

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

464 M.D. 2021 & 465 M.D. 2021 (Consolidated)

CAROL ANN CARTER, MONICA PARRILLA, REBECCA POYOUROW,
WILLIAM TUNG, ROSEANNE MILAZZO, BURT SIEGEL, SUSAN
CASSANELLI, LEE CASSANELLI, LYNN WACHMAN, MICHAEL
GUTTMAN, MAYA FONKEU, BRADY HILL, MARY ELLEN BALCHUNIS,
TOM DEWALL, STEPHANIE MCNULTY, 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 Notices,
Respondents

and

PHILIP T. GRESSMAN, RON Y. DONAGI, KRISTOPHER R. TAPP, PAMELA
GORKIN, DAVID P. MARSH, JAMES L. ROSENBERGER, AMY MYERS,
EUGENE BOWMAN, 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 Notices,
Respondents

**SENATE DEMOCRATIC CAUCUS' BRIEF IN RESPONSE TO
PROPOSED REDISTRICTING PLANS**

/s/ Marco S. Attisano

Marco S. Attisano
Pa. Id. No. 316736
Flannery Georgalis, LLC
707 Grant Street, Suite 2750
Pittsburgh, PA 15219
(412) 438-8209
mattisano@flannerygeorgalis.com

/s/ Clifford B. Levine

Clifford B. Levine
Pa. Id. No. 33507
Emma F.E. Shoucair
Pa. Id. No. 325848
625 Liberty Avenue, 5th Floor
Pittsburgh, PA 15222-3152
clifford.levine@dentons.com
emma.shoucair@dentons.com

/s/ Corrie Woods

Corrie Woods
Pa. Id. No. 314580
Woods Law Offices PLLC
200 Commerce Drive, Suite 210
Moon Township, PA 15108
(412) 329-7751
cwoods@woodslawoffices.com

/s/ A. Michael Pratt

A. Michael Pratt
Pa. Id. No. 44973
Kevin Greenberg
Pa. Id. No. 82311
Greenberg Traurig, LLP
1717 Arch Street, Suite 400
Philadelphia, PA 19103
greenbergk@gtlaw.com

*Counsel for Intervenors,
Senate Democratic Caucus*

TABLE OF CONTENTS

TABLE OF CITATIONS	ii
I. BACKGROUND	1
II. SUMMARY OF ARGUMENT	2
III. ARGUMENT	3
<i>A. This Honorable Court Should Adopt Senate Democratic Caucus’ Proposed Plans Because They Comply With Federal Law and Optimize the Avoidance of Unconstitutional Partisan Vote Dilution As Compared to Other Plans</i>	<i>3</i>
<i>B. Several other parties and amici curiae submitted plans that do not minimize partisan vote dilution.</i>	<i>4</i>
<i>C. Several other parties have advanced an erroneous argument that an unadopted or failed legislative enactment is somehow entitled to deference before this Honorable Court, which argument ignores that it is an unadopted or failed legislative enactment and promotes a vision of legislative supremacy that is contrary to the bedrock constitutional principle of separation of powers.</i>	<i>9</i>
<i>D. One party has advanced an argument regarding modifications to the elections calendar that ignore the need for appellate review and the executive’s assessment of its needs for administering the primary election.</i>	<i>12</i>
IV. CONCLUSION	13

TABLE OF AUTHORITIES

Cases

<i>Cook v. Luckett</i> , 735 F.2d 912 (5 th Cir. 1984)	10
<i>Donnelly v. Meskill</i> , 345 F. Supp. 962 (D. Conn. 1972)	9, 10
<i>Holt v. 2011 Legislative Reapportionment Commission</i> , 67 A.3d 1211 (Pa. 2013)	11
<i>In re Ross Twp. Election Dist. Reapportionment</i> , 489 A.2d 297 (Pa. Super. 1985)	10
<i>League of Women Voters v. Commonwealth</i> 178 A.3d 737 (Pa. 2018)	4, 5, 7, 8, 9, 12
<i>Newbold v. Osser</i> , 230 A.2d 54 (Pa. 1967).....	10
<i>Skolnick v. State Electoral Bd. of Ill.</i> , 336 F.Supp. 839 (N.D. Ill. 1971)	9, 10
<i>Tallahassee Branch of NAACP v. Leon Cnty.</i> , 827 F.2d 1436 (11 th Cir. 1987)..	9, 10
<i>Upham v. Seamon</i> , 456 U.S. 37 (1982)	10
<i>Whitcomb v. Chavis</i> , 403 U.S. 124 (1971).....	10
<i>White v. Weiser</i> , 412 U.S. 783 (1973)	10

Other Authorities

The Federalist No. 47, at 301 (J. Coode ed. 1961)	11
---	----

Constitutional Provisions

Pa. Const., art. IV, § 15	11
---------------------------------	----

**SENATE DEMOCRATIC CAUCUS' BRIEF IN RESPONSE TO
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 Response to Proposed Redistricting Plans, and offer the following:

I. 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 and seeking the adoption of a remedial plan.¹ On January 14, 2022, this Honorable Court entered an order directing parties and *amici curiae* to, *inter alia*, submit proposed plans, together with any supporting expert report and/or brief, January 24, 2022, at 5 p.m., and to file any rebuttal reports and/or briefs by today, January 26, 2022, at 5 p.m. *See* Order, 1/14/22, unpaginated at 2-3. On January 24, the parties and *amici* complied, filing plans and supporting reports and briefs. The Senate Democratic Caucus now files a supplemental report

¹ The Senate Democratic Caucus takes the position that the Pennsylvania Supreme Court is the ultimate arbiter of the remedial plan when the political branches fail to act. The Supreme Court should review this matter *de novo*, consistent with *Mellow* and *League*. This constitutional duty is further supported by the Supreme Court’s role in drawing remedial maps when the Legislative Reapportionment Commission fails to act. Pa. Const. art. I, § 17(h). The Senate Democratic Caucus preserves this issue for appeal.

from Dr. Devin Caughey, attached hereto as Exhibit A, and this Brief In Response To Proposed Redistricting Plans.

II. SUMMARY OF ARGUMENT

This Honorable Court should adopt one of the Senate Democratic Caucus' Proposed Plans because they comply with federal law and optimize the avoidance of unconstitutional partisan vote dilution as compared to other plans. Indeed, several of the other parties and *amici curiae* have submitted plans that do not optimize the avoidance of unconstitutional vote dilution, instead hiding partisan vote dilution behind facial adherence to, for example, minimizing political subdivision splits (which Senate Democratic Caucus' plans also accomplish).

Additionally, several of the other parties have advanced an erroneous argument that an unadopted or failed legislative enactment is somehow entitled to deference before this Honorable Court. This argument ignores that it is an unadopted or *failed* legislative enactment and promotes a vision of legislative supremacy that is contrary to the bedrock constitutional principle of separation of powers. In any event, redistricting plans that unconstitutionally dilute votes are not entitled to deference.

Finally, one party has advanced an argument regarding modifications to the elections calendar that ignores the need for appellate review and the executive's articulation of the time it needs to administer the election.

III. ARGUMENT

A. This Honorable Court Should Adopt Senate Democratic Caucus’ Proposed Plans Because They Comply With Federal Law and Optimize the Avoidance of Unconstitutional Partisan Vote Dilution As Compared to Other Plans

As detailed in Senate Democratic Caucus’ initial brief, a proposed redistricting plan must comply with federal law and must comply with the Free and Equal Elections Clause of the Pennsylvania Constitution by employing traditional redistricting criteria in a way that avoids unconstitutional partisan vote dilution. The Senate Democratic Caucus’ proposed redistricting plans do so. *See generally* Senate Democratic Caucus’ Brief In Support of Senate Democratic Caucus’ Proposed Redistricting Plan (“Democratic Caucus’ Brief”), 1/24/22, at 8-21.

Indeed, they optimize the avoidance of unconstitutional partisan vote dilution as compared to other proposed plans, and strikingly so as compared to Republican Legislative Intervenors’ proposed plan. As explained in Dr. Devin Caughey’s expert report, attached to Senate Democratic Caucus’ initial brief,² the Senate Democratic Caucus’ proposed plans, which nearly eliminate partisan bias, outscore the Republican Legislative Intervenors’ proposed plan, which is significantly biased towards Republicans, across all considered metrics. *See id.*, Exh. C, at 18 (opining that the Senate Democratic Caucus’ plans contain slight Republican biases and that the Legislative Republican Intervenors’ plans increase those biases as measured by

² Senate Democratic Caucus has attached Dr. Caughey’s *curriculum vitae* hereto as Exhibit B.

some metrics by up to nearly 460%). Republican Congressmen’s plans suffer from similarly glaring defects. *See generally* Supplemental Report of Dr. Devin Caughey, 1/26/22, attached hereto as Exhibit A, at 22-23.

In short, Senate Democratic Caucus’ proposed plans employ traditional redistricting criteria to avoid unconstitutional partisan vote dilution to a greater degree than the other maps, and, thus, are superior in terms of compliance with the Free and Equal Elections Clause, the fundamental goal of which is to ensure that dominant political factions do not use the law to entrench their power at the expense of the Commonwealth’s voters.

B. Several other parties and amici curiae submitted plans that do not minimize partisan vote dilution.

In their briefs, several other parties and *amici curiae* ignore, attempt to dodge, or outright attack our Supreme Court’s holding in *League of Women Voters v. Commonwealth* 178 A.3d 737 (Pa. 2018), that the Free and Equal Elections Clause requires the avoidance of partisan vote dilution. The Republican House leaders argue at length that this Honorable Court should not consider the Pennsylvania Constitution’s command to avoid partisan vote dilution, which they have spun into “proportional representation,” urging that there is essentially a natural geographic partisan gerrymander because Democratic voters cluster heavily in urban areas. *See* Opening Brief of House Republican Intervenors Kerry Benninghoff, Majority

Leader, and Bryan Cutler, Speaker, of the Pennsylvania House of Representatives In Support of Proposed Congressional Redistricting Map, 1/24/22 (“Republican House Leaders Brief”), at 21-24. The Republican Senate leaders, for their part, ignore the constitutional prohibition on vote dilution entirely. *See generally* Pre-Hearing Opening Brief of Senate Republican Intervenors Jake Corman, President Pro Tempore of the Pennsylvania Senate, and Kim Ward, Majority Leader of the Pennsylvania Senate, 1/24/22 (“Republican Senate Leaders Brief”). The Republican Congressmen acknowledge that the Pennsylvania Constitution prohibits vote dilution, but attempt to transmogrify its prohibition on *partisan* vote dilution into some sort of prohibition on geographic-based vote dilution divorced from partisanship. *See* Brief of Guy Reschenthaler, Jeffrey Varner, Tom Marino, Ryan Costello, and Bud Shuster, 1/24/22 (“Republican Congressmen’s Brief”), at 16, 22-42. Each of these participants offers instead greater focus on traditional redistricting criteria such as compactness or the number of counties, municipalities, wards and precincts that their redistricting plans divide.

These arguments misstate the focus of *League*. Our Supreme Court in *League* recognized that the Free and Equal Election Clause was originally adopted to prevent the use of election laws to accomplish *partisan vote dilution*. *See* Senate Democratic Caucus’ Brief in Support of Senate Democrats’ Caucus’ Proposed Redistricting Plan, 1/24/22, at 12-15. Contrary to the House Republican leaders’ argument, the

Clause does not permit a dominant political faction to use its opponents' geographic clustering to solidify power and disenfranchise opponents. *Accord, e.g., League*, 178 A.3d at 805-809 (discussing Pennsylvania's unfortunate history of geographic factionalism); *see also id.* at 808 (noting the adoption of a constitution under which "the people's right to elect their representatives in government would be equally available to all, and would, hereinafter, not be intentionally diminished by laws that discriminated against a voter based on his . . . geography of his residence[.]") (internal citation omitted). In other words, the Free and Equal Elections Clause contemplates that there is no such thing as a "natural" – *i.e.* geographic – partisan gerrymander.

