### AN END TO GERRYMANDERING: HOW RIGOROUS AND NEUTRAL DESIGN CRITERIA CAN RESTRAIN OR END PARTISAN REDISTRICTING

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### ABSTRACT

Gerrymandering, or partisan redistricting, is the "art" of packing an opposing party's likely voters into a few districts and fragmenting remaining concentrations of opposing voters into separate districts where they cannot achieve the majorities needed to elect state and federal representatives who reflect their interests. Gerrymandering can be stopped or greatly restrained by strictly imposing neutral and historic design criteria of compactness and by minimizing splits in political subdivisions (counties, cities, townships, etc.) during the process of equalizing population between electoral districts. This Essay proposes a method of neutral redistricting to end partisan gerrymandering in Pennsylvania and other states. The key to this method is to deprive map drafters of discretion to pick and choose territory needed to "crack or pack" an opposing party's likely voters and replace that discretion with historic and known municipal boundaries.

The use of rigorous design criteria is compatible with both neutral independent commissions and the most aggressive partisan gerrymanderers. Both types of drafters are forced to design districts using whole political subdivisions arranged compactly in an electoral map. Most importantly, when applied rigorously, neutral design criteria create objective, judicially enforceable standards to evaluate, approve, reject, or redraw legislative maps that violate the principles of free and fair elections. This method of redistricting answers the plea of the United States Supreme Court for a neutral and judicially manageable standard to draw and evaluate electoral maps.

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### Introduction

In September of 2017, a team of lawyers challenged the 2011 Pennsylvania congressional map in federal court under Article I, Section 4 of the U.S. Constitution. This Section provides: "The Times, Places and Manner of holding Elections for Senators and Representatives, shall be prescribed in each State by the Legislature thereof; but the Congress may at any time by Law make or alter such Regulations, except as to the Places of chusing Senators."

The team's focus was to persuade a three-judge panel, which is required in redistricting cases,<sup>3</sup> to interpret the words "[t]he Times, Places and Manner of holding Elections" as giving state legislators the power to hold only fair elections and not to use that power to favor one political party over another.

The 2011 Pennsylvania congressional map, with its tortured districts, delivered thirteen of eighteen congressional seats to Republicans in a state that consistently voted approximately 50% Democratic and 50% Republican in statewide elections from 2012 through 2016.<sup>5</sup> The legal team knew that gerrymandering was wrong but had no answer for how to prevent it other than asking the trial court to appoint a neutral commission or a neutral expert to redraw the ill-formed map.

The absence of a judicially manageable standard to evaluate electoral maps was the stated reason why the U.S. Supreme Court refused to weigh in on gerrymandering in 2004 and again in 2019.<sup>6</sup> In *Vieth v. Jubelirer*, <sup>7</sup> a case challenging the fairness of the 2001 Pennsylvania congressional map, Justice Kennedy framed the problem as follows:

The object of districting is to establish "fair and effective representation for all citizens." At first it might seem that courts could determine, by the exercise of their own judgment, whether political classifications are related to this object or instead burden representational rights. The lack, however, of any agreed upon model of fair and effective representation makes this analysis difficult to pursue.

<sup>1.</sup> See Complaint – Injunctive Relief Requested, Agre v. Wolf, 284 F. Supp. 3d. 591 (E.D. Pa. 2018) (No. 2:17-cv-04392-MMB). The team, including the author, was led by Thomas H. Geoghegan, Esq. and Alice W. Ballard, Esq. The Brennan Center of New York University is a valuable resource for lawyers and researchers working on redistricting cases. The site has collected pleadings and opinions of major redistricting cases since 2016. See, e.g., Agre v. Wolf, Brennan Ctr. for Just. (May 29, 2018), http://www.brennancenter.org/our-work/court-cases/agre-v-wolf [https://perma.cc/E3K9-GK44].

<sup>2.</sup> U.S. CONST. art. I, § 4, cl. 1.

 <sup>28</sup> U.S.C. § 2284(a) (2018) ("A district court of three judges shall be convened when otherwise required by Act of Congress, or when an action is filed challenging the constitutionality of the apportionment of congressional districts or the apportionment of any statewide legislative body.").

<sup>4.</sup> U.S. CONST. art. I, § 4, cl. 1.

<sup>5.</sup> See Karen L. Haas, Office of the Clerk, U.S. House of Representatives, Statistics of the Presidential and Congressional Election of November 8, 2016, at 62–64 (2017); Karen L. Haas, Office of the Clerk, U.S. House of Representatives, Statistics of the Presidential and Congressional Election of November 4, 2014, at 40–41 (2015); Karen L. Haas, Office of the Clerk, U.S. House of Representatives, Statistics of the Presidential and Congressional Election of November 6, 2012, at 52–53 (2013).

See Rucho v. Common Cause, 139 S. Ct. 2484, 2508 (2019); Vieth v. Jubelirer, 541 U.S. 267, 305–06 (2004).

<sup>7. 541</sup> U.S. 267 (2004).

The second obstacle—the absence of rules to confine judicial intervention—is related to the first. Because there are yet no agreed upon substantive principles of fairness in districting, we have no basis on which to define clear, manageable, and politically neutral standards for measuring the particular burden a given partisan classification imposes on representational rights. Suitable standards for measuring this burden, however, are critical to our intervention. Absent sure guidance, the results from one gerrymandering case to the next would likely be disparate and inconsistent.<sup>8</sup>

The most serious problem with the Court's refusal to referee partisan maps is that if legislators can draw districts favorable to themselves or their political party, they can remain in power indefinitely and become less accountable to the will of the people through democratic elections.

In *Vieth*, Justice Kennedy left open the possibility that American ingenuity could solve the problem and someday create a judicially manageable standard to control partisan gerrymandering. He stated:

That no such standard has emerged in this case should not be taken to prove that none will emerge in the future. Where important rights are involved, the impossibility of full analytical satisfaction is reason to err on the side of caution. . . . This possibility suggests that in another case a standard might emerge that suitably demonstrates how an apportionment's *de facto* incorporation of partisan classifications burdens rights of fair and effective representation (and so establishes the classification is unrelated to the aims of apportionment and thus is used in an impermissible fashion).

. . .

If suitable standards with which to measure the burden a gerrymander imposes on representational rights did emerge, hindsight would show that the Court prematurely abandoned the field. That is a risk the Court should not take. <sup>10</sup>

In 2019, redistricting reform was again addressed by the U.S. Supreme Court in *Rucho v. Common Cause*, <sup>11</sup> a case involving partisan gerrymandering of congressional seats in North Carolina and Maryland. <sup>12</sup> Given the absence of agreed-upon objective, neutral standards, Chief Justice Roberts, writing for the majority, came to a similar conclusion as the majorities in *Davis v. Bandemer* <sup>13</sup> and *Vieth*:

Thirteen years later, in *Davis* v. *Bandemer*, we addressed a claim that Indiana Republicans had cracked and packed Democrats in violation of the Equal Protection Clause. A majority of the Court agreed that the case was justiciable, but the Court splintered over the proper standard to apply. Four Justices would have required proof of "intentional discrimination against an identifiable political group and an actual discriminatory effect on that group." Two Justices would have focused on "whether the boundaries of the voting

<sup>8.</sup> Vieth, 541 U.S. at 307-08 (Kennedy, J., concurring) (citation omitted).

