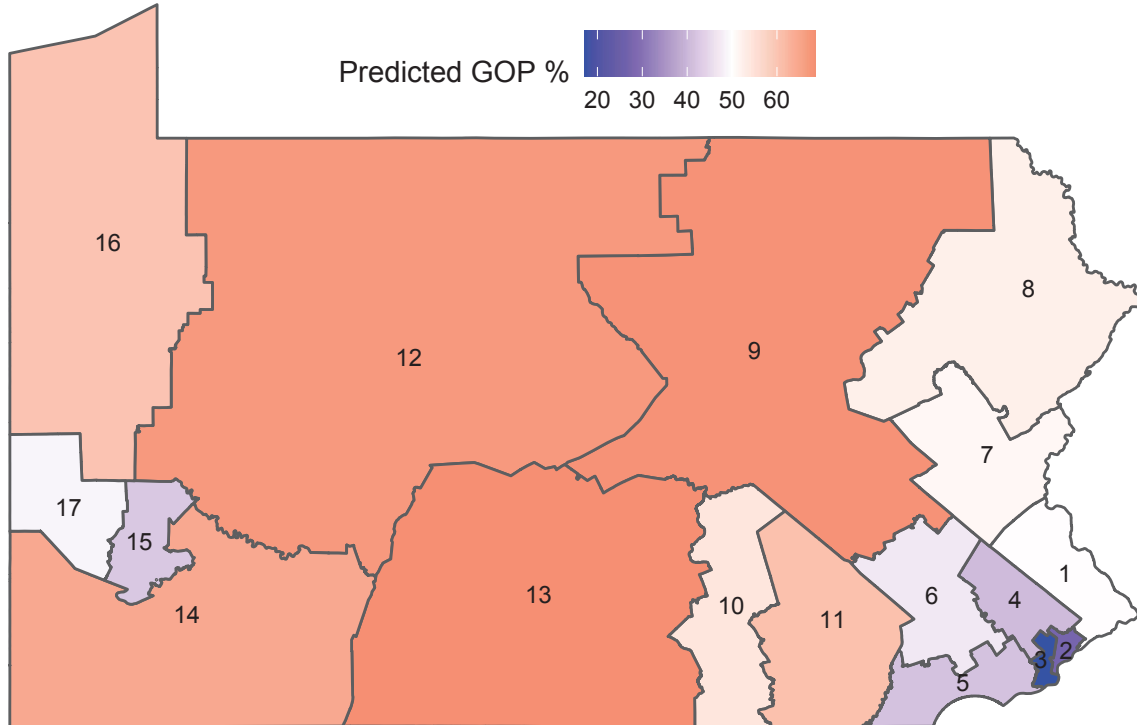
3.2 Governor Wolf’s proposed US House map

This section analyzes the partisan fairness of the US House map proposed by Pennsylvania governor Tom Wolf, which contains 17 districts. Using estimates from PlanScore’s predictive model, the map below plots the expected Republican share in each district if the current plan were used over the next decade.⁵ The distribution of district partisanship in this map is again left-skewed. In the least Republican district, Democrats are predicted to earn 83% of the vote, but the most Republican districts the predicted Republican share is only 68%.

⁵The map’s PlanScore page can be accessed at <https://planscore.campaignlegal.org/plan.html?20220122T235509.555956271Z>

Note that the skewed distribution is the product of two Democratic outliers (districts 2 and especially 3).

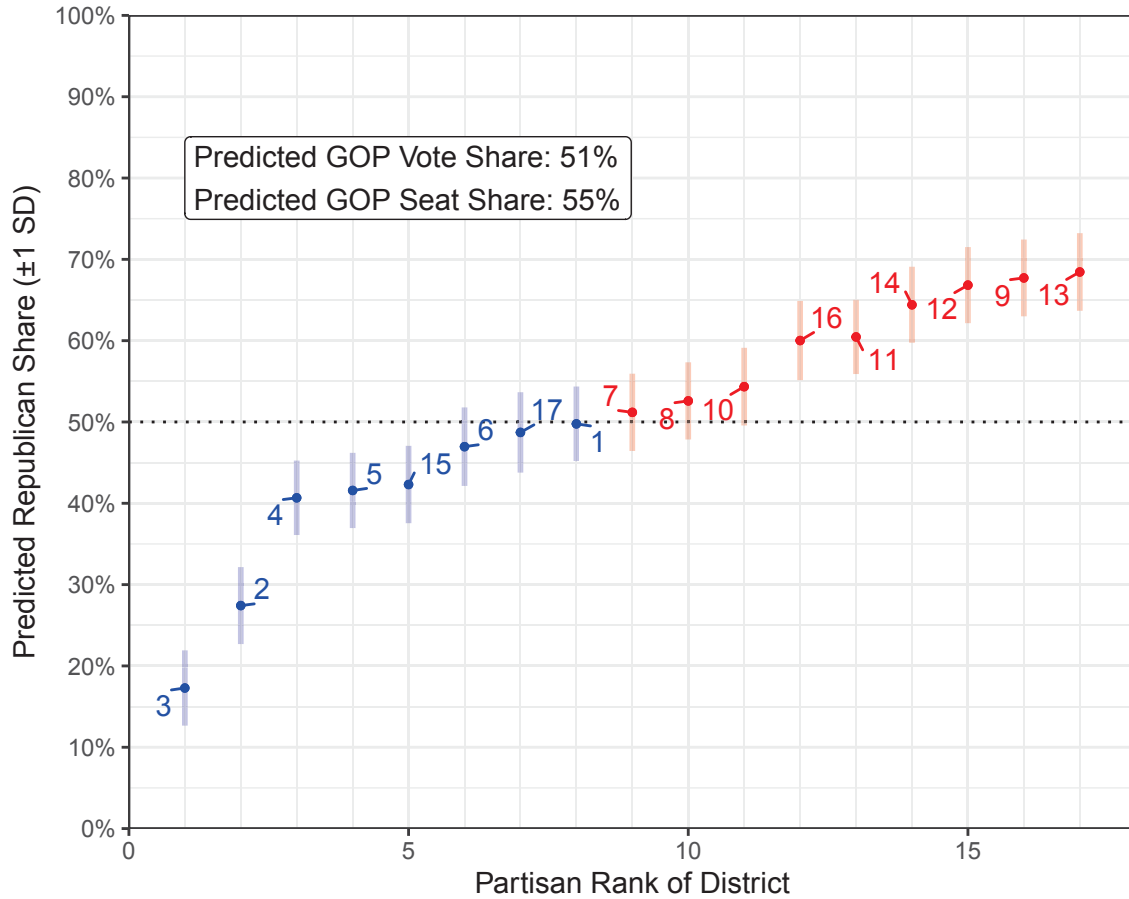
Governor's US House Plan: Map



The partisan distribution plot below shows the PlanScore model's predictions for Republicans' statewide vote share and seat share, averaging over statistical uncertainty and variation across election cycles. In the average election cycle, Republicans are predicted to win 51% of the statewide vote in Pennsylvania congressional elections and to carry 55% of US House seats.⁶

⁶Note that because the estimated seat share takes into account predictive uncertainty, it will not necessarily match the number of red (Republican) districts in the partisan distribution figure, which in this case is 9 of 17, or 53%.