Moreover, and also contrary to the Republican argument, the prohibition on vote dilution is conceptually distinct from a requirement of proportionality. In short, even in an electoral system in which there is a prohibition on vote dilution, there remains something of a "winner's bonus": the majority party will almost always win a super-proportional share of seats. Under Senate Democratic Caucus' proposed plans, for example, there remains a winner's bonus: "in the average election cycle, Republicans are predicted to win 51% of the statewide vote . . . and to carry 54% of House seats." Democratic Caucus' Brief, Exh. C, at 13; *see also id.* at 16. It is just that the Republican leaders' proposed plan takes the winner's bonus and *double* it. *See id.* at 10 (noting that average Republican advantage of 1% statewide translates

to an average advantage of 8% in seats). Indeed, it is further notable that their plan *minimizes* Democratic winners bonuses and maximizes Republican ones. *See generally id.* In an election cycle in which Democrats win 55% of votes, they are predicted to win 10, or 58% of seats (which Republicans winning only 51% can achieve), but in an election cycle in which Republicans win 55% of votes, they are predicated to win 12, or 70% of seats. *See generally id.* Notably, Democrats would have to win roughly 60% of votes, or win by a 20% margin, to gain such a clear advantage. *See id.* All of which is to say that *League* requires that plans be *responsive* to vote share, not that proportional outcomes are required to match voting percentages. *See* Supplemental Report of Devin Caughey, Exh. A, at 4.

Relatedly, and contrary to the Republican Congressmen's argument, our Supreme Court in *League* was clearly focused on the avoidance of *partisan* vote dilution based on geography, not geography in a vacuum. Indeed, in discussing the aforementioned history of geographic factionalism, it clearly recognized the coalition of various geographic and other groups into a political faction, and ensuing efforts to disenfranchise opposing factions, as the chief evil against which the adoption of the Clause as a constitutional provision was meant to work. *Accord League*, 178 A.3d at 805-09 (explaining that early geographic, economic, and religious factions coalesced into the Proprietary Party and Anti-Proprietary Party, the former of which took hold of the colonial assembly and used reapportionment

and other election laws to disenfranchise supporters of the latter, and the ultimate triumph of reformers in adopting the Clause).

In any event, more broadly addressing all of the foregoing arguments, *League* does not constitutionalize the traditional redistricting factors set forth therein for their own sakes. Indeed, *League* does not even say that the Pennsylvania Constitution affirmatively requires their observance. Instead, it indicates that a plan’s violation of the Clause by partisan vote dilution can be *evidenced* by its subordination of those generally relevant factors to partisan advantage. *See id.* at 816 (“Because these factors are deeply rooted in the organic law of our Commonwealth, and continue to be the foundational requirements which state legislative districts must meet . . . we find these neutral benchmarks to be particularly suitable as a measure in assessing whether a [C]ongressional districting plan dilutes the potency of an individual’s ability to select the [C]ongressional representative of his or her choice, and thereby violates the Free and Equal Elections Clause[.]”); *see also id.* (describing the factors as “consistent” with the “overarching intent” to avoid “any law which discriminatorily dilutes the power of [a] vote” and, thus, “a measure by which to assess” whether a plan dilutes votes); *id.* (describing the factors as decreasing the risk of vote dilution); *id.* at 817 (describing the factors as providing “a ‘floor’ of protection for an individual against the dilution of his or her vote in the creation of . . . districts”).

Indeed, *League* recognizes that plans may employ traditional redistricting factors, but nevertheless dilute votes, and that it is the *dilution* that violates constitutional commands. *See id.* at 817 (“However, this is not the exclusive means by which a violation of Article I, Section 5 may be established. As we have repeatedly emphasized throughout our discussion, the overarching objective of this provision of our constitution is to prevent dilution of an individual’s vote by mandating that the power of his or her vote in the selection of representatives be equalized to the greatest degree possible with all other Pennsylvania citizens.”); *see also id.* (recognizing that plans may comport with the factors and nevertheless effect partisan vote dilution, including as evidenced by vote efficiency gaps); *see also id.* at 820 (recognizing mean-median difference analysis).

At bottom, the aforementioned participants attempt to obfuscate what *League* makes clear: the Free and Equal Elections Clause prohibits partisan vote dilution. And Senate Democratic Caucus’ maps effectuate that prohibition more than theirs do.

C. Several other parties have advanced an erroneous argument that an unadopted or failed legislative enactment is somehow entitled to deference before this Honorable Court, which argument ignores that it is an unadopted or failed legislative enactment and promotes a vision of legislative supremacy that is contrary to the bedrock constitutional principle of separation of powers.

In their briefs, the Republican House leaders and Republican Senate leaders argue that their plan deserves deference, or, failing that, “special consideration,” because it is of legislative origin, although they concede, as they must, that it is not law.³ See Republican House Leaders’ Brief at 9-12 (citing, as pertinent herein, *Tallahassee Branch of NAACP v. Leon Cnty.*, 827 F.2d 1436 (11th Cir. 1987); *Donnelly v. Meskill*, 345 F. Supp. 962 (D. Conn. 1972); *Skolnick v. State Electoral Bd. of Ill.*, 336 F.Supp. 839 (N.D. Ill. 1971); *In re Ross Twp. Election Dist. Reapportionment*, 489 A.2d 297 (Pa. Super. 1985); *Newbold v. Osser*, 230 A.2d 54 (Pa. 1967)); Republican Senate Leaders Brief at 10-12 (citing *Cook v. Luckett*, 735 F.2d 912 (5th Cir. 1984); *Upham v. Seamon*, 456 U.S. 37 (1982); *White v. Weiser*, 412 U.S. 783 (1973); *Whitcomb v. Chavis*, 403 U.S. 124 (1971), and *Donnelly*, *supra*).

Preliminarily, virtually none of these decisions, most of which are extrajurisdictional and nonbinding, approach the proposition that a failed legislative enactment is entitled to deference or special consideration by a court adopting a remedial plan. See *Tallahassee Branch of NAACP*, *supra* (involving question of whether a plan was legislatively or judicially adopted to determine level of deference required in assessing whether governing law required single-member districts); *In*

³ As of this writing, the plan has been enacted by the General Assembly and awaits the Governor’s signature or veto. The Governor is expected to veto.

re: Ross Twp., supra (involving duly enacted reapportionment plan); *Newbold, supra* (same); *Cook, supra* (involving challenge and modification to duly enacted reapportionment plan); *Upham, supra* (involving challenge to duly enacted redistricting plan); *White, supra* (same); *Whitcomb, supra* (same). And the decisions that do stand for the proposition are unpersuasive. *See Donnelly, supra* (adopting a party-proposed plan that slightly modified a legislatively enacted plan, without precedent or reasoning, on the ground that it only slightly modified the legislatively enacted plan was a “tiebreaker” of sorts); *Skolnick, supra* (adopting a party-proposed plan that passed one chamber of the state legislative house without any explanation as to the fact’s relevance).

Indeed, the argument that a failed legislative enactment is entitled to deference at all is remarkable, as it promotes a vision of legislative supremacy that is contrary to the bedrock constitutional principle of separation of powers. Presentment to the executive is a fundamental part of enacting legislation. *See* The Federalist No. 47, at 301 (J. Coode ed. 1961) (J. Madison) (noting that the accumulation of all powers of government “in the same hands . . . may justly be pronounced the very definition of tyranny”); Pa. Const., art. IV, § 15 (requiring presentment of bills to the Governor). And examining the argument more closely, it rests on highly dubious precepts. First, it rests on the notion that the policy preferences of a majority each house of the General Assembly adequately reflect the Commonwealth’s political

will. Putting aside for the moment that many, including the former Republican local official whose plan provided the basis for the (albeit further gerrymandered) failed enactment at issue, have argued that the existing state legislative districts that provide for that majority themselves constitute an illegal partisan gerrymander, *see Holt v. 2011 Legislative Reapportionment Commission*, 67 A.3d 1211 (Pa. 2013), it bears noting that these majorities represent a series of constituencies across the Commonwealth, that representatives of other constituencies have opposed the plan, and that, in the event the Governor were to veto the plan, he would be the only public official elected by a majority of Pennsylvanians, performing a constitutionally vested authority in doing so. Thus, reasonable arguments exist, at a minimum, that an unadopted or failed legislative enactment, if anything, is entitled to *less* consideration than plans that have not been affirmatively rejected by an elected official with a statewide constituency. In any event, the Republican House leaders and Republican Senate leaders have not—and cannot—provide authority or persuasive argument to the effect that legislative flotsam is entitled to deference.

D. One party has advanced an argument regarding modifications to the elections calendar that ignore the need for appellate review and the executive's assessment of its needs for administering the primary election.

Finally, in their brief, Congressional Republicans urge that Petitioners are attempting to force this Honorable Court to a hasty decision by stressing a false imminence to logistical needs in administering 2022 election activity. They contend

that this Court can consider this matter up to and including February 22, 2022. *See* Republican Congressmen’s Brief at 43-46. They arrive at this date by analogy to executive representations made in the context of *League*. *See id.* On that point, the Senate Democratic Caucus would merely note that, first, whatever this Honorable Court’s decision, one party or another is highly likely to file an appeal to our Supreme Court, which appeal will take time to litigate, consider, and decide. *Accord League, supra* (involving recommended findings of fact and conclusions of law issued by then-Judge, now-Justice Brobson on December 29, 2018, litigation, a judgment order without opinion issued on January 22, 2018, an opinion issued on February 7, 2018, further litigation, and a remedial plan issued on February 15, 2018). Additionally, the Senate Democratic Caucus would further note that *League* predated our Commonwealth’s adoption of its existing vote-by-mail system, which manifests distinguishing and significant logistical delays. For its part, the Senate Democratic Caucus would suggest that the executive branch, rather than one current and several retired federal legislators, knows best its needs in administering the law.

IV. CONCLUSION

Accordingly, in light of all the foregoing, Senate Democratic Caucus respectfully requests that this Honorable Court adopt a Senate Democratic Caucus Proposed plan.

Respectfully submitted,

/s/ Marco S. Attisano

Marco S. Attisano
Pa. Id. No. 316736
Flannery Georgalis, LLC
707 Grant Street, Suite 2750
Pittsburgh, PA 15219
(412) 438-8209
mattisano@flannerygeorgalis.com

/s/ Corrie Woods

Corrie Woods
Pa. Id. No. 314580
Woods Law Offices PLLC
200 Commerce Drive, Suite 210
Moon Township, PA 15108
(412) 329-7751
cwoods@woodslawoffices.com

/s/ Clifford B. Levine

Clifford B. Levine
Pa. Id. No. 33507
Emma F.E. Shoucair
Pa. Id. No. 325848
625 Liberty Avenue, 5th Floor
Pittsburgh, PA 15222-3152
clifford.levine@dentons.com
emma.shoucair@dentons.com

/s/ A. Michael Pratt

A. Michael Pratt
Pa. Id. No. 44973
Kevin Greenberg
Pa. Id. No. 82311
Greenberg Traurig, LLP
1717 Arch Street, Suite 400

Philadelphia, PA 19103
greenbergk@gtlaw.com

Counsel for Intervenors,
Senate Democratic Caucus

EXHIBIT A – SUPPLEMENTAL REPORT OF DR. DEVIN CAUGHEY

Evaluation of Pennsylvania US House Maps

Current, Governor’s, Two Republican, and Two Democratic Plans

Devin Caughey*

January 26, 2022

Contents

1	Summary	2
2	Data and methods used in this report	2
2.1	Background on PlanScore	2
3	Measures of partisan fairness	3
3.1	Partisan symmetry	4
3.2	Efficiency gap	5
3.3	Mean–median difference	5
3.4	Declination	5
4	Analysis of districting plans	6
4.1	Current (2018–2020) US House map	6
4.2	Governor Wolf’s proposed US House map	9
4.3	Pennsylvania House Republicans’ proposed US House map	12
4.4	Pennsylvania Senate Democrats’ proposed US House map #1	15
4.5	Pennsylvania Senate Democrats’ proposed US House map #2	19
5	Comparison of maps	22
A	Supplementary Analyses	23
A.1	Senator Reschenthaler’s proposed map	23
	Works cited	25

*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.

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 5, Tables 6 and 7). 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.

In addition, a supplementary analysis of a plan proposed by Senator Reschenthaler is included as an appendix.

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

2.1 Background on PlanScore

PlanScore (<https://planscore.campaignlegal.org/>) is a project of the Campaign Legal Center, a nonprofit, nonpartisan organization focused on campaign finance, voting rights, political communications, and government ethics. The website conducts automated analyses of the partisan fairness of districting plans using standard political science methods. Through its “Score a Plan” feature, PlanScore permits users to upload plans to be scored. To score a plan, PlanScore uses Geographic Information System (GIS) data to merge districts with precinct-level electoral and demographic data. Then, using a model that takes into account presidential

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/>.

vote, incumbency status, and state- and election-specific factors, PlanScore simulates the outcome of future congressional and legislative elections in each district. Importantly, these predictions reflect variability stemming from cycle-specific partisan swings as well as the idiosyncratic features of a given race, such as candidate quality.

