IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

WILLIAM WHITFORD, ROGER ANCLAM, EMILY BUNTING, MARY LYNNE DONOHUE, HELEN HARRIS, WAYNE JENSEN, WENDY SUE JOHNSON, JANET MITCHELL, ALLISON SEATON, JAMES SEATON, JEROME WALLACE, and DONALD WINTER, Plaintiffs, v. GERALD C. NICHOL, THOMAS BARLAND, JOHN FRANKE, HAROLD V. FROEHLICH, KEVIN J. KENNEDY, ELSA LAMELAS, and TIMOTHY VOCKE, Defendants.	)	No. 15-cv-421-bbc

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PLAINTIFFS' REPLY TO DEFENDANTS' RESPONSE TO PLAINTIFFS' ADDITIONAL PROPOSED FINDINGS OF FACT IN OPPOSITION TO DEFENDANTS' MOTION FOR SUMMARY JUDGMENT

In opposition to the motion for summary judgment filed by defendants**,** plaintiffs William Whitford et al., by their attorneys, respectfully submit their reply to defendants' response to plaintiffs' Additional Proposed Finding of Fact ("APFOF," Dkt. 69). Plaintiffs have not included a reply where the proposed finding was not disputed by defendants.

I. Plaintiffs' Experts and Their Analyses

1. Simon Jackman is a Professor of Political Science at Stanford University who teaches classes on American politics and statistical methods in the social sciences. (Jackman Rpt. (Dkt. 62) at p. 1.)

DEFENDANTS' RESPONSE: Undisputed.

2. Professor Jackman has authored and published many articles in peer-reviewed journals

over the last decade on a variety of subjects in his field, including the properties of electoral systems and election administration. (Jackman Decl. (Dkt. 58-2) at pp. 3-7.)

DEFENDANTS' RESPONSE: Undisputed.

3. Kenneth Mayer is a Professor of Political Science at the University of Wisconsin Madison, and a faculty affiliate at the University's Lafollette School of Public Affairs. He teaches courses on American politics, the presidency, Congress, campaign finance, election law, and electoral systems. (Mayer Rpt. (Dkt. 54) at p. 2.)

DEFENDANTS' RESPONSE: Undisputed.

4. Professor Mayer has published numerous articles in peer-reviewed journals on the topics of American politics, the presidency, Congress, campaign finance, election law, and electoral systems. (Mayer Rpt. (Dkt. 54) at pp. 3-4; Mayer Decl. (Dkt. 59-1) at pp. 2-7.)

DEFENDANTS' RESPONSE: Undisputed.

5. Both Professor Mayer and Professor Jackman were already highly experienced in studying and analyzing the principles of partisan symmetry on which the efficiency gap is based before this lawsuit was filed, and both are have years of experience as political scientists on which they base their calculations of the metrics for any district plan.

DEFENDANTS' RESPONSE: Disputed. The plaintiffs cite to no evidence in support of this proposed finding.

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** The statement in APFOF ¶ 5 is fully supported by the citations in APFOF ¶¶ 1-4.

6. Wasted votes are votes that are cast either for a losing candidate ("lost votes") or for a winning candidate but in excess of what he or she needed to prevail ("surplus votes"). (Jackman Rpt. (Dkt. 62) at pp. 15-16.)

DEFENDANTS' RESPONSE: Undisputed. but only to the extent this is a description of the definition of the term the plaintiffs use in this case.

7. The efficiency gap measures the extent to which one party's voters are more cracked and packed than the other's, and so provides a single intuitive figure (expressed as a negative value for a pro-Republican gap and a positive value for a pro-Democratic gap) that can be used to assess the existence and extent of partisan gerrymandering and to compare one plan's partisan impact to another's. (Jackman Rpt. (Dkt. 62) at pp. 15-16.)

DEFENDANTS' RESPONSE: Disputed. The "existence and extent of partisan gerrymandering" is a question of law, not of fact. [See legal briefs]

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether the efficiency gap measures the extent to which one party's voters are more cracked and packed than the other's, and so provides a single intuitive figure (expressed as a negative value for a pro-Republican gap and a positive value for a pro-Democratic gap) that can be used to compare one plan's partisan impact to another's. Professor Jackman's opinion is that the efficiency gap can be used to assess the existence and extent of partisan gerrymandering, though whether that political science opinion supports a finding of a constitutional violation is a question of law. (Jackman Rpt. (Dkt. 62) at pp. 15-16.)

8. Professor Jackman calculated the efficiency gap for every state house election for which data was available over the period from 1972 to 2014, using actual election results. To do so, he did not aggregate wasted votes district by district, but rather used a simplified computation method based on statewide electoral data. (Jackman Rep. (Dkt. 62) at p. 16.)

DEFENDANTS' RESPONSE: Disputed. Jackman calculated the efficiency gap for "general election results since 1972 in states whose lower houses are elected via single-member districts, or where single-member districts are the norm" available in the data set "available from the Inter-University Consortium for Political and Social Research." (Jackman Rep. (Dkt. 62) at 20.) The defendants do not dispute the second sentence of the proposed finding.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether Jackman calculated the efficiency gap for 786 state house elections from 1972 to 2014, using actual election results. (Defendant's PFOF (Dkt. 47) ¶ 129.)

9. Defendants' expert, Professor Goedert, "concur[s] that th[e] shortcut [used by Professor Jackman] is an appropriate and useful summary measure of [the] efficiency gap." (Goedert Rpt. (Dkt. 51) at p. 5; Goedert Dep. (Dkt. 65) at 70:17-73:2.)

DEFENDANTS' RESPONSE: Undisputed.

10. Using the simplified method for Wisconsin's Current Plan, Professor Jackman arrived at an efficiency gap of -13% in 2012 and -10% in 2014. (Jackman Rpt. (Dkt. 62) at p. 4.)

DEFENDANTS' RESPONSE: Undisputed.

11. Professor Jackman also found that, from 1972 to 2010, not a single map in the country was as asymmetric as the Plan in its first two elections, and that there is nearly a 100% likelihood that the Plan will continue to disadvantage Democrats throughout its lifespan. (Jackman Rpt. (Dkt. 62) at pp. 4-5, 63-73.)