Governor's US House Plan: Partisan Distribution



3.2.1 Formal analysis of partisan fairness

The table below summarizes the partisan fairness of the governor’s proposed map according to four standard metrics generated by PlanScore. It reports each metric’s predicted value in future elections along with measures of durability and extremity.

Table 2: Partisan fairness of governor’s plan

Metric	Pred Value	Prob GOP Adv	Plans Less Pro-GOP	Plans Less Biased
Partisan Bias	2.9%	68%	66%	27%
Efficiency Gap	3.5%	72%	74%	41%
Mean–Median	1.0%	68%	62%	14%
Declination	0.1	71%	64%	37%

The **partisan bias** estimate of 2.9% implies that in an election where the two parties split the statewide vote, Republicans would be expected to win 52.9% (9 of 17) House seats. We can be 68% confident that the partisan bias will favor Republicans in future elections. A partisan bias of 2.9% is more pro-Republican than 66% of maps in the PlanScore library, and is larger in absolute magnitude than 27% of maps.

The **efficiency gap** estimate implies that in the typical election, Republicans would be expected to waste 3.5% fewer votes than Democrats. We can be 72% confident that the EG will favor Republicans in future elections. An EG of 3.5% is more pro-Republican than 74% of maps in the PlanScore library, and is larger in absolute magnitude than 41% of maps.

The estimated **mean–median difference** of 1% indicates that median district is 1 percentage point more Republican than the average district. We can be 68% confident that the MMD will favor Republicans in future elections. An MMD of 1% is more pro-Republican than 62% of maps in the PlanScore library, and is larger in absolute magnitude than 14% of maps.

Finally, the estimated **declination** of 0.1 indicates a steeper angle in Democratic districts than Republican ones. We can be 71% confident that the declination will favor Republicans in future elections. An declination of 0.1 is more pro-Republican than 64% of maps in the PlanScore library, and is larger in absolute magnitude than 37% of maps.

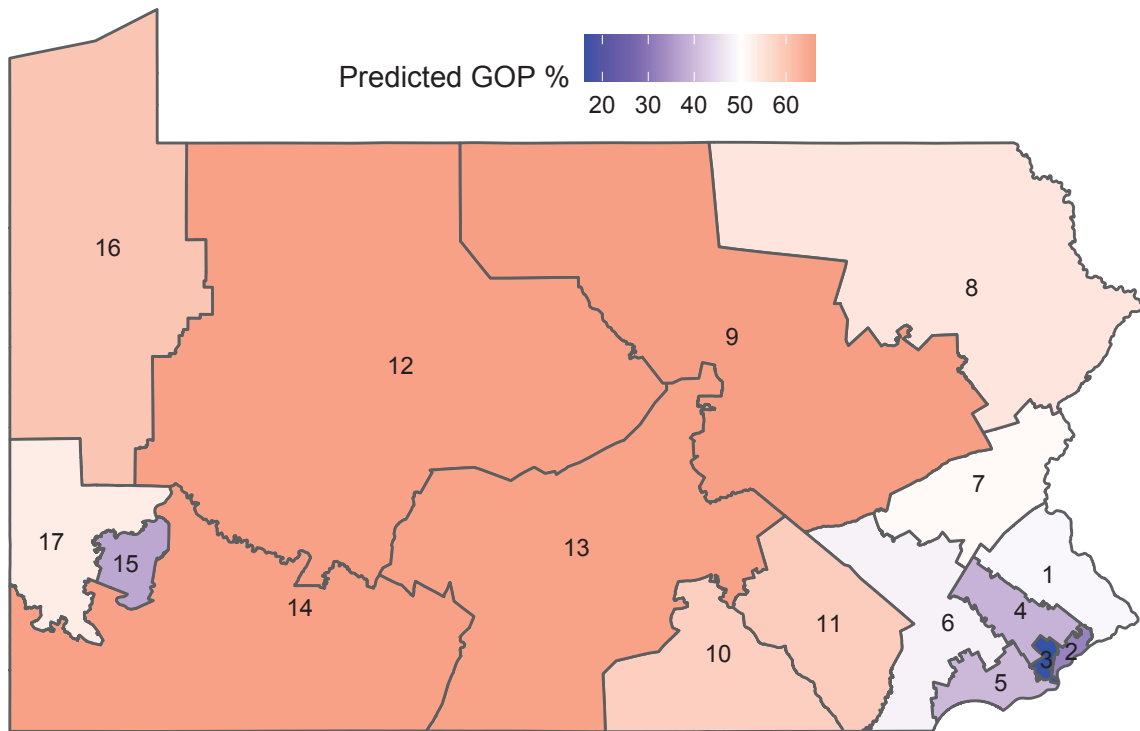
In summary, all four metrics indicate that the governor’s proposed map has a modest pro-Republican bias. We can be fairly confident the pro-Republican bias will persist in future elections, but we can also expect it to favor Democrats about 30% of the time. Compared to maps from other states and redistricting cycles, this is a reasonably fair map: most maps in PlanScore’s library favor one party or the other to a greater degree than this one does.

3.3 Pennsylvania House Republicans’ proposed US House map

This section uses PlanScore’s predictive model to analyze the partisan fairness of the US House map proposed by Pennsylvania House Republican (reproduced below).⁷

