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Governor Tom Wolf*

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

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 for the Pennsylvania Bureau of Election Services and Notaries, Respondents.	No. 464 MD 2021
PHILIP T. GRESSMAN; RON Y. DONAGI; KRISTOPHER R. TAPP; PAMELA GORKIN; DAVID P. MARSH; JAMES L. ROSENBERGER; AMY MYERS; EUGENE BOMAN; GARY GORDON; LIZ MCMAHON; TIMOTHY G. FEEMAN; and GARTH ISAAK,	No. 465 MD 2021

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 for the Pennsylvania Bureau of Election
Services and Notaries,
Respondents.

**POST-HEARING SUBMISSION OF
<u>INTERVENOR-RESPONDENT GOVERNOR TOM WOLF</u>**

Intervenor-Respondent Governor Tom Wolf ("the Governor") submits this

post-hearing submission in support of his proposed 17-district congressional plan.

I. Introduction

The two-day evidentiary hearing in this matter, held on January 27 and 28,

2022, proved that Pennsylvanians can—and should—have a congressional district

plan that both (1) satisfies the traditional redistricting criteria and (2) provides all

Pennsylvanians an equal opportunity to elect the representatives of their choice. It

also proved that, among the 13 plans submitted for the Court's consideration, the

Governor's plan is the standout choice. There are a few plans that do a truly

excellent job of satisfying the traditional criteria, and a few that exemplify partisan

fairness, but only one plan—the Governor's—belongs to both groups. Because the

Governor's plan best manages the trade-offs inherent in redistricting, and best

realizes the goals set forth by the Pennsylvania Supreme Court in *League of*

Women Voters v. Commonwealth, 178 A.3d 737 (Pa. 2018) ("*League of Women Votes I*), we respectfully request that the Court adopt the Governor's redistricting plan.

II. Proposed Findings of Fact

A. The Traditional Redistricting Process Has Failed to Result in a Lawfully Enacted Reapportionment Plan.

1. Intervenor-Respondent Thomas W. Wolf is Governor of the Commonwealth of Pennsylvania.

2. One of the Governor's official duties is signing or vetoing bills passed by the General Assembly. *See* Pa. Const. art. IV, § 15.

3. "Pennsylvania's congressional districts are drawn by the state legislature as a regular statute, subject to veto by the Governor." *League of Women Voters I*, 178 A.3d at 742.

4. Using the 2010 census numbers, the 2011 Congressional Redistricting Act of 2011, Senate Bill 1249, "was enacted on December 22, 2011, setting forth Pennsylvania's 18 congressional districts." *Id.* at 743.

5. In 2018, the Pennsylvania Supreme Court struck the Congressional Redistricting Act of 2011 as unconstitutional. *Id.* at 825.

6. As a result of that decision, the court adopted a remedial congressional districting plan (the "2018 Remedial Plan"), which contains 18 districts, based on the 2010 Census's apportionment count. *See generally League*

of Women Voters v. Cmmw., 181 A.3d 1083, 1088 (Pa. 2018) ("*League of Women Voters II*").

7.   According to the 2020 Census, Pennsylvania's population is 13,002,700. (Joint Stipulation of Facts ("JSOF") ¶ 4.)

8.   The 2020 Census's apportionment counts show that Pennsylvania is entitled to 17 seats in the United States House of Representatives. (*Id.* ¶ 1.)

9.   While waiting for action by the General Assembly, the Governor has played an active role in advocating for a fair and transparent redistricting process.

10.   In September 2021, the Governor issued an Executive Order creating the Pennsylvania Redistricting Advisory Council, a six-member council comprised of redistricting experts formed to provide guidance to the Governor and assist his review of any congressional redistricting plan passed by the General Assembly.[1]

11.   At the same time, Governor Wolf announced the opening of a redistricting website or "portal," which members of the public could use to submit

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[1] Commonwealth of Pennsylvania Governor's Office, Executive Order 2021-05 (Sept. 13, 2021), https://www.governor.pa.gov/wp-content/uploads/2021/09/20210913-EO-2021-05-Redistricting-Advisory-Council.pdf; *see also* Press Release, Office of Governor Tom Wolf, *Governor Wolf Creates Redistricting Advisory Council to Help Evaluate Fairness in Upcoming Congressional Redistricting Map* (Sept. 13, 2021), https://www.governor.pa.gov/newsroom/governor-wolf-creates-redistricting-advisory-council-to-help-evaluate-fairness-in-upcoming-congressional-redistricting-map/.

This Court can taken judicial notice of information on Executive Branch web sites, as well as "publicized political facts." *Nieves v. Pennsylvania Bd. of Probation and Parole*, 983 A.2d 236, 239 (Pa. Commw. Ct. 2009).

proposed maps, outline communities of interest, and submit comments to help shape the outcome of this critical part of our democratic process.[2]

12.   The Redistricting Council held nine hearings throughout the state to accept testimony from the public on a set of Redistricting Principles to help guide the Governor's review of any map passed by the General Assembly.

13.   These Redistricting Principles, derived from Pennsylvania and U.S. Supreme Court precedent, were finalized by the Council and made public by the Governor on November 24, 2021.[3]

14.   In the General Assembly, proposed congressional redistricting plan House Bill 2146 was first introduced and referred to the State Government Committee on December 8, 2021, more than two weeks after the Governor announced his Redistricting Principles. (*See* Opening Br. of House GOP at 6.)

15.   Although HB 2146 was derived from a redistricting plan created by a citizen, Amanda Holt (*id.*), throughout the legislative process, "several changes were made" (*id.* at 7).

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[2] Press Release, Office of Governor Tom Wolf, *Governor Wolf Creates Redistricting Advisory Council to Help Evaluate Fairness in Upcoming Congressional Redistricting Map* (Sept. 13, 2021), https://www.governor.pa.gov/newsroom/governor-wolf-creates-redistricting-advisory-council-to-help-evaluate-fairness-in-upcoming-congressional-redistricting-map/; *see also Give Feedback on Pennsylvania Redistricting* https://www.governor.pa.gov/redistricting-feedback/ (last accessed Jan. 29, 2022).

[3] *See* Pennsylvania Redistricting Advisory Council, *Redistricting Principles*, https://www.governor.pa.gov/wp-content/uploads/2021/11/Redistricting-Advisory-Council-Final-Principles.pdf.

16.   During the General Assembly's deliberations, the Governor provided

public feedback on proposed maps, including clearly stating the many reasons that

HB 2146 is unacceptable,[4] and publicly highlighted two redistricting maps as

examples of new congressional district boundaries that are consistent with the

Redistricting Principles, free of gerrymandering, and in full accord with United

States and Pennsylvania Supreme Court precedent.[5] One of the maps highlighted

by the Governor is the Proposed 17-District Congressional Redistricting Plan that

the Governor submitted in this litigation (the "Plan" or "GovPlan").

17.   Nonetheless, HB 2146 passed the House of Representatives on

January 12, 2021 (Opening Br. of House GOP at 8), and on January 24, 2022, the

Senate gave HB 2416 third consideration and passed it (Senate GOP Response Br.

at 1).

18.   Governor Wolf vetoed HB 2146 on January 26, 2022.[6]

19.   The Governor's Veto Message states:

This legislation fails the test of fundamental fairness. The result of a
partisan political process, HB 2146 does not deliver on the

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[4] *See, e.g.,* Letter from Governor Tom Wolf to Speaker and Majority Leader of
Pennsylvania House of Representatives (Dec. 28, 2021), https://www.governor.pa.gov/wp-content/uploads/2021/12/12.28.21-TWW-Cutler-Benninghoff-HB-2146-Final.pdf.

[5] *See* Governor Tom Wolf, *Congressional Districts Map Proposals* (Jan. 15, 2022),
https://www.governor.pa.gov/congressional-districts-map-proposals/.

[6] *See* Veto Message, Office of the Governor of the Commonwealth of Pennsylvania (Jan.
26, 2022), https://www.governor.pa.gov/wp-content/uploads/2022/01/20220126-HB-2146-Veto-Message.pdf.

Pennsylvania Constitution's guarantee of free and equal elections. The people of Pennsylvania deserve a fair election map that promotes accountability and responsiveness to voters and is drawn in an open and honest way. Instead, HB 2146 adopts a map selected by politicians to take advantage of the process and choose their own voters. This directly contravenes a "core principle of our republican form of government" identified by the Pennsylvania Supreme Court: "that the voters should choose their representatives, not the other way around." *League of Women Voters v. Commonwealth*, 178 A.3d 737, 740-41 (Pa. 2018).[7]

B.   The Current Litigation

20.   Against the backdrop of the General Assembly's refusal to submit to the Governor a redistricting plan that comported with the Free and Equal Elections Clause of the Pennsylvania Constitution and the Redistricting Principles, two sets of Petitioners initiated these consolidated cases against the Acting Secretary of the Commonwealth of Pennsylvania and the Director of the Bureau of Election Services and Notaries in the Commonwealth Court, at docket numbers 464 MD 2021 and 465 MD 2021, respectively entitled *Carter v. Degraffenreid* and *Gressman v. Degraffenreid* (the "Consolidated Actions").

21.   In the Petitions for Review, the Petitioners ask the Court to "[a]dopt a new congressional district plan that complies with Article I, Section 5 of the Pennsylvania Constitution; Article I, Section 2 of the U.S. Constitution; and 2

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[7] *Id.*

U.S.C. § 2." (*See, e.g.*, Pet. for Review at 19 ¶ c, *Carter v. Degraffenreid*, 464 MD 2021 (Dec. 17, 2021).)

22. Since the *Carter* and *Gressman* Petitioners filed suit, the Court has granted intervenor status to the following parties: (i) Tom Wolf, Governor of the Commonwealth of Pennsylvania; (ii) Pennsylvania State Senators Maria Collett, Katie J. Muth, Sharif Street, and Anthony H. Williams; (iii) the Speaker and Majority Leader of the Pennsylvania House of Representative and the President Pro Tempore and Majority Leader of the Pennsylvania Senate; (iv) Senator Jay Costa and members of the Democratic Caucus of the Senate of Pennsylvania; (v) Representative Joanna E. McClinton, Leader of the Democratic Caucus of the Pennsylvania House of Representatives; and (vi) Congressman Guy Reschenthaler, Swatara Township Commissioner Jeffrey Varner, Tom Marino, Ryan Costello, and Bud Shuster. (Jan. 14, 2022 Order ¶ 2.)

23. Relatedly, the Court denied applications to intervene from several groups of individual voters, instead permitting them to participate as amici curiae: (i) Voters of the Commonwealth of Pennsylvania; (ii) Citizen-Voters; (iii) Draw the Lines-PA; (iv) and Khalif Ali et al. (Jan. 14, 2022 Order ¶ 5.)

24. The Court permitted all of the Petitioners, Respondents, Intervenors, and Amici alike to submit at least one proposed 17-district congressional redistricting map for the Court's consideration, as well as a supporting brief and

expert report. (*Id.* ¶¶ 2, 6.) The Court allowed original parties and intervenors to submit up to two maps; amici curiae were permitted to submit one map. (*Id.*)

25.   The following parties and amici submitted maps:

- The *Carter* Petitioners ("Carter")

- The *Gressman Petitioners* ("Gressman/GMS")

- Intervenor Governor Wolf (the "Plan" or "GovPlan")

- The Republican Legislative Intervenors ("HB-2146")

- The Reschenthaler Intervenors (two maps, "Reschenthaler1" and "Reschenthaler2")

- The House Democratic Intervenors ("HouseDemCaucus")

- The Senate Democratic Intervenors (two maps, "SenateDemCaucus1" and "SenateDemCaucus2")

- Draw the Lines Amici ("CitizensPlan")

- Voters of the Commonwealth of PA Amici ("VotersOfPA")

- Khalif Ali et al. Amici ("KhalifAli")

- Citizen Voters Amici ("CitizenVoters")

C.   Traditional Criteria for Reviewing Proposed Redistricting Plans

26.   When the Pennsylvania Supreme Court struck down the 2011 Census Plan, it announced a standard for reviewing redistricting plans. *See League of Women Voters I*, 178 A.3d at 817-18.