<sup>9.</sup> See id. at 311-13.

<sup>10.</sup> Id.

<sup>11. 139</sup> S. Ct. 2484 (2019).

<sup>12.</sup> Rucho, 139 S. Ct. at 2487.

<sup>13. 478</sup> U.S. 109 (1986), abrogated by Rucho, 139 S. Ct. 2484.

districts have been distorted deliberately and arbitrarily to achieve illegitimate ends." Three Justices, meanwhile, would have held that the Equal Protection Clause simply "does not supply judicially manageable standards for resolving purely political gerrymandering claims." At the end of the day, there was "no 'Court' for a standard that properly should be applied in determining whether a challenged redistricting plan is an unconstitutional partisan political gerrymander." <sup>14</sup>

Regarding the Vieth decision, Chief Justice Roberts observed:

Eighteen years later, in *Vieth*, the plaintiffs complained that Pennsylvania's legislature "ignored all traditional redistricting criteria, including the preservation of local government boundaries," in order to benefit Republican congressional candidates. Justice Scalia wrote for a four-Justice plurality. He would have held that the plaintiffs' claims were nonjusticiable because there was no "judicially discernible and manageable standard" for deciding them. Justice Kennedy, concurring in the judgment, noted "the lack of comprehensive and neutral principles for drawing electoral boundaries [and] the absence of rules to limit and confine judicial intervention." <sup>15</sup>

This Essay proceeds in three parts. Section I of this Essay discusses the challenge of partisan redistricting and the historical design standards used to address those challenges. Section II addresses the emergence of objective design criteria for electoral maps. Finally, Section III explains the significance of the methodology the author's team used in developing a neutral, objective, and judicially manageable standard to evaluate electoral maps.

### I. TOWARD A NEUTRAL, JUDICIALLY MANAGEABLE STANDARD

Around the same time that the team had formed to challenge the 2011 Pennsylvania congressional map, a small group of lawyers, engineers, and activists formed a committee called Concerned Citizens for Democracy (CCFD). CCFD sought to answer Justice Kennedy's challenge of creating a comprehensive and neutral set of principles: a judicially manageable standard of redistricting that restrained partisan gerrymandering. CCFD was eventually called upon to provide technical support to the *Agre v. Wolf* team in challenging the 2011 map in the U.S. District Court for the Eastern District of Pennsylvania.

CCFD began its experiment by limiting the number of divided municipalities and other political subdivisions in an effort to restrain partisan selection of voters. CCFD then experimented by looking at visual compactness as the primary constraint on district

<sup>14.</sup> Rucho, 139 S. Ct. at 2497 (citations omitted).

<sup>15.</sup> Id. at 2498 (alteration in original) (citations omitted).

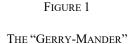
<sup>16.</sup> CCFD, a nonprofit, unincorporated association organized under the laws of Pennsylvania pursuant to 15 PA. STAT. AND CONST. STAT. ANN. § 9111–36 (West 2020), was later granted nonprofit status under Section 501(c)(3) of the Internal Revenue Code. See I.R.C. § 501(c)(3) (2018). CCFD has been studying and developing a neutral, judicially enforceable remedy to partisan gerrymandering in Pennsylvania since February 2017. See Gerrymandering in PA, CONCERNED CITIZENS FOR DEMOCRACY, http://concernedcitizensfordemocracy.org/gerrymandering-in-pa [https://perma.cc/LL2X-KUJ2] (last visited Apr. 1, 2021).

<sup>17.</sup> Gerrymandering in PA, supra note 16; see also Vieth, 541 U.S. at 307-08.

<sup>18. 284</sup> F. Supp. 3d 591 (E.D. Pa. 2018).

design. Maximally compact districts looked like circles with saw-toothed edges. These districts were compact but did not respect any municipal boundaries.

CCFD then explored creating Pennsylvania congressional districts without unnecessarily dividing any political subdivisions (counties, townships, wards, etc.) but ignoring the compactness requirement. CCFD observed that a map drawer could "crack and pack" opposing voters, almost at will, by assembling whole municipalities in an elongated manner to achieve partisan aims. The group noted that the original "Gerry-Mander," shown in Figure 1, was formed of whole Massachusetts townships in a noncompact manner. Therefore, the group observed that districts that respected municipal boundaries, but were not compact, would be subject to abusive partisan gerrymandering.





<sup>19.</sup> Cartoon, "The Gerry-Mander", 1813, SMITHSONIAN NAT'L MUSEUM OF AM. HIST., http://americanhistory.si.edu/collections/search/object/nmah\_509530 [https://perma.cc/AWS3-QVK5] (last visited Apr. 1, 2021) ("The 'Gerry-Mander' cartoon first appeared in the Boston Gazette, March 26, 1812, and was quickly reprinted in Federalist newspapers in Salem (this copy is from the Salem Gazette from April 2, 1813) and Boston. The cartoon expressed opposition to state election districts newly redrawn by Massachusetts' Jeffersonian Democratic-Republican Party, led by Governor Elbridge Gerry. Fearing that the Federalist Party would gain power in the 1812 election, Gerry consolidated Federalist voting strength in a salamander-shaped voting district. The practice—though not invented by Gerry—became known as a 'gerrymandering.'").