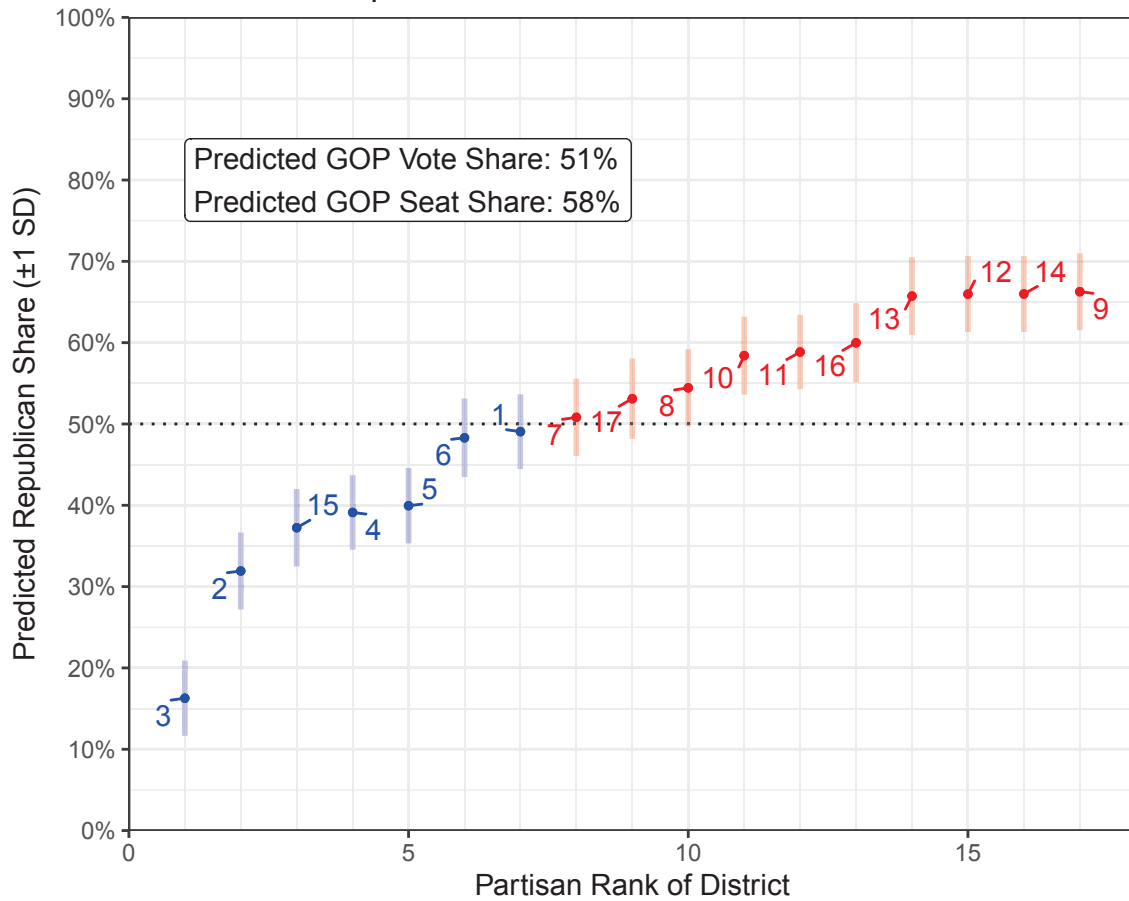
⁷The map’s PlanScore page can be accessed at <https://planscore.campaignlegal.org/plan.html?20220122T235521.601157977Z>

PA House Republicans' US House plan: Map



The distribution of district partisanship in this plan is very left-skewed. In the least Republican district, Democrats are predicted to earn 84% of the vote, but the most Republican districts the predicted Republican share is only 66%. Note that the skewed distribution is the product of two Democratic outliers (districts 2 and especially 3), plus a cluster of 60%+ Democratic districts (4, 5, and 15).

PA House Republicans' US House Plan: Partisan Distribution



This left tail of highly Democratic districts can be seen more clearly in the figure above, which plots the predicted Republican share in each district along with 68% prediction intervals. The partisan distribution plot indicates the PlanScore model’s predictions for Republicans’ statewide vote share and seat share, averaging over statistical uncertainty and variation across election cycles. In the average election cycle, Republicans are predicted to win 51% of the statewide vote in Pennsylvania US House elections and to carry 58% of House seats.⁸

3.3.1 Formal analysis of partisan fairness

The table below summarizes the partisan fairness of the map according to four standard metrics generated by PlanScore. It reports each metric’s predicted value in future elections along with measures of durability and extremity.

⁸Note that because the estimated seat share takes into account predictive uncertainty, it will not necessarily match the number of red (Republican) districts in the partisan distribution figure, which in this case is 10 of 17, or 59%.

Table 3: Partisan fairness of Republican US House plan

Metric	Pred Value	Prob GOP Adv	Plans Less Pro-GOP	Plans Less Biased
Partisan Bias	6.3%	87%	76%	55%
Efficiency Gap	6.6%	88%	84%	64%
Mean–Median	2.3%	87%	69%	36%
Declination	0.19	87%	75%	60%

The **partisan bias** estimate of 6.3% implies that in an election where the two parties split the statewide vote, Republicans would be expected to win 56.3% (9.6 of 17) House seats. We can be 87% confident that the partisan bias will favor Republicans in future elections. A partisan bias of 6.3% is more pro-Republican than 76% of maps in the PlanScore library, and is larger in absolute magnitude than 55% of maps.

For example, under this map, 2016 Republican presidential candidate Donald Trump would have earned 50.7% of the two-party vote in the average US House district, but he would have carried 58.8% of House seats. By contrast, in 2020, the Democratic candidate Joe Biden would have averaged 50.6% of the vote while carrying only 47.1% of seats.

The **efficiency gap** estimate implies that in the typical election, Republicans would be expected to waste 6.6% fewer votes than Democrats. We can be 88% confident that the EG will favor Republicans in future elections. An EG of 6.6% is more pro-Republican than 84% of maps in the PlanScore library, and is larger in absolute magnitude than 64% of maps.

The estimated **mean–median difference** of 2.3% indicates that median district is 2.3 percentage points more Republican than the average district. We can be 87% confident that the MMD will favor Republicans in future elections. An MMD of 2.3% is more pro-Republican than 69% of maps in the PlanScore library, and is larger in absolute magnitude than 36% of maps.

Finally, the estimated **declination** of 0.19 again indicates a steeper angle in Democratic districts than Republican ones. We can be 87% confident that the declination will favor Republicans in future elections. An declination of 0.19 is more pro-Republican than 75% of maps in the PlanScore library, and is larger in absolute magnitude than 60% of maps.