3 Measures of partisan fairness

This section provides background on how academic social scientists define and measure partisan fairness in legislative districting. Most mathematical details are relegated to footnotes. Unless otherwise stated, I use the convention that positive numbers indicate a Republican advantage and negative numbers a Democratic one.

First, it is important to note that as defined here, partisan fairness is an attribute of a map itself, regardless of the map-drawers' intentions. Partisan advantage can be the result of map-drawers' conscious efforts to maximize one party's prospects (i.e., partisan gerrymandering), but it is affected by other factors as well, such as the geographic distribution of partisan support. My analysis focuses on the partisan effects of the maps at issue without delving into questions of partisan intent.

Second, there is no single theoretical standard of partisan fairness. Not only are there several alternative metrics, but the value of each metric depends on the precise electoral scenario—for example, whether the national political environment favors one party or the other. Moreover, in most cases the fairness of a map in a given scenario cannot be directly observed, but rather must be estimated based on extrapolations from past electoral results. In short, partisan fairness can reasonably be measured in several ways, each of which is subject to uncertainty. Consequently, unless we have good reason to favor one measure over others, we can be most confident in a map's fairness when multiple measures coincide.³

PlanScore uses election predictions to calculate partisan fairness scores and associated uncertainty for four standard measures:

- partisan symmetry/bias
- the efficiency gap
- the mean–median difference
- declination.

Because it deems partisan symmetry and mean–median scores reliable only in competitive states, PlanScore does not calculate partisan symmetry or declination scores for states where one party's predicted votes share exceeds 55%. Below I provide background on all four measures.

³For evidence that various fairness metrics usually yield similar results and are highly correlated in competitive states, see Nagle (2015); Stephanopoulos and Warshaw (2020).

3.1 Partisan symmetry

Partisan symmetry is grounded in the idea that under a fair districting plan, the translation of votes into seats is neutral with respect to party.⁴ That is, if one party wins (say) 60% of legislative seats when it earns 55% of votes statewide, then the other party too should receive 60% of seats with 55% of votes.⁵ The relationship between vote share and expected seat share across the entire range of vote share is called the *seats–votes function*.

The *partisan bias* (PB) of a district map indicates how much it deviates from partisan symmetry. More specifically, in a two-party system, the partisan bias is half the difference between the two parties’ seat shares when each receives the same statewide vote share.⁶ Like the seats–votes function, partisan bias is not a single number, but rather varies depending on the statewide vote share of the reference party (henceforth, the Republican Party). For example, the partisan bias when Republicans win 60% of the statewide vote—which is defined in terms of a contrast with their seat share with a vote share of 40%—can and usually does differ from the bias when Republicans win 55% of the vote. It is thus often convenient to summarize the partisan bias by evaluating it at 50% (a statewide tie). In this case, both parties receive the same vote share, so the partisan bias is simply half the difference between the Republican and Democratic seat shares.

Symmetry is not the same as *proportionality*, which requires that a party’s expected seat share equal its vote share.⁷ Due to the well-known “winner’s bonus” in majoritarian electoral systems, the majority party in a state usually wins a super-proportional share of seats unless the map is biased strongly against it.⁸ How much seat share changes as a function of a change in vote share—i.e., the steepness of the seats–votes function—is called its *responsiveness*. Empirically, responsiveness in the United States typically ranges between 1 and 3 percentage points in seat share for each point in vote share.⁹ A symmetrical districting scheme need not be proportional as long as seats–votes function is equally disproportionate for all parties, and reasonable arguments can be made for various degrees of responsiveness. That said, some states include proportionality as a standard for evaluating districting plans.

⁴Grofman and King (2007); Katz, King, and Rosenblatt (2020). This report follows the notation used in the latter article.

⁵In a two-party system, partisan symmetry can be expressed formally as the condition $S(V) = 1 - S(1 - V)$, where V is party A’s average vote share across districts and $S(V)$ is A’s expected seat share given vote share V . Unless otherwise state, this report maintains the simplifying assumption that vote share is correlated with turnout across districts, in which case the statewide vote share equals the average vote share across districts.

⁶Formally, partisan bias in a two-party system is defined as $\beta(V) = \frac{S(V) - [1 - S(1 - V)]}{2}$, where V is the vote share of the reference party. The two terms are divided by 2 to capture their distance from symmetry rather than from each other.

⁷Formally, proportionality means that for all values of a party’s vote share V , $S(V) = V$, where $S(V)$ is the party’s expected seat share at V .

⁸For the classic statement of the winner’s bonus in terms of a “cube law,” see Kendall and Stuart (1950).

⁹Katz, King, and Rosenblatt (2020), 172

3.2 Efficiency gap

An alternative standard to symmetry of the seats–vote curve is equality between each party’s number of “wasted” votes.¹⁰ A wasted vote is one cast for a losing candidate or for a winning candidate beyond the 50% + 1 required for victory. A party with many wasted votes is inefficient at translating votes into seats. The *efficiency gap* is thus defined as the difference in wasted votes between the two parties. When this gap is positive, Republicans waste fewer votes than Democrats and therefore enjoy an electoral advantage.

The efficiency gap can be calculated from aggregate election results by subtracting twice the Republican statewide vote margin from the Republican seat margin, where margin is defined as two-party share minus 50%.¹¹ Like partisan bias, the efficiency gap differs depending on the statewide vote breakdown. Standard practice in the literature is to evaluate the efficiency gap at a realistic prediction of the statewide vote share, but also evaluate the metric’s sensitivity to different electoral swings.

Although it uses equality of wasted votes rather than partisan symmetry as its normative standard, the EG is implicitly related to the seats–votes function. For the EG to be 0 for all vote shares, the seats–votes function must not only be symmetric, but also award each party two percentage points in seat share for each additional point in vote share it earns.¹² In other words, the EG will regard a symmetrical seats–votes function as fair if it has a responsiveness of 2.

3.3 Mean–median difference

The *mean–median difference* (MMD) is the Republican vote share in the median district minus the average Republican share. A large positive value of the MMD indicates that the distribution of Republican vote shares across districts is “left skewed”—that is, it has a long tail of lopsided Democratic districts. In a narrowly balanced state, the concentration of one party’s supporters in a small number of districts will disadvantage that party in the translation of votes to seats. The MMD is thus a good diagnostic of partisan bias when the state as a whole is competitive between the parties.¹³

3.4 Declination

The most recently developed of the metrics I consider, the *declination* is designed to identify an “artificial” break in the partisan distribution of districts at a Republican vote share of 50%.¹⁴ If districts are plotted in order of partisanship and lines are drawn from the 50% mark

¹⁰Stephanopoulos and McGhee (2015)

¹¹Formally, the efficiency gap is equal to $S(V) - 2V + 0.5$, where V is the statewide Republican vote share and $S(V)$ the Republican seat share.

¹²Due to its implicit 2-to-1 seats–votes slope, the EG is not a useful measure outside the 25%–75% vote-share range, where for the EG to be 0 seat share would need to be greater than 100%.

¹³In the case of a statewide tie, the mean–median difference is 0 if and only if there is no partisan bias; Katz, King, and Rosenblatt (2020), 173.

¹⁴Warrington (2018). Formally, let $S(V)$ and $1 - S(V)$ respectively denote Republican and Democratic seat shares, and let R and D respectively denote the average Republican vote share in Republican- and

to the middle of each party’s cloud of districts, the difference between the lines’ angles is the declination. Alternatively, and perhaps more intuitively, the declination can be understood as the normalized difference between the lopsidedness of Democratic and Republican districts.¹⁵ When one party’s districts are more lopsided than the other’s, the distribution of district partisanship will be skewed.

4 Analysis of districting plans

4.1 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.¹⁶

Democratic-won districts. The angle of the line from 50% to the center of mass of the Republican districts is

$$\theta_R = \arctan \left[\frac{2R - 1}{S(V)} \right],$$

and the analogous angle for Democratic districts is

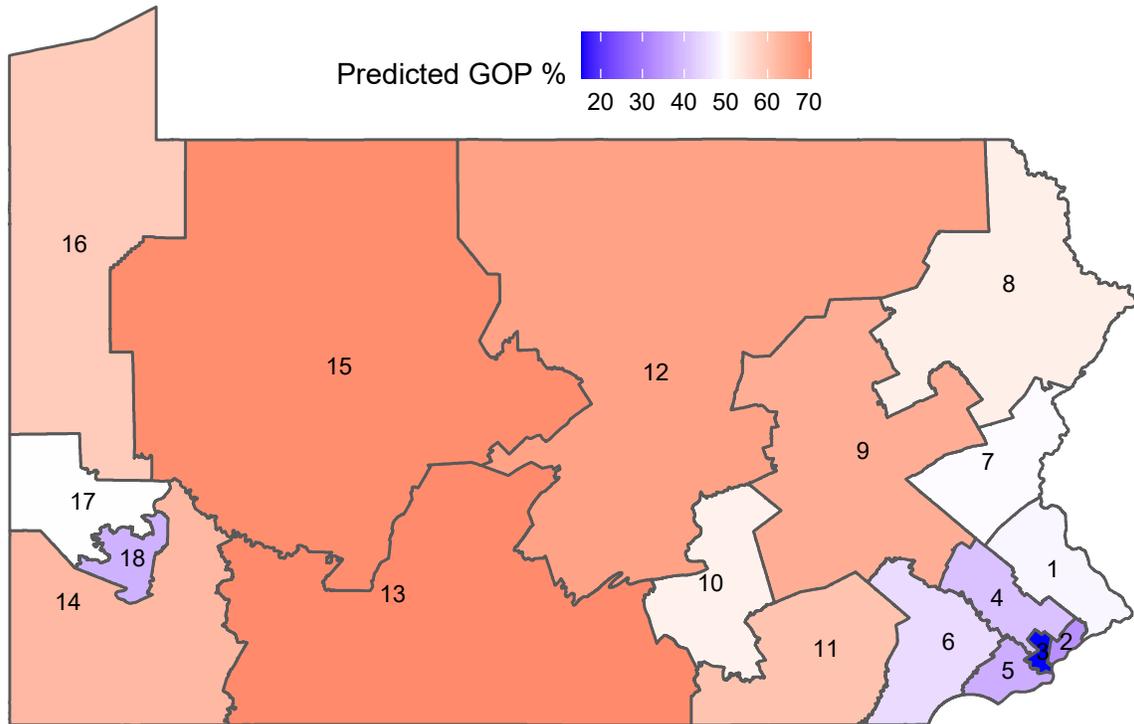
$$\theta_D = \arctan \left[\frac{1 - 2D}{1 - S(V)} \right].$$

The declination is the normalized difference of angles, $\delta = 2(\theta_R - \theta_D)/\pi$.