Historically, both Congress and the Pennsylvania legislature addressed the problem of partisan gerrymandering by requiring that districts be compact, contiguous, of roughly equal population, and that districts minimize the division of counties, townships, cities, boroughs, and wards. The requirement that districts be contiguous first appeared in the Federal Apportionment Act of 1842<sup>20</sup> "in 'an attempt to forbid the practice of the Gerrymander." The 1901 Reapportionment Act<sup>22</sup> and the 1911 Federal Reapportionment Act<sup>23</sup> (1911 Reapportionment Act) set forth three of the four redistricting requirements, which later appeared in the 1968 Pennsylvania Constitution.<sup>24</sup> Section 3 of the 1911 Reapportionment Act provides:

That in each State entitled under this apportionment to more than one Representative, the Representatives to the [next Congress] and each subsequent Congress shall be elected by districts composed of a contiguous and compact territory, and containing as nearly as practicable an equal number of inhabitants.<sup>25</sup>

Section 3 of the 1901 Reapportionment Act contained nearly identical language.<sup>26</sup>

Article II, section 16 of the Pennsylvania Constitution is a near verbatim restatement of three design standards from the 1911 Reapportionment Act.<sup>27</sup> State legislative districts were required to be "compact and contiguous territory as nearly equal in population as practicable."<sup>28</sup> The drafters of the Pennsylvania Constitution added a fourth requirement that an electoral map may not divide municipalities and other political subdivisions "[u]nless absolutely necessary."<sup>29</sup> Article II, section 16 provides:

The Commonwealth shall be divided into 50 senatorial and 203 representative districts, which shall be composed of compact and contiguous territory as nearly equal in population as practicable. Each senatorial district shall elect one Senator, and each representative district one Representative. Unless absolutely necessary no county, city, incorporated town, borough, township or ward shall be divided in forming either a senatorial or representative district.<sup>30</sup>

The 1968 Pennsylvania Constitution thereby addressed partisan gerrymandering in state house and senate districts but left federal gerrymandering unregulated.<sup>31</sup> The 1911 Reapportionment Act was deemed to have expired when the next reapportionment act, which did not contain these provisions, was enacted.<sup>32</sup> However, an examination of the

<sup>20.</sup> Ch. 47, 5 Stat. 491 (1842).

<sup>21.</sup> Rucho, 139 S. Ct. at 2495 (quoting Elmer C. Griffith, The Rise and Development of the Gerrymander 12 (1907)).

<sup>22.</sup> Ch. 93, 31 Stat. 733 (1901).

<sup>23.</sup> Ch. 5, 37 Stat. 13 (1911).

<sup>24.</sup> See PA. CONST. art. II, § 16.

<sup>25. 1911</sup> Reapportionment Act § 3, 37 Stat. at 14.

<sup>26. 1901</sup> Reapportionment Act § 3, 31 Stat. at 734.

<sup>27.</sup> Compare PA. CONST. art. II, § 16, with 1911 Reapportionment Act § 3, 37 Stat. at 14.

<sup>28.</sup> PA. CONST. art. II, § 16.

<sup>29.</sup> *Id*.

<sup>30.</sup> *Id*.

<sup>31.</sup> See id.

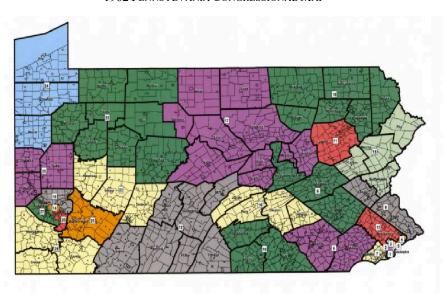
<sup>32.</sup> Wood v. Broom, 287 U.S. 1, 6–7 (1932); see also Act of June 18, 1929, ch. 28, 46 Stat. 21.

Pennsylvania congressional maps enacted in 1943,<sup>33</sup> 1951,<sup>34</sup> 1962,<sup>35</sup> and 1972<sup>36</sup> reveals that, despite this repeal, these requirements continued to be followed.

These maps show that the Pennsylvania legislature had little problem creating congressional maps with districts that were compact, contiguous, and equal in population to the extent reasonably practicable.<sup>37</sup> The legislature also did not divide political subdivisions unless necessary to create districts of equal population.<sup>38</sup> The 1962 Pennsylvania congressional district map, shown in Figure 2, illustrates how districts were composed of whole counties that were assembled or divided compactly to achieve roughly equal population districts.

Figure 2

1962 Pennsylvania Congressional Map



<sup>33.</sup> See Pennsylvania Congressional Districts: Act 119 of 1943, PA. REDISTRICTING, http://www.redistricting.state.pa.us/Resources/GISData/Districts/Congressional/1941/PDF/CongressionalDistricts\_1943.pdf [https://perma.cc/KN4G-9WFX] (last visited Apr. 1, 2021).

<sup>34.</sup> See Pennsylvania Congressional Districts: Act 464 of 1951, PA. REDISTRICTING, http://www.redistricting.state.pa.us/Resources/GISData/Districts/Congressional/1951/PDF/CongressionalDistricts 1951.pdf [https://perma.cc/3MMF-KDBA] (last visited Apr. 1, 2021).

<sup>35.</sup> See Pennsylvania Congressional Districts: Act 1 of 1962, PA. REDISTRICTING, http://www.redistricting.state.pa.us/Resources/GISData/Districts/Congressional/1961/PDF/CongressionalDistricts 1962.pdf [https://perma.cc/AT5D-FSU2] (last visited Apr. 1, 2021).

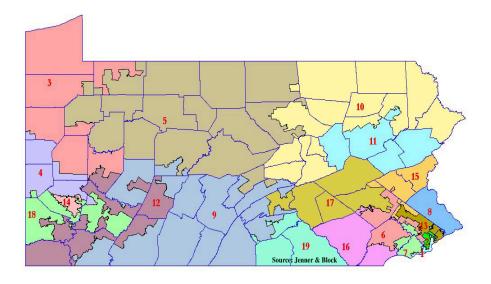
<sup>36.</sup> See Pennsylvania Congressional Districts: Act 3 of 1972, PA. REDISTRICTING, http://www.redistricting.state.pa.us/Resources/GISData/Districts/Congressional/1971/PDF/CongressionalDistricts\_1971.pdf [https://perma.cc/K5PC-E4CK] (last visited Apr. 1, 2021).

<sup>37.</sup> See supra notes 33-36 and accompanying text.

<sup>38.</sup> See *supra* notes 33–36 and accompanying text for examples of prior Pennsylvania congressional maps.

The 2002 Pennsylvania congressional map, shown in Figure 3, began to show signs of more aggressive gerrymandering.<sup>39</sup> Montgomery County—which demonstrated increasing Democratic voter strength in the 1990s by electing two Democratic members of Congress in November 1992<sup>40</sup> and November 1998<sup>41</sup>—was cracked into four pieces, distributing its voters into the neighboring Seventh, Sixth, Fifteenth, and Second Congressional Districts.<sup>42</sup> The map also showed significant gerrymandering in the southwestern corner of the state, where Democrats from the inner-ring suburbs of Pittsburgh were added to the Fourteenth District.<sup>43</sup> Whenever drafters deliberately move opposing voters to one district, the drafters simultaneously remove such voters from the abutting district. By adding suburban Democratic voters to more liberal voting cities, the drafters of this map also cleansed suburban districts of Democratic voters.

FIGURE 3
2002 PENNSYLVANIA CONGRESSIONAL MAP



<sup>39.</sup> See Pennsylvania Congressional Districts – 19 Districts Total, U.S. CENSUS BUREAU, http://www2.census.gov/geo/maps/cong\_dist/cd108\_gen/ind\_pdf/Pennsylvania/PA\_CDloc.pdf [https://perma.cc/C2HM-3RC2] (last visited Apr. 1, 2021).