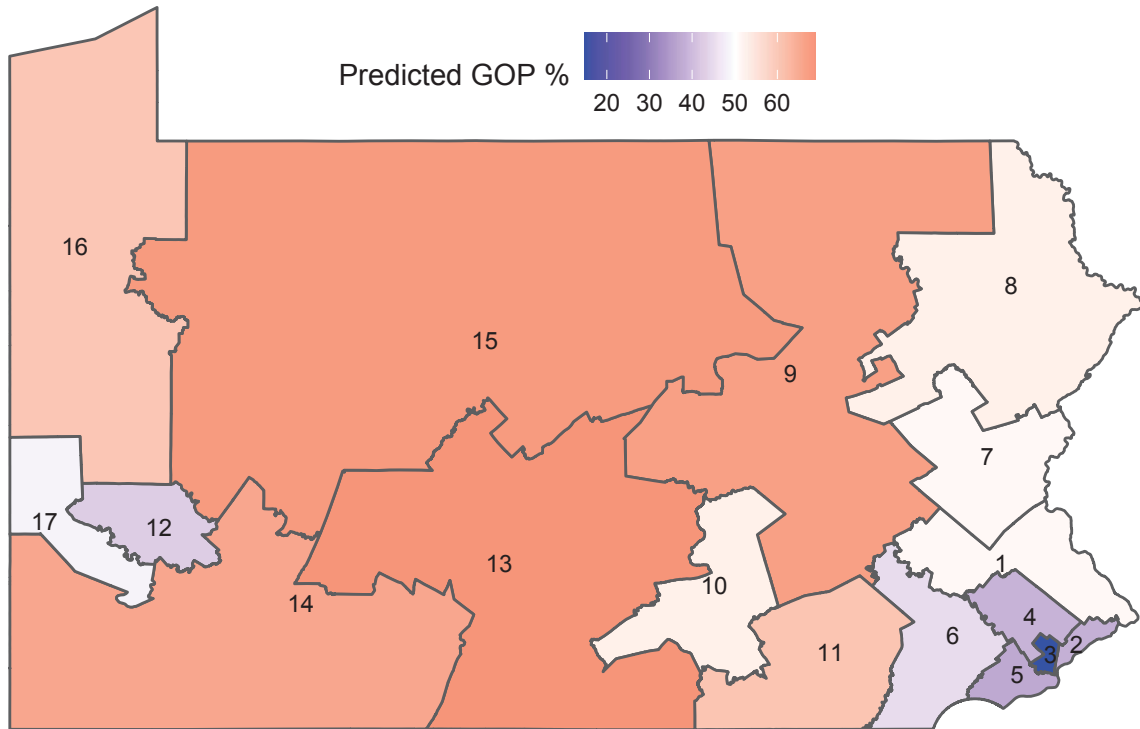
In summary, all four metrics indicate that the Republican US House plan is strongly biased in favor of the Republican Party. Compared to maps from other states and redistricting cycles, this degree of partisan advantage is fairly unusual, and we can be highly confident that the map would continue to favor Republicans in future elections.

3.4 Pennsylvania Senate Democrats’ proposed US House map #1

This section uses PlanScore’s predictive model to analyze the partisan fairness of the first US House map proposed by Senate Democrats (reproduced below).⁹

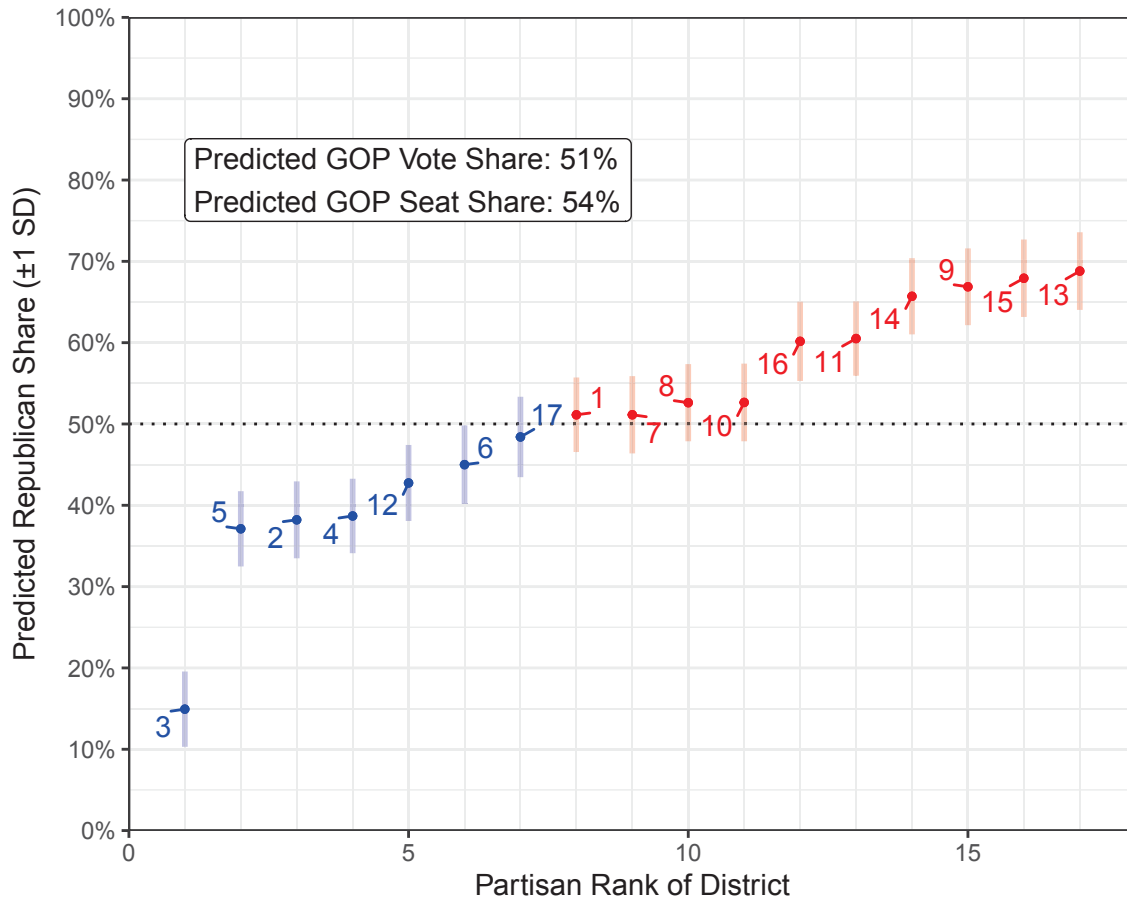
⁹The map’s PlanScore page can be accessed at <https://planscore.campaignlegal.org/plan.html?20220123T184413.521104546Z>

PA Senate Democrats' US House Plan #1: Map



The distribution of district partisanship in this plan is left-skewed. In the least Republican district, Democrats are predicted to earn 85% of the vote, but the most Republican districts the predicted Republican share is only 69%. Note that the skewed distribution is the product of one highly Democratic outlier (district 3).

PA Senate Democrats' US House Plan #1: Partisan Distribution



This left tail of highly Democratic districts can be seen more clearly in the figure above, which plots the predicted Republican share in each district along with 68% prediction intervals. The partisan distribution plot indicates the PlanScore model’s predictions for Republicans’ statewide vote share and seat share, averaging over statistical uncertainty and variation across election cycles. In the average election cycle, Republicans are predicted to win 51% of the statewide vote in Pennsylvania US House elections and to carry 54% of House seats.¹⁰

3.4.1 Formal analysis of partisan fairness

The table below summarizes the partisan fairness of the map according to four standard metrics generated by PlanScore. It reports each metric’s predicted value in future elections along with measures of durability and extremity.