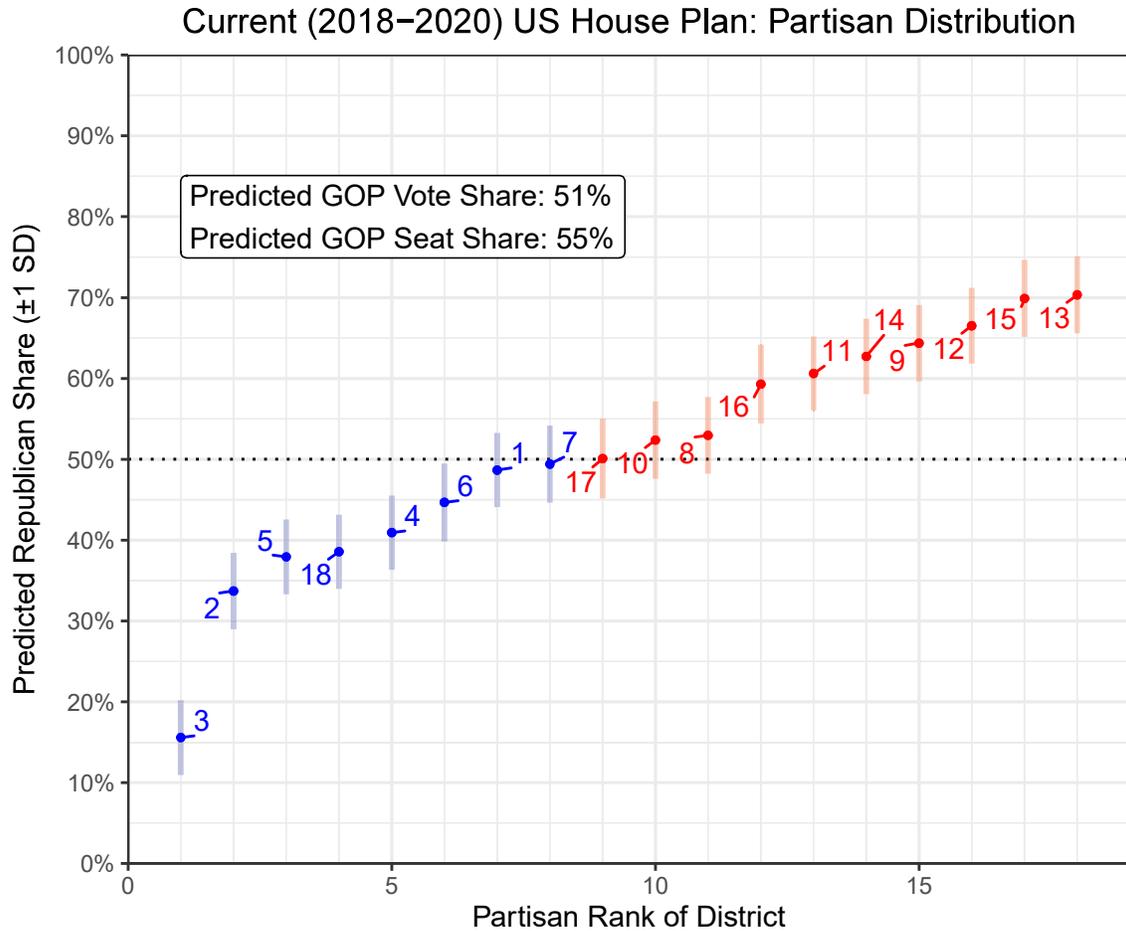
¹⁵Katz, King, and Rosenblatt (2020), 173

¹⁶The 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.¹⁷

4.1.1 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.

¹⁷Note 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.

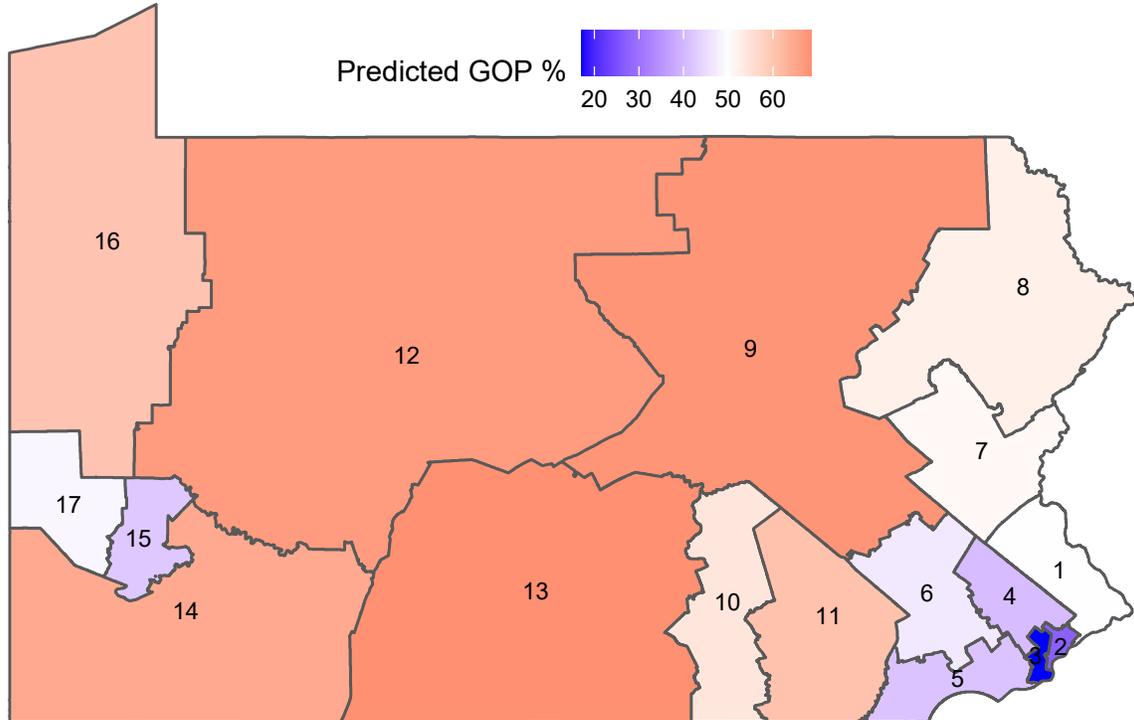
4.2 Governor Wolf’s proposed US House map

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.¹⁸ 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%.

¹⁸The 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).

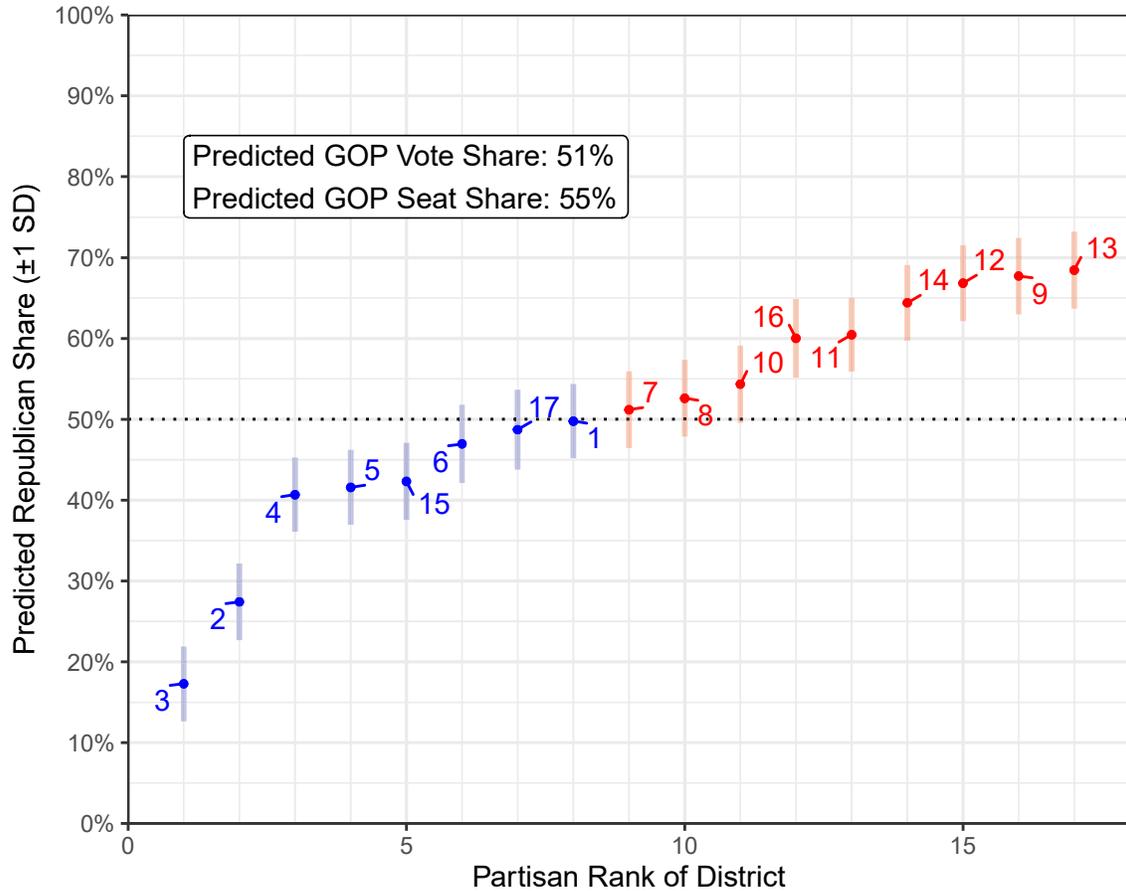
Governor's US House Plan: Map



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.¹⁹

¹⁹Note 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



4.2.1 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.

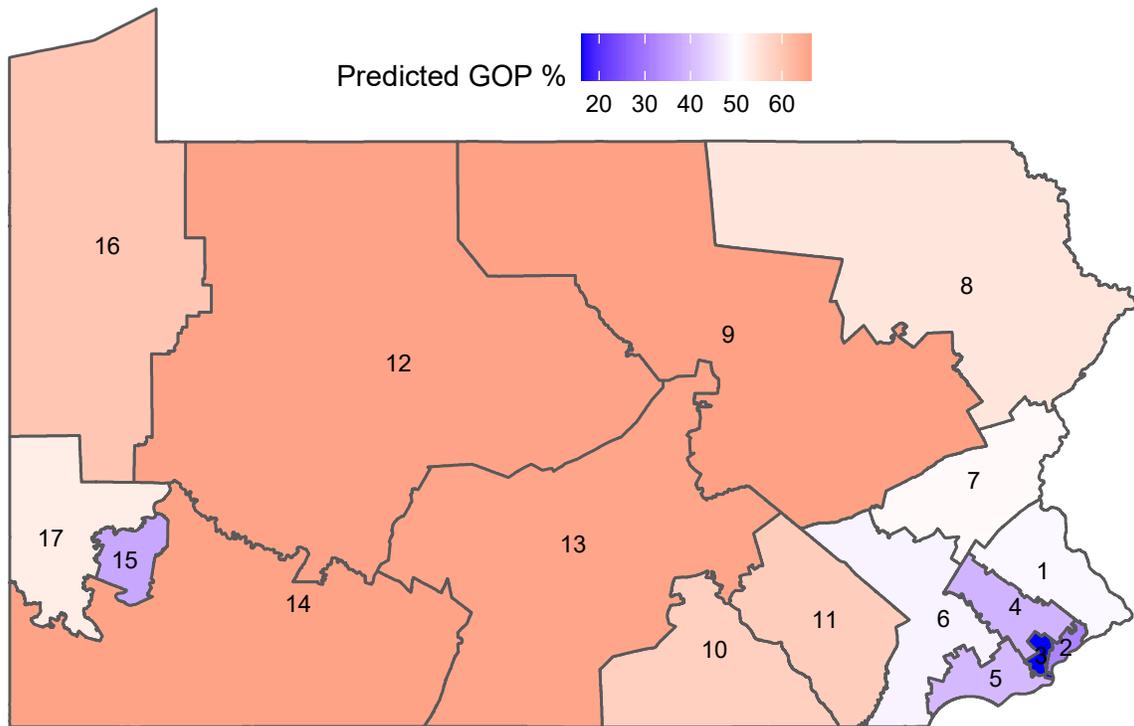
In summary, all four metrics indicate that the governor’s proposed map has a modest pro-Republican bias. We can be fairly confident the pro-Republican bias will persist in future elections, but we can also expect it to favor Democrats about 30% of the time. Compared to maps from other states and redistricting 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.