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27.   In Pennsylvania, a court reviewing a redistricting plan must proceed in two steps: first, it must determine whether the plan comports with the *League of Women Voters I* "neutral 'floor' criteria," *id.* at 817; and second, it must also ensure that the plan does not "nevertheless operate to unfairly dilute the power of a particular group's vote for a congressional representative[,]" such as by entrenching partisan advantage. *Id.*

1.   Pennsylvanians Have a Right to Select the Representatives of Their Choice on a Level Playing Field

28.   For a redistricting plan to respect the right of voters under the Free and Equal Elections Clause of the Pennsylvania Constitution to choose their representatives on equal terms, it must satisfy certain "neutral benchmarks" that are "particularly suitable as a measure in assessing whether a congressional districting plan dilutes the potency of an individual's ability to select the congressional representative of his or her choice." *Id.* at 816.

29.   Those "neutral benchmarks" are whether the congressional districts created under a plan (1) are "composed of compact and [(2)] contiguous territory"; (3) are "as nearly equal in population as practicable"; and (4) "do not divide any county, city, incorporated town, borough, township, or ward, except where necessary to ensure equality of population." *Id.* at 816-17 (citation and quotation omitted).

The use of compactness, contiguity, and the maintenance of the integrity of the boundaries of political subdivisions maintains the strength of an individual's vote in electing a congressional representative. When an individual is grouped with other members of his or her community in a congressional district for purposes of voting, the commonality of the interests shared with the other voters in the community increases the ability of the individual to elect a congressional representative for the district who reflects his or her personal preferences.

Id. at 816.

30.   In *League of Women Voters II*, when the Supreme Court compared the 2018 Remedial Plan to the proposed plans submitted by the parties, the Court assessed whether the Remedial Plan was "superior or comparable to all plans submitted by the parties" with regard to each of the neutral criteria. 181 A.3d at 1087.

31.   But application of these criteria does not exhaust the inquiry into whether, or to what degree, a given plan affords voters a fair and equal opportunity to translate popular support into legislative representation—or, conversely, operates to entrench structural partisan advantage. Instead, "[t]hese neutral criteria provide a 'floor' of protection for an individual against the dilution of his or her vote in the creation of such districts." *League of Women Voters I*, 178 A.3d at 817.

2.   District Maps Must Not Dilute Pennsylvanians' Power to Choose Their Representatives

32.   In addition to using neutral criteria to determine whether a proposed redistricting plan permits voters to select the representative of his or her choice, the

Court must also conduct a second inquiry, to be sure that a plan does not "nevertheless operate to unfairly dilute the power of a particular group's vote for a congressional representative[,]" such as by entrenching partisan advantage. *Id.* at 817.

33.   In *League of Women Voters I*, the Court identified "unfair partisan political advantage" as one form of prohibited vote dilution. *Id.* Similarly, in *Mellow v. Mitchell*, 607 A.2d 204 (Pa. 1992), the Court assessed whether the proposed map was "politically fair," ultimately selecting a map that "result[ed] in a politically fair balance in the Pennsylvania delegation between Democrats and Republicans." *Id.* at 210.

34.   Courts must therefore assess a proposed redistricting plan's partisan fairness to avoid vote dilution because, as the Court cautioned in *League of Women Voters I*, "congressional districting maps, … although minimally comporting with the[] neutral 'floor' criteria, [may] nevertheless operate to unfairly dilute the power of a particular group's vote for a congressional representative." 178 A.3d at 817.

III. Governor Wolf's Plan

35.   Governor Wolf first publicly released the Plan on January 15, 2022, as an example of the type of redistricting plan he would sign if passed by the General Assembly. *See supra* ¶ 16.

36.   The Governor's Plan is described below:

➢ District 1 — Greater Bucks County: Includes all communities of Bucks County outside of those immediately adjacent to Northeast Philadelphia and connects them with similar communities in Montgomery County. These communities include similar economic traits and are experiencing increased population. This district in Montgomery County has grown slightly to adjust for needed population in Bucks County. Numerous comments on the Redistricting Public Comment Portal noted that Bucks County is a swing district and that it should continue to maintain its competitiveness. The minimal shifts in the boundaries of District 1 will continue to make it a competitive district going forward.

➢ District 2 — The Great Northeast: Maintains the entirety of Northeast Philadelphia and North Philadelphia east of Broad Street, with the western and southern borders unchanged and linking with the similar suburban communities of Bensalem and Eddington. Interstate 95 and Roosevelt Boulevard (Rt. US-1) run through the district and SEPTA connects the district through multiple bus and train lines. This is an Opportunity District (Black and Latino voters make up a majority of voters in the district).

➢ District 3 — Schuylkill East: District 3 unites the communities of Northwest and West Philadelphia and North Philadelphia west of Broad Street and Center City, largely along similar lines as the current district. The district picks up a small amount of additional needed population in Southwest and South Philadelphia, but largely maintains continuity with the existing District. This is a Majority-Black District (in other words, Black voters make up a majority of voters in the district).

➢ District 4 — MontCo/Berks: District 4 includes the majority of Montgomery County, which has a fast-growing population that requires more than one district. Popular with commuters to Philadelphia or King of Prussia, the district includes the neighboring communities of Lower Merion, Abington, Cheltenham, Norristown, Upper Dublin, and Lower Providence. Like the 2018 Remedial Plan, District 4 includes a portion of Berks County.

➢ District 5 — Southeast Corner: With all of Delaware County and portions of South Philadelphia and southern Montgomery County, these communities comprise the southeast border with New Jersey and Delaware. The region has the Philadelphia International Airport, which spans the county border, and industrial areas in Southwest Philadelphia, PhilaPort and the fast-growing Navy Yard, linking them with industrial and port facilities south of Philadelphia in Delaware County. To attain needed population, the district expands slightly beyond its current area in Montgomery County along the Schuylkill River.

➢ District 6 — Keystone: Much like the 2018 Remedial Plan, District 6 connects Chester County and a portion of southern Berks County including Reading, the fourth largest city in Pennsylvania. Both counties have a rich history dating back to the founding of the commonwealth and contain significant state parks and green space. With Chester among the fastest growing counties in the state, and similarly strong population growth in Reading and the surrounding area, only slight adjustments are needed from the 2018 Remedial Plan. In the Public Comment Portal, numerous comments expressed a desire that Reading not be split—noting that Reading has grown in population and contains an expanding Latino population for which constituents wanted to have equitable representation. This map honors that request and keeps Reading whole.

➢ District 7 — The Lehigh Valley: This district comprises all of Lehigh and Northampton counties and southern Monroe County. Much like the existing district, this map has three third-class cities of Allentown, Bethlehem and Easton with their shared heritage of manufacturing and common interests. The district is crisscrossed

by major intersecting highways including I-78, I-476 and the Lehigh Valley Thruway, Route 22, making this area an increasing warehousing and logistics hub, and spurring growth that landed Lehigh County in the top five fastest growing counties in the state over the past decade.

➤ District 8 — Mountain Northeast: District 8 centers around the cities of Scranton, Wilkes-Barre, and Hazelton. With all of Lackawanna, Pike, and Carbon counties, along with neighboring communities in Luzerne, Monroe, and Wayne counties, these communities share cultural and geographical similarities as part of the Pocono region. The outdoors and recreation are important to the region's economy and lifestyle, with many state parks, forests, and game lands. The district includes fast-growing bedroom communities for New York City, and like District 7, is connected by major highways I-78, I-81, and I-476, offering access to both New York and Philadelphia population centers.

➤ District 9 — East Central: Connecting communities with common socio-economic and cultural interests, District 9 includes counties of the Northern Tier with adjoining counties to the south, as well as much of the North Branch of the Susquehanna River, with the exception of portions included in District 8 to avoid splitting Wilkes-Barre and Scranton. The district includes larger communities of Lebanon, Pottsville, Bloomsburg, Tunkhannock and Forest City.

➤ District 10 — Susquehanna Valley West: Extending west from the Susquehanna River, District 10 includes all of York and Adams counties, and eastern Cumberland County. This district shares a rich agricultural heritage and identity, even as the district's economy modernizes increasingly towards manufacturing and logistics. Close to the Maryland border and rich with Pennsylvania history, District 10 contains several interstates—I-81, I-83, I-76 and US 11/15—making it a busy corridor for the trucking industry, commuters, and visitors to central Pennsylvania creating ease of travel between counties, cities, boroughs, and townships. Residents of Cumberland, Adams and York counties share high quality K-12 schools and top-rated public and private colleges and universities, such as Dickinson, Gettysburg, York, Central Penn, and Penn State

York. This region boasts farmland, state parks, ski resorts, and seasonal festivals, as well as a variety of industries from health care and retail to technology, and manufacturing.

➢ District 11 — Susquehanna Valley East: District 11 unites the fast-growing areas of Lancaster County with southern Dauphin County, including Harrisburg. Linked by Route 283, Amtrak's Keystone Service and the Turnpike, the counties have vibrant urban centers with significant cultural opportunities and restaurants, as well as suburban enclaves transitioning gradually to less dense agricultural areas and rich history in agriculture. The district is home to the State Capital, and various industries, including candy and confection giant The Hershey Company, major health care providers with Lancaster General Hospital and the Penn State Health Milton S. Hershey Medical Center, along with significant agricultural operations and small farms throughout. The Pennsylvania Redistricting Public Comment Portal received many comments on how this area of the map should be drawn, a frequent comment concerned keeping Harrisburg whole and not connecting it with other counties to the north.

➢ District 12 — Ridge and Valley: This district comprises much of the same area as the current 13th District, but like other districts, has stretched eastward, following the ridge and valley geography of the Appalachians. District 12 includes the third-class city of Altoona and significant recreational areas including Raystown Lake, numerous large Game Land tracts, and State Parks and Forests.

➢ District 13 — Southwest Corner: District 13 combines the major energy-producing counties of Washington, Greene, Fayette, Somerset and Westmoreland, with their shared industries of gas exploration and mining, into one compact district in the southwest. The district unites businesses and families of the Mon Valley communities—with common interests and history—with communities to the east and west. Outdoor recreation with the Laurel Highlands and Great Allegheny Passage Trail is helping to drive tourism to the area. As with other areas of the map, the shifts in District 13 are driven by population shifts, with the addition of

Somerset County as the district expands eastward to add needed population.

➢ District 14 — Pennsylvania Wilds: This district joins some of the most rural counties in Pennsylvania and is known for its tourism and outdoor assets, including the largest free-roaming elk herd in the northeastern United States, the Allegheny National Forest, the darkest skies on the East Coast, and several state parks and outdoor recreational opportunities. This district includes all of Warren, McKean, Potter, Tioga, Forest, Elk, Cameron, Clinton, Clarion, Jefferson, Clearfield, Centre, Armstrong, and Indiana counties as well as a portion of Lycoming County. The core of this district remains the same as the current 15th District but has shifted eastward due to population decline in the Northwest and North Central part of the state. The district includes Warren, Bradford, Coudersport, St. Marys, Emporium, Lock Haven, Clarion, Brookville, DuBois, Bellefonte, Parker, and Indiana. Multiple public comments from the Governor's Redistricting Portal suggest that Centre County not be divided, and District 14 honors that request by keeping Centre County whole.