DEFENDANTS' RESPONSE: Disputed. The defendants do not dispute that Jackman found that, from 1972 to 2010, not a single map in the country was as asymmetric, as measured by his method of calculating the efficiency gap, as the Plan in its first two

elections. The defendants dispute the remainder of the proposed finding. Jackman found that "[t]he probability that the Wisconsin plan—if left undisturbed—will turn out to have a positive, pro-Democratic, average efficiency gap is for all practical purposes zero." (Jackman Rebuttal Rep. (Dkt. 63) at 16.)

PLAINTIFFS' REPLY **Defendants fail to create a genuine dispute** because Professor Jackman found that there is essentially a 100% likelihood *both* that the Current Plan will never favor Democrats in any given year (Jackman Rpt. (Dkt. 62) at pp. 4-5, 63-73), *and* that the Current Plan's average efficiency gap will be pro-Republican (Jackman Rebuttal Rpt. (Dkt. 63) at p. 16).

12. Professor Jackman opined that any plan that gives rise to an efficiency gap of 7% or more in its first election is likely to create a partisan advantage that will endure for the remainder of the decade. (Jackman Rpt. (Dkt. 62) at pp. 56-69; Jackman Rebuttal Rpt. (Dkt. 63) at pp. 5-17; Jackman Decl. Ex. D (Dkt. 58-4) at pp. 1-6.)

DEFENDANTS' RESPONSE: **Disputed.** Jackman performed a historical analysis that "compute[d] this probability of a sign flip in EG conditional on the magnitude of the EG observed with the first election under a districting plan." (Jackman Rep. (Dkt. 62) at 60.) He found "Districting plans unfavorable to Democrats, with EG < −.07 are not unusual; about 10% of post-1990 plans generate EG measures below -.07; the proportion of these plans that then record a sign flip is only about 10%." (Jackman Rep. (Dkt. 62) at 66.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** because they do not cite the Jackman Rebuttal Report in addition to the Jackman Report. In his Rebuttal Report, Professor Jackman carries out several additional analyses confirming the reasonableness and conservatism of the suggested 7% threshold, including a series of prognostic tests, a comparison of plans' initial and lifetime efficiency gaps, and sensitivity testing for all current plans. (Jackman Rebuttal Rpt. (Dkt. 63) at pp. 5-17; Jackman Decl. Ex. D (Dkt. 58-4) at pp. 1-6.) He concludes that there is "powerful evidence that (a) first-election *EG* estimates are predictive with respect to the *EG* estimates that will be observed over the life of the plan; and (b) the threshold values of +/- 0.07 are conservative, generating high-confidence predictions as to the behavior of the district plan in successive elections." (Jackman Rebuttal Rpt. (Dkt. 63) at p. 16.)

13. Unlike Professor Jackman, Professor Mayer used the full method to calculate the efficiency gap, tallying wasted votes on a district-by-district basis. (Mayer Rpt. (Dkt. 54) at pp. 5-10.)

DEFENDANTS' RESPONSE: **Undisputed.**

14. Also unlike Professor Jackman, Professor Mayer did not use actual vote totals. Instead, because he was comparing an actual with a hypothetical plan, he used a regression analysis to estimate what the wasted votes would have been in each district, under both the Current Plan and his Demonstration Plan. (Mayer Rpt. (Dkt. 54) at pp. 8-18.)

DEFENDANTS' RESPONSE: **Undisputed.**

15. Professor Mayer's results were remarkably similar to those generated by Professor Jackman using actual results, with Professor Jackman calculating a -13% efficiency gap for the Current Plan in 2012 and Professor Mayer calculating a -12% efficiency gap for the Current Plan in 2012. (Jackman Rpt. (Dkt. 62) at p. 72; Mayer Rpt. (Dkt. 54) at p. 46.)

DEFENDANTS' RESPONSE: **Disputed.** Mayer and Jackman calculated the efficiency gap using different numbers of seats won by the Republicans, with Mayer using 57 Republican seats and Jackman using 60 seats. Not "remarkably similar."

> **PLAINTIFFS' REPLY:** **Defendants fail to create a genuine dispute** because the efficiency gap calculated by Professor Mayer is within the credible interval range of Professor Jackman's point estimate for the Current Plan's 2012 efficiency gap and therefore can be considered "remarkably similar." (Jackman Rpt. (Dkt. 62) at p. 72.)

16. Professor Mayer also found that his Demonstration Plan would have had an efficiency gap of only -2% in 2012, which is more than 80% smaller than the Current Plan. (Mayer Rpt. (Dkt. 54) at p. 46.)

DEFENDANTS' RESPONSE: **Undisputed.**

17. Professor Mayer further determined that the baseline partisanship estimates prepared prior to the 2012 election by the Legislature's consultant, Professor Keith Gaddie, corresponded to an efficiency gap of -12% for the Current Plan. (Mayer Rpt. (Dkt. 54) at p. 46.)

DEFENDANTS' RESPONSE: **Undisputed.**

II. National Trends in the Efficiency Gap and Their Explanations

18. Professor Jackman's work shows that over the modern redistricting era, from 1972 to 2014, the average efficiency gap of state house plans has been -0.5%, or almost exactly zero. (Jackman Rpt. (Dkt. 62) at p. 35.)

DEFENDANTS' RESPONSE: Disputed. Professor Jackman's work shows that over the modern redistricting era, from 1972 to 2014, the average efficiency gap of state house plans has been -0.5%. Defendants dispute that this is "almost exactly zero."

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to the cited fact that Professor Jackman's work shows that the average efficiency gap of state house plans from 1972 to 2014 has been -0.5%. (Jackman Rpt. (Dkt. 62) at p. 35.)

19. Over the modern redistricting era, from 1972 to 2014, the average efficiency gap for congressional plans has been almost exactly zero. (Nicholas O. Stephanopoulos & Eric M. McGhee, Partisan Gerrymandering and the Efficiency Gap, 82 U. Chi. L. Rev. 831, 869-70 (2015), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2457468.)

DEFENDANTS' RESPONSE: 19: Disputed. Stephanopoulos and McGhee determined there was an "average efficiency gap[] of . . . -0.32 percent for state houses." 82 U. Chi. L. Rev. 831, 869 (2015).

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to the fact that Stephanopoulos and McGhee found that the average efficiency gap for congressional plans has been "-0.20 seats for Congress" and that "this imbalance is relatively trivial" and "hovers around zero." (*Id*. at 869.)