¹⁰Note that because the estimated seat share takes into account predictive uncertainty, it will not necessarily match the number of red (Republican) districts in the partisan distribution figure, which in this case is 10 of 17, or 59%.

Table 4: Partisan fairness of PA Senate Democrats’ US House plan #1

Metric	Pred Value	Prob GOP Adv	Plans Less Pro-GOP	Plans Less Biased
Partisan Bias	1.8%	63%	62%	16%
Efficiency Gap	2.3%	66%	68%	26%
Mean–Median	0.7%	63%	60%	9%
Declination	0.06	65%	60%	27%

The **partisan bias** estimate of 1.8% implies that in an election where the two parties split the statewide vote, Republicans would be expected to win 51.8% (8.8 of 17) House seats. We can be 63% confident that the partisan bias will favor Republicans in future elections. A partisan bias of 1.8% is more pro-Republican than 62% of maps in the PlanScore library, and is larger in absolute magnitude than 16% of maps.

Under this map, 2016 Republican presidential candidate Donald Trump would have earned 50.8% of the two-party vote in the average US House district, but he would have carried 58.8% of House seats. In 2020, the Democratic candidate Joe Biden would have averaged 50.5% of the vote while carrying 52.9% of seats.

The **efficiency gap** estimate implies that in the typical election, Republicans would be expected to waste 2.3% fewer votes than Democrats. We can be 66% confident that the EG will favor Republicans in future elections. An EG of 2.3% is more pro-Republican than 68% of maps in the PlanScore library, and is larger in absolute magnitude than 26% of maps.

The estimated **mean–median difference** of 0.7% indicates that median district is 0.7 percentage points more Republican than the average district. We can be 63% confident that the MMD will favor Republicans in future elections. An MMD of 0.7% is more pro-Republican than 60% of maps in the PlanScore library, and is larger in absolute magnitude than 9% of maps.

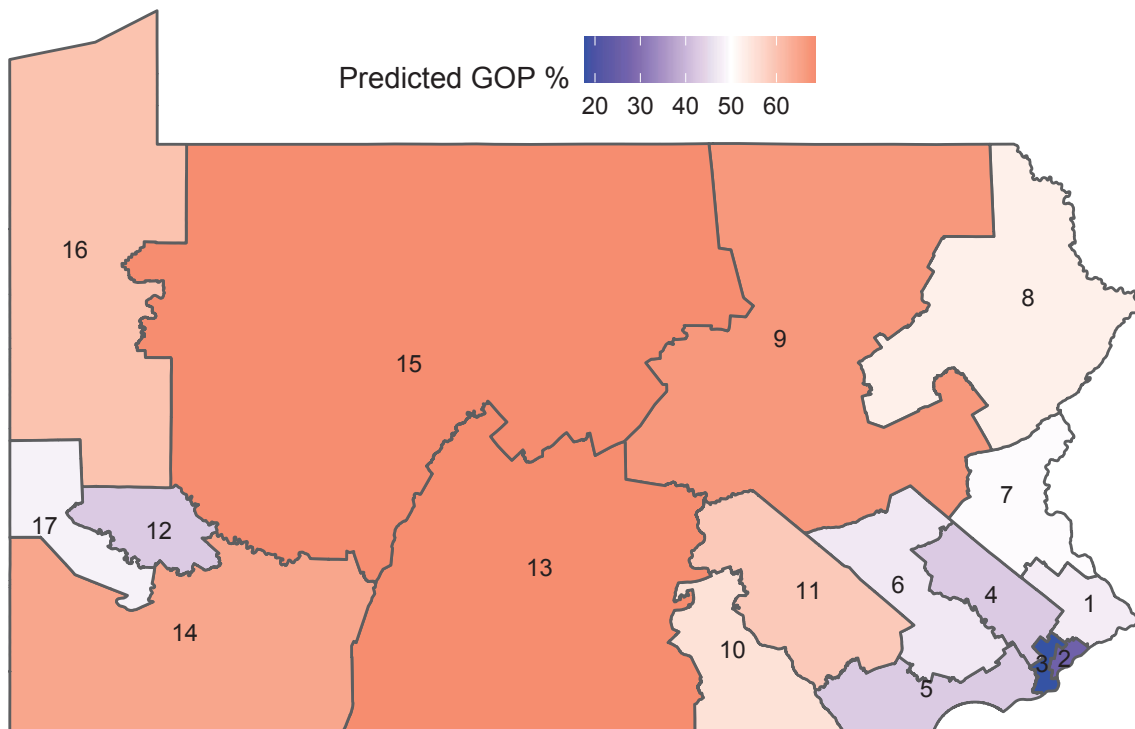
Finally, the estimated **declination** of 0.06 again indicates a steeper angle in Democratic districts than Republican ones. We can be 65% confident that the declination will favor Republicans in future elections. An declination of 0.06 is more pro-Republican than 60% of maps in the PlanScore library, and is larger in absolute magnitude than 27% of maps.

In summary, all four metrics indicate that the first US House plan proposed by Pennsylvania Senate Democrats mildly favors the Republican Party, and we can expect it to do so in about two-thirds of elections. Compared to maps from other states and redistricting cycles, this map is unusually fair; about three-quarters of maps in PlanScore’s library are more biased towards one party or the other.

3.5 Pennsylvania Senate Democrats' proposed US House map #2

This section uses PlanScore's predictive model to analyze the partisan fairness of the second US House map proposed by Pennsylvania Senate Democrats (reproduced below).¹¹