<sup>40.</sup> See Dallas L. Dendy, Jr., Office of the Clerk, U.S. House of Representatives, Statistics of the Presidential and Congressional Election of November 3, 1992, at 62 (1993) (listing Democrat Marjorie Margolies-Mezvinsky as winning Pennsylvania's Thirteenth District).

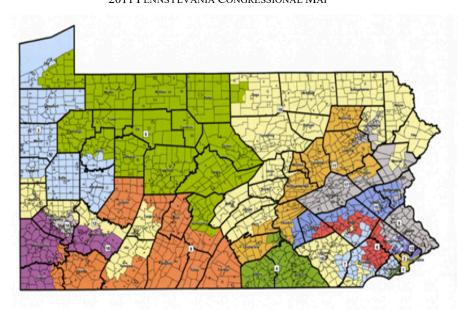
<sup>41.</sup> See JEFF TRANDAHL, OFFICE OF THE CLERK, U.S. HOUSE OF REPRESENTATIVES, STATISTICS OF THE CONGRESSIONAL ELECTION OF NOVEMBER 3, 1998, at 38 (1999) (listing Democrat Joseph M. Hoeffel as winning Pennsylvania's Thirteenth District, which included Montgomery County).

<sup>42.</sup> See Pennsylvania Congressional Districts – 19 Districts Total, supra note 39.

<sup>43.</sup> See id.

The 2011 Pennsylvania congressional map, shown in Figures 4 and 4-A, was drafted in a wildly and unabashedly gerrymandered manner.<sup>44</sup> To the untrained eye, the map contained mysterious and unusual shapes, some of which were so contorted that they were described as cartoon characters.<sup>45</sup>

FIGURE 4
2011 PENNSYLVANIA CONGRESSIONAL MAP



Visually, the worst gerrymandering was the Seventh Congressional District,<sup>46</sup> located in the southeastern part of the state. This district is known for its shape resembling Disney cartoon characters and is described as "Goofy Kicking Donald Duck."<sup>47</sup>

<sup>44.</sup> See Pennsylvania Congressional Districts: Act of 131 of 2011, PA. REDISTRICTING, http://www.redistricting.state.pa.us/Resources/GISData/Districts/Congressional/2011/PDF/2011-PA-Congressional-Map.pdf [https://perma.cc/D5LY-PTGR] (last visited Apr. 1, 2021).

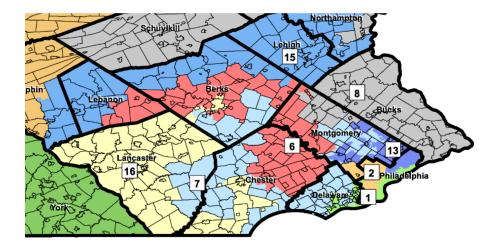
<sup>45.</sup> See Trip Gabriel, In a Comically Drawn Pennsylvania District, the Voters Are Not Amused, N.Y. TIMES (Jan. 26, 2018), http://www.nytimes.com/2018/01/26/us/pennsylvania-gerrymander-goofy-district.html [https://perma.cc/E8HF-2CV3]; see also Pennsylvania Congressional Districts: Act of 131 of 2011, supra note 44.

<sup>46.</sup> See infra Figure 4-A; see also Gabriel, supra note 45.

<sup>47.</sup> Gabriel, supra note 45.

FIGURE 4-A

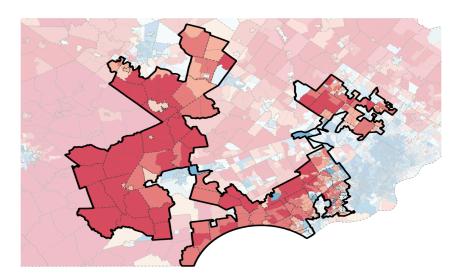
## An Expanded View of Southeastern Pennsylvania in the 2011 Pennsylvania Congressional Map



The head and body of Goofy—which appear in Figure 5 as a dog's snout, head, open mouth, body extending south, and left leg formed by the Delaware-Pennsylvania border—were a collection of suburban Republican-leaning neighborhoods in Montgomery and Delaware Counties. 48

<sup>48.</sup> Cf. Michaelle Bond, The Philadelphia Suburbs Turned Blue in a Big Way. What Do Democrats Plan To Do with Their New Power?, PHILA. INQUIRER (Nov. 6, 2019), http://www.inquirer.com/news/delaware-county-blue-wave-democrats-gop-election-bucks-chester-20191106.html [https://perma.cc/67Q4-XLT6] (discussing the results of the 2019 election where Democrats gained "the lead role in shaping all of Philadelphia's collar counties" for the first time ever).

Figure 5  $\label{eq:Figure 5}$  Republican and Democratic Voting Strength in and Around the Seventh Congressional District  $^{49}$ 



This figure is instructive in that it shows how the drafters were able to use census blocks, combined with historical voting data, to separate Republican and Democratic voters on a block-by-block basis. <sup>50</sup> If one looks at Goofy's ears on the upper right of Figure 5, one sees that Democratic voters (located on the right—above, between, and below Goofy's ears) were removed from the Seventh Congressional District and simultaneously added to the Thirteenth Congressional District, a packed Democratic seat. <sup>51</sup> This practice underscores the principle that unrestrained allocation of territory will allow a gerrymanderer to simultaneously pack urban districts with suburban Democrats while cleansing suburban districts of Democratic voters. <sup>52</sup>

The other notable feature of the Seventh District is the cartoon figure on the left, often described as the Donald Duck part of the district. This portion of the district

<sup>49.</sup> Figure 5 was created by Daniel McGlone of Azavea and was introduced in *Agre v. Wolf*, 284 F. Supp. 3d 591 (E.D. Pa. 2018).

<sup>50.</sup> Daniel McGlone, Azavea, Partisan Gerrymandering in Pennsylvania 17–19 (2017), as submitted in Agre, 284 F. Supp. 3d 591 (No. 17-4392).

<sup>51.</sup> See supra Figure 5. Compare Pennsylvania Congressional Act of 131 of 2011, supra note 44, with Pennsylvania Congressional Districts – 19 Districts Total, supra note 39. In 2012, the Democratic candidate won the Thirteenth Congressional District with 69.1% of the total vote; in 2014, by 67.1% of the total vote; and in 2016, the Democratic candidate was unopposed and won 100% of the vote. Pennsylvania's 13th Congressional District, BALLOTPEDIA, http://ballotpedia.org/Pennsylvania%27s\_13th\_Congressional\_District [https://perma.cc/M3G6-SUJN] (last visited Apr. 1, 2021).