20. In the last three redistricting cycles, however, state house plans have become steadily more pro-Republican, with their average efficiency gap dropping from -0.6% in the 1990s to -2.1% in the 2000s to -3.2% in the 2010s. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 20.)

DEFENDANTS' RESPONSE: Undisputed.

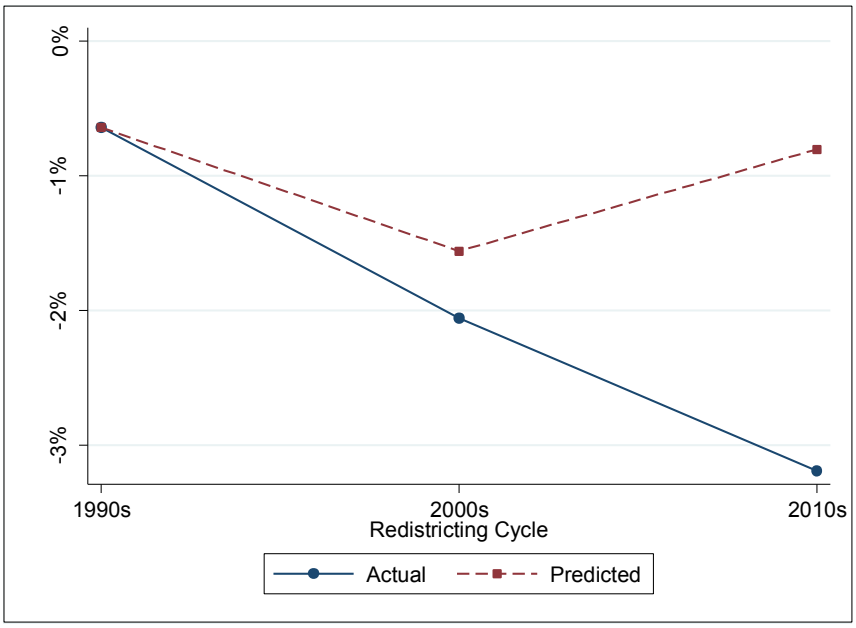
21. The proportion of plans that were designed by Republicans in full control of state government increased from about 10% in the 1990s to about 20% in the 2000s to about 40% in the 2010s. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 19; Trende Dep. (Dkt. 66) at 79:11-23.)

DEFENDANTS' RESPONSE: Undisputed.

22. By comparison, fewer than 20% of current plans were designed by Democrats in full control of the state government. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 19.)

DEFENDANTS' RESPONSE: Undisputed.

23. The chart below shows how the average efficiency gap of state house plans would have changed from the 1990s to the 2010s if the distribution of party control over redistricting had remained constant over this period.



(Jackman Rebuttal Rpt. (Dkt. 63) at p. 20; Jackman Decl. Ex. F (Dkt. 58-6).)

DEFENDANTS' RESPONSE: Disputed. The chart does not show what the average efficiency gap of all state house plans would have been because Jackman's analysis did not consider plans enacted without unified partisan control. His rebuttal report says "The omitted category is any other institution responsible for redistricting, such as divided government, a court, or a commission." (Jackman Rebuttal Rep. (Dkt. 63) at 20.) Jackman says plans without partisan control accounted for 60% of plans in the 1990s and 40% of plans in the 2010s. (Jackman Rebuttal Rep. (Dkt. 63) at 18.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether the chart shows what the average efficiency gap of state house plans would have been if the distribution of party control over redistricting had remained constant over this period. Professor Jackman included *all* plans in his analysis. In his *regression model*, Professor Jackman properly omitted one of the three dummy variables for control over redistricting, namely the dummy variable for "any other institution responsible for redistricting, such as divided government, a court, or a commission." (Jackman Rebuttal Rep. (Dkt. 63) at 19.) It is an elementary statistical point that of a series of dummy variables that collectively account for all cases in the analysis, one must be omitted from the model. The coefficients for the remaining dummy variables then indicate their impact relative to the omitted variable.

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24. The average efficiency gap would barely have changed if the distribution of party control over redistricting had remained constant from 1990 to 2010, going from -0.6% only to -0.8%. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 20.)

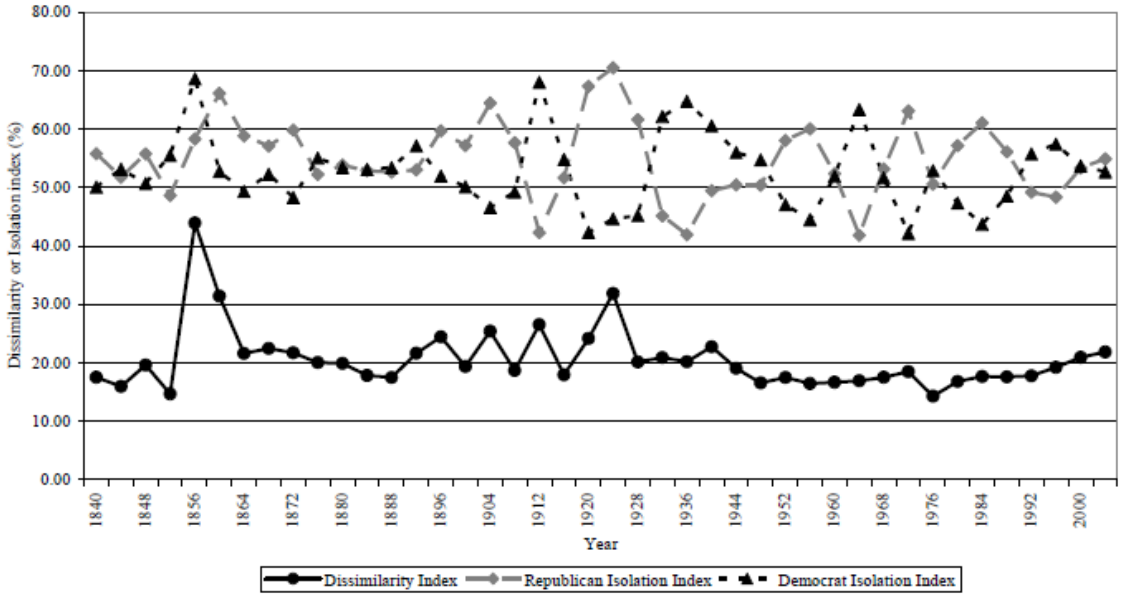
DEFENDANTS' RESPONSE: Disputed. Jackman's analysis does not show what the average efficiency gap of all state house plans would be because Jackman's analysis did not consider plans enacted without unified partisan control. His rebuttal report says "The omitted category is any other institution responsible for redistricting, such as divided government, a court, or a commission." (Jackman Rebuttal Rep. (Dkt. 63) at 20.) Jackman says plans without partisan control accounted for 60% of plans in the 1990s and 40% of plans in the 2010s. (Jackman Rebuttal Rep. (Dkt. 63) at 18.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether Professor Jackman's analysis shows that the average efficiency gap would barely have changed if the distribution of party control had remained constant from 1990 to 2010. Professor Jackman included *all* plans in his analysis. In his *regression model*, Professor Jackman properly omitted one of the three dummy variables for control over redistricting, namely the dummy variable for "any other institution responsible for redistricting, such as divided government, a court, or a commission." (Jackman Rebuttal Rep. (Dkt. 63) at 19.) It is an elementary statistical point that of a series of dummy variables that collectively account for all cases in the analysis, one must be omitted from the model. The coefficients for the remaining dummy variables then indicate their impact relative to the omitted variable.