4.3 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).²⁰

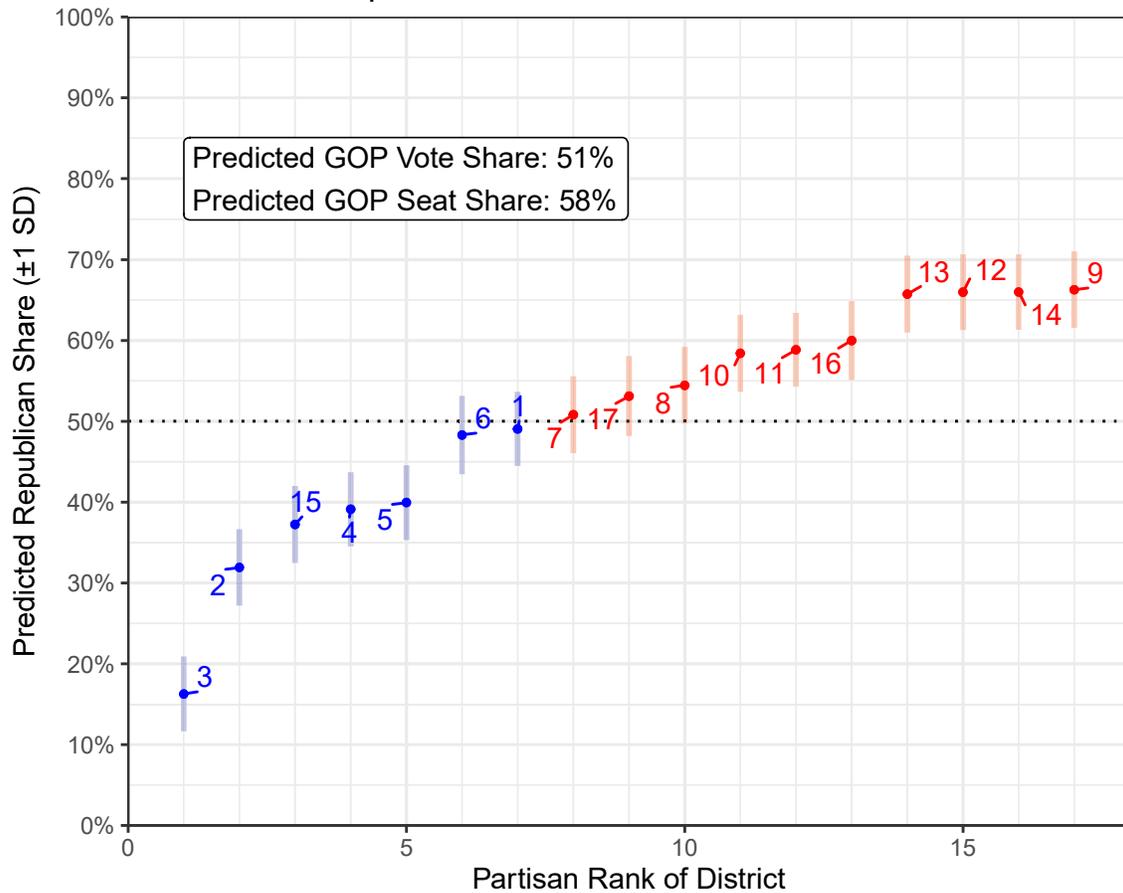
²⁰The map’s PlanScore page can be accessed at <https://planscore.campaignlegal.org/plan.html?20220122T235521.601157977Z>

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.²¹

4.3.1 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.

²¹Note 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.

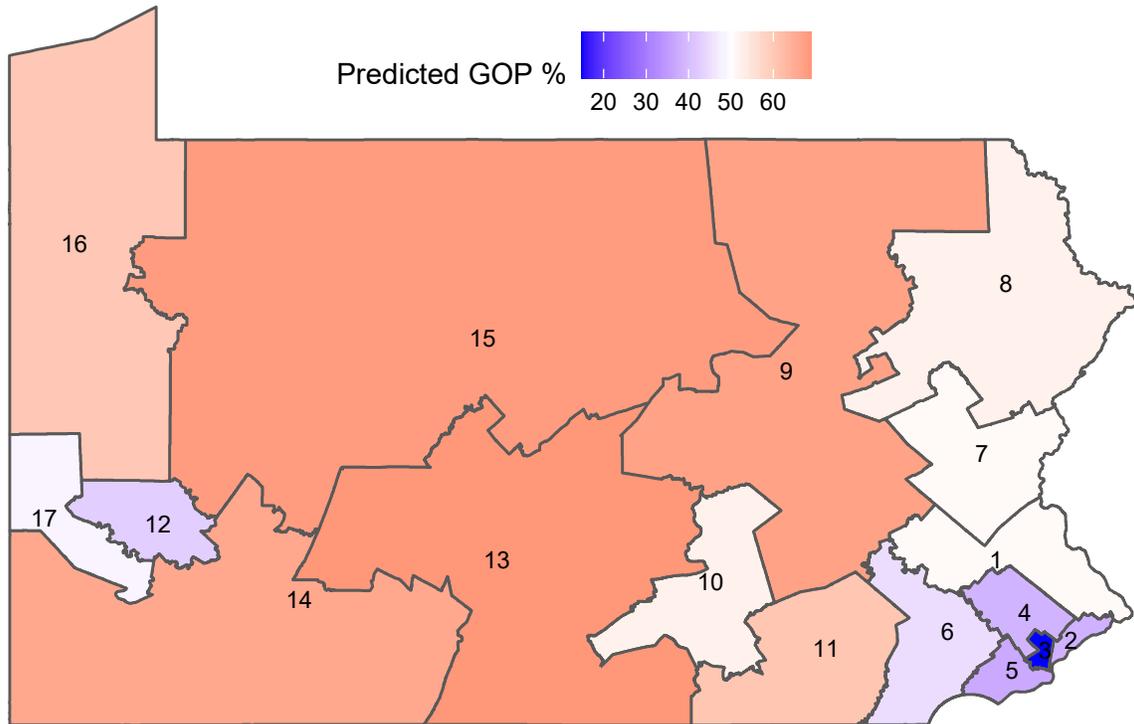
In summary, all four metrics indicate that the Republican US House plan is strongly biased in favor of the Republican Party. Compared to maps from other states and redistricting cycles, this degree of partisan advantage is fairly unusual, and we can be highly confident that the map would continue to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

4.4 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).²²

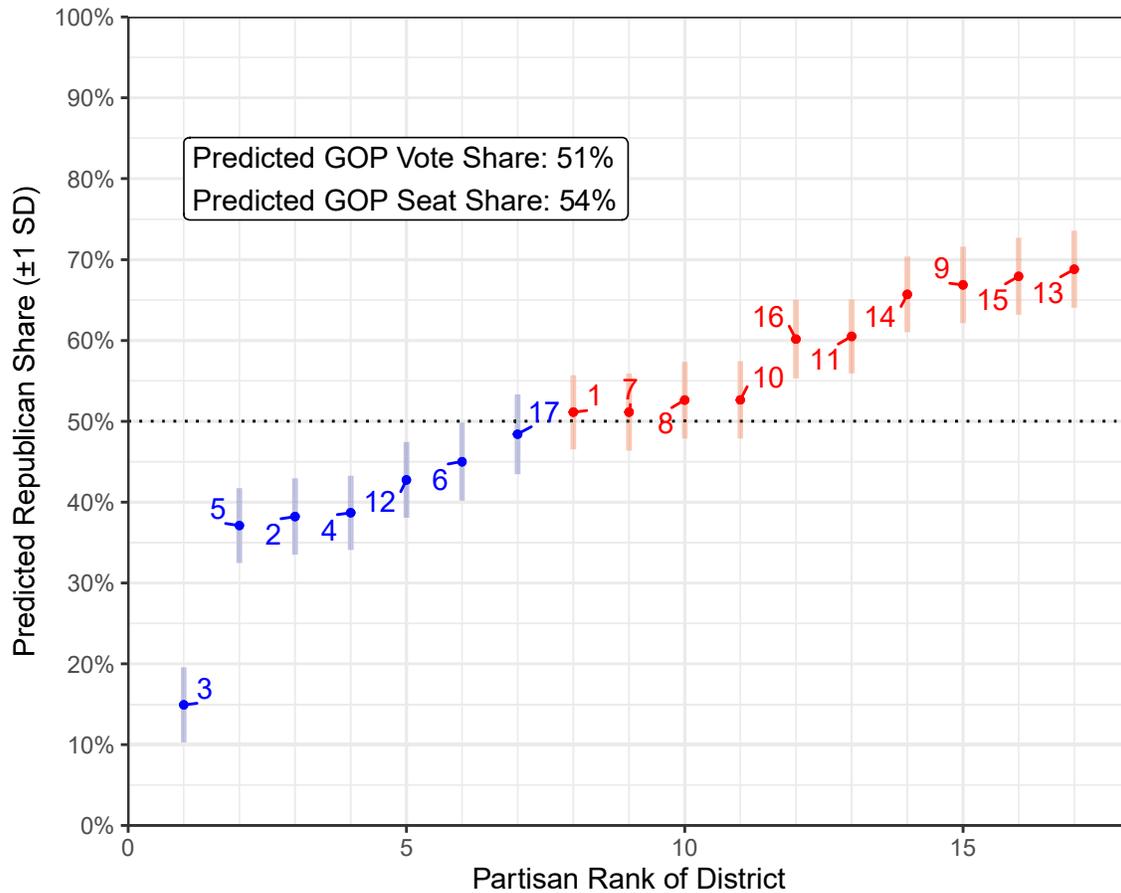
²²The map’s PlanScore page can be accessed at <https://planscore.campaignlegal.org/plan.html?20220123T184413.521104546Z>

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.²³

4.4.1 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.

²³Note 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.

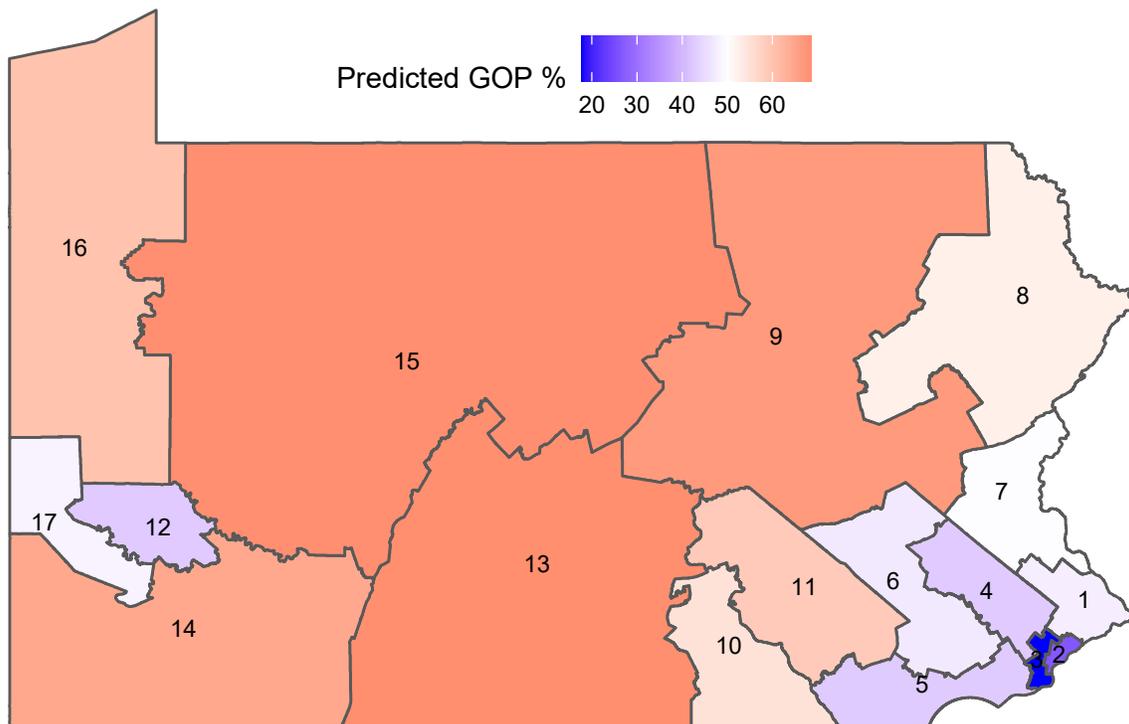
Finally, the estimated **declination** of 0.06 again indicates a steeper angle in Democratic districts than Republican ones. We can be 65% confident that the declination will favor Republicans in future elections. An declination of 0.06 is more pro-Republican than 60% of maps in the PlanScore library,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