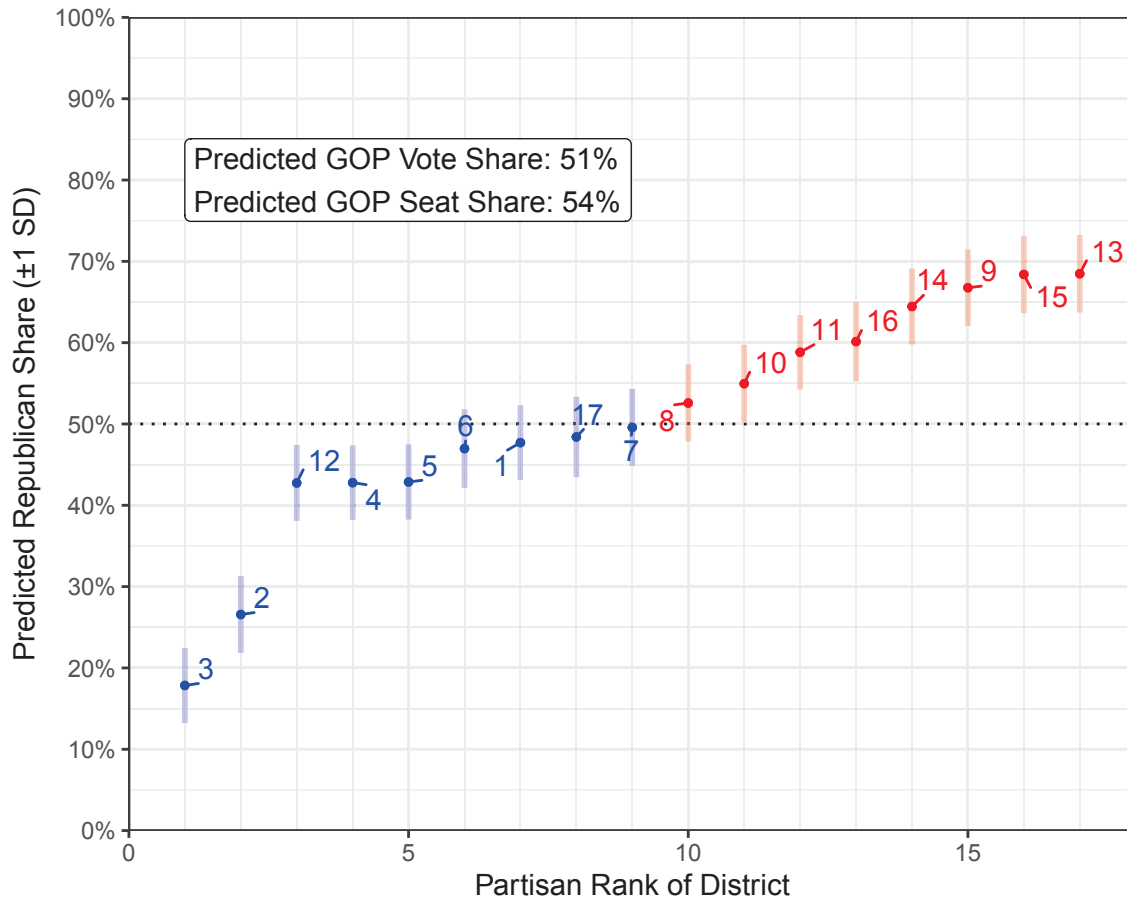
PA Senate Democrats' US House Plan #2: Map



The distribution of district partisanship in this plan is left-skewed. In the least Republican district, Democrats are predicted to earn 82% of the vote, but the most Republican districts the predicted Republican share is only 68%. Note that the skewed distribution is the product of two highly Democratic outliers (districts 2 and especially 3).

¹¹The map's PlanScore page can be accessed at <https://planscore.campaignlegal.org/plan.html?20220124T154615.687846006Z>

PA Senate Democrats' US House Plan #2: Partisan Distribution



This left tail of highly Democratic districts can be seen more clearly in the figure above, which plots the predicted Republican share in each district along with 68% prediction intervals. The partisan distribution plot indicates the PlanScore model’s predictions for Republicans’ statewide vote share and seat share, averaging over statistical uncertainty and variation across election cycles. In the average election cycle, Republicans are predicted to win 51% of the statewide vote in Pennsylvania US House elections and to carry 54% of House seats.¹²

3.5.1 Formal analysis of partisan fairness

The table below summarizes the partisan fairness of the map according to four standard metrics generated by PlanScore. It reports each metric’s predicted value in future elections along with measures of durability and extremity.

¹²Note that because the estimated seat share takes into account predictive uncertainty, it will not necessarily match the number of red (Republican) districts in the partisan distribution figure, which in this case is 8 of 17, or 47%.

Table 5: Partisan fairness of PA Senate Democrats’ US House plan #2

Metric	Pred Value	Prob GOP Adv	Plans Less Pro-GOP	Plans Less Biased
Partisan Bias	1.5%	60%	61%	13%
Efficiency Gap	2.4%	67%	68%	26%
Mean–Median	0.5%	60%	58%	7%
Declination	0.07	66%	60%	27%

The **partisan bias** estimate of 1.5% implies that in an election where the two parties split the statewide vote, Republicans would be expected to win 51.5% (8.8 of 17) House seats. We can be 60% confident that the partisan bias will favor Republicans in future elections. A partisan bias of 1.5% is more pro-Republican than 61% of maps in the PlanScore library, and is larger in absolute magnitude than 13% of maps.

Under this map, 2016 Republican presidential candidate Donald Trump would have earned 50.6% of the two-party vote in the average US House district, but he would have carried 47.1% of House seats.¹³ In 2020, the Democratic candidate Joe Biden would have averaged 50.7% of the vote while carrying 52.9% of seats.

The **efficiency gap** estimate implies that in the typical election, Republicans would be expected to waste 2.4% fewer votes than Democrats. We can be 67% confident that the EG will favor Republicans in future elections. An EG of 2.4% is more pro-Republican than 68% of maps in the PlanScore library, and is larger in absolute magnitude than 26% of maps.

The estimated **mean–median difference** of 0.5% indicates that median district is 0.5 percentage points more Republican than the average district. We can be 60% confident that the MMD will favor Republicans in future elections. An MMD of 0.5% is more pro-Republican than 58% of maps in the PlanScore library, and is larger in absolute magnitude than 7% of maps.

Finally, the estimated **declination** of 0.07 again indicates a steeper angle in Democratic districts than Republican ones. We can be 66% confident that the declination will favor Republicans in future elections. An declination of 0.07 is more pro-Republican than 60% of maps in the PlanScore library, and is larger in absolute magnitude than 27% of maps.

In summary, all four metrics indicate that the second US House plan proposed by Pennsylvania Senate Democrats slightly favors the Republican Party, and we can expect it to do so in about three-fifths of elections. Compared to maps from other states and redistricting cycles, this map is unusually fair; over three-quarters of maps in PlanScore’s library are more biased towards one party or the other.

¹³Note that despite the map’s small pro-Republican bias in a tied election, Trump actually carried fewer than half of districts in 2016. This discrepancy is due to the fact that the partisan bias estimate averages over electoral scenarios, and in a large minority of such scenarios, Republicans capture several narrowly Democratic districts. Put differently, though the *median* outcome of this map probably favors Democrats slightly, the *average* (which is sensitive to Republicans’ larger “upside”) favors Republicans.

4 Comparison of maps

The tables below compare the partisan fairness of the maps considered in this report. Table 5 reports the estimated values of various fairness metrics, and Table 6 reports the percentage of plans in PlanScore’s historical library that are less biased than the plan in question.