25. Edward Glaeser and Bryce Ward calculated what is known as the isolation index for Democratic and Republican voters by county from 1840 to 2004. This index indicates, for the average Democratic or Republican voter, what share of his or her fellow county residents are also Democrats or Republicans. (Edward L. Glaeser & Bryce Adam Ward, Myths and Realities of American Political Geography (2005) (Dkt. 59-3) at pp. 5-6.)

DEFENDANTS' RESPONSE: Undisputed.

26. As the below chart reveals, over the last half-century, both Democratic and Republican isolation scores have been close to 50%, oscillating over a range from roughly 40% to 60%.



(Edward L. Glaeser & Bryce Adam Ward, Myths and Realities of American Political Geography 39 (2005), Mayer Decl. Ex. C (Dkt. 59-3) at p. 39.)

DEFENDANTS' RESPONSE: **Undisputed** that this is the range calculated by Glaeser and Ward.

27. In the final election covered by the Glaeser and Ward study (2004), "[t]he isolation index . . . was 53.4 percent for Republicans and 52.6 percent for Democrats." Thus "[t]he isolation measures show even less of a trend." (Mayer Decl. Ex. C (Dkt. 59-3) at p. 6.)

DEFENDANTS' RESPONSE: **Undisputed.**

28. For both 2012 and 2014, Professor Goedert constructed models with a measure essentially identical to the efficiency gap as the dependent variable, along with the following independent variables: whether a plan was designed by Democrats or Republicans in full control of the state government or through a bipartisan or nonpartisan process; each state's proportions of black and Hispanic residents; each state's level of urbanization; the Democratic share of the statewide vote; and the number of seats in each state. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 6; Nicholas Goedert, The Case of the Disappearing Bias: A 2014 Update to the "Gerrymandering or Geography (2015), Goedert Dep. Ex. 21 (Dkt. 65-3) at p.13; Goedert Dep. (Dkt. 65) at 79:24-80:3.)

DEFENDANTS' RESPONSE: **Disputed.** The proposed finding misstates Professor Goedert's research. To analyze the results of the congressional elections in both 2012 and 2014, Professor Goedert constructed three different models, one of which used a measure

essentially identical to the efficiency gap as the dependent variable, along with the following independent variables: whether a plan was designed by Democrats or Republicans in full control of the state government or through a bipartisan or nonpartisan process; each state's proportions of black and Hispanic residents; the percentage of the state deemed urbanized by the U.S. Census; the Democratic share of the statewide vote; and the number of seats in each state. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 1, 5-6; Nicholas Goedert, The Case of the Disappearing Bias: A 2014 Update to the "Gerrymandering or Geography (2015), Goedert Dep. Ex. 21 (Dkt. 65-3) at p.13; Goedert Dep. (Dkt. 65) at 79:24-80:3, 81:23-82:1.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether Professor Goedert constructed a model in his analysis of the 2012 and 2014 elections that uses a measure essentially identical to the efficiency gap as the dependent variable, along with the following independent variables: whether a plan was designed by Democrats or Republicans in full control of the state government or through a bipartisan or nonpartisan process; each state's proportions of black and Hispanic residents; the percentage of the state deemed urbanized by the U.S. Census; the Democratic share of the statewide vote; and the number of seats in each state.

29. Both of Professor Goedert's models have large R-squared values (0.829 in 2012, 0.570 in 2014), indicating that the models account for a large fraction of the variance in the efficiency gap. (Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 6; Goedert Dep. Ex. 21 (Dkt. 65-3); Goedert Dep. (Dkt. 65) at 79:24-80:3.)

DEFENDANTS' RESPONSE: Disputed. Goedert's model does not predict an efficiency gap. The dependent variable in Goedert's model "is the deviation in democratic seats won from historical expectation given a certain vote share." (Goedert Dep. (Dkt. 60) at 77:9-11.) His model "ends up I think rather coincidentally being very close to efficiency gap when one party wins say between 40 and 60 percent of the vote." (Goedert Dep. (Dkt. 60) at 77:20-23.)

Goedert's model examines congressional elections. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 1, 5-6.) Therefore it cannot be used to determine anything with respect to state legislative elections, which the proposed finding implies.

Goedert's model is intended to "give a prediction about the average impact of" the dependent variables "given that the electoral conditions are identical to the electoral conditions in a particular election." (Goedert Dep. (Dkt. 60) at 76:22-25.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether Professor Goedert's dependent variable is "a measure essentially

identical to the efficiency gap" (Defs.' Resp. to Pls.' [Additional] Proposed Findings of Fact ("Defs.' APFOF Resp.") (Dkt. 76) no. 28.) Defendants' response also does not dispute that Professor Goedert's models have high R-squared values, which indicate that the models account for a large fraction of the variance in the measure that is "essentially identical to the efficiency gap." (Id.) Further, the only material difference here between congressional and state house plans is the number of districts in the plan. The predicted efficiency gap's *size* would likely be smaller for a state house plan given its larger number of districts, but the predicted efficiency gap's *partisan direction* would remain the same. (Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 57 Q.J. POL. SCI. 239, 252 (2013).) In other words, Professor Goedert's predictions for congressional plans are applicable to state house plans too, at least with respect to the partisan direction of the estimates.