4.5 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).²⁴

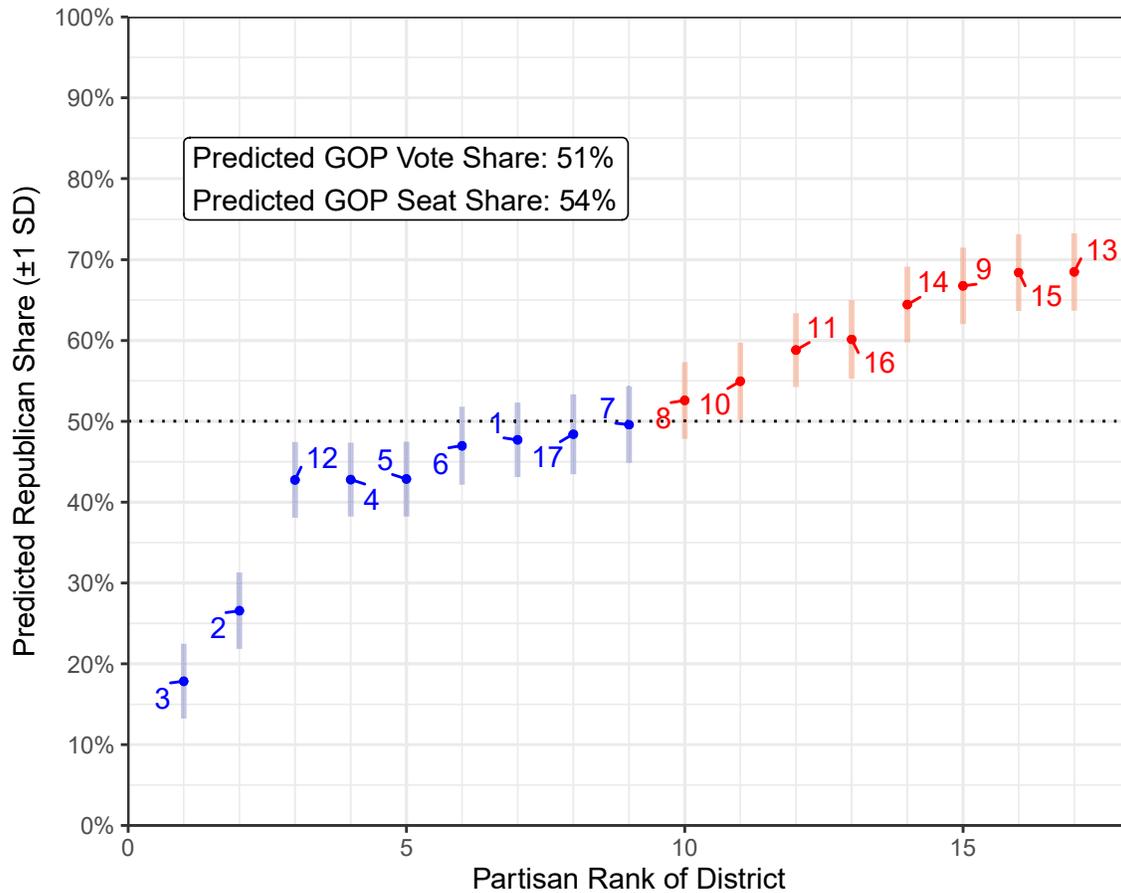
PA Senate Democrats' US House Plan #2: Map



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).

²⁴The 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.²⁵

4.5.1 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.

²⁵Note 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.²⁶ 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.

²⁶Note 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.

5 Comparison of maps

The tables below compare the partisan fairness of the maps considered in this report. Table 6 reports the estimated values of various fairness metrics, and Table 7 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

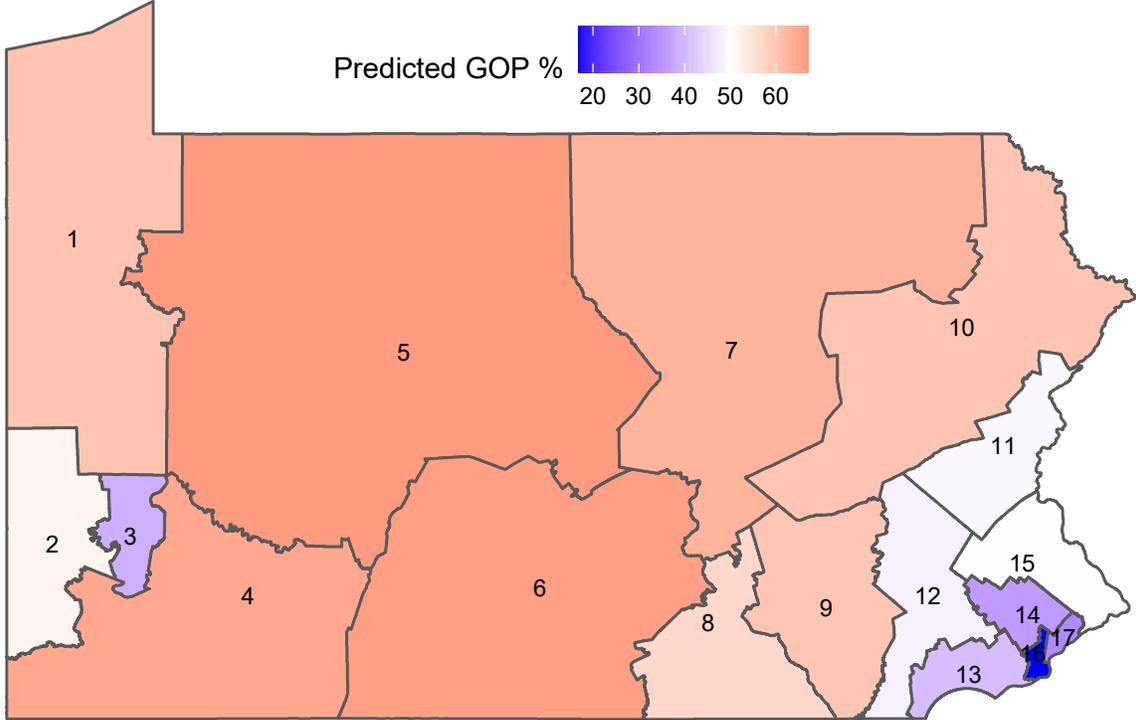
Table 7: Extremity of partisan advantage relative to PlanScore library

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%

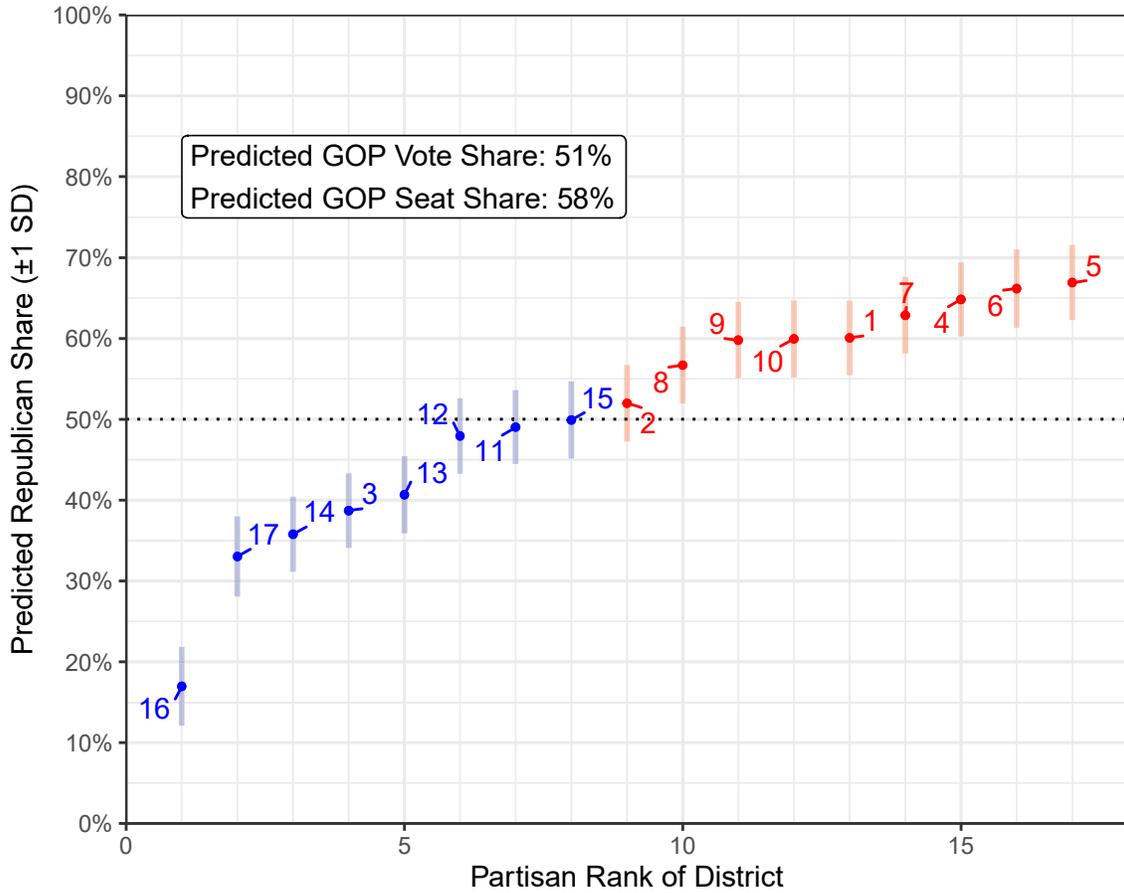
A Supplementary Analyses

A.1 Senator Reschenthaler's proposed map

Reschenthaler Senate Plan: Map



Resenthaler Plan: Partisan Distribution



The table below summarizes the partisan fairness of the Resenthaler US House map according to four standard metrics generated by PlanScore.²⁷ It reports each metric’s predicted value in future elections along with measures of durability and extremity.

Table 8: Partisan fairness of Resenthaler plan

Metric	Pred Value	Prob GOP Adv	Plans Less Pro-GOP	Plans Less Biased
Partisan Bias	5.9%	85%	76%	53%
Efficiency Gap	6.3%	87%	83%	63%
Mean–Median	2.4%	85%	69%	36%
Declination	0.18	87%	74%	59%

²⁷The map’s PlanScore page can be accessed at <https://planscore.campaignlegal.org/plan.html?20220126T025615.888048406Z>.

Works cited

- Grofman, Bernard, and Gary King. 2007. "The Future of Partisan Symmetry as a Judicial Test for Partisan Gerrymandering After *LULAC v. Perry*." *Election Law Journal: Rules, Politics, and Policy* 6 (1): 2–35.
- Katz, Jonathan N., Gary King, and Elizabeth Rosenblatt. 2020. "Theoretical Foundations and Empirical Evaluations of Partisan Fairness in District-Based Democracies." *American Political Science Review* 114 (1): 164–78.
- Kendall, M. G., and A. Stuart. 1950. "The Law of the Cubic Proportion in Election Results." *British Journal of Sociology* 1 (3): 183–96.
- Nagle, John F. 2015. "Measures of Partisan Bias for Legislating Fair Elections." *Election Law Journal: Rules, Politics, and Policy* 14 (4): 346–60.
- Stephanopoulos, Nicholas O., and Eric M. McGhee. 2015. "Partisan Gerrymandering and the Efficiency Gap." *University of Chicago Law Review* 82 (2): 831–900.
- Stephanopoulos, Nicholas O., and Christopher Warshaw. 2020. "The Impact of Partisan Gerrymandering on Political Parties." *Legislative Studies Quarterly* 45 (4): 609–43.
- Warrington, Gregory S. 2018. "Quantifying Gerrymandering Using the Vote Distribution." *Election Law Journal: Rules, Politics, and Policy* 17 (1): 39–57.

EXHIBIT B – CURRICULUM VITAE OF DR. DEVIN CAUGHEY

Devin Caughey

Last updated: December 6, 2021

Massachusetts Institute of Technology
Department of Political Science
E53-463, Cambridge, MA 02139

Email: devin.caughey@gmail.com
Phone: (703) 999-8822
Web: <http://devincaughey.com>

Academic Appointments

Massachusetts Institute of Technology, Cambridge, MA

2020– | *Associate Professor (with Tenure)*, Department of Political Science
2017–20 | *Silverman Family Career Development Associate Professor (without Tenure)*,
Department of Political Science
2013–17 | *Assistant Professor*, Department of Political Science
2012 | *Instructor*, Department of Political Science

Princeton University, Princeton, NJ

2016–17 | *Visiting Associate Research Scholar*, Center for the Study of Democratic Politics, Woodrow Wilson
School of Public and International Affairs

Education

University of California–Berkeley, Berkeley, CA

2012 | Ph.D. in Political Science (chair: Eric Schickler)
Thesis: "Congress, Public Opinion, and Representation in the One-Party South, 1930s–1960s"
2007 | M.A. in Political Science

Cambridge University, Clare College, Cambridge, UK

2006 | M.Phil. in Historical Studies (supervisor: Anthony Badger)

Yale University, New Haven, CT

2004 | B.A. in History (*cum laude*, with distinction in the major)

Monographs

Forthcoming

- 2022 | Devin Caughey and Christopher Warshaw. 2022. *Dynamic Democracy: Citizens, Parties, and Policy-making in the American States*. Forthcoming, Chicago: University of Chicago Press (264 pages).