Table 6: Partisan advantage values for various maps

Metric	Current	Governor	Republican	Democratic 1	Democratic 2
Partisan Bias	2.1%	2.9%	6.3%	1.8%	1.5%
Efficiency Gap	2.9%	3.5%	6.6%	2.3%	2.4%
Mean–Median	0.8%	1.0%	2.3%	0.7%	0.5%
Declination	0.08	0.1	0.19	0.06	0.07

Table 7: Extremity of partisan advantage relative to PlanScore library

Metric	Current	Governor	Republican	Democratic 1	Democratic 2
Partisan Bias	23%	27%	55%	16%	13%
Efficiency Gap	32%	41%	64%	26%	26%
Mean–Median	13%	14%	36%	9%	7%
Declination	35%	37%	60%	27%	27%
AVERAGE	26%	30%	54%	20%	18%

EXHIBIT D
SCHOENBERG DECLARATION

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

CAROL ANN CARTER; *et al.*,
Petitioners,

v.

LEIGH M. CHAPMAN; *et al.*,
Respondents.

CASES CONSOLIDATED

NO. 464 M.D. 2021
ORIGINAL JURISDICTION

PHILLIP T. GRESSMAN; *et al.*,
Petitioners,

v.

LEIGH M. CHAPMAN; *et al.*,
Respondents.

NO. 465 M.D. 2021
ORIGINAL JURISDICTION

DECLARATION OF LORA SCHOENBERG

I, Lora Schoenberg, hereby declare and state upon personal knowledge as follows:

I. Professional Experience

1. My name is Lora Schoenberg. I am providing this Declaration in connection with the Senate Democratic Caucus Intervenors' submission.
2. I attended Miami University of Ohio from 1979-1983. I obtained a Bachelor of Philosophy degree.
3. I have been working for the Pennsylvania Senate since December of 1990.

4. I have worked in the Democratic Leader's office since February of 1992.

5. I have been involved in mapmaking as a mapmaker for the Senate Democratic Caucus starting in 2001. I was also involved in reapportionment of State Senate and/or Congressional maps in 2001, 2011-12, 2018, and 2021-2022. I was the lead mapmaker starting in 2001, and the lead redistricting staff since 2018.

II. Methodology for Creation and Analysis of Proposed Maps

6. We use a mapping software called Maptitude for drawing legislative and Congressional maps. This software was created by the Caliber Corporation.

7. In drawing the proposed 2022 maps, we have used 2021 Data Set #1 as approved by Pennsylvania's Legislative Reapportionment Commission.

8. In the statistics that follow, the splits come from the Maptitude report on political subdivision splits. Additionally, I verified everything but the precinct splits through the Legislative Data Processing Center. The only reason I did not so verify the precinct splits in this way is that the Legislative Data Processing Center does not provide that information.

9. In working with members of the Caucus, other parties, counsel and outside consultants, I am the person responsible for delivering the mapping information and details so as to ensure uniformity and accuracy. That has been the case for the maps and testimony associated with the submissions of the Senate Democratic

Caucus Intervenors.

III. 2018 Map (Current)

10. The 2018 Map splits 14 counties. These counties are split a total of 20 times.

11. The 2018 Map splits 23 municipalities, for a total of 26 municipal splits.

12. The 2018 Map splits 20 wards for a total of 20 ward splits.

13. The 2018 Map splits 10 precincts, for a total of 10 precinct splits.

14. The total number of split political subdivisions is 67, with 76 total political subdivision splits.

15. The population of Districts 2, 3, 5, 6, 7, 10, 11, 12, 13, 14, 15, 17, and 18 is 705,688.

16. The population of Districts 1, 4, 8, 9, and 16 is 705,687.

17. District 3 is a majority-minority district mandated by Section 2 of the VRA. Its Black Voting Age Population (BVAP) using the 2010 census data used at the time it was created was 56.3%.

18. District 2 is a coalition district, containing 24.7% BVAP, 18.9% Latino VAP, and 6.7% Asian VAP.

IV. Governor's Map

19. The Governor's Map, released publicly on January 15, 2022, splits 16 counties, for a total of 19 county splits.

20. The Governor's Map splits 18 municipalities, for a total of 19 municipal splits.

21. The Governor's Map splits 26 wards, for a total of 26 ward splits.

22. The Governor's Map splits 17 precincts, for a total of 17 precinct splits.

23. In total, the Governor's Map splits 77 political subdivisions, with 81 total splits.

24. The population of Districts 1, 5, 6, 8, 10, 11, 12, 13, 14, 15, 16, and 17 is 764,865.

25. The population of Districts 2, 3, 4, 7, and 9 is 764, 864.

26. District 3 is a majority-minority district mandated by Section 2 of the VRA. Its BVAP is 49.1%.

27. District 2 is a coalition district, with 24.1% BVAP, 22.5% Latino VAP, and 9.7% Asian VAP.

V. House GOP Map

28. HB 2146, Printer's No. 2541, contains a map passed by the Pennsylvania House, which I have labelled as the "House GOP Map."

29. The House GOP Map splits 15 counties, with 18 total county splits.

30. The House GOP Map splits 16 municipalities, for a total of 18 municipal splits.

31. The House GOP Map splits 19 wards, with a total of 19 ward splits.

32. The House GOP Map splits 9 precincts, with a total of 9 precinct splits.

33. In total, the House GOP Map splits 59 political subdivisions, with 64 total political subdivision splits.

34. The population of Districts 1, 2, 3, 4, 5, 6, 10, 11, 12, 14, 16, and 17 is 764,865.

35. The population of Districts 7, 8, 9, 13, and 15 is 764,864.

36. District 3 is a majority-minority district mandated by Section 2 of the VRA. Its BVAP is 52.5%.

37. District 2 is a coalition district, containing 22.7% BVAP, 22% Latino VAP, and 9.6% Asian.

VI. Senate Democratic Caucus Map (Map No. 1)

38. The Senate Democratic Caucus Map, or Senate Democratic Map No. 1, splits 17 counties, with 19 total county splits.

39. The Senate Democratic Caucus Map splits 19 municipalities with 20 total municipal splits.

40. The Senate Democratic Caucus Map splits 18 wards, with 18 total ward splits.

41. The Senate Democratic Caucus Map splits 16 precincts, with 16 total precinct splits.

42. In total, the Senate Democratic Caucus Map splits 70 political subdivisions,

with 73 total political subdivision splits.

43. The population of Districts 1, 3, 5, 8, 9, 11, 12, 13, 14, 15, 16, and 17 is 764,865.

44. The population of Districts 2, 4, 6, 7, and 10 is 764,864.

45. District 3 is a majority-minority district mandated by Section 2 of the VRA. Its BVAP is 52.0%.

46. District 2 is a coalition district, with 18.5% BVAP, 20.6% Latino VAP, and 9.7% Asian VAP.

47. District 5 is an emerging coalition district, with 24.5% BVAP, 4.9% Latino VAP, and 7.9% Asian VAP.

VII. Senate Democratic Caucus Alternate Map (Map. No. 2)

48. The Senate Democratic Caucus Alternate Map, or Senate Democratic Map No. 2, splits 16 counties, with a total of 18 county splits.