➢ District 15 — The I-79 Corridor: District 15 includes Erie and counties to the south along the Ohio border to Lawrence and Butler counties. For the western tip of Pennsylvania, manufacturing, retail trade, and health care and social assistance are among the largest employers. From shipping ports and vineyards to hiking and biking trails, the northern I-79 corridor of the Lake Erie region bordering Ohio and New York includes counties that are designated transitional as their economic status. As with other areas of the map, the shifts in District 15 are responses to population changes by adding Venango County, and most of Butler County, which was divided nearly in half under the 2018 Remedial Plan. The district expands eastward to add needed population. District 15 includes Erie, along with other communities, including Meadville, Titusville, Oil City, Franklin, Sharon, and New Castle.

➢ District 16 — Allegheny West: Unites Beaver County with western Allegheny County, including part of Pittsburgh and a small part of Butler County. Rich with a history in manufacturing along the Ohio River and throughout the region, the District is

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transforming with smaller manufacturing and service industries. This configuration was modelled on the original Draw the Lines Pennsylvania Citizens' Map. In evaluating the 1,500 submissions that contributed to the Citizens' Map, Draw the Lines found that many mappers created a clear line of demarcation between Beaver County and Washington County and put Butler County in a district with Erie. They thus adopted these preferences and divided Pittsburgh to ensure that there would only be a single county split in Allegheny County.

> District 17 — Allegheny East: Connects the eastern portion of Pittsburgh to the eastern suburbs along the Parkway East and south to the entrance to the upper Mon Valley and a portion of Westmoreland County. This map recognizes the decades-long economic connection of these communities and the area's evolving technology sector along with strong educational and medical institutions.

(*See* Gov. Wolf Opening Br. at 12-18.)

IV.   Governor Wolf's Expert, Dr. Moon Duchin

A.   Dr. Duchin Is a Renowned Data Scientist Specializing in Redistricting.

37.   Governor Wolf retained Dr. Moon Duchin, a Professor of Mathematics and a Senior Fellow in the Jonathan M. Tisch College of Civic Life at Tufts University, to "evaluate several maps that have been proposed as alternatives for Congressional redistricting in Pennsylvania, and particularly to compare them in terms of traditional districting principles and partisan fairness." (Duchin Report at 1.)

38.   At Tufts, Dr. Duchin runs the MGGG Redistricting Lab. (Duchin CV at 1, attached to Duchin Report.) Dr. Duchin was also a Guggenheim Fellow and

the Evelyn Green Davis Fellow, Radcliffe Institute for Advanced Study in 2018-19

(*id.*), and has published numerous scholarly works about redistricting (*id.* at 2-3.)

43. Dr. Duchin's work also spans well beyond theoretical discussions of

quantitative redistricting. Dr. Duchin described her work, just in this election cycle,

with "various line-drawing bodies such as redistricting commissions, independent

and bipartisan commissions around the country which have brought [her] into call

balls and strikes as [she] see[s] it and try to put plans in the context in terms of

metrics trying to understand the alternatives and the political geography." (Tr.

325:25-326:15.)

B.   As Dr. Duchin's Analysis Shows, the Governor's Plan Is Among the Top Performing Redistricting Plans Using the Traditional Criteria.

40.   Dr. Duchin evaluated the Governor's Plan and the other twelve plans

submitted to the Court to determine which plans satisfied an "excellence standard"

with regard to the traditional criteria, i.e., the *League of Women Voters I* neutral

benchmarks. (*See* Duchin Responsive Report at 2.)

41.   Dr. Duchin described and analyzed each of the traditional criteria as

follows.

42.   <u>Contiguity</u>: According to Dr. Duchin, "[c]ontiguity requires that, for

each district, it is possible to transit from any part of the district to any other part,

staying inside the district. That is, contiguity is the requirement that each district be composed of a single connected piece." (Duchin Report at 5.)

43. <u>Compactness</u>: Dr. Duchin stated that a plan's compactness can be measured in several ways. "The two compactness metrics most commonly appearing in redistricting are the Polsby-Popper score and the Reock score. Polsby-Popper is a recent name for a metric from ancient mathematics: the isoperimetric ratio comparing a region's area to its perimeter via the formula $4\pi A/P^2$. Higher scores are considered more compact, with circles uniquely achieving the optimum score of 1. Reock is a different measurement of how much a shape differs from a circle: it is computed as the ratio of a region's area to that of its circumcircle, defined as the smallest circle in which the region can be circumscribed. From this definition, it is clear that it too is optimized at a value of 1, which is achieved only by circles. In addition, the 2018 Court Order [in *League of Women Voters I*] specified three more metrics—*Schwartzberg*, *Convex Hull*, and *Population Polygon*—that should be reported for every plan." (*Id.*) "Schwartzberg is $P/2\sqrt{\pi A}$. Convex Hull is the ratio of the district's area to that of its convex hull, or 'rubber-band enclosure.' And Population Polygon is the ratio of the district's population to the state's population within the convex hull." (*Id.* at 5 n.3.)

44. <u>Population Balance</u>: Dr. Duchin observed that "courts have required serious attention to balancing the population across electoral districts in a plan,

under a norm called *One Person, One Vote*. … [I]n most U.S. states, Congressional districts are fine-tuned so that their total population deviates by no more than one person from any district to any other." (*Id.* at 4.)

45.   <u>Respect for Political Boundaries</u>: Dr. Duchin summarized this principle as requiring that "counties, cities, and other relevant political and administrative geographies should be kept intact in districts as much as practicable." (*Id.* at 6.) Dr. Duchin further explained that, particularly when comparing the closely related principles of compactness and political subdivision splits, "there are trade-offs, and that perhaps if you split one more county you can get a better compactness score and so on. So these all reflect decisions about those tradeoffs." (Tr. 338:12-18.) Further, Dr. Duchin noted that not all splits are created equal; for example one county split in the Governor's Plan is a split of six voters from Chester County, (*see id.* at 338:19-339:4), and not all splits are *per se* negative. Sometimes, for example, a split of a city in two might result in that city having two members in Congress, and thus double the representation. (*See id.* at 340:3-341:4; 341:24-342:11.)

46.   Other parties' experts repeatedly agreed that, particularly in the context of political subdivision splits, mapmakers had to make tradeoffs. As the *Carter* Petitioners' expert, Dr. Jonathan Rodden, testified, "in general the idea is to not split these jurisdictions, but there are trade-offs between different jurisdictions.

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We want to, in many cases focusing on counties is what redistricters are specially attentive to. We want to try not to split counties, keep counties whole when we can, and that's something I took very seriously. But I also pay very close attention to vote tabulation districts in my analysis and try to minimize splits of vote tabulation districts." (Tr. 94:25-95-13.) Further, Dr. Rodden agreed that "there's a trade-off where an redistricting expert has to face, between --- between splits in different places and also involving compactness." (*Id.* at 106:1-6.) Similarly, Dr. Daryl DeFord, the *Gressman* Petitioners' expert, testified that "in redistricting there's lots of examples of potential trade-offs between the metrics and between the criteria. And in a situation like this one where many of the plans are preserving lots of political boundaries, the compactness measures that are measuring sort of the external perimeters of those boundaries are to a large extent sort of controlled by the municipal boundaries themselves, because they perform the outer boundaries of the districts. And so given that, there can be some tension between these, depending on the shapes of the municipal boundaries that are preserved." (*Id.* at 215:17-216:9.) Finally, Dr. Keith Naughton, testifying on behalf of the Reschenthaler Intervenors, conceded that "there are trade-offs among the traditional redistricting criteria and in particular between the number of split political subdivisions and compactness." (*Id.* at 829:19-830:3).

47.   Applying the traditional criteria, Dr. Duchin concluded that "[a]ll 13 plans are contiguous, and all 13 plans are closely population-balanced for either Census PL population or prisoner-adjusted population." (Duchin Responsive Report at 2.)

48.   As a result, Dr. Duchin stated that "the neutral criteria most relevant for distinguishing the plans are **compactness** and **respect for counties and municipalities**." (*Id.* (emphasis in original).) The following Table demonstrates Dr. Duchin's calculations regarding each plan's compactness and respect for counties:

Table 1: Comparison of compactness and splitting metrics.

name	mean Polsby	mean Schwartz	mean Reock	mean ConvHull	mean PopPoly	cut edges	split counties	county pieces	split munis	muni pieces
GovPlan	0.3808	1.6534	0.4313	0.8257	0.7834	5185	16	35	18	37
CitizensPlan	0.3785	1.6625	0.4512	0.8120	0.7725	5237	14	30	16	33
HB-2146	0.3212	1.8197	0.4087	0.7987	0.7524	5907	15	33	16	34
Carter	0.3214	1.8103	0.4499	0.7922	0.7416	5926	14	31	20	41
Gressman/GMS	0.3478	1.7351	0.4261	0.8176	0.7582	5582	15	32	16	33
HouseDemCaucus	0.2787	1.9693	0.4286	0.7717	0.7205	6853	16	34	18	37
SenateDemCaucus1	0.3147	1.8144	0.4137	0.7918	0.7519	6047	17	36	19	39
SenateDemCaucus2	0.3346	1.7478	0.4146	0.8153	0.7601	5505	16	34	16	33
Reschenthaler1	0.3629	1.6859	0.4347	0.8238	0.7737	5090	13	29	16	33
Reschenthaler2	0.3524	1.7127	0.4231	0.8161	0.7658	5237	13	29	16	33
CitizenVoters	0.3490	1.7133	0.4412	0.8082	0.7575	5173	14	31	16	33
VotersOfPA	0.3965	1.6069	0.4697	0.8209	0.7681	5052	15	31	18	37
KhalifAli	0.3523	1.7204	0.4448	0.8111	0.7456	5266	16	35	18	37

(*Id.*[8])

49.   As shown in the chart, the Governor's Plan has the second best Polsby-Popper score, the second best mean Schwartzberg score, the best mean

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[8] The higher score is better for all compactness metrics except Schwartzberg and cut edges. For Schwartzberg and cut edges, a lower score is better.

Convex Hull score, the best mean Population Polygon score, and the fourth best cut edges score.

50.   With respect to respect for counties and municipalities, all plans are within a range of 13 to 17 split counties, meaning no plan averaged more than 1 county split per congressional district. (*See id.*) As Dr. Duchin explained, any plan with fewer than 17 county splits is "really considered excellent" given that all are drawing 17 congressional districts. (Tr. 337:12-24.) And all plans are within a range of 16-20 split municipalities (*id.*)—out of more than 2,000 total municipalities in the Commonwealth. (*Id.* at 493:5-15.)

51.   HB 2146, by contrast, consistently scores in the bottom four plans for compactness. Its mean Polsby Popper score is 11th out of 13, its mean Schwartz score is 12th out of 13, its mean Reock score is 13th out of 13, its mean Convex Hull score is 10th out of 13, its mean Population Polygon score is 9th of 13, and its cut edges score is 10th of 13. (*See id.*)

52.   Dr. Duchin concluded that, with respect to compactness, "the maps [submitted to the Court] are quite good across the board, but that you can still see some that are better. And the Governor's plan, in particular, is highly compact." (Tr. 334:15-21.) She explained:

> By far the two most compact plans, considering these metrics overall, are VotersOfPA and GovPlan. The next two, some ways behind the leaders, are Reschenthaler1 and CitizensPlan.