<sup>52.</sup> See Reid J. Epstein & Nick Corasaniti, The Gerrymander Battles Loom, as G.O.P. Looks To Press Its Advantage, N.Y. Times (Feb. 1, 2021), http://www.nytimes.com/2021/01/31/us/politics/gerrymander-census-democrats-republicans.html [https://perma.cc/BG63-Q9HF] (discussing efforts to gerrymander suburban districts in cities such as Atlanta and Houston, as well as in northeastern Ohio).

consisted of rural Republican voting territory, which was added to the Seventh Congressional District to give it a strong Republican lean that would last for a decade of elections. Here, the drafters succeeded in securing Republican victories in the Seventh District<sup>53</sup> in 2012, 2014, and 2016.<sup>54</sup>

Looking at the 2011 congressional map as a whole, in both the eastern and western halves of Pennsylvania, congressional districts were elongated from east to west in search of reliable, rural Republican voters in the center of the Commonwealth.<sup>55</sup> Starting at the top of the eastern part of the Commonwealth, the Tenth, Eleventh, Seventeenth, Fifteenth, and Sixth Congressional Districts were also elongated from east to west.<sup>56</sup> For example, the Tenth District, from Pike County in the northeast along the Delaware River to Mifflin County in the center of the state, appears to break five counties in search of rural voters, thus violating the principle against not dividing political subdivisions unless "absolutely necessary."<sup>57</sup> Similarly, the Sixth District (shaped like a tadpole), with its head in Chester County and its elongated tail reaching westward through Montgomery, Berks, and Lebanon Counties, also violated the principle of compactness.<sup>58</sup> In the western part of the state, the Fifth, Third, Twelfth, Eighteenth, and Ninth congressional districts were elongated from west to east in search of rural voters.<sup>59</sup>

Each of these drafting choices demonstrates an obvious departure from the customary drafting criteria of compactness and the preservation of whole political subdivisions. <sup>60</sup> The absence of historic design standards for congressional districts allowed drafting choices in the 2011 map that crack and pack opposing voters at will. When one compares the Pennsylvania congressional maps of 1943, 1951, 1962, and 1972 with the 2011 map, a story of neutral redistricting versus partisan redistricting emerges. <sup>61</sup> The former maps show a genuine effort to follow the custom of forming compact districts that preserve counties and other political subdivisions. <sup>62</sup> The 2011 map reveals rampant

- 55. See supra Figure 4.
- 56. See supra Figure 4.
- 57. See supra Figure 4; see also PA. CONST. art. II, § 16. The fragmented counties comprising the Tenth Congressional District are Monroe, Lackawanna, Tioga, Northumberland, and Perry. See Pennsylvania Congressional Act of 131 of 2011, supra note 44.
  - 58. See supra Figure 4; see also PA. CONST. art II, § 16.
- Compare supra Figure 4, with Pennsylvania Congressional Districts 19 Districts Total, supra note
   39.
- 60. See supra notes 21-38 and accompanying text for an explanation of the compactness and preservation principles.
- 61. Compare Pennsylvania Congressional Districts: Act 3 of 1972, supra note 36, Pennsylvania Congressional Districts: Act 1 of 1962, supra note 35, Pennsylvania Congressional Districts: Act 464 of 1951, supra note 34, and Pennsylvania Congressional District: Act 119 of 1943, supra note 33, with Pennsylvania Congressional Districts: Act of 131 of 2011, note 44.
  - 62. See supra notes 33-36 and accompanying text.

<sup>53.</sup> In the Seventh Congressional District, the Republican candidate won the seat by 59.4% to 40.6% in 2012, 62% to 38% in 2014, and 59.5% to 40.5% in 2016. *Pennsylvania's 7th Congressional District*, BALLOTPEDIA, https://ballotpedia.org/Pennsylvania%27s\_7th\_Congressional\_District [https://perma.cc/R5YP-X9BZ1 (last visited Apr. 1, 2021).

<sup>54.</sup> In the neighboring Thirteenth Congressional District, the Democratic candidate won the seat by 69.1% to 30.9% in 2012, by 67.1% to 32.9% in 2014, and with 100% of the vote in 2016 as the Republicans were unable to find a challenger to the Democratic incumbent. *Pennsylvania's 13th Congressional District*, *supra* note 51.

gerrymandering, where each district displays the drafters' strategy to cleanse Democratic voters from Republican majority districts or crack and fragment concentrations of Democratic voters to limit their voting power.<sup>63</sup>

Gerrymandering in the 2011 map was made possible by the drafters' ability to abandon the requirements that districts be compact and that drafters minimize splits in political subdivisions.<sup>64</sup> By reimposing these traditional rules, courts and legislatures could end or dramatically limit gerrymandering.

### II. THE EMERGENCE OF CCFD'S DESIGN CRITERIA

The 1972 congressional map, created after *Wesberry v. Sanders*,<sup>65</sup> was CCFD's inspiration for how to design districts in a fair manner. *Wesberry* involved a plaintiff who resided in a Georgia congressional district with a population two to three times greater than other congressional districts in the state.<sup>66</sup> The Supreme Court held that Article I, Section 2's requirement that representatives be chosen "by the People of the several States" meant that, as nearly as is practicable, states were under an obligation to equalize the population of allotted congressional districts.<sup>67</sup>

The 1972 congressional map, shown in Figure 6, represented a genuine effort to ensure compact districts and minimal municipal divisions while maintaining equal populations. The drafters appeared to form congressional districts by using whole counties and then adding whole townships along the borders of each district to equalize population. For example, the Twenty-Fifth Congressional District, in the middle of the western border of Pennsylvania, added a row of townships in Allegheny County to Butler County in order to equalize population.<sup>68</sup> Similarly, the Eighth Congressional District (Bucks County) in southeast Pennsylvania added a row of townships along the border with Montgomery County.<sup>69</sup>

<sup>63.</sup> See Pennsylvania Congressional Districts: Act of 131 of 2011, supra note 44; see also Wesley Pegden, Ariel D. Procaccia & Dingli Yu, A Partisan Districting Protocol with Provably Nonpartisan Outcomes 1 (Oct. 24, 2017) (unpublished manuscript), http://arxiv.org/pdf/1710.08781.pdf [https://perma.cc/XSU8-5WCU]; Jonathan Lai & Liz Navratil, Pennsylvania, Gerrymandered: A Guide to Pa.'s Congressional Map Redistricting Fight, PHILA. INQUIRER (Sept. 24, 2018), http://www.inquirer.com/philly/news/politics/state/pennsylvania-gerrymandering-case-congressional-redistricting-map-coverage-guide-20180615.html

<sup>[</sup>https://perma.cc/XH7F-BU7D] (discussing experts' views that the 2011 Pennsylvania congressional map was an "extreme outlier" in the significant advantage it provided Republicans in the state).