49. The Senate Democratic Caucus Alternate Map splits 16 municipalities, for a total of 17 municipal splits.

50. The Senate Democratic Caucus Alternate Map splits 14 wards, for a total of 14 ward splits.

51. The Senate Democratic Caucus Alternate Map splits 16 precincts, for a total of 16 precinct splits.

52. In total, the Senate Democratic Caucus Alternate Map splits 62 political

subdivisions, for a total of 65 political subdivision splits.

53. The population of Districts 2, 4, 7, 8, 9, 10, 12, 13, 14, 15, 16, and 17 is 764,865.

54. The population of Districts 1, 3, 5, 6, and 11 is 764,854.

55. District 3 is a majority-minority district mandated by Section 2 of the VRA. Its BVAP is 51.0%.

56. District 2 is a coalition district composed of 28.2% BVAP, 22.1% Latino VAP, and 9% Asian VAP.

57. District 5 is an emerging coalition district with 16.7% BVAP, 5.3% Latino VAP, and 5.2% Asian VAP.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: January 24, 2022

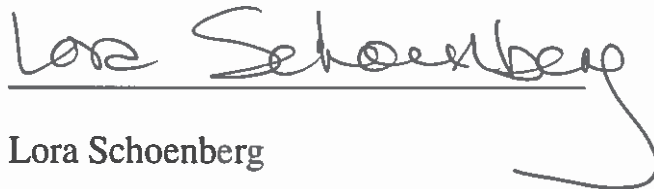

Lora Schoenberg

EXHIBIT E
LAMB REPORT

Assessment of Reapportionment Plan as Submitted by Pennsylvania Senate Democratic Caucus as it relates to Pittsburgh and its Southern and Western Neighborhoods

Michael Lamb, Pittsburgh City Controller

January 24, 2022

Background and Experience

I am currently the elected City Controller of Pittsburgh serving in my fourth term as well as an attorney admitted to practice in the Commonwealth of Pennsylvania. I am a lifelong resident of the south hills of Pittsburgh. My father, Senator Thomas F. Lamb, was the former State Senator and Majority Leader from the 42nd District that included the southern and western neighborhoods of Pittsburgh along with many of the adjoining suburban communities. My nephew, Congressman Conor Lamb represents the 17th Congressional District which includes many southern and western communities bordering the City of Pittsburgh.

In addition to my family history and being a city official, my experience includes being elected county wide as the Allegheny County Prothonotary, having run Statewide for Auditor General and having worked in Pittsburgh City Council. I also helped to create the multi-municipal organization known as CONNECT, the Congress of Neighboring Communities. I am a graduate of Penn State University and hold a Master's Degree from The Heinz College of Information Systems and Public Policy at Carnegie Mellon University. I am also a graduate of the Local Government Academy. My background and experience bring an understanding of municipal cooperation and working across municipal boundaries with communities of interest from a city, county and statewide perspective.

Assessment

On review of the reapportionment plan submitted by the Senate Democratic Caucus it is clear that the plan appropriately separates some wards and neighborhoods from others within the City of Pittsburgh in two proposed congressional districts.

While it has been the stated objective of the reapportionment process to leave municipalities intact within congressional districts, in many cases it is not possible due to population or, in the case of the City of Pittsburgh, not the best solution for long established communities of interest.

Pittsburgh, unlike most American cities, is a collection of neighborhoods, not laid out by numbered blocks or planning department plats. In fact, many neighborhoods in Pittsburgh were formed by the natural topography and industrial history of this unique city. This is particularly true of the city's southern and western neighborhoods which sit across the Monongahela River from the rest Pittsburgh.

My family came to these neighborhoods more than 100 years ago. My immigrant ancestors settled in the Beechview and Elliott neighborhoods of Pittsburgh. When my grandfather bought a

plot of land on Cape May Avenue in Beechview in 1919, his sister, who lived on Forbes Avenue near Duquesne University in downtown Pittsburgh, could not understand why he wanted to live “in the wilderness.” While the distinction between these neighborhoods and the rest of the city may not currently be as stark as that, there are clear dissimilarities among these southern and western communities of interest and the rest of Pittsburgh.

At one time in the not so distant past, most of these southern and western hilltop and industrial valley communities were towns or boroughs in their own right or parts of other townships. That autonomy and independence is an important part of who these neighborhoods are. In fact one independent municipality, Mount Oliver Borough, continues to operate its own independent government despite being surrounded by southern Pittsburgh neighborhoods.

In my neighborhood of Mount Washington we constantly welcome tourists and others to Grandview Avenue to take in what has been called the most beautiful urban vista in the world. Yet, despite our proximity to Pittsburgh’s central business district, I have many neighbors who have not been in downtown Pittsburgh in more than 10 years.

The southern and western neighborhoods are communities of interest separate and apart from downtown, Oakland, and the east end of Pittsburgh. They are primarily residential communities separate and distinct from each other. In most cases they have closer ties to their suburban neighbors than to the rest of the city. Mount Washington, Allentown, Overbrook and Beechview share the T with Dormont, Castle Shannon, Mount Lebanon and Bethel Park. People regularly, if mistakenly, refer to Banksville as Green Tree City. The Brownsville Road business district unites the South Side Slopes, Arlington, Knoxville and Carrick in the city with the boroughs of Mount Oliver, Brentwood, Baldwin and Whitehall. And in the spider like city border on our western edge it is hard to know when you are in Pittsburgh or when you are in Crafton, Carnegie, Ingram or McKees Rocks.

The natural outmigration of city residents that occurs in the urban core of every American city follows particular patterns in Pittsburgh. City residents in our southern and western neighborhoods seeking a suburban life style, almost always move to southern or western municipalities. These communities of interest are familiar and long established. The residents of southern and western city neighborhoods and their suburban municipal neighbors worship together, shop in the same places and belong to the same gyms, clubs and leagues.

These communities of interest are bound by shared experience that goes beyond their municipal boundaries. Here, the Monongahela River represents a border more meaningful and recognizable than the meandering city line and reapportionment of our congressional districts should consider that.

At CONNECT, our goal has always been to recognize our municipal independence and improve public services while making municipal boundaries less relevant. Congressional representation should acknowledge these communities of interest and in the case of Pittsburgh realize that the municipal boundary is less relevant to strong representation. The reapportionment plan submitted by the Senate Democratic Caucus accomplishes that and should be met with your approval.