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When it comes to splits, I judge all of the plans to be excellent, with the possible exception of *Carter* and SenateDemCaucus1. All eleven others have 13-16 county splits and 16-18 municipality splits, which may be close to optimal for reasonable 17-district plans in Pennsylvania (though it is computationally intractable to prove this rigorously)."

(Duchin Responsive Report at 2.)

53.   In summary, based on her quantitative analysis, Dr. Duchin identified two "tiers" of excellence to grade the plans' adherence to the traditional criteria. (*Id.* at 3.)

54.   First, she identified four plans in a "high excellence" tier:

- GovPlan

- VotersOfPA

- Reschenthatler1

- CitizensPlan

(*Id.*)

55.   Second, Dr. Duchin identified a second tier "meeting an excellence standard":

- KhalifAli

- Reschenthaler2

(*Id.*)

C.   The Governor's Plan Performs at a High Level with Respect to Other Traditional Principles.

56.   Relying on *League of Women Voters I*, Dr. Duchin also identified several other traditional principles that she took into account when reviewing the Governor's Plan, namely preservation of prior district lines (or "least change"), protection of incumbents, and respect for communities of interest. (Duchin Opening Report at 6.)

57.   Least Change: To measure the "Least Change" principle, Dr. Duchin compared the Governor's Plan, HB 2146, and the CitizensPlan to the 2018 Remedial Plan, *i.e.*, Pennsylvania's currently drawn congressional map. (*Id.*) Dr. Duchin explained the rationale for this approach as follows: "If you believe that the old plan is a good one, if you believe that the old plan has shown itself to perform in ways that are fair, if you believe that the old plan represents the principles that you're trying to embody, then it does make some sense that you try to look a lot like it." (Tr. 347:7-23.)

58.   Dr. Duchin concluded that the Governor's Plan "keeps the districts intact to the greatest extent of" those three plans. (*Id.* at 10.)

Least change

	relabeling	displacement
GovPlan	(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18)	2,438,850
CitizensPlan	(1, 2, 3, 4, 5, 6, 7, 8, 12, 10, 11, 15, 13, 14, 18, 16, 17)	2,755,864
HB-2146	(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 15, 13, 14, 18, 16, 17)	2,797,612

As discussed more fully below, *see infra* ¶¶ 92-93, the Carter Petitioners' expert,

Dr. Rodden, conducted his own "least change" analysis and agreed that the

Governor's Plan was among the best in the field. (Rodden Responsive Report at 2.)

59.   Protection of Incumbents: Dr. Duchin explained that protection of

incumbents means, where possible, avoiding "double-bunking" two incumbent

members of congress in the same district. (*See* Tr. 347:24-348:18.) Dr. Duchin

determined that each of the Governor's Plan, CitizensPlan and HB 2146 create two

districts with two incumbents members of Congress. (*See* Duchin Opening Report

at 10.)

60.   As Dr. Duchin further testified, "it's my understanding that District 5

and the Governor's plan [pairs] two Democratic incumbents. Just for the record, in

my view, when I'm trying to assess whether a plan is a gerrymander for one party,

I think it would avoid pairing the incumbents of that party. So to me, this is a sign

that this is not a Democratic gerrymander plan." (Tr. 349:3-14.)

61.   Communities of Interest: Dr. Duchin described that the fundamental

concept is that there is value to maintaining "geographical areas where the

residents have shared interests that are relevant to their representation.…[T]his

could be shared history, shared economics, shared culture, many other examples."

(Id. at 342:12-343:2.) Dr. Duchin clarified, however, that the principle "doesn't

always mean a community should be held whole. Sometimes it's more effectively

split. But they should be kind of top of mind for the line drawers, as they draw."

(*Id.* at 343:7-11.)

62.   As Dr. Duchin noted, communities of interest were indeed a top-of-the-mind consideration in developing the Governor's Plan. Dr. Duchin stated that the Governor's Plan was "drawn after a robust public input process and in view of hundreds of collected comments and suggestions":

> The Governor's office set up a website (portal.pennsylvania-mapping.org) to accept comments and maps from the public. One option for submitters was to include a map paired with narrative comments describing their communities of interest. Active from September to December of 2021, the portal received 126 COI submissions. In addition, grassroots organizations like Pennsylvania Voice (pennsylvaniavoice.org) collected hundreds of additional submissions through the same online mapping platform, called Districtr.

(Duchin Opening Report at 11-12.)

63.   Dr. Duchin concluded about the Governor's Plan: "It's one of the very best. In my view it's extremely compact. It is economical in terms of political boundary splits and the splits that it is has [sic] have a good story. I find it to do well by the likes of incumbent pairing and leas[t] change across the board. It's an excellent plan on traditional districting principles." (Tr. 349:15-350:7.)

D.   **As Dr. Duchin's Analysis Demonstrates, the Governor's Plan Is Among the Top Performing Redistricting Plans Using Various Metrics for Partisan Fairness.**

64.   Dr. Duchin used best practices from mathematics and statistics, such as "the design and implementation of randomized algorithms for generating districting plans," (Duchin Opening Report at 1), to assess whether potential maps, including the Governor's Plan, exhibited partisan fairness and promoted accountability and responsiveness to voters. Dr. Duchin explained that, conceptually, numerical measures of partisan fairness "address how a certain quantitative share of the vote should be translated to a quantitative share of the seats in a state legislature or Congressional delegation." (Duchin Report at 13.)

65.   Dr. Duchin described partisan fairness and accountability and responsiveness to voters in terms of two core principles: first, a political party winning the majority of votes ought, as a general matter, to win a majority of congressional seats (the "Majority-Rule Principle"); and second, elections with close vote margins ought generally to result in a close split in the number of seats won (the "Close-Votes-Close-Seats Principle"). (*Id.* at 13.) These principles are visualized in the below graphic designed by Dr. Duchin, which "plots the results from overlaying a districting plan on a series of elections. The x-coordinate is the vote share for Republicans in that election. The y-coordinate is the number of

Republican seats. The figure is set up to show the 50-50 mark as a 'bulls-eye' target in the center, meaning that a close vote produced even representation."
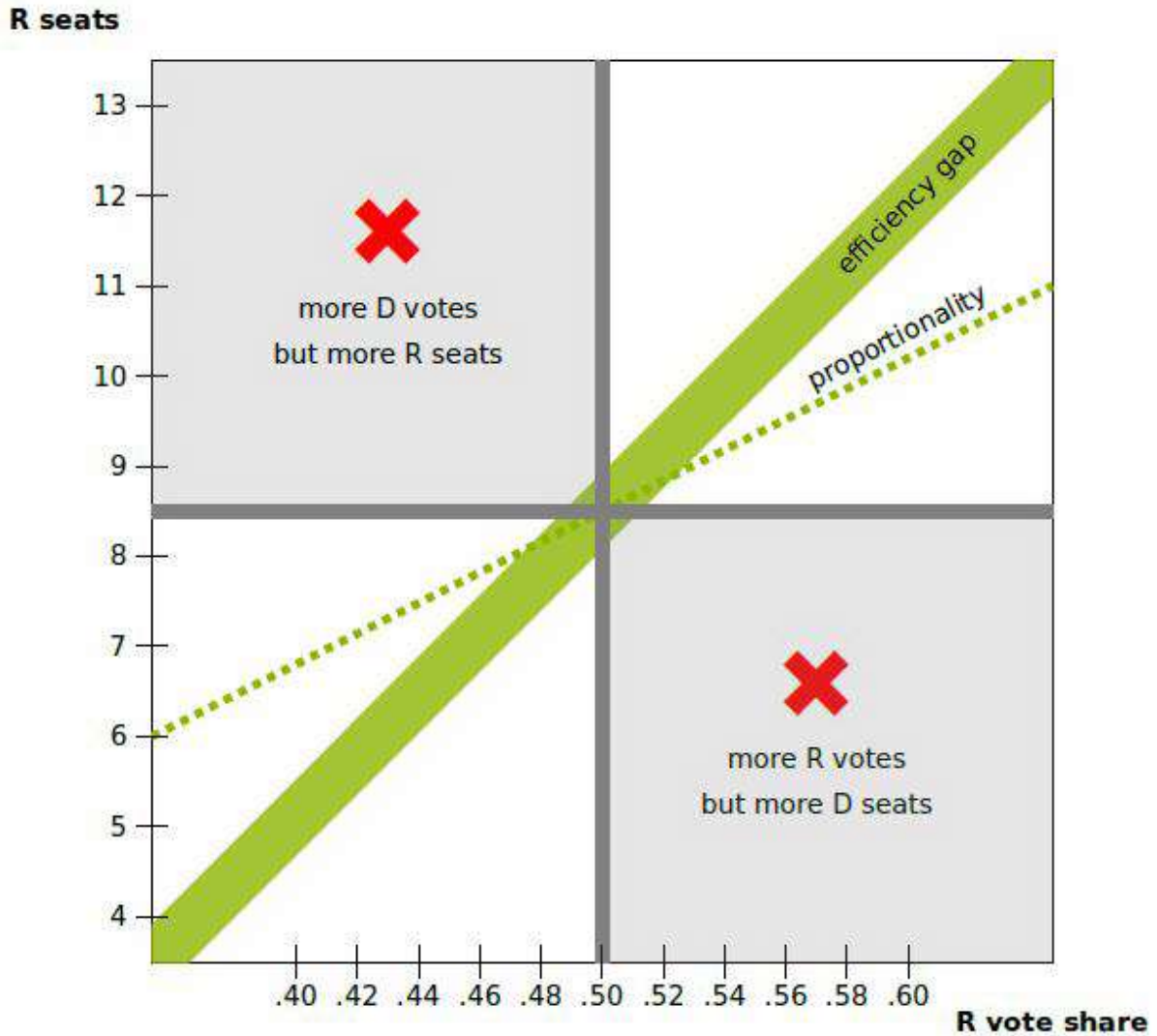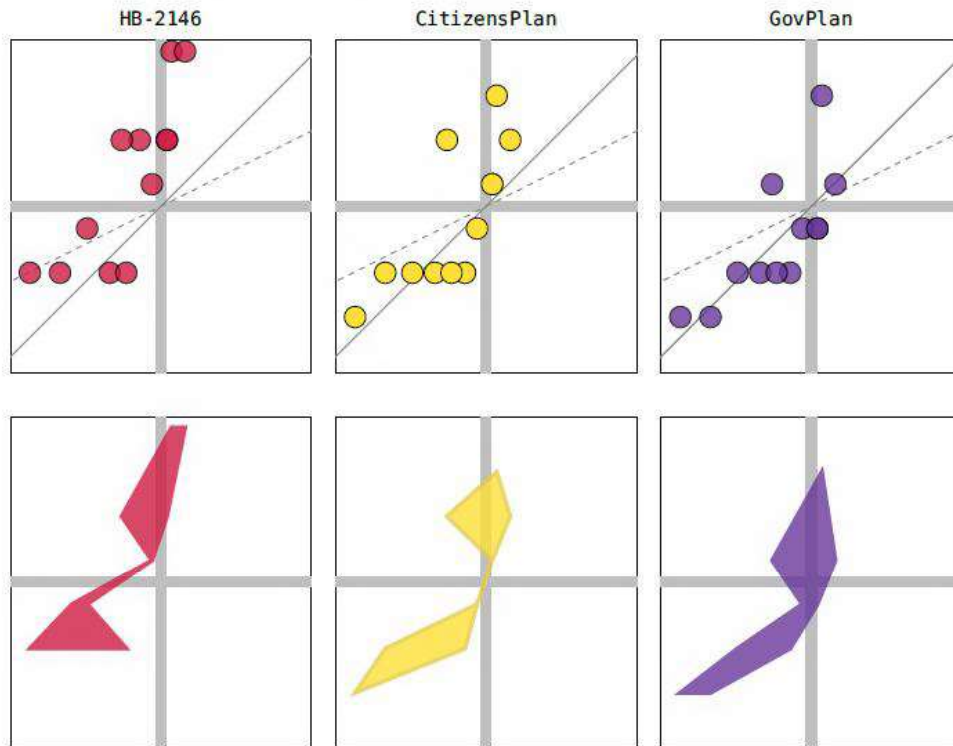

(*Id.* at 14.)