<sup>64.</sup> See, e.g., *supra* notes 33–38 and accompanying text for a discussion of prior congressional maps in Pennsylvania that lacked elements of gerrymandering.

<sup>65. 376</sup> U.S. 1 (1964).

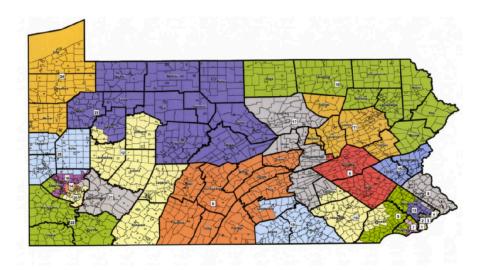
<sup>66.</sup> Wesberry, 376 U.S. at 2-3.

<sup>67.</sup> Id. at 7-8.

<sup>68.</sup> Compare Pennsylvania Congressional Districts: Act 1 of 1962, supra note 35, with Pennsylvania Congressional Districts: Act 3 of 1972, supra note 36.

<sup>69.</sup> Compare Pennsylvania Congressional Districts, Act 1 of 1962, supra note 35, with Pennsylvania Congressional Districts, Act 3 of 1972, supra note 36.

# FIGURE 6 1972 PENNSYLVANIA CONGRESSIONAL MAP



After studying the 1972 congressional map,<sup>70</sup> CCFD was inspired to develop a set of rules that mandated drawing districts compactly in a manner that minimized the division of municipalities.<sup>71</sup> The CCFD method makes partisan drafting of districts difficult, if not impossible, by denying drafters the ability to pick and choose territory based upon past voting behavior and replacing that discretion with compactly assembled districts, using whole municipalities.

The CCFD method requires drafters, when creating congressional districts, to start the redistricting process by assembling counties into electoral districts with roughly equal target populations, based on the population of the state divided by its allotted number of districts. To further equalize population, drafters shall then add whole townships or municipalities at the assembled county borders. CCFD developed two additional rules for drafting to prevent suburban cracking and packing.

<sup>70.</sup> Pennsylvania Congressional Districts: Act 3 of 1972, supra note 36.

<sup>71.</sup> See Brief for Amicus Curiae Concerned Citizens for Democracy at 6–10, League of Women Voters v. Commonwealth, 178 A.3d 737 (Pa. 2018) (No. 159 MM 2017). Section II of CCFD's amicus brief lays out a step-by-step guide for Pennsylvania to comply with the Pennsylvania Supreme Court's January 22, 2018, order to create new congressional districts. Id.; see also Order, League of Women Voters, 178 A.3d 737 (No. 159 MM 2017). The Brennan Center for Justice provides access to all court documents related to this case on their website. See League of Women Voters of Pennsylvania v. Commonwealth of Pennsylvania, BRENNAN CTR. FOR JUST. (Oct. 29, 2018), http://www.brennancenter.org/our-work/court-cases/league-women-voters-pennsylvania-v-commonwealth-pennsylvania [https://perma.cc/76H2-W3CP].

<sup>72.</sup> See Brief for Amicus Curiae Concerned Citizens for Democracy, supra note 71, at 7-8.

<sup>73.</sup> Id. at 8.

<sup>74.</sup> See id. at 7-9.

First, drafters may divide counties only a minimum number of times necessary to form equal population districts. <sup>75</sup> This rule would prevent drafters from dividing a county with a large percentage of an opponent's likely voters into many separate districts. <sup>76</sup> Second, where a city or county contains extra population that is insufficient to form a single congressional district, drafters must add territory, as a whole, to a single abutting county in need of additional population to reach the target population of a congressional district. <sup>77</sup> The purpose of this rule is to prevent drafters from packing cities by simply adding urban voters to inner-ring suburban territory, which both tend to vote Democratic, in an effort to dilute Democratic votes. <sup>78</sup>

The final set of design criteria, as reflected in *Agre* expert witness Anne Hanna's report and testimony, reads as follows:

Congressional districts shall be composed of territory which is:

- 1. Compact;
- 2. Contiguous;
- 3. As equal in population as practicable; and
- "Unless absolutely necessary, no county, city, incorporated town, borough, township or ward shall be divided in forming . . ." a Congressional district.

However given the tendency of those drafting Congressional districts to use partisan criteria or partisan proxies for the design of districts, some useful additional guidelines to avoid gerrymandered maps might be as follows. I wish to emphasize that these guidelines are not exhaustive, and additional neutral criteria might be considered. In addition these criteria are based on the assumption that it is legally required to have exactly equal populations in each district (+ or – one person) based on the preceding U.S. Census.

- 1. No county shall be divided unless absolutely necessary to create Congressional districts that are "equal in size to the extent reasonably practicable" and then may be divided only as many times as is absolutely necessary to achieve this objective.
- 2. No precinct, borough, township, incorporated town, or ward shall be divided unless absolutely necessary to create Congressional districts that are "equal in size to the extent reasonably practicable" and then may be divided only as many times as is absolutely necessary to achieve this objective.
- 3. Where additional territory is needed for additional population in a district, it shall be added from the border of a contiguous County and shall move inward only after all of the contiguous territory of the County has first been utilized.
- 4. If a county's population is greater than the average Congressional district size, any additional population may not be added to adjoining counties that have a population greater than that of an average district. Such additional population must instead be added to adjoining Counties whose population is

<sup>75.</sup> *Id.* at 7–8.

<sup>76.</sup> See id. at 9-10.

<sup>77.</sup> Id. at 8.

<sup>78.</sup> See *supra* Figure 5 for an illustration of the concentrations of the Democratic voters on both sides of the border of Philadelphia, shown with light dotted lines.

smaller than the average district (unless there is no adjoining county which is smaller than an average district).

5. Districts shall be "reasonably compact". [sic] An appropriate compactness score can be derived by using any of several common measures of geometric compactness, the simplest and most intuitive being the Polsby-Popper, Schwartzberg, and Reock measures. The Legislature might choose to measure the compactness of the Congressional districts from the 1931, 1943, 1951 and 1962 maps to devise a target level of compactness for any new Congressional District map.<sup>79</sup>

CCFD filed two amicus briefs in *League of Women Voters v. Commonwealth*, <sup>80</sup> a case parallel to *Agre*, challenging the 2011 Pennsylvania congressional map before the Pennsylvania Supreme Court. <sup>81</sup> The first brief analyzed the 2011 congressional map and presented a "Step[-]by[-]Step Guide to Complying with this Court's January 22, 2018 Order in creating new Congressional districts," along with a proposed map that reflected the CCFD method of redistricting. <sup>82</sup> The second brief, filed during the remedy phase, analyzed the Republican leadership's remedial map and similarly contained a step-by-step guide to neutral redistricting. <sup>83</sup>