Published

- 2020 | Devin Caughey, Adam J. Berinsky, Sara Chatfield, Erin Hartman, Eric Schickler, and Jasjeet J. Sekhon. 2020. *Target Estimation and Adjustment Weighting for Survey Nonresponse and Sampling Bias*. Elements in Quantitative and Computational Methods for the Social Sciences. Cambridge, UK: Cambridge University Press. <https://doi.org/10.1017/9781108879217> (112 pages).
- 2018 | Devin Caughey. 2018. *The Unsolid South: Mass Politics and National Representation in a One-Party Enclave*. Princeton, NJ: Princeton University Press (240 pages).
- * Leon Epstein Award for best book on political organizations and parties (winner)
 - * Allan Sharlin Award for outstanding book in social science history (honorable mention)
 - * Reviews: *The Nation*, *Journal of Politics*, *Perspectives on Politics*, *Political Science Quarterly* and *Journal of Southern History*

Refereed Articles

- 2020 | [16] Devin Caughey, Michael C. Dougal, and Eric Schickler. 2020. "Policy and Performance in the New Deal Realignment: Evidence from Old Data and New Methods." *Journal of Politics* 82 (2). <https://doi.org/10.1086/707305>.
- 2019 | [15] Devin Caughey, Tom O'Grady, and Christopher Warshaw. 2019. "Policy Ideology in European Mass Publics, 1981–2016." *American Political Science Review* 113 (3): 674–693. <https://doi.org/10.1017/S0003055419000157>.
- [14] Devin Caughey and Mallory Wang. 2019. "Dynamic Ecological Inference for Time-Varying Population Distributions Based on Sparse, Irregular, and Noisy Marginal Data." *Political Analysis* 27 (3): 388–396. <https://doi.org/10.1017/pan.2019.4>.
- 2018 | [13] Allan Dafoe, Baobao Zhang, and Devin Caughey. 2018. "Information Equivalence in Survey Experiments." *Political Analysis* 26 (4): 399–416. <http://dx.doi.org/10.1017/pan.2018.9>.
- [12] Devin Caughey, James Dunham, and Christopher Warshaw. 2018. "The Ideological Nationalization of Partisan Subconstituencies in the American States." *Public Choice* 176 (1–2): 133–151. <http://dx.doi.org/10.1007/s11127-018-0543-3>.
- [11] Devin Caughey and Christopher Warshaw. 2018. "Policy Preferences and Policy Change: Dynamic Responsiveness in the American States, 1936–2014." *American Political Science Review* 112 (2): 249–266. <http://dx.doi.org/10.1017/S0003055417000533>.

- 2017 [10] Devin Caughey, Chris Tausanovitch, and Christopher Warshaw. 2017. "Partisan Gerrymandering and the Political Process: Effects on Roll-Call Voting and State Policies." *Election Law Journal* 16, no. 4 (Symposium on Partisan Gerrymandering and the Efficiency Gap): 453–469. <http://dx.doi.org/10.1089/elj.2017.0452>.
 * Cited by appellees' briefs in *Whitford v. Gill* (2017) and *Rucho v. Common Cause* (2018), U.S. Supreme Court
- [9] Devin Caughey, Christopher Warshaw, and Yiqing Xu. 2017. "Incremental Democracy: The Policy Effects of Partisan Control of State Government." *Journal of Politics* 79 (4): 1–17. <http://dx.doi.org/10.1086/692669>.
- [8] Devin Caughey, Allan Dafoe, and Jason Seawright. 2017. "Nonparametric Combination (NPC): A Framework for Testing Elaborate Theories." *Journal of Politics* 79 (2): 688–701. <http://dx.doi.org/10.1086/689287>.
- 2016 [7] Devin Caughey and Christopher Warshaw. 2016. "The Dynamics of State Policy Liberalism, 1936–2014." *American Journal of Political Science* 60 (4): 899–913. <http://dx.doi.org/10.1111/ajps.12219>.
 * Winner, APSA State Politics Section Best Journal Article Award
- [6] Devin Caughey and Eric Schickler. 2016. "Substance and Change in Congressional Ideology: NOMINATE and Its Alternatives." *Studies in American Political Development* 30 (2): 128–146. <http://dx.doi.org/10.1017/S0898588X16000092>.
- [5] Allan Dafoe and Devin Caughey. 2016. "Honor and War: Southern U.S. Presidents and the Effects of Concern for Reputation." *World Politics* 68 (2): 341–381. <http://dx.doi.org/10.1017/S0043887115000416>.
- 2015 [4] Devin Caughey and Christopher Warshaw. 2015. "Dynamic Estimation of Latent Opinion Using a Hierarchical Group-Level IRT Model." *Political Analysis* 23 (2): 197–211. <http://dx.doi.org/10.1093/pan/mpu021>.
 * Reprinted in Robert J. Frazese Jr., ed. 2017. *Advances in Political Methodology*. Elgar.
- [3] Rosa Arboretti, Eleonora Carrozzo, and Devin Caughey. 2015. "A Rank-based Permutation Test for Equivalence and Non-inferiority." *Italian Journal of Applied Statistics* 25 (1): 81–92. http://sa-ijas.stat.unipd.it/sites/sa-ijas.stat.unipd.it/files/05_1.pdf.
- 2011 [2] Devin Caughey and Jasjeet S. Sekhon. 2011. "Elections and the Regression Discontinuity Design: Lessons from Close U.S. House Races, 1942–2008." *Political Analysis* 19 (4): 385–408. <http://dx.doi.org/10.1093/pan/mpro32>.
 * Winner, Warren Miller Prize and *Political Analysis* Editors' Choice Award
 * Reprinted in Robert J. Franzese, ed. 2015. *Quantitative Research in Political Science*. SAGE.
- [1] Eric Schickler and Devin Caughey. 2011. "Public Opinion, Organized Labor, and the Limits of New Deal Liberalism, 1936–1945." *Studies in American Political Development* 25 (2): 1–28. <http://dx.doi.org/10.1017/S0898588X11000101>.

Non-Refereed Publications

- 2021 Devin Caughey and Eric Schickler. 2021. "The Democratic-CIO Alliance: The Benefits of Friendship." *Labor: Studies in Working-Class History* 18 (3): 120–125. <https://doi.org/10.1215/15476715-9061521>.
- 2020 Devin Caughey and Sara Chatfield. 2020. "Causal Inference and American Political Development: Contrasts and Complementarities." *Public Choice* 185:359–376. <https://doi.org/10.1007/s11127-019-00694-4>.
- 2019 Devin Caughey and Christopher Warshaw. 2019. "Public Opinion in Subnational Politics." *Journal of Politics* 81, no. 1 (Symposium on Subnational Policymaking): 352–363. <https://doi.org/10.1086/700723>.
- 2018 Devin Caughey. 2018. Review of *Unstable Majorities: Polarization, Party Sorting, and Political Stalemate*, by Morris P. Fiorina. *Perspectives on Politics* 16 (4): 1178–1179. <https://doi.org/10.1017/S153759271800275X>.
- 2017 Devin Caughey and Eric Schickler. 2017. "Keith Poole, Ideology Scores, and the Study of Congressional Development." *The Legislative Scholar: The Newsletter of the Legislative Studies Section of the American Political Science Association* 2 (2): 37–42. http://legislativestudies.org/wp-content/uploads/2017/11/legislative_scholar_fall_2017.pdf.

Software

- 2017 James Dunham, Devin Caughey, and Christopher Warshaw. 2017. *dgo: Dynamic Estimation of Group-Level Opinion*. R package. <https://CRAN.R-project.org/package=dgo>.
- 2015 Devin Caughey. 2015. *NPC: Nonparametric Combination of Hypothesis Tests*. R package. <http://CRAN.R-project.org/package=NPC>.
- 2014 Devin Caughey. 2014. "FisherSens and SumTestSens." In *rbounds: Perform Rosenbaum bounds sensitivity tests for matched and unmatched data*. R package. Creator and maintainer: Luke J. Keele. <http://CRAN.R-project.org/package=rbounds>.

Grants and Fellowships

- 2016–17 Visiting Scholar Fellowship, Center for the Study of Democratic Politics, Princeton University
- 2015 PolMeth Thematic Methodology Meeting Grant (\$14,250); with Stephen Jessee, Alex Tahk, Christopher Warshaw, and Teppei Yamamoto; for "Improving Spatial Models" conference, MIT, May 1–2
- 2011 Mike Synar Graduate Research Fellowship, Institute of Governmental Studies, UC-Berkeley
- 2010 Clogg Scholarship Award, Society for Political Methodology and ICPSR Summer Program in Quantitative Methods in Social Research
- 2009–11 NSF Integrated Graduate Education Research and Training (IGERT) Program Fellowship in Politics, Economics, Psychology, and Public Policy
- 2008 NSF Graduate Research Fellowship (honorable mention)

Awards and Honors

- 2019 | APSA Political Organizations and Parties Section Leon Epstein Outstanding Book Award (2017–2018), for *The Unsolid South*
 Social Science History Association Allan Sharlin Memorial Book Award (honorable mention), for *The Unsolid South*
- 2017 | APSA State Politics Section Best Journal Article Award, with Chris Warshaw, for “Dynamics of State Policy Liberalism”
- 2015 | APSA award for best paper on state politics and policy presented at the 2014 annual meeting, with Chris Warshaw, for “Dynamic Representation in the American States, 1960–2012”
- 2014 | APSA Walter Dean Burnham Award for best dissertation in the field of Politics and History
- 2012 | Warren Miller Prize for best article published in *Political Analysis*, with Jasjeet S. Sekhon, for “Elections and the Regression Discontinuity Design”
Political Analysis Editors’ Choice Award, with Jasjeet S. Sekhon, for “Elections and the Regression Discontinuity Design”
 Kenneth E. Boulding Award for best graduate student paper presented at an International Studies Association meeting, with Allan Dafoe, for “Honor and War”
- 2008 | Outstanding Graduate Student Instructor Award, UC-Berkeley Graduate Council

Conference Papers

- 2019 | Devin Caughey and Sara Chatfield. 2019. “Causal Inference and American Political Development: Contrasts and Complementarities.” Paper presented at the Causal Inference & American Political Development Conference, University of Southern California, Los Angeles, CA, January 10, 2019.
- 2018 | Devin Caughey, Hiroto Katsumata, and Teppei Yamamoto. 2018b. “Item Response Theory for Conjoint Survey Experiments.” Paper presented at the annual meeting of the American Political Science Association, Boston, MA, August 30, 2018.
 Devin Caughey, Hiroto Katsumata, and Teppei Yamamoto. 2018a. “Item Response Theory for Conjoint Experiments.” Paper presented at the summer meeting of the Society for Political Methodology, Brigham Young University, Provo, UT, July 21, 2018.
 Elissa Berwick and Devin Caughey. 2018. “Multidimensional Latent Preferences from Sparse Survey Data: A Group-Level Dynamic IRT Model for Spanish Regions.” Poster presented at the summer meeting of the Society for Political Methodology, Brigham Young University, Provo, UT, July 20, 2018.
- 2017 | Devin Caughey and Christopher Warshaw. 2017. “Dynamic Responsiveness in the American States, 1936–2014.” Paper presented at the workshop *How Do Politicians Learn?*, Princeton University, Princeton, NJ, May 17, 2017.
 Devin Caughey and Erin Hartman. 2017. “Target Selection as Variable Selection: Using the Lasso to Select Auxiliary Vectors for the Construction of Survey Weights.” Paper presented at the Annual Meeting of The Society for Political Methodology, University of Wisconsin–Madison, Madison, WI, July 13, 2017.