66. Dr. Duchin explained: "Majority Rule, then, translates to the idea that the Southeast and Northwest quadrants should be avoided. Close-Votes-Close-Seats now says that if an election is near even placing it horizontally near the

center of the plot, then the vertical position should be aimed at the bulls-eye in the

middle of the plot rather than falling consistently above or below the target." (*Id.*)

67.　Applying these principles to plans presented in this litigation, Dr.

Duchin demonstrated that HB 2146 always misses the bulls-eye, often in the no-go

Northwest quadrant, while the CitizensPlan and Governor's Plan hit and tightly

circle the bulls-eye, and only venturing significantly into a no-go quadrant once,

and only in the Northwest quadrant advantaging Republicans.

Figure 6: This time, the three new proposed plans are overlaid on the same elections. HB-2146 entrenches a Republican advantage, while CitizensPlan and especially GovPlan are far superior at leveling the partisan playing field.

(*Id.* at 16.)

68.　Dr. Duchin summarized HB 2146's performance as "consistently

converting close elections to heavy Republican representational advantages[,]"

whereas the Governor's Plan "does an excellent job of hitting that [bulls-eye] target." (Tr. 364:20-365:9.)

69.   Dr. Duchin also compared the partisan fairness of the Governor's Plan and all of the other maps using a different method, by means of an "ensemble" of 100,000 randomly drawn districting plans, to see how the maps would perform across recent elections. To compare the Governor's Plan to the ensemble, Dr. Duchin employed four metrics to measure the partisan fairness of a given congressional district map. (*See* Duchin Opening Report at 2, 17.)

70.   First, Dr. Duchin quantified each map's "efficiency gaps," which is "based on the idea of wasted votes, defined as any winning votes in excess of 50%, or any losing votes at all." (*Id.* at 17.)

71.   Second, Dr. Duchin calculated each map's "Eguia artificial partisan advantage," which "compares the outcomes under districted plurality elections to the outcomes under ostensibly neutral political subdivisions, such as counties." (*Id.*)

72.   Third, Dr. Duchin determined each map's "mean-median score," which indicates "how much of the vote in a state is needed to capture half of the representation." (*Id.*)

73.   And fourth, Dr. Duchin computed each map's "partisan bias score," or "how much of the representation would be captured by each party if the election underwent a uniform partisan swing to a 50-50 share." (*Id.*)

74.   The end result, for each plan and each partisan fairness metric, is displayed in the Table below:

Table 3: Comparison of all plans under four metrics of fairness in the economics and political science literature.

	total efficiency gap	total Eguia metric	total mean-median	total partisan bias
GovPlan	0.1007	−0.0486	−0.0077	−0.1176
CitizensPlan	−0.1678	−0.3427	−0.1042	−0.6471
HB-2146	−0.8336	−0.9898	−0.2927	−1.2353
Carter	−0.0058	−0.1663	−0.113	−0.5294
Gressman/GMS	0.1394	−0.0486	−0.0385	−0.2353
HouseDemCaucus	0.1814	0.0102	−0.0071	0.1765
SenateDemCaucus1	−0.2601	−0.4015	−0.1382	−0.7059
SenateDemCaucus2	0.1221	−0.0486	0.0106	0.1176
Reschenthaler1	−1.1024	−1.2251	−0.2524	−1.1176
Reschenthaler2 2	−1.1042	−1.2251	−0.2534	−1.0588
CitizenVoters	−0.4074	−0.5192	−0.1847	−0.6471
VotersOfPA	−0.5686	−0.6957	−0.2734	−0.8824
KhalifAli	−0.3166	−0.4604	−0.1209	−0.4706
ensemble mean	−0.6755	−0.8451	−0.2872	−1.1437

(Duchin Responsive Report at 4.)

75.   Dr. Duchin explained that the color-coding corresponds to the Plan's partisan fairness: "the color coding here is the pal[e]st when the scores are closest to zero, which is where you want to be in all four cases. The darker reds are more Republican favoring. The darker blues are more Democratic favoring on these scores." (Tr. 371:18-24.)

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76.   As Dr. Duchin explained, "one thing that stands out is that the Governor's plan is excellent across the board, that in all four of these metrics it gives scores that are either the closest or nearly the closest to zero." (*Id.* at 372:3-8.) "Of the twelve other plans, the Governor's Plan dominates [i.e., is equal or better in every metric] 10 and is in a trade-off position with the other two (*Carter* and HouseDemCaucus)." (Duchin Responsive Report at 4.)

E.   **Political Geography Does *Not* Mean That Pennsylvania Has to Have an Unfair Congressional Map Entrenching a Structural Partisan Advantage**

77.   In response to the testimony of several other experts about the geography of Pennsylvania, and concentrations of Democratic voters in cities compared to relatively spread out Republican voters dispersed away from cities, Dr. Duchin underscored that the Commonwealth's geography "manifestly doesn't prevent you from drawing a fair map." (Tr. 380:21-22.)

78.   Dr. Duchin also emphasized that not only could mapmakers achieve fairness irrespective of Pennsylvania's political geography, but doing so would not require compromising on any of the traditional redistricting principles: "[Y]ou can get to better scores of fairness with no cost at all in terms of compactness, contiguity, political subdivisions and so on." (*Id.* at 383:1-5.)

79.   Other experts agreed with Dr. Duchin on this point. As the *Carter* Petitioners' expert, Dr. Rodden, testified, "one thing we see is when we do a lot of

simulations a good share of those simulations end up in a range that --- that is ---

that produces the kind of partisan fairness we're talking about. So it is not the case

that the human geography in Pennsylvania somehow requires that we draw unfair

districts. There's just no --- there's no evidence for that." (Tr. 192:16-193:1.) The

Gressman Petitioners' expert, Dr. DeFord, concurred, opining that while

Republicans have a "partisan advantage" as a result of the political geography of

Pennsylvania, it is still possibly to draw a plan that "treat[s] both parties

evenhandedly across a wide range of election outcomes." (DeFord Opening

Report at 40.)

F.   Dr. Duchin Concluded that the Governor's Plan Is an Excellent Choice for the Court to Adopt.

80.   Dr. Duchin's analysis showed three things about Governor Wolf's

Plan.

81.   First, Dr. Duchin concluded that, although most of the plans because

the Court are "very good" with respect to the traditional districting principles, the

Governor's Plan is one of four that meets a "standard of excellence[.]" (Duchin

Responsive Report at 5.)

82.   Second, Dr. Duchin concluded that in terms of the plans' partisan

fairness, three plans, including the Governor's Plan, were in a class of their own,

and were not dominated by any other plans. (*Id.*)

83.   Third and finally, Dr. Duchin concluded that the Governor's Plan was

the *only* plan that was in both the first and second categories. That is, only the

Governor's Plan met the standard of excellence on the traditional districting

principles *and* was in the dominant class of plans for partisan fairness.

84.   "Therefore it is [Dr. Duchin's] conclusion that the Governor's plan is

an excellent choice (though not the only reasonable choice) as the best plan before

the Court." (*Id.*)

V.   The Other Parties' Experts

A.   Other Experts Recognized the Excellence of Dr. Duchin's Analysis.

85.   Professor Devin Caughey testified that "the reports that I've seen and

the testimony that I saw from other experts, especially from … Moon Duchin, was

excellent, and I have no reason to doubt anything that she said." (Tr. 981:12-17.)

B.   To the Extent the Other Parties' Experts Conducted Statistical Analysis Comparing the Plans, Their Analysis Confirms the Excellence of the Governor's Plan.

1.   Compactness

86.   Not all of the experts conducted nearly as thorough an analysis of all

the plans before the Court as did Dr. Duchin. For example, the House Republican

Intervenors' expert, Dr. Michael Barber, calculated the compactness scores of the

plans using only one metric, Polsby-Popper. (*See* Barber Rebuttal Report at 8,

Table 1.)

87.   Other experts, like those of the Reschenthaler Intervenors, did not calculate any compactness scores for plans' other than their own. (*See generally* Brunell Opening Report; Naughton Responsive Report.)

88.   As multiple experts testified, the different compactness scores "all give us a little bit different information. They all tell us something different about the geometry of districts, the shape of districts" (Tr. 92:17-21), and no one compactness measure is more important than the others. (*Id.* at 93:2-7; 251:8-252:6.)

89.   Of the experts that did calculate the compactness scores of the plans submitted to the Court, each concluded that the Governor's compactness score is exemplary. For the one measure of compactness that the House Legislative Intervenors' expert Dr. Barber did calculate, he determined that the Governor had the second highest Polsby-Popper score of all plans. (*See* Barber Rebuttal Report at 8, Table 1.)

90.   The *Gressman* Petitioners' expert, Dr. DeFord, calculated four measures of compactness: Mean Polsby-Popper; Mean Reock; Mean Convex Hull; and Cut Edges. The Governor's Plan scored best in Mean Polsby-Popper; best in Mean Convex Hull; second best in Cut Edges; and tied for third best for Mean Reock (two plans tied in second). (DeFord Rebuttal Report at 9.)

2. Population Equality and Contiguity

91.   The experts generally agreed that all of the plans, including the Governor's Plan, are contiguous and achieve population equality. (*See, e.g.,* Rodden Responsive Report at 2-3; DeFord Rebuttal Report at 4, 9.)

3. Least Change

92.   Dr. Rodden drew the *Carter* Petitioners' map using the "least change" principle as his guide, setting out "to draw a new 17-district plan that is as similar as possible to the existing plan, preserving the cores and boundaries of districts where feasible." (Rodden Opening Report at 1.)

93.   Not surprisingly, Dr. Rodden also used a measure of change, the amount of population share retained in a district compared to the 2018 Remedial Plan, to compare the *Carter* Plan with the other plans submitted to the Court. Dr. Rodden's analysis shows that the districts in Governor Wolf's Plan retains the fourth highest population share compared to the 2018 Remedial Plan; the Governor's Plan is also one of only five plans that maintain a population share of greater than 80%. (Rodden Responsive Report at 2.)

4. Partisan Fairness

(a) The Court Should Not Weigh All Partisan Fairness Testimony Equally

94. Of the experts who provided testimony or opinion evidence, only some conducted partisan fairness analysis of plans submitted on behalf of other parties.

95. Those experts were: Dr. Duchin, Dr. DeFord, Dr. Rodden, Dr. Barber (all three of whom are discussed *supra*), and Professor Devin Caughey, who testified on behalf of the Senate Democratic Intervenors.

96. Dr. Barber's analysis, as discussed a greater length *infra*, warrants no weight given his lack of publication on redistricting-related topics, his relative unfamiliarity with the methodology he used to conduct his analysis, the fact that his methodology has not been peer-reviewed, and many other reasons.