30. Professor Goedert's models can be used to predict what the efficiency gap would have been in 2012 and 2014 in a state that resembled the country as a whole—demographically, geographically, and electorally—if that state's plan was designed through a bipartisan or nonpartisan process. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 15-16; Goedert Dep. (Dkt. 65) at 90:12-18.)

DEFENDANTS' RESPONSE: Disputed. Goedert's model does not predict an efficiency gap. The dependent variable in Goedert's model "is the deviation in democratic seats won from historical expectation given a certain vote share." (Goedert Dep. (Dkt. 60) at 77:9-11.) His model "ends up I think rather coincidentally being very close to efficiency gap when one party wins say between 40 and 60 percent of the vote." (Goedert Dep. (Dkt. 60) at 77:20-23.) Goedert's model examines congressional elections. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 1, 5-6.) Therefore it cannot be used to determine anything with respect to state legislative elections, which the proposed finding implies. Goedert's model is intended to "give a prediction about the average impact of" the dependent variables "given that the electoral conditions are identical to the electoral conditions in a particular election." (Goedert Dep. (Dkt. 60) at 76:22-25.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether Professor Goedert's dependent variable is "a measure essentially identical to the efficiency gap" (Defs.' APFOF Resp. (Dkt. 76) no. 28.) Additionally, the only material difference here between congressional and state house plans is the number of districts in the plan. The predicted efficiency gap's *size* would likely be smaller for a state house plan given its larger number of districts, but the predicted efficiency gap's *partisan direction* would remain the same. (Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 57 Q.J. POL. SCI. 239, 252 (2013).) In other words, Professor Goedert's predictions for congressional plans apply to state house plans too, at least with respect to the partisan direction of the estimates.

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31. Plugging the appropriate values of the independent variables into th [sic] models reveals that the typical state would have had a pro-Democratic efficiency gap of 0.7% in 2012, and a pro-Democratic efficiency gap of 1.6% in 2014, if its map had been drawn by a court, a commission, or divided state government. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 15-16.)

DEFENDANTS' RESPONSE: Disputed. Goedert's model does not predict an efficiency gap. The dependent variable in Goedert's model "is the deviation in democratic seats won from historical expectation given a certain vote share." (Goedert Dep. (Dkt. 60) at 77:9-11.) His model "ends up I think rather coincidentally being very close to efficiency gap when one party wins say between 40 and 60 percent of the vote." (Goedert Dep. (Dkt. 60) at 77:20-23.)

Goedert's model examines congressional elections. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 1, 5-6.) Therefore it cannot be used to determine anything with respect to state legislative elections, which the proposed finding implies.

The finding of fact does not specify that Goedert's model relates only to states with seven or more congressional districts. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 1.) Goedert at the deposition testified the demographic information in the hypothetical "includes states the model is not meant to apply to." (Goedert Dep. (Dkt. 92:3-7.) Further, the findings' use of a purportedly "typical state" has no basis in reality. There is no "typical state" that "resemble[s] the country as a whole—demographically, geographically, and electorally."

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to whether Professor Goedert's dependent variable is "a measure essentially identical to the efficiency gap" (Defs.' APFOF Resp. (Dkt. 76) no. 28.) Defendants also do not dispute that the demographic, geographic, and political data corresponds to the average for the United States, or that, using the data, Professor Goedert's models produce the specified estimates. Additionally, the only material difference here between congressional and state house plans is the number of districts in the plan. The predicted efficiency gap's *size* would likely be smaller for a state house plan given its larger number of districts, but the predicted efficiency gap's *partisan direction* would remain the same. (Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 57 Q.J. POL. SCI. 239, 252 (2013).) In other words, Professor Goedert's predictions for congressional plans are applicable to state house plans too, at least with respect to the partisan direction of the estimates.

32. But, as explained in Professor Jackman's rebuttal report, "there are several issues with [Jowei Chen & Jonathan Rodden, Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures, 57 Q.J. Pol. Sci. 239 (2013)] that make it inapplicable

here." (Jackman Rebuttal Rpt. (Dkt. 63) at p. 20.)

DEFENDANTS' RESPONSE: Disputed. The question of whether Chen & Rodden's work is "applicable here" is a question of law for the Court, not a question of fact for an expert witness.

> **PLAINTIFFS' REPLY: Raises a dispute material to legal issues pending before the court and cannot be resolved at summary judgment**. Whether Chen and Rodden's methodology is sound and makes sense as applied to this case is also a question of fact on which experts may opine. At the very least this is a mixed issue of law and fact that requires further consideration by the Court.

33. Chen and Rodden's simulated plans completely ignore the Voting Rights Act as well as state legal requirements such as respect for political subdivisions and respect for communities of interest, which are in effect in a majority of states. (Jackman Rebuttal Rpt. (Dkt. 63) at pp. 20-21; Goedert Dep. (Dkt. 65) at 154:20-55:3; Trende Dep. (Dkt. 66) at 67:10-21.)

DEFENDANTS' RESPONSE: Undisputed.

34. Chen and Rodden use only presidential election results from 2000 in their analysis. They do not use state legislative election results (which are more relevant to the issue of state legislative partisan gerrymandering) or results from more recent years. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 21.)

DEFENDANTS' RESPONSE: Disputed. Defendants do not dispute that Chen and Rodden use only presidential election results from 2000 in their analysis and that they do not use state legislative election results or results from more recent years.

Defendants dispute that state legislative election results "are more relevant to the issue of partisan gerrymandering." Chen and Rodden are simulating election results of elections that did not take place. Professor Mayer creates a model that uses presidential vote shares to predict legislative vote shares and plaintiffs below claim "this sort of modeling is the appropriate (in fact, the only) way to assess proposed maps under which no elections have been held," APFOF ¶ 93. In his report, Mayer says "[t]he presidential vote is, not surprisingly, an extremely strong predictor of the legislative vote." (Mayer Rep. (Dkt. 54) at 13.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to whether presidential or state legislative election results are more relevant to the issue of state legislative partisan gerrymandering. Chen and Rodden use *only* presidential election results in their analysis. By contrast, Professor Mayer uses presidential election results as an independent variable in a model in which the *dependent* variable is state legislative election results. (Mayer Rpt. (Dkt. 54) at pp. 10-21.) His work is thus not subject to this criticism.