- Allan Dafoe, Baobao Zhang, and Devin Caughey. 2017. "Confounding in Survey Experiments: Diagnostics and Solutions." Paper presented at the workshop *A Perfect Match? Comparative Political Economy and Conjoint Analysis*, University of Zurich, Zurich, Switzerland, January 9, 2017.
- 2016 Devin Caughey. 2016a. "Exclusion and Responsiveness: Congressional Representation in the One-Party South." Paper presented at the American-British-Canadian Political Development Workshop, University of Toronto, Toronto, Canada, September 30, 2016.
- Devin Caughey, James Dunham, and Christopher Warshaw. 2016b. "The Ideological Nationalization of Mass Partisanship: Policy Preferences and Partisan Identification in State Publics, 1946–2014." Paper presented at the APSA Annual Meeting, Philadelphia, PA, September 3, 2016.
- Devin Caughey and Sara Chatfield. 2016. "Creating a Constituency for New Deal Liberalism: The Policy Feedback Effects of the Tennessee Valley Authority." Paper presented at the APSA Annual Meeting, Philadelphia, PA, September 1, 2016.
- Devin Caughey, Allan Dafoe, and Luke Miratrix. 2016. "Beyond the Sharp Null: Permutation Tests Actually Test Heterogeneous Effects." Paper presented at the summer meeting of the Society for Political Methodology, Rice University, Houston, TX, July 22, 2016.
- Devin Caughey and Erin Hartman. 2016. "Target Selection as Variable Selection: Using the Lasso to Select Auxiliary Vectors for the Construction of Survey Weights." Paper presented at the MPSA Annual Meeting, Chicago, IL, April 6, 2016.
- Devin Caughey, James Dunham, and Christopher Warshaw. 2016a. "Polarization and Partisan Divergence in the American Public, 1946–2012." Paper presented at the MPSA Annual Meeting, Chicago, IL, April 2, 2016.
- Devin Caughey. 2016b. "Representation without Parties: Reconsidering the One-Party South, 1930–62." Paper presented at the SPSA Annual Meeting, San Juan, PR, January 8, 2016.
- 2015 Devin Caughey, Tom O'Grady, and Christopher Warshaw. 2015. "Ideology in the European Mass Public: A Dynamic Perspective." Paper presented at the General Conference of the European Consortium for Political Research, Montreal, Canada, August 25, 2015.
- Allan Dafoe, Baobao Zhang, and Devin Caughey. 2015. "Confounding in Survey Experiments." Paper presented at the Annual Meeting of The Society for Political Methodology, University of Rochester, Rochester, NY, July 23, 2015.
- 2014 Allan Dafoe, Baobao Zhang, and Devin Caughey. 2014. "Confounding in Survey Experiments." Paper presented at the APSA Annual Meeting, Washington, DC, August 29, 2014.
- Devin Caughey. 2014. "Representation without Parties: Reconsidering the One-Party South, 1930–62." Paper presented at the APSA Annual Meeting, Washington, DC, August 28, 2014.
- Devin Caughey and Christopher Warshaw. 2014a. "Dynamic Representation in the American States, 1960–2012." Paper presented at the APSA Annual Meeting, Washington, DC, August 28, 2014.
- * Winner, APSA award for best paper on state politics and policy
- Devin Caughey and Christopher Warshaw. 2014b. "The Policy Effects of Partisan Control of State Governorships." Paper presented at the Conference on State Political Institutions and the Executive Branch, Washington, DC, August 27, 2014.
- Devin Caughey and Mallory Wang. 2014. "Bayesian Population Interpolation and Lasso-Based Target Selection in Survey Weighting." Paper presented at the Annual Meeting of The Society for Political Methodology, University of Georgia, Athens, GA, July 24, 2014.

- Devin Caughey and Eric Schickler. 2014. "Structure and Change in Congressional Ideology: NOMINATE and Its Alternatives." Paper presented at the Congress and History Conference, University of Maryland, College Park, June 11, 2014.
- 2013 Devin Caughey, Michael Dougal, and Eric Schickler. 2013. "The Policy Bases of the New Deal Realignment: Evidence from Public Opinion Polls, 1936–1952." Paper presented at the APSA Annual Meeting, Chicago, IL, August 31, 2013.
- Devin Caughey, Allan Dafoe, and Jason Seawright. 2013a. "Testing Elaborate Theories in Political Science: Nonparametric Combination of Dependent Tests." Paper presented at the APSA Annual Meeting, Chicago, IL, August 29, 2013.
- Devin Caughey and Christopher Warshaw. 2013. "Dynamic Estimation of Latent Opinion from Sparse Survey Data Using a Group-Level IRT Model." Paper presented at the Annual Meeting of The Society for Political Methodology, University of Virginia, Charlottesville, VA, July 20, 2013.
- Devin Caughey, Allan Dafoe, and Jason Seawright. 2013b. "Testing Elaborate Theories in Political Science: Nonparametric Combination of Dependent Tests." Paper presented at the MPSA Annual Meeting, Chicago, IL, April 20, 2013.
- 2012 Devin Caughey. 2012a. "Participation and Contestation in the One-Party South: Sources of Ideological Diversity in the 'Southern Bloc'." Paper presented at the MIT American Politics Conference, Cambridge, MA, September 21, 2012.
- Devin Caughey. 2012b. "Participation and Contestation in the One-Party South: Sources of Ideological Diversity in the 'Southern Bloc'." Paper presented at the WPSA Annual Meeting, Portland, OR, March 22, 2012.
- 2011 Devin Caughey. 2011. "The Mass Basis of the 'Southern Imposition': Labor Unions, Public Opinion, and Representation, 1930s–1940s." Paper presented at the APSA Annual Meeting, Seattle, WA, September 3, 2011.
- Allan Dafoe and Devin Caughey. 2011. "Honor and War: Using Southern Presidents to Identify Reputational Effects in International Conflict." Paper presented at the ISA Annual Meeting, Montreal, Quebec, March 17, 2011.
- * Winner, ISA Kenneth E. Boulding Award for best graduate student paper
- 2010 Allan Dafoe and Devin Caughey. 2010. "Honor, Reputation, and War: Using Southern Presidents to Identify the Effect of Culture on International Conflict Behavior." Paper presented at the APSA Annual Meeting, Washington, DC, September 3, 2010.
- Eric Schickler and Devin Caughey. 2010. "Public Opinion, Organized Labor, and the Limits of New Deal Liberalism, 1936–1945." Paper presented at the APSA Annual Meeting, Washington, DC, September 2, 2010.
- 2009 Devin Caughey. 2009. "Pro-Incumbent Bias in Close Elections: Implications for Regression Discontinuity Designs." Poster presented at the Annual Meeting of The Society for Political Methodology, Yale University, New Haven, CT, July 29, 2009.
- Devin Caughey, Sara Chatfield, and Adam Cohon. 2009. "Defining, Mapping, and Measuring Bureaucratic Autonomy." Paper presented at the MPSA Annual Meeting, Chicago, IL, April 4, 2009.
- 2007 Devin Caughey. 2007. "Responding to the Roosevelt Reconstruction: Southern Senators, the Supreme Court, and the New Deal Coalition." Paper presented at the UC-Berkeley Political Science Graduate Student Conference, May 2, 2007.

Invited Talks

- 2021 Harvard Law School (February 17): "Dynamic Democracy: Citizens, Politicians, and Policy-making in the American States"
- 2020 Harvard University (March 6): "Dynamic Democracy: Citizens, Politicians, and Policymaking in the American States"
 University of Rochester (February 7): "Dynamic Democracy: Citizens, Politicians, and Policy-making in the American States"
- 2019 Columbia University (October 15): "Item Response Theory for Conjoint Experiments"
- 2018 University of California, Los Angeles (October 29): "Creating a Constituency for New Deal Liberalism: The Political Effects of the Tennessee Valley Authority, 1933–1962"
- 2017 Northwestern University (January 27): "Policy and Performance in the New Deal Realignment"
- 2016 Princeton University (November 17): "Dynamic Responsiveness in the American States"
 Johns Hopkins University (March 24): "The Selectoral Connection in the One-Party South"
- 2015 Yale University (September 17): "Beyond the Sharp Null: Permutation Tests of Bounded Null Hypotheses"
- 2014 Boston University (November 14): "Representation without Parties: Reconsidering the One-Party South"
 Harvard University, Applied Statistics Seminar (November 5): "Bayesian Population Interpolation and Lasso-Based Target Selection in Survey Weighting"
 Dartmouth College (April 22): "The Dynamics of State Policy Liberalism, 1956–2012"
 Ohio State University (April 18): "The Dynamics of State Policy Liberalism, 1956–2012"
- 2013 University of Chicago, Harris School (November 14): "A Dynamic Model of Public Opinion, with Applications to Realignment and Representation in the Wake of the New Deal"
 Princeton University (October 24): "A Dynamic Model of Public Opinion, with Applications to Realignment and Representation in the Wake of the New Deal"
 University of Illinois (September 13): "A Dynamic Model of Public Opinion, with Applications to Realignment and Representation in the Wake of the New Deal"
 Yale University (January 16): "Congress, Public Opinion, and Representation in the One-Party South, 1930s–1960s"
- 2011 Pennsylvania State University, New Faces in Political Methodology Conference (April 30): "Regression-Discontinuity Designs and Popular Elections: Implications of Pro-Incumbent Bias in Close U.S. House Races"

Teaching

2021–22	Fall 17.850: Political Science Scope and Methods (graduate)
2020–21	Fall 17.263: Electoral Politics (undergraduate) 17.830: Empirical Methods in Political Economy (graduate) 17.850: Political Science Scope and Methods (graduate)
2019–20	Spring 17.202: American Political Institutions (graduate) Fall 17.20: Introduction to American Politics (undergraduate) 17.850: Political Science Scope and Methods (graduate)
2018–19	Spring 17.20: Introduction to American Politics (undergraduate) 17.S951: Political Representation in American Politics (graduate)
2017–18	Spring 17.202: American Political Institutions (graduate) Fall 17.20: Introduction to American Politics (undergraduate) 17.850: Political Science Scope and Methods (graduate)
2015–16	Spring 17.20: Introduction to American Politics (undergraduate) 17.S918: Southern Politics since 1863 (undergraduate)
2014–15	Spring 17.20: Introduction to American Politics (undergraduate) 17.202: American Political Institutions (graduate)
2013–14	Spring 17.S918: Southern Politics since 1863 (undergraduate) Fall 17.150: The American Political Economy in Comparative Perspective (graduate) 17.20: Introduction to American Politics (undergraduate)
2012–13	Spring 17.20: Introduction to American Politics (undergraduate) Fall 17.263/264: US National Elections (undergraduate/graduate)

Advising

Undergraduate

2020–21	Darya Guettler, MIT (thesis advisor)
2017–18	Sarah Melvin, MIT (thesis advisor)

Graduate

2020–	Chloe Wittenberg, MIT (dissertation committee member)
2019–	Zeyu (Chris) Peng, MIT (dissertation committee member)
2018–20	Clara Vandeweerd, MIT (dissertation committee member)
2017–20	Nicolas Dumas, MIT (dissertation committee member)
2017–20	Olivia Bergman, MIT (dissertation committee member)
2016–20	Baobao Zhang, Yale (external dissertation committee member)
2018–19	Sam Hoar, MIT (master's thesis committee member)
2018–19	Elissa Berwick, MIT (dissertation committee member)
2016–19	Megan Goldberg, MIT (dissertation committee member)
2013–18	James Dunham, MIT (dissertation committee member)
2013–17	James Conran, MIT (dissertation committee member)

Service

Department

2021–22	Chair, Open-Field Senior Search Committee
2020–21	Graduate Program Committee / Diversity, Equity, and Inclusion Working Group
2019–20	Comparative Politics Search Committee
2018–19	Admissions/Financial Aid Committee
	American Politics Search Committee
2017–18	Political Science Concentration Advisor
	Undergraduate Program Committee
2015–16	Admissions/Financial Aid Committee
	Undergraduate Program Committee
2014–15	Undergraduate Program Committee
2013–14	American Politics Search Committee

University

- 2020– SHASS lead, Schwarzman College of Computing Common Ground Standing Committee
 2017–19 Faculty Fellow, MIT SHASS Burchard Scholars Program

Professional Organizations

- 2020– Advisory Board Member, American Political Economy Project
 2019– Coordinator, Pioneer Valley American Political Development Reading Group
 2019 Host committee, 36th annual meeting of the Society for Political Methodology
 2017 Miller Prize committee for best article published in *Political Analysis*
 2014 Miller Prize committee for best article published in *Political Analysis*
 PolMeth Graduate Student Poster Award committee, Society for Political Methodology
 2013 Miller Prize committee for best article published in *Political Analysis*
 V. O. Key Award committee for best book on Southern politics, SPSA
 2012 Mary Parker Follett Award committee for best article or book chapter, APSA Politics and History Organized Section

Publishers

Reviewer

Chapman & Hall

Oxford University Press

Journals

Reviewer

American Journal of Political Science
American Political Science Review
American Politics Research
American Sociological Review
British Journal of Political Science
Conflict Management and Peace Science
Contemporary Economic Policy
European Journal of Political Economy
Journal of Conflict Resolution
Journal of Electoral Studies
Journal of Experimental Political Science
Journal of Health Politics, Policy and Law
Journal of Political Economy
Journal of Law, Economics, and Organization

Journal of Politics
Legislative Studies Quarterly
Observational Studies
Party Politics
Political Analysis
Political Behavior
Political Research Quarterly
Political Science Research and Methods
Proceedings of the Nat'l Academy of Sciences
Quarterly Journal of Political Science
Regional & Federal Studies
State Politics & Policy Quarterly
Studies in American Political Development