97. But as Dr. Duchin opined about partisan fairness modeling, "[t]o understand partisan fairness in the context of the range of electoral conditions in Pennsylvania, it is crucial to observe a range of voting behavior in the state. This is why creating a 'voting index' or 'election blend' is highly inadvisable." (Duchin Responsive Report at 3.)

98. She elaborated: "there are two options for a responsible modeler: either show observed elections serially, one at a time and not averaged, so that the local effects of incumbency and office and national climate can be considered in

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assessing the pattern, or study how and whether the Congressional voting patterns do in fact resemble a statewide average, and how they differ." (*Id.*)

99.   Dr. Duchin and Dr. DeFord's analysis "show[ed] observed elections serially, one at a time and not averaged, so that the local effects of incumbency and office and national climate can be considered in assessing the pattern[,]" (Duchin Responsive Report at 3), and Dr. Duchin and Dr. DeFord ran *multiple* partisan fairness analyses across the parties' plans. (*See* Duchin Responsive Report at 4; DeFord Rebuttal Report at 9-19.)

(b)   Dr. DeFord's and Professor Caughey's Partisan Fairness Analysis Confirms that the Governor's Plan Is Excellent

100.   Dr. DeFord's partisan fairness calculations underscore that the Governor's Plan is one of the fairest proposals, if not the most fair proposal, before the Court.

101.   'First, Dr. DeFord assessed the fairness of the plans using a "majority-responsiveness metric," which is "a simple measure of direct majority responsiveness, computing for a given election whether the party that won statewide also would have won carried a majority of districts in the proposed redistricting plan." (DeFord Rebuttal Report at 9.)

102.   Dr. DeFord summarized those findings for the parties' plans in two tables (*id.* at 11-12, Tables 10-11), the latter of which is copied below:

¶32 Table 10 provides my summary calculations of each Proposed Plan's performance on the majority-responsiveness metric.

	GMS	House Repubs	Gov'r	Carter	Sen. Dem. 1	Sen. Dem. 2	House Dem.	Repub. Congr. 1	Repub. Congr. 2	2018
Democrat-Favoring Outcome	1	0	2	1	0	2	1	0	0	0
Republican-Favoring Outcome	2	5	2	2	3	1	2	6	6	1
Total	3	5	4	3	3	3	3	6	6	1

Table 10: Number of elections, by political party, where the redistricting plan did not convert a majority of votes into a majority of seats (districts)

(*Id.* at 12.)

103.   Dr. DeFord conducted the same analysis for the maps submitted by the amici as well:

Table 10a: Number of elections, by political party, where the redistricting plan did not convert a majority of the votes into a majority of the seats (districts)

	GMS	Concerned Citizens	Draw the Lines	Citizen Voters	Ali et al.	Voters of PA	2018
Democrat-Favoring Outcome	1	0	0	0	1	0	0
Republican-Favoring Outcome	2	2	2	2	2	3	1
Total	3	2	2	2	2	3	1

(*Id.* at 30.)

104.   Dr. DeFord testified that he agreed the Governor's Plan is the "only one plan listed here that has perfect balance in the number of Democrat and Republican favoring deviations[.]" (Tr. 264:20-265:8.)

105. Dr. DeFord also calculated the mean efficiency gap of the parties'

plans. (*See* DeFord Rebuttal Report at 15, Table 13.) Dr. DeFord testified that the

Governor's Plan and *Carter* Plan are "the best performing maps" using the mean

score. (Tr. 266:7-21.)

106. Professor Caughey testified that the Governor's Plan rated "very

similarly on partisan fairness metrics" to the 2018 Remedial Plan adopted by the

Pennsylvania Supreme Court. (Tr. 972:8-18.) Professor Caughey also concluded

that Governor Wolf's Plan is "by far" more fair than HB 2146. (Caughey

Responsive Report at 2.)

C. The Expert Opinions of Dr. Michael Barber and Dr. Keith Naughton Should Be Given Little or No Weight

1. The Court Should Discount Dr. Barber's Opinions and Testimony

107. The Court should discount the testimony of Dr. Michael Barber, the

expert witness who submitted expert reports on behalf of the House Republican

Intervenors and testified on behalf of both the House and Senate Republican

Intervenors.

108. Dr. Barber's opinions are not credible due to (a) his lack of sufficient

expertise in the field of redistricting; (b) the untested and/or unreliable

methodologies he employed in conducting an ensemble analysis based on

simulated maps; and (c) the significant concessions he made during the evidentiary

hearing.

109.   First, as to his lack of experience, Dr. Barber has never been

published in the area of redistricting, let alone on the topic of partisan influence in

the redistricting process. (Tr. 562:4-8; 562:9-12.)

110.   Additionally, prior to the very recent North Carolina redistricting

litigation and this case, Dr. Barber had never used "any algorithm to generate

simulated district maps." (*Id.* at 562:13-563:24.)

111.   Dr. Barber conceded during his testimony that, on multiple other

occasions, courts have "concluded or found that [his] testimony should be given

little weight or no credit." (*Id.* at 564:3-565:22.) The Court should made the same

determination here.

112.   Second, Dr. Barber's opinions should not be afforded any weight here

because he employed untested and/or unreliable methodologies in conducting an

ensemble analysis based on simulated maps.

113.   Dr. Barber testified that he used a "sequential Monte Carlo analysis,"

which he described as "a very new algorithm," to create the maps he relied on for

the "simulation" analysis he performed. (*Id.* at 598:21-600:11.)

114.   Dr. Barber conceded that this methodology was not peer-reviewed,

and that the papers he cited in support of the analysis he used were in fact

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describing a different method (the peer-reviewed and widely-relied upon Markov Chain Monte Carlo method). (*Id.* at 598:21-600:11.)

115.   Additionally, the map simulations Dr. Barber relied upon in forming his conclusions were not representative of the types of maps at issue in this case.

116.   After conceding that, in order to make a valid comparison against a control set, he would need to create sample maps "under the same conditions" as the plans being compared (*id.* at 567:12-25), Dr. Barber testified that his map simulations allowed no more than *one* split municipality (Philadelphia), even though *every one of the maps up for consideration here, including the HB-2146 map*, split more than one municipality (*id.* at 570:17-571:18).

117.   Indeed, Dr. Barber was unable to explain how he was able to ensure that his simulated maps constituted a representative sample, other than to state vaguely that he relied on "mathematical proofs" and "other principles in statistics" to assure him the sample he had drawn was representative of the maps being compared. (*Id.* at 600:12-604:8.)

118.   Third, Dr. Barber essentially conceded during the hearing that vote dilution and partisan fairness concerns should be considered and factored in to the map drawing process.

119.   Specifically, Dr. Barber admitted that given the choice between two redistricting plans that are identical for practical purposes on traditional

redistricting criteria, drawn by "monkeys" with no partisan intentions, where (a) one map, while typical of randomly-drawn maps under the traditional redistricting criteria, results in an uneven split of seats based on even votes for both parties; and (b) the other map "get[s] rid of the bias that harms the voter," Dr. Barber would "pick the one that was less biased." (*Id.* at 582:7-586:3).

1. The Court Should Discount Dr. Naughton's Opinions and Testimony

120. Likewise, the Court should not credit the opinion of Dr. Keith Naughton, the expert witness who testified on behalf of the Reschenthaler Intervenors.

121. Dr. Naughton's opinions lack credibility and should be discounted because (a) he is a partisan political operative with no demonstrated experience in redistricting; (b) his opinion is just that – his own opinion – unsupported by any particular methodology, evidence, data analysis, or authority; and (c) he testified that has never read the *League of Women Voters* precedential opinion from 2018, let alone factored its mandate or guiding principles into the opinions he offers here.

122. First, as to his lack of relevant experience or expertise, Dr. Naughton testified that "much of [his] professional career has been dedicated to helping Republican candidates in Pennsylvania win their seats." (Tr. 769:19-770:4.)

123. Dr. Naughton conceded that he is not a mathematician. (*Id.* at 792:3-5.)

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124.   Additionally, Dr. Naughton agreed that his cv identifies "no particular experience in redistricting," and that he has never served as an expert in redistricting litigation before. (*Id.* at 777:17-778:9.)

125.   Second, Dr. Naughton agreed that his report "does not identify any particular methodology" that he used to arrive at his conclusions, and does not "cite any authority or particular evidence for [his] opinions." (*Id.* at 779:12-21; *see also id.* at 813:5-22.)

126.   Moreover, Dr. Naughton conceded that he provided no quantitative analysis of how any of the proposed plans perform on the neutral redistricting criteria. (*Id.* at 792:3-22.)

127.   Dr. Naughton further testified that he did not "consider vote dilution in [his] analysis to reach the conclusions [he] reached." (*Id.* at 861:13-16.)

128.   Third, considering his testimony that he has never read even a summary of the *League of Women Voters* opinion, Dr. Naughton certainly did not factor its mandate or guiding principles into his assessment of the maps offered here.

129.   Specifically, Dr. Naughton testified that while he "may have seen a citation to" the *League of Women Voters* decision from 2018, he has never read the opinion or even a summary of it. (*Id.* at 816:10-817:24.)

130. He further testified that he was not aware, even vaguely, that the Pennsylvania Supreme Court in *League of Women Voters* held that there were such things as unconstitutional gerrymanders, and invalidated a map on that basis. (*Id.* at 822:18-18.)

131. Even more problematically, in an article entitled "Gerrymandering Merry-Go Round," which was published in PA Townhall.com on February 14, 2018, one week after *League of Women Voters I* concluded that the Congressional Redistricting Act of 2011 was an unconstitutional gerrymander, Dr. Naughton wrote: "Those who shake their fists at gerrymandering and clog the courts with their lawsuits are really announcing their own rigidity and intellectual bankruptcy to the world." (*Id.* at 818:19-821:3.)

VI. Legal Argument[9]

A. HB 2146 Is Not Entitled to Any Special Weight

Perhaps recognizing that their map fares poorly under the standards set forth in *League of Women Voters*, the Republican Legislative Intervenors seek to sidestep those standards altogether. According to the Republican Legislative Intervenors, their map should be chosen—or, alternatively, should be accorded

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[9] The Governor respectfully incorporates by reference the arguments set forth in Governor Wolf's Brief in Support of Proposed 17-District Congressional Redistricting Plan (Jan. 24, 2022) and Governor Wolf's Responsive Brief in Support of Proposed 17-District Congressional Restricting Plan (Jan. 26, 2022).

deference by the Court—simply because it was passed, on party-line votes, by the General Assembly. Their position contravenes the law.

The Governor, who was elected by a majority of all Pennsylvania voters and constitutes a co-equal branch of Pennsylvania government, vetoed HB 2146. As he had previously explained, the Republican Legislative Intervenors' map was fundamentally unfair to Pennsylvania voters. Accordingly, unless the General Assembly overrides the Governor's veto by the requisite supermajority (which it has not done and, based on the initial votes on HB 2146, cannot do), HB 2146 has no legal force or effect. *See* Pa. Const. art. IV, § 15. Accordingly, there is no basis for any deference to the Republican Legislative Intervenors' map. The Republican Legislative Intervenors' arguments are at odds not only with the case law, but also with common sense.