35. Chen and Rodden's simulated maps do not actually constitute a representative sample of all possible maps that satisfy their criteria. Because of flaws in their simulation algorithm, their maps capture only an arbitrary subset of the entire solution space. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 21; Benjamin Fifield et al., A New Automated Redistricting Simulator Using Markov Chain Monte Carlo (2015), Jackman Decl. Ex. H (Dkt. 58-8) at pp. 2- 3.)

DEFENDANTS' RESPONSE: **Disputed.** The cited evidence does not explain how Chen and Rodden's simulated maps do not "constitute a representative sample of all possible maps that satisfy their criteria." Defendants are unsure of the meaning of the phrase "arbitrary subset of the entire solution space," but Chen and Rodden's article explains their methodology and why it is not "arbitrary." (Dkt. 49-13:10-13.)

> **PLAINTIFFS' REPLY:** **Defendants fail to create a genuine dispute.** Fifield et al. explain why Chen and Rodden's simulated maps do not constitute a representative sample: "In fact, most, if not all, of these existing studies use essentially the same Monte Carlo simulation algorithm where a geographical unit is randomly selected as a 'seed' for each district and then neighboring units are added to contiguously grow this district until it reaches the pre-specified population threshold (e.g., Cirincione et al., 2000; Chen and Rodden, 2013). Unfortunately, no theoretical justification is given for these existing simulation algorithms, and some of them are best described as ad-hoc." Fifield et al. also comment as to Chen and Rodden's methods: "the algorithms come with no theoretical result and are not even designed to uniformly sample redistricting plans even though researchers have a tendency to assume that they are." (Benjamin Fifield et al., A New Automated Redistricting Simulator Using Markov Chain Monte Carlo (2015); Jackman Decl. Ex. H (Dkt. 58-8) at pp. 2, 16.)

36. Chen and Rodden's results are directly contradicted by other recent work using a nearly identical methodology. Roland Fryer and Richard Holden also simulated plans with contiguous, compact, and equipopulous districts for multiple states. But they found that, "[u]nder maximally compact districting, measures of Bias are slightly smaller in all states except [one]." And not only are the biases slightly smaller, they are also slightly pro-Democratic in all cases. (Roland Gerhard Fryer & Richard Holden, Measuring the Compactness of Political Districting Plans, 54 J.L. & Econ. 493 (2011), Goedert Dep. Ex. 18 (Dkt. 65-1) at pp. 514-15; Jackman Rebuttal Rpt. (Dkt. 63) at p. 21.)

DEFENDANTS' RESPONSE: **Disputed.** The research of Fryer and Holden does not contradict the research of Chen and Rodden and does not "us[e] a nearly identical methodology." Fryer and Holden "estimat[ed] a counterfactual of the 2000 congressional elections in California, New York, Pennsylvania and Texas using optimally compact districts derived from our algorithm." (Dkt. 65-1:6.) They then "estimate[d] a seat-vote curve for the actual and hypothetical districting plans of each state." (Dkt. 65-1:6.) They found that "[u]nder maximally compact districting, measures of Bias are slightly smaller in all states except Pennsylvania, although none of the differences are statistically significant." (Dkt. 65-1:24.)

Fryer and Holden's analysis compares the bias of plans in place during the 2000 election to the bias present in a simulated election under their algorithm's version of a maximally compact plan. They do not attempt to analyze the likelihood that bias against one party would appear through the districting process itself by using multiple randomly generated districts, as Chen and Rodden do.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Fryer and Holden's "optimally compact districts" are extremely similar to Chen and Rodden's distributions of plans with compact districts. This is evident from comparing the authors' simulated congressional plans for Florida, the state on which Chen and Rodden focus. (Roland Gerhard Fryer & Richard Holden, *Measuring the Compactness of Political Districting Plans*, 54 J.L. & Econ. 493, 531 (2011); Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 57 Q.J. POL. SCI. 239, app. at 1 (2013).) Both sets of authors also calculate the same measure of partisan asymmetry, partisan bias, for their simulated compact plans. However, Fryer and Holden find that their simulated compact plans have small *pro-Democratic* biases in all cases, thus directly contradicting Chen and Rodden's key findings. (Fryer & Holden, *supra*, at 514-15.)

37. The only other evidence defendants cite in support of their claim that Democrats are becoming more clustered nationwide is the opinion of their expert (Sean Trende) based on his analysis of a set of maps comparing county-level presidential election results in 1996 and 2012 in the West South Central region of the country. (Trende Decl. (Dkt. 55) ¶¶ 66-68.)

DEFENDANTS' RESPONSE: Disputed. The defendants present the trend of efficiency gaps in favor of Republicans beginning in the 1990s, even under plans drawn with no partisan intent, as evidence that Democrats have become more clustered. (Dkt. 47 ¶¶ 141-50, 164-70, 180-84, 201-216.) Defendants do not dispute that they also present the analysis of Sean Trende mentioned in this finding in support of Democrats' increased clustering.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Defendants identify no evidence that the pro-Republican trend in the efficiency gap since the 1990s is attributable to the growing clustering of Democratic voters. In fact, as demonstrated by Professor Jackman using rigorous regression analysis, "it is the change in party control that appears to account for essentially all of the pro-Republican trend in the efficiency gap over the past two decades—and not, as claimed by Trende and Goedert, a dramatic alteration of the country's political geography." (Trende Dep. (Dkt. 66) at 59:2-23; Jackman Rebuttal Rpt. (Dkt. 63) at p. 20.)

38. Trende admits that there are no "peer-reviewed studies that have analyzed the geographic clustering of Democratic and Republican voters by examining trends in counties won by each part[y's] presidential candidate." (Trende Dep. (Dkt. 66) at 51:6-11.)

DEFENDANTS' RESPONSE: Undisputed.

39. Trende admits that the maps he relied upon make no adjustment for counties' wildly divergent populations. (Trende Dep. (Dkt. 66) at 52:25-53:3; Goedert Dep. (Dkt. 65) at 186:5-7.)

DEFENDANTS' RESPONSE: Disputed. Trende admits that his maps make no adjustment for population differences and that the counties "do vary in population size." (Trende Dep. (Dkt. 66) at 53:2.) The cited evidence does not support the finding that the population differences are "wildly divergent."