The CCFD method of redistricting resulted in a proposed map that had fewer county and municipal divisions and a greater compactness score than any map submitted by the parties.<sup>84</sup> This method created compact districts in the first instance that minimized the splitting of political subdivisions.<sup>85</sup>

On February 19, 2018, the Pennsylvania Supreme Court released its remedial congressional map and ordered that the Pennsylvania Department of State use the map

<sup>79.</sup> Report of Anne C. Hanna, Expert Witness, to author (Nov. 7, 2017) (on file with author) (emphasis omitted). Hanna's report was entitled *Report on Whether Traditional Neutral Criteria Exist To Draw Congressional Districts Without Partisan Gerrymandering* and was submitted into evidence in *Agre v. Wolf*, 284 F. Supp. 3d 591 (E.D. Pa. 2018). Hanna, *supra*; *Agre*, 284 F. Supp. 3d at 660–63 (discussing Hanna's expert testimony). See Transcript Morning Session of Trial Day 2 at 5–90, *Agre*, 284 F. Supp. 3d 591 (No. 17-4392), for a transcript of Hanna's testimony on direct, cross, and redirect examination during trial.

<sup>80. 178</sup> A.3d 737 (Pa. 2018).

<sup>81.</sup> See Brief for Amicus Curiae Concerned Citizens for Democracy, supra note 71; An Analysis of the Pennsylvania Congressional Map Proposed by President Pro Tempore Joseph B. Scarnati, III and Speaker Michael C. Turzai: An Amicus Brief by Amicus Curiae Concerned Citizens for Democracy, League of Women Voters, 178 A.3d 737 (No. 159 MM 2017 LE) [hereinafter Second Brief for Concern Citizens for Democracy as Amicus Curiae].

<sup>82.</sup> Brief for Amicus Curiae Concerned Citizens for Democracy, *supra* note 71, at 7–10 (providing a lay person's guide to the proposed redistricting). A more technical guide for drafters appears at Appendix A as "CCFD A Step[-]by[-]Step Approach to Neutral Drafting of Districts Technical Guide," which includes a proposed map, compactness scores using five mathematical tests prescribed by the Pennsylvania Supreme Court, and reports on the number of county and municipal splits in the proposed maps. *Id.* at app. A.

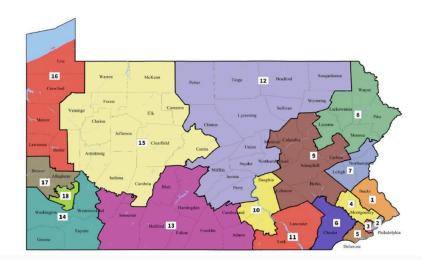
<sup>83.</sup> See Second Brief for Concern Citizens for Democracy as Amicus Curiae, supra note 81, at 3–14; see also Application for Leave to File an Amicus Brief in Response to the Congressional Map Proposed by President Pro Tempore Joseph B. Scarnati, III and Speaker Michael C. Turzai by Amicus Brief By Amicus Curiae Concerned Citizens for Democracy, League of Women Voters, 178 A.3d 737 (No. 159-MM-2017).

<sup>84.</sup> See Brief for Amicus Curiae Concerned Citizens for Democracy, supra note 71, at apps. A—C (providing a proposed Pennsylvania congressional map by expert Anne Hanna and five mathematical compactness scores as prescribed by the Pennsylvania Supreme Court—namely, Polsby-Popper, Schwartzberg, Minimum Convex Polygon, Reock, and Population Polygon).

<sup>85.</sup> See id.

to conduct the 2018 primary election.<sup>86</sup> The remedial congressional map, shown in Figure 7, reflected CCFD's method of drawing compact districts, which was stated in its amicus briefs.<sup>87</sup> Congressional districts were formed using whole counties, were assembled compactly, and additional territory (to equalize population) was composed of whole townships along the border of counties.<sup>88</sup>

FIGURE 7  $\label{eq:FIGURE 7} {\it Pennsylvania Supreme Court's Remedial Map in League of Women Voters v. } \\ {\it Commonwealth}^{89}$ 



Comparing the 2018 remedial congressional map with the 2011 congressional map, the tortured districts are eliminated and replaced by more compact shapes that follow county boundaries with far fewer splits or fragmented municipalities. 90 A few odd shapes remain—for example, the Eighteenth District in Allegheny County. 91

As reflected in the map, the method of redistricting was nearly identical to the CCFD method. Counties were assembled compactly and whole townships were added at the border of assembled counties, layer by layer, until nearly equal populations were

<sup>86.</sup> See League of Women Voters v. Commonwealth, 181 A.3d 1083, 1087-88 (Pa. 2018) (per curiam).

<sup>87.</sup> Compare id. at 1089 app. A, with Brief for Amicus Curiae Concerned Citizens for Democracy, supra note 71, at app. A.

<sup>88.</sup> See Nate Cohn, Matthew Bloch & Kevin Quealy, The New Pennsylvania Congressional Map, District by District, N.Y. TIMES (Feb. 19, 2018), http://www.nytimes.com/interactive/2018/02/19/upshot/pennsylvania-new-house-districts-gerrymandering.html [https://perma.cc/2JSP-6MQS] (displaying an interactive map that shows old and new districts' changes in shape between the 2011 map and the 2018 remedial map).

<sup>89. 181</sup> A.3d 1083, 1089 app. A (Pa. 2018) (per curiam).

<sup>90.</sup> See Cohn et al., supra note 88. Compare League of Women Voters, 181 A.3d at 1089 app. A, with Pennsylvania Congressional Districts: Act of 131 of 2011, supra note 44.

<sup>91.</sup> See supra Figure 7.

achieved. Then, a single municipality was divided along a common border to equalize populations.

The importance of this map was demonstrated in the 2018 general election. As anticipated, compactness created naturally Republican districts in rural voting areas and naturally Democratic districts in urban areas. 92 Competitive or swing districts appeared in the suburbs of Philadelphia and Allegheny Counties, and old factory towns in the northeast and southwest counties of the state created very competitive seats. 93 With the tendency of Democrats to self-pack in cities, 94 the map was naturally slightly Republican leaning. 95 However, this perceived disadvantage to Democrats, in CCFD's view, is outweighed by the implementation of a set of fair design standards that makes aggressive gerrymandering impossible and provides the courts with an objective, judicially manageable standard.

Compactness and the number of split counties, cities, townships, wards, precincts, and other political subdivisions (which are the result of a proposed map) are mathematical calculations that can be easily compared to other proposed maps. CCFD's methodology thereby provides courts an objective mathematical measure of partisan redistricting. Unnecessarily noncompact districts and districts with numerous splits in political subdivisions can create a prima facie case of partisan gerrymandering.