State supreme courts and the U.S. Supreme Court have flatly rejected the Republican Legislative Intervenors' position. Just months ago, in November 2021, the Wisconsin Supreme Court expressly dismissed the argument that vetoed reapportionment plans receive special weight or consideration: "The legislature asks us to use the maps it passed during this redistricting cycle as a starting point, characterizing them as an expression of 'the policies and preferences of the State[.]' The legislature's argument fails because the recent legislation did not survive the political process." *Johnson v. Wisconsin Elections Commn.*, 967

N.W.2d 469, 490 n.8 (Wis. 2021) (Grassl Bradley, J.) (citation omitted). Other

state supreme courts agree. *See, e.g., Hartung v. Bradbury*, 33 P.3d 972, 979 (Or.

2001) (rejecting argument that Oregon Secretary of State, who as matter of statute

conducts reapportionment after impasse between legislature and governor, "should

have deferred to the Legislative Assembly's plan of reapportionment, even though

the Governor vetoed that plan"); *Wilson v. Eu*, 823 P.2d 545, 576 (Cal. 1992)

(rejecting argument that "special deference be given to the various plans passed by

the Legislature but vetoed by the Governor").

Most importantly, the U.S. Supreme Court has similarly stated that a

legislature's vetoed reapportionment plan does not warrant anything more than

"thoughtful consideration[.]" *Sixty-Seventh Minnesota State Sen. v. Beens*, 406

U.S. 187, 197 (1972) (distinguishing between "the *State's* policy" on districting, on

the one hand, and the legislature's vetoed reapportionment plan, on the other hand,

which "represented *only* the legislature's proffered current policy." (emphasis

added)); *accord O'Sullivan v. Brier*, 540 F. Supp. 1200, 1202 (D. Kan. 1982)

("[W]e are not required to defer to any plan that has not survived the full

legislative process to become law." (citing *Beens*, 406 U.S. at 197)).

Without citation or reference to the overwhelming weight of authority, the

Republican Legislative Intervenors rely solely on two federal district court

decisions, *Donnelly v. Meskill*, and *Skolnick v. State Electoral Board. of Illinois*,.

Each is fifty-years-old; no Pennsylvania court has cited to either decision; and the

facts of both cases are easily distinguishable. In *Carstens v. Lamm*, 543 F. Supp. 68

(D. Colo. 1982), which factored heavily in Judge Craig's Findings, Recommended

Decision and Form of Order in *Mellow*, *see* 607 A.2d at 208 n.1; *see also id.* at

215, 219, the court refused to follow *Donnelly* for reasons that are equally

applicable here:

> [In *Donnelly*, the court] concluded 'if time permitted extended
> hearings before the court or extended consideration by a court-
> appointed master, a better plan might be devised, weighing all
> possible factors.' In the instant case, the Court has solicited extensive
> submissions from the parties and does not face the same severe time
> constraints which confronted the Donnelly court. Thus, we do not feel
> that the holding in … Donnelly compels us to give priority to [a
> legislature's vetoed plan], particularly if a better plan is available.

Carstens, 543 F. Supp. at 78.[10] As in *Carstens*, this Court has solicited extensive

submissions from many parties and amici and held a two-day hearing involving

extensive direct and cross-examination of multiple expert witnesses. There is no

basis to defer to HB 2146, particularly in light of the copious authority stating that

any such deference would be error. As the *Carstens* court aptly observed:

> Both the Governor and the General Assembly are integral and
> indispensable parts of the legislative process. To take the [House
> Legislative Intervenors'] position to its logical conclusion, a partisan

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[10] In *Mellow*, the Supreme Court recognized that "Judge Craig relied on earlier cases, to wit … *Carstens v. Lamm*, 543 F. Supp. 68 (1982)[.]" 607 A.2d at 208 fn.1; *see also id.* at 215, 219. Although *Mellow* did not explicitly cite the portions of *Carstens* distinguishing *Donnelly*, the Court's reliance on *Carstens* in *Mellow* nonetheless suggests that Judge Craig agreed with the methodology used to decide *Carstens*.

state legislature could simply pass any bill it wanted, wait for a gubernatorial veto, file suit on the issue and have the Court defer to their proposal. This Court will not override the Governor's veto when the General Assembly did not do so.

Id. at 79.

Likewise, *Skolnick* is off-point given its facts. In *Skolnick*, the court reviewed a reapportionment plan that received "the over-whelming approval of one house of the legislature," and enjoyed "substantial bipartisan support," but was never brought to a vote in the other house of the legislature. 336 F. Supp. at 846. As a result, the court cautioned that it "would be unwise to attempt to guess the fate of the map in the upper house." *Id.* Here, there is no need for the Court to guess the fate of HB 2146. Governor Wolf vetoed it, meaning it is not a law and does not have the "substantial bipartisan support" attributed to the plan in *Skolnick*. *Id.*

The Republican Legislative Intervenors' reliance on the Elections Clause of the United States Constitution is equally misplaced. The Republican Legislative Intervenors argue that because the Elections Clause provides that "[t]he Times, Places and Manner of holding Elections for Senators and Representatives, shall be prescribed in each State by the *Legislature* thereof[,]" U.S. Const. art. I, § 4 (emphasis added), a legislative enactment of the General Assembly "reflects state policies and the people's preferences[.]" (House GOP Br. at 11; *see also* Senate GOP Br. at 10.) Operating under the misapprehension that the General Assembly

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has a monopoly on the legislative power, they posit that "[t]his Court should adopt the House Plan regardless of whether it is ultimately vetoed by the Governor." (*Id.* at 12; *see* Senate GOP Br. at 11 (arguing, wrongly, that "Pennsylvania's legislative power (and therefore its power to engage in congressional redistricting) is vested *exclusively* in the General Assembly").)[11] But the Supreme Court of the United States has flatly rejected the Republican Legislative Intervenors' constitutional argument.

Where, as in Pennsylvania, a governor has the authority under the state constitution to veto election-related legislation, the U.S. Supreme Court has concluded that, under the Elections Clause, "legislative action in districting the state for congressional elections shall be subject to the veto power of the Governor as in other cases of the exercise of the lawmaking power." *Smiley v. Holm,* 285 U.S. 355, 373 (1932). The Court reaffirmed *Smiley* in *Arizona State Legis. v. Arizona Indep. Redistricting Commn.,* 576 U.S. 787 (2015): "'[T]he Legislature' [as that term is used in the Elections Clause] comprises the referendum and the

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[11] As this Court and the Pennsylvania Supreme Court have explicitly stated, the Governor's power to approve or veto bills is a quintessentially legislative power: "'The Governor's powers include his power to veto legislation to the extent that this power is vested in him by Sections 15 and 16 of Article IV. The Governor's exercise of his veto power is unique in that it is essentially a limited *legislative power*[.]'" *Brouillette v. Wolf,* 213 A.3d 341, 362 (Pa. Commw. Ct. 2019) (en banc) (quoting *Jubelirer v. Rendell,* 953 A.2d 514, 529 (Pa. 2008) (emphasis added)). Redistricting legislation, like all legislation, is "subject to veto by the Governor." *League of Women Voters I,* 178 A.3d at 742.

Governor's veto in the context of regulating congressional elections." *Id.* at 806

(quoting *Smiley,* 285 U.S. at 373).

Accordingly, HB 2146 "cannot be sustained by virtue of any authority

conferred by the Federal Constitution upon the Legislature … to create

congressional districts independently of the participation of the Governor as

required by the state Constitution with respect to the enactment of laws." *Smiley*,

285 U.S. 373. The Governor has vetoed HB 2146; thus, HB 2146 has no legal

status under the Elections Clause. In sum, as a matter of law, HB 2146 is not

entitled to any degree of deference.[12]

> **B.**   **The Expert Reports Submitted by the Republican Legislative Intervenors' and Reschenthaler Intervenors' Non-Testifying Experts Should Be Excluded, and Expert Reports by Other Non-Testifying Experts Should Be Appropriately Discounted Due to the Lack of Cross-Examination**

During the hearing, the Governor (and at least one other party) objected to

the admission of certain expert reports proffered by the Republican Legislative

Intervenors and Reschenthaler Intervenors; the authors of those reports, Dr. John

M. Memmi and Dr. Thomas L. Brunell, respectively, did not testify at the hearing.

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[12] To the extent the Court agrees with the House Republican Intervenors that HB 2146 is entitled to some degree of deference, the Governor's Plan—submitted by a coequal branch of government that is an equally "integral and indispensable part[] of the legislative process"—should be entitled to the same deference. *Cartstens*, 543 F. Supp. at 73 (explaining that the map passed by the legislative branch "cannot represent current state policy any more than the Governor's proposal," and that the Court "regarded the plans submitted by both the Legislature and the Governor as 'proffered current [state] policy'").

Those two intervenor groups also proffered reports by *other* experts who *did* testify at the hearing and were subject to cross-examination; the Governor did not object to the admission of those testifying experts' reports. At the conclusion of the evidence, the Court overruled the Governor's objection to the admission of Dr. Memmi's and Dr. Brunell's reports.

The Governor respectfully submits that the Court should reconsider its ruling and exclude the reports. Such exclusion is warranted for two overlapping reasons: the reports are inadmissible hearsay, *see* Pa.R.E. 802, and allowing the reports into evidence would bestow an unfair advantage on the parties proffering them.

It is one thing to admit an expert report where the expert has been subjected to full cross-examination on the substance of the opinions set forth in the report. But where an expert is not made available for cross-examination, the expert's opinions escape the adversarial testing that is one of the lynchpins of the judicial fact-finding process. *See Heddings v. Steele*, 526 A.2d 349, 351 (Pa. 1987) (approvingly citing Dean Wigmore's statement that "cross-examination is 'beyond any doubt the greatest legal engine ever invented for the discovery of truth'"); *Commonwealth v. Dulaney*, 295 A.2d 328, 331 (Pa. 1972) (explaining that "cross-examination and judicially supervised procedure provide safeguards for the establishing of the whole, as against the possibility of merely partial, truth"

(quoting *Grunewald v. United States*, 353 U.S. 391, 422-423 (1957))). Indeed, as discussed above, the cross-examinations of certain testifying experts in this case—particularly Drs. Barber and Naughton—revealed significant reasons to discount the experts' opinions.

Whether to admit Dr. Memmi's and Dr. Brunell's reports is also a question of fairness. Dr. Memmi's report addresses the same map as does the report of the Republican Legislative Intervenors' testifying witness, Dr. Barber. And although the Reschenthaler Intervenors submitted two maps, they did not have Dr. Brunell address one map while their testifying expert, Dr. Naughton, addressed the other. Both experts' reports were proffered in support of both maps. The other parties at the hearing all offered expert reports by one witness, namely, the witness who testified at the hearing and was subject to cross-examination. The Governor respectfully submits that, to safeguard the truth-seeking process and place the parties on a level playing field, the expert reports of Dr. Memmi and Dr. Brunell should not be admitted into evidence.

For similar reasons, the reports submitted by the amici's experts should be weighed in a manner that appropriately reflects their lack of exposure to cross-examination. The Governor readily appreciates the Court's rationale for allowing those amici to submit expert reports; the Court was admirably attempting to balance consideration of those parties' views and proposed maps, on the one hand,

with the need to ensure that the evidentiary hearing, in which the amici were not permitted to participate, was manageable. But it is nonetheless true that the amici's expert reports were not subject to the kind of rigorous adversarial testing applied to the reports submitted by the experts who testified at the hearing. The Governor respectfully requests that the Court's assessment of the amici reports take account of that important difference.