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute**. Trende agrees that the counties in his maps "vary enormously in population size," and that "there are differences on the order of at least 1,000 times" in county population. (Trende Dep. (Dkt. 66) at 52:25-53:16.) Professor Goedert also admitted that Wisconsin's counties vary dramatically in size, with some being "very very large." (Goedert Dep. (Dkt. 65) at 186:8-25.)

40. Trende admits that the maps do not display each party's margin of victory in each county. (Trende Dep. (Dkt. 66) at 52:3-6.)

DEFENDANTS' RESPONSE: Undisputed.

41. Trende admits that the maps are based on presidential rather than state legislative election results. (Trende Dep. (Dkt. 66) at 53:25-54:13.)

DEFENDANTS' RESPONSE: Undisputed.

42. Trende admits that the maps do not generate any quantitative measure of partisan clustering over time, but rather are simply meant to be "eyeball[ed]." (Trende Dep. (Dkt. 66) at 59:2-8.)

DEFENDANTS' RESPONSE: Disputed. Trende did not say that his maps are meant to be "eyeball[ed]." This was a statement by counsel to which Trende did not agree. (Trende Dep. (Dkt. 66) at 59:2-8.) Trende testified that "a court can look at [the map] and pretty clearly see what's going on in the state." (Trende Dep. (Dkt. 66) at 59:15-17.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to the fact that Trende does not provide any quantitative measure of partisan clustering. Whether one calls his method an "eyeball" test or a test where one "can look [at the map] and pretty clearly see what's going on," the fact remains that this method is not quantitative, nor used in any peer-reviewed studies. (Trende Dep. (Dkt. 66) at 51:6-11; 59:15-17; Defs.' APFOF Resp. (Dkt. 76) ¶ 38.)

III. Wisconsin's Political Geography

43. The three-judge federal district court in Baumgart v. Wendelberger, 2002 WL 34127471 (E.D. Wis. May 30, 2002) did not consider likely electoral effects, and adopted a plan more similar to that submitted by the Republican intervenors than to the one offered by the Democratic intervenors. (Id. at *7; Mayer Dep. (Dkt. 52) at 121:7-16.)

DEFENDANTS' RESPONSE: Disputed. The three-judge federal district court in Baumgart v. Wendelberger, 2002 WL 34127471 (E.D. Wis. May 30, 2002) did consider districting for "political fairness" as suggested by the Democrats in that case. Id. at *6. The court rejected using this as a criteria for districting because "using this finding as the basis for a plan is that it does not take into account the difference between popular and legislative majorities, and the fact that, practically, there is no way to draw plans which use the traditional criteria and completely avoid this result." Id. Given that "Wisconsin Democrats tend to be found in high concentrations in certain areas of the state, [] the only way to assure that the number of seats in the Assembly corresponds roughly to the percentage of votes cast would be at-large election of the entire Assembly." Id. The court rejected the plans submitted by both Republicans and Democrats and "undertook its redistricting endeavor in the most neutral way it could conceive—by taking the 1992 reapportionment plan as a template and adjusting it for population deviations." Id. at *7. The court nowhere mentions that its plan is closer to the one offered by the Republicans and neither does Mayer's deposition.

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to the fact that the court in *Baumgart v Wendelberger* 2002 WL 34127471 (E.D. Wis. May 30, 2002) did not use "political fairness" as a criterion in drawing its remedy plan. The court's plan was also more similar to the Republican intervenors' proposal than to that of the Democratic intervenors in terms of population deviation, municipality splits, and the number of voters disenfranchised with respect to Senate elections. *Id*. at *7.

44. The average efficiency gap of the Wisconsin state house redistricting plan from 1972-1980 was -0.3% and it was drawn by divided government. (Jackman Rpt. (Dkt. 62) at p. 72; Jackman Decl. Ex. F (Dkt. 58-6) at p. 3.)

DEFENDANTS' RESPONSE: Undisputed.

45. The average efficiency gap of the Wisconsin state house redistricting plan from 1982-1990 was -1.9%, and it was drawn by a court. (Jackman Rpt. (Dkt. 62) at p. 72; Jackman Decl. Ex. F (Dkt. 58-6) at p. 11.)

DEFENDANTS' RESPONSE: Undisputed.

46. The average efficiency gap of the Wisconsin state house redistricting plan from 1992-2000 was -2.4%, and it was drawn by a court. (Jackman Rpt. (Dkt. 62) at p. 72; Jackman Decl. Ex. F (Dkt. 58-6) at p. 18.)

DEFENDANTS' RESPONSE: Undisputed.

47. The average efficiency gap of the Wisconsin state house redistricting plan from 2002-2010 was -7.6%, and it was drawn by a court. (Jackman Rpt. (Dkt. 62) at p. 72; Jackman Decl. Ex. F (Dkt. 58-6) at p. 25.)

DEFENDANTS' RESPONSE: **Undisputed.**

48. The average efficiency gap for the Demonstration Plan drawn by Professor Mayer is calculated by averaging the efficiency gaps for the three scenarios that Professor Mayer used in conducting his sensitivity testing. These are "D minus 5" (1.96%); "My Plan Incumbent Baseline" (3.71%); and "D plus 3" (3.85%), resulting in an average efficiency gap of -1.9% (Mayer Rebuttal Rpt. (Dkt. 64) at p. 26.)

DEFENDANTS' RESPONSE: **Disputed.** The plaintiffs have consistently presented pro-Republican efficiency gaps as negative, but this proposed finding treats pro-Republican efficiency gaps as positive. For the Demonstration Plan, Mayer calculates an efficiency gap of 1.96% under his "D minus 5" model, and efficiency gap of -3.71% for his "My Plan Incumbent Baseline" model, and of -3.85 under his "D Plus 3" model. (Mayer Rebuttal Rpt. (Dkt. 64) at p. 26.) The average of these efficiency gap models is -1.86%. The sum of the efficiency gaps is -5.6 (1.96 + -3.71 + -3.85 = -5.6), which divided by 3 is -1.86.

> **PLAINTIFFS' REPLY:** **Defendants fail to create a genuine dispute** as to the fact that the average efficiency gap calculated by Professor Mayer under the sensitivity testing is -1.86% (or -1.9% rounded to one decimal place). Plaintiffs' summary of Professor Mayer's results inadvertently omitted a negative sign for two of the results ("D plus 3" should be listed as -3.85%, and "My Plan Incumbent Baseline" should be listed as -3.71%), but the final conclusion of an average efficiency gap of -1.9% contains no typographical error.