### III. THE SIGNIFICANCE OF CCFD'S METHODOLOGY

The most significant accomplishment of the CCFD redistricting methodology is that it creates a judicially manageable standard for redistricting. If all districts, whether at the congressional or state level, are composed of counties or townships assembled compactly with other whole townships or political subdivisions (added along a border to reach equal population districts), then drafters who violate this norm would need to publicly and transparently explain their drafting choices. By having a standard of well-drafted districts, violations of this standard are both mathematically and visually detectable.

Unusually shaped districts can be further examined and understood by looking at the partisan voting patterns inside or outside of established political subdivisions in a proposed map. For example, highly fragmented counties with a concentration of voters from the party opposing the drafter will create an inference of cracking. <sup>96</sup> Splitting off a small concentration of opposing voters and adding them to districts overwhelmingly populated by voters of the drafter's own party will create an inference of both cracking

<sup>92.</sup> See Pennsylvania Election Results 2018, POLITICO, http://www.politico.com/election-results/2018/pennsylvania/ [https://perma.cc/5P45-GFSS] (last updated Apr. 3, 2021).

<sup>93.</sup> See id.

<sup>94.</sup> See Drew DeSilver, How the Most Ideologically Polarized Americans Live Different Lives, PEW RES. CTR. (June 13, 2014), http://www.pewresearch.org/fact-tank/2014/06/13/big-houses-art-museums-and-in-laws-how-the-most-ideologically-polarized-americans-live-different-lives/ [https://perma.cc/HKP7-LEKL] ("[L]iberals opt for smaller houses and walkable communities in cities . . . . "); see also supra Figure 5.

<sup>95.</sup> See Aaron Bycoffe, Pennsylvania's New Map Helps Democrats. But It's Not A Democratic Gerrymander, FIVETHIRTYEIGHT (Feb. 20, 2018, 1:16 PM), http://fivethirtyeight.com/features/pennsylvanias-new-map-helps-democrats-but-its-not-a-democratic-gerrymander/ [https://perma.cc/7HFT-WDJH].

<sup>96.</sup> See *supra* Figure 3 and notes 41–42 for a discussion of how Montgomery County was fragmented as a result of its Democratic voter strength.

and packing. A look at the partisan distribution of votes along a district boundary almost always explains the decision of the drafter to include or exclude territory for partisan or other reasons.<sup>97</sup>

Employing a rigorous standard for drafting electoral maps enables courts to detect and remedy gerrymandered maps. Just as the Pennsylvania Supreme Court did in 2018, 98 a court can order a legislature or an expert to redraw the map in a manner that follows the standards and does not crack or pack opposing voters. This is the elusive remedy referred to by Justice Kennedy in *Vieth*. 99 A remedy based on neutral and objective drafting rules that can be measured mathematically creates a judicially enforceable standard. 100 Where the standard is abused or ignored, and lines deviate from the norm, a court could find a prima facie case of partisan intent. 101 The drafters would then be required to explain a neutral basis for their drafting choices. 102

In response, a challenger could present evidence that the drafters' choices result in the packing or fragmenting of an opposing party's voters to dilute the power of that party's votes. A preponderance of the evidence test would be an appropriate basis for overturning a map, mainly because gerrymandering is often subtle and hard to detect or prove. <sup>103</sup> A partisan intent test should be all that is required to find a map unconstitutional. On the other hand, reliance solely on an "effects test," <sup>104</sup> although helpful in demonstrating a pattern of gerrymandering, would allow an unfair map to stand for a number of years, which is an unacceptable result.

Another advantage of the CCFD method is that by ensuring electoral districts are both compact and undivided, the approach generates districts that tend to be compliant with the Voting Rights Act.<sup>105</sup> After drafting districts use objective criteria, as noted above, the drafters should then verify that the map is in compliance with the Voting Rights Act by not diluting or splitting concentrations of minority voters.<sup>106</sup> The CCFD

<sup>97.</sup> See, e.g., *supra* Figure 5 for an example of a Pennsylvania district where many parts of the boundary line appear to divide areas with bipartisan voters.

<sup>98.</sup> See Order of Jan. 22, 2018, League of Women Voters v. Commonwealth, 181 A.3d 1083 (Pa. 2018) (per curiam).

<sup>99.</sup> See Vieth v. Jubelirer, 541 U.S. 267, 307-08 (2004) (Kennedy, J., concurring).

<sup>100.</sup> See id.

<sup>101.</sup> See, e.g., id. at 347-51 (Souter, J., dissenting).

<sup>102.</sup> See id. at 351.

<sup>103.</sup> See supra notes 6-15 and accompanying text.

<sup>104.</sup> An "effects test" was described by the district court in *Rucho* as "a showing 'that the dilution of votes of supporters of a disfavored party in a particular district—by virtue of cracking or packing—is likely to persist in subsequent elections such that an elected representative from the favored party in the district will not feel a need to be responsive to constituents who support the disfavored party." Rucho v. Common Cause, 139 S. Ct. 2484, 2502 (2019) (quoting Common Cause v. Rucho, 318 F. Supp. 3d 777, 867 (M.D.N.C. 2018)).

<sup>105. 42</sup> U.S.C. § 1973 (2018); see Brief for Amicus Curiae Concerned Citizens for Democracy, supra note 71, at 7–10.

<sup>106.</sup> In *Thornburg v. Gingles*, the U.S. Supreme Court established a legal framework for "vote dilution through submergence" claims. 478 U.S. 30, 48 (1986). Under the *Gingles* test, plaintiffs must show the existence of three preconditions: (1) the racial or language minority group is "sufficiently large and geographically compact to constitute a majority in a single-member district," (2) the minority group is "politically cohesive" (meaning its members tend to vote similarly), and (3) the "majority votes sufficiently as a bloc to enable it . . . usually to defeat the minority's preferred candidate." *Id.* at 50–51 (citations omitted).

method tends to keep both communities of interest and minority communities intact so voter dilution does not occur.

### CONCLUSION

The most powerful implication of the CCFD method of redistricting is that rigorous historic design standards create a neutral method of drafting, evaluating, judging, and if necessary, redrafting electoral maps by requiring electoral districts to be highly compact without unnecessarily dividing political subdivisions. The method imposes neutral redistricting rules that provide a judicially manageable standard. Courts can easily detect violations of those neutral principles by a visual test, supported by examining the number of split counties, townships, and other political subdivisions, along with the compactness scores for each proposed electoral district. Litigants can then provide circumstantial evidence of partisan intent by showing partisan voting patterns to explain the lines drawn on a proposed map. CCFD's methodology has ultimately answered the pleas of Justice Kennedy in *Vieth* and Chief Justice Roberts in *Rucho* for a neutral, judicially manageable standard to judge and remedy partisan electoral maps. <sup>107</sup>