C. **Comparing the Congressional Districting Plans Before the Court, Governor Wolf's Plan Is Excellent on the Traditional Criteria and Achieves Partisan Fairness, Making It Unlikely to Dilute any Particular Group's Vote.**

As the Supreme Court held in *League of Women Voters v. Commonwealth*, 178 A.3d 737 (Pa. 2018) (*League of Women Voters I*), the Free and Equal Elections Clause "governs all aspects of the electoral process," including reapportionment, and "provides the people of this Commonwealth an equally effective power to select the representative of his or her choice, and bars the dilution of the people's power to do so." *Id.* at 814. To ensure compliance with the Free and Equal Elections Clause, a court reviewing a redistricting plan must proceed in two steps: first, it must determine whether the plan comports with the *League of Women Voters I* "neutral 'floor' criteria," *id.* at 817; and second, it must also ensure that the plan does not "nevertheless operate to unfairly dilute the power

of a particular group's vote for a congressional representative[,]" such as by

entrenching partisan advantage. *Id.*[13]

Here, because the Court is reviewing many plans, the scope of the Court's

inquiry is different than the one undertaken in *League of Women Voters I*: the

Court is not considering whether to invalidate an enacted plan; it is choosing

among many proposed plans in the absence of a lawfully enacted map.

Accordingly, as in *Mellow v. Mitchell*, 607 A.2d 204 (Pa. 1992), the inquiry is

more appropriately framed as: "Which of the [13] plans timely offered to this

[C]ourt comes closest to the constitutional standards in all pertinent respects?" *See*

id. at 218.[14] As a result, this case goes beyond simply asking whether each plan

satisfies the requirements of steps one and two of the *League of Women Voters I*

analysis. Instead, the Court is tasked with determining which plans are "superior or

comparable to the other submissions" using the neutral criteria "floor" at step one,

see League of Women Voters II, 181 A.3d at 1087, and then among those plans,

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[13] In *League of Women Voters I*, the Court recognized that "advances in map drawing
technology and analytical software can potentially allow mapmakers, in the future, to engineer
congressional districting maps, which, although minimally comporting with these neutral 'floor'
criteria, nevertheless operate to unfairly dilute the power of a particular group's vote for a
congressional representative." 178 A.3d at 817. To ensure that is not the case here, particularly
given the limited factual record about the development of each proposed district map, the Court
must look beyond the "floor" criteria to ensure that the plan adopted by the Court does not
"unfairly dilute the power of a particular group's vote for a congressional representative." *Id.*

[14] The question presented in *Mellow* was included in Judge Craig's "Findings,
Recommended Decision and Form Order," which the Supreme Court adopted. *Mellow v.
Mitchell*, 607 A.2d 204, 211 (Pa. 1992).

identifying which are the least likely to cause systemic vote dilution at step two, *i.e.*, which plans best realize the goal of fundamental fairness and avoid entrenching partisan advantage.

Based on the "excellent" – in the words of one other expert – analysis of Governor Wolf's redistricting expert, Dr. Moon Duchin, several of the proposed maps, including the Governor's Plan, establish themselves as viable candidates at step one. But at the second step, Dr. Duchin concluded the Governor's Plan best achieves partisan fairness and promotes accountability and responsiveness to voters, so as best to guarantee no unfair dilution of "the power of a particular group's vote." *League of Women Voters I*, 178 A.3d at 817.

1. *League of Women Voters I* Step One: Adherence to Neutral Criteria

At step one, Dr. Duchin quantified the proposed redistricting plans' faithfulness to the *League of Women Voters I* "neutral criteria" of compactness, contiguity, population deviation, and keeping together political subdivisions. *Id.* at 816-17. For population deviation and contiguity, there was relatively little differentiation among the plans. (*See supra* ¶ 47; Duchin Responsive Report at 2.) And for minimizing split political subdivisions, all of the plans performed well, meaning that the differences among the plans are not disqualifying. (*See supra* ¶ 50; *see also* Duchin Responsive Report at 2.) Indeed, Dr. Duchin concluded that any plan with fewer than 17 county splits is "really considered excellent" given

that all are drawing 17 congressional districts. (Tr. 337:12-24.) And Dr. Duchin determined that all plans were equally excellent in their treatment of municipalities, splitting a range of only 16-20, (*id.*)—out of more than 2,000 total municipalities in the Commonwealth. (*Id.* at 493:5-15.)

Compactness, however, demonstrates a wider gap among all of the at-issue proposals. Dr. Duchin determined that the Governor's Plan has the second best Polsby-Popper score, the second best mean Schwartzberg score, the best mean Convex Hull score, the best mean Population Polygon score, and the fourth best cut edges score. (*See supra* ¶¶ 48-49; Duchin Responsive Report at 4.) Similarly, of the other experts that did calculate the compactness scores of the plans submitted to the Court, each concluded that the Governor's compactness score is exemplary. (*See supra* ¶¶ 86-90.) For the one measure of compactness that the House Legislative Intervenors' expert Dr. Barber did calculate, he determined that the Governor had the second highest Polsby-Popper score of all plans. (*See* Barber Rebuttal Report at 8, Table 1.) The *Gressman* Petitioners' expert, Dr. DeFord, calculated four measures of compactness: Mean Polsby-Popper; Mean Reock; Mean Convex Hull; and Cut Edges. The Governor's Plan scored best in Mean Polsby-Popper; best in Mean Convex Hull; second best in Cut Edges; and tied for third best for Mean Reock (two plans tied in second). (DeFord Rebuttal Report at 9.)

Thus, the record undeniably supports Dr. Duchin's determination that, using the traditional criteria, two tiers of plans separated themselves, with the Governor's squarely in Tier One:

<div align="center">

Neutral Criteria – Tier One
Governor Wolf's Plan
Amici Voters of the Commonwealth of PA Plan
Intervenor-Respondent Reschenthaler et al. Plan 1
Amicus Vote the Lines PA Plan

Neutral Criteria – Tier Two
Amici Ali et al. Plan
Intervenor-Respondent Reschenthaler et al. Plan 2

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(Duchin Responsive Report at 3.

2. *League of Women Voters I* Step Two: Ensuring No Unfair Vote Dilution by Achieving Partisan Fairness

At step two, Dr. Duchin quantified the proposed redistricting plans' political fairness, to ensure that each plan does not pose a risk of unfairly diluting the power of a particular group's vote. Dr. Duchin compared the plans using four measures of partisan fairness, each of which was discussed in her expert report and Governor Wolf's Brief in support of his Plan: (1) total efficiency gap; (2) Eguia metric; (3) mean-median score; (4) partisan bias score. (*See supra* ¶¶ 69-74.) Using all four metrics, Dr. Duchin determined that, of the twelve plans aside from the Governor's, the Governor's Plan dominates 10 and is in a "trade-off position" with

two others (the *Carter* Petitioner's plan and House Democratic Caucus plan).

(Duchin Responsive Report at 4.)

	total efficiency gap	total Eguia metric	total mean-median	total partisan bias
GovPlan	0.1007	−0.0486	−0.0077	−0.1176
CitizensPlan	−0.1678	−0.3427	−0.1042	−0.6471
HB-2146	−0.8336	−0.9898	−0.2927	−1.2353
Carter	−0.0058	−0.1663	−0.113	−0.5294
Gressman/GMS	0.1394	−0.0486	−0.0385	−0.2353
HouseDemCaucus	0.1814	0.0102	−0.0071	0.1765
SenateDemCaucus1	−0.2601	−0.4015	−0.1382	−0.7059
SenateDemCaucus2	0.1221	−0.0486	0.0106	0.1176
Reschenthaler1	−1.1024	−1.2251	−0.2524	−1.1176
Reschenthaler2 2	−1.1042	−1.2251	−0.2534	−1.0588
CitizenVoters	−0.4074	−0.5192	−0.1847	−0.6471
VotersOfPA	−0.5686	−0.6957	−0.2734	−0.8824
KhalifAli	−0.3166	−0.4604	−0.1209	−0.4706

(*See supra* ¶ 74; *see also* Duchin Response Report at 4.)

In sum, of the proposed plans that were among the top tiers at step one of the *League of Women Voters I* analysis, only the Governor's Plan performed highly at step two, measuring for partisan fairness. That is not to say that no other plan exhibited partisan fairness. But the only plan that achieved first-tier excellence under both the traditional redistricting criteria *and* partisan-fairness metrics was the Governor's Plan.

In *League of Women Voters I*, the Supreme Court emphasized that "a healthy representative democracy" requires that "all voters … have an equal opportunity to translate their votes into representation." *Id.* at 814. The Governor's Plan not only comports with the neutral criteria; it also delivers on that "mandate[e] that the

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power of [each] vote in the selection of representatives be equalized to the greatest degree possible with all other Pennsylvania citizens." *League of Women Voters I*, 178 A.3d at 817.

VII. Conclusion

With so many numbers to compare, every party can pick their favorite number to hold up as the most important. But Dr. Duchin has offered a principled way to find a tier of plans that stand out as best at managing the trade-offs inherent in redistricting; in data science, this is called the "Pareto frontier." For the traditional districting principles, there are four plans on this frontier: the Governor's Plan, the Citizens/Draw the Lines Amici's Plan, the VotersOfPA Amici's Plan, and the Reschenthaler 1 Plan.

But once we've established a "floor" of good adherence, or even excellent adherence, to traditional principles – as required by *League of Women Voters I* – we can legitimately seek other qualities of a good redistricting plan. Indeed, *League of Women Voters I* specifically requires doing so. Chief among those must be notions of fairness, or of treating voters even-handedly, no matter the party of their preferred candidates, to ensure that all voters have an equal opportunity to translate their votes into representation.

Using bedrock fairness concerns, like avoiding consistent anti-majoritarian outcomes, we can already disqualify several of the plans, especially the

VotersOfPA Amici's Plan, the Reschenthaler 1 and 2 Plans, and HB-2146. (*See supra* ¶¶ 102-103; DeFord Rebuttal Report at 12, Table 10, 30 Table 10a.) And then we turn to numbers from simplified metrics of partisan fairness to similarly create tiers of the best as well as the worst performers. (*See supra* ¶¶ 74-76; Duchin Rebuttal Report at 4.) Now the Pareto frontier—the plans in a tradeoff relationship to each other, but not dominated by any other—consists of the Governor's plan, the House Democratic Caucus plan, and the Carter plan. Table Four in Dr. Duchin's Rebuttal Report lets us see what all experts agree on: that an average blindly drawn plan exhibits a distinct Republican skew, by the numbers. Indeed, the Table shows that only one plan in the 13 under consideration is worse in all four simplified metrics than a "typing monkey" making plans completely at random with no regard for fairness. The bottom-tier plan of all is the one passed by the General Assembly, HB 2146.

In the positive direction, one plan stands alone as the strongest choice for adoption. The Pareto frontier of optimality for the traditional principles has four plans; the Pareto frontier of optimality for the simplified partisan metrics has three plans. Only one plan is in both top tiers: the Governor's Plan. Since the Court must

pick just one, this stands out as the clear choice by the rules, priorities, and

standards in the Supreme Court's decision from just four years ago.[15]

Respectfully submitted,

HANGLEY ARONCHICK SEGAL
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[15] With respect to the issue of the election calendar, the Governor and Respondents respectfully rely on the Affidavit of Jonathan Marks submitting during the hearing, as well as the arguments made at the hearing by their counsel.

CERTIFICATION REGARDING PUBLIC ACCESS POLICY

I certify that this filing complies with the provisions of the Public Access Policy of the Unified Judicial System of Pennsylvania: Case Records of the Appellate and Trial Courts that require filing confidential information and documents differently than non–confidential information and documents.

Dated: January 29, 2022   _/s/ Robert A. Wiygul_

Robert A. Wiygul