49. In his rebuttal report, Professor Mayer plugged in Wisconsin's values for Goedert's models' independent variables (6.6% black, 6.5% Hispanic, 70.2% urbanized, 50.8% Democratic in 2012, and 47.2% Democratic in 2014) and assumed a bipartisan or nonpartisan redistricting process. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 15-16.)

DEFENDANTS' RESPONSE: **Disputed.** In his rebuttal report, Professor Mayer plugged Wisconsin's values (6.6% black, 6.5% Hispanic, 70.2% urbanized, 50.8% Democratic congressional vote share in 2012, and 47.2% Democratic congressional vote share in 2014) into Goedert's model for congressional elections in 2012 and assumed a bipartisan or nonpartisan redistricting process. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at 5-6; Mayer Rebuttal Rpt. (Dkt. 64) at pp. 15-16.)

> **PLAINTIFFS' REPLY:** **Defendants fail to create a genuine dispute** as to the fact that, in his rebuttal report, Professor Mayer plugged in relevant statistics for Wisconsin into Professor Goedert's models for 2012 and 2014, respectively. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 15-16.)

50. The results of this analysis were a pro-Democratic efficiency gap of 1.9% in 2012, and a pro-Democratic efficiency gap of 4.4% in 2014. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 15-16; Goedert Dep. (Dkt. 65) at 85:7-20.)

DEFENDANTS' RESPONSE: Disputed. Professor Goedert's model does not predict an efficiency gap. The dependent variable in Goedert's model "is the deviation in democratic seats won from historical expectation given a certain vote share." (Goedert Dep. (Dkt. 60) at 77:9-11.) His model "ends up I think rather coincidentally being very close to efficiency gap when one party wins say between 40 and 60 percent of the vote." (Goedert Dep. (Dkt. 60) at 77:20-23.)

Goedert's model examines congressional elections. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 1, 5-6.) Therefore it cannot be used to determine anything with respect to state legislative elections, which the proposed finding implies.

Goedert's model is intended to "give a prediction about the average impact of" the dependent variables "given that the electoral conditions are identical to the electoral conditions in a particular election." (Goedert Dep. (Dkt. 60) at 76:22-25.) Thus, this calculation predicts the average impact of these dependent variables given the electoral conditions of the 2012 and 2014 congressional elections.

Goedert testified that "I don't know that I would be able to say with any confidence that it had a pro democratic bias considering like a two percent bias in favor of the democratic [sic] would be a small fraction of a seat, right? It would be like 1/10 of a seat." (Goedert Dep. (Dkt. 60) at 86:6-10.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** Defendants' admit that Professor Goedert's dependent variable is "a measure essentially identical to the efficiency gap" (Defs.' APFOF Resp. (Dkt. 76) no. 28). Professor Goedert also admitted in his deposition that he "certainly could not confidently say that there is a [R]epublican bias generated from the model." (Goedert Dep. (Dkt. 60) at 86:18-19.) Additionally, the only material difference here between congressional and state house plans is the number of districts in the plan. The predicted efficiency gap's *size* would likely be smaller for a state house plan given its larger number of districts, but the predicted efficiency gap's *partisan direction* would remain the same. (Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 57 Q.J. POL. SCI. 239, 252 (2013).) In other words, Professor Goedert's predictions for congressional plans are applicable to state house plans too, at least with respect to the partisan direction of the estimates.

51. In his rebuttal report, Professor Mayer calculated measures of the isolation and concentration of Wisconsin's Democratic and Republican voters. One of these measures was the isolation index, which indicates, for the average Democratic or Republican voter, how much more heavily Democratic or Republican his or her ward is than the state as a

whole. A Democratic isolation score of 10%, for example, means that the average Democratic voter lives in a ward that is 10% more Democratic than the state in its entirety. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 16-17; Edward Glaeser & Jacob Vigdor, The End of the Segregated Century (2012), Mayer Decl. Ex. D (Dkt. 59-4) at p. 3.)

DEFENDANTS' RESPONSE: Undisputed.

52 The other measure of the isolation and concentration of Wisconsin's Democratic and Republican voters, Global Moran's I, shows how spatially clustered Democratic or Republican voters are. It varies from -1 (perfect dispersion) to +1 (perfect clustering). (Mayer Rebuttal Rpt. (Dkt. 64) at pp 16- 17; Su-Yeul Chung & Lawrence A. Brown, Racial/Ethnic Sorting in Spatial Context: Testing the Explanatory Frameworks, 28 Urb. Geo. 312 (2007), Mayer Decl. Ex. E (Dkt. 59-5) at p. 322.)

DEFENDANTS' RESPONSE: Disputed. The article cited provides that "Global Moran's I (Cliff and Ord, 1981) provides a measure of clustering or segregation over the entire study area for each racial/ethnic group. A value approaching +1.0 indicates a very high level of clustering, a negative value indicates dispersal, and values in between can be evaluated accordingly, but also by their significance level." (Mayer Decl. Ex. E (Dkt. 59-5) at p. 322.) This standard therefore measures segregation of groups compared to complete random distribution. The article uses it in relation to racial groups and Mayer does not explain how it would analyze two groups that each make up about 50% of the population, like Republicans and Democrats. The article also goes on to use a further analysis called Local Morans I which Mayer did not apply in his report. (Mayer Decl. Ex. E (Dkt. 59-5) at p. 322.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Global Moran's I indicates the geographic clustering of *any* variable, not only of racial or ethnic affiliation. It is "the most commonly employed method of assessing the significance and/or degree of spatial autocorrelation in the data." Wendy K. Tam Cho, *Contagion Effects and Ethnic Contribution Networks*, 47 AM. J. POL. SCI. 368, 372 (2003). Cho, for examples, uses Global Moran's I to examine the geographic clustering of campaign contributions, plainly a variable other than racial or ethnic affiliation.

53. For Wisconsin, the below table displays the Democratic isolation, Republican isolation, Democratic clustering, and Republican clustering scores for all available years (2004-2014 for the isolation index and 2012-2014 for Global Moran's I).

Year	Democratic Isolation	Republican Isolation	Democratic Clustering	Republican Clustering
2004	20%	21%		
2006	16%	17%		
2008	15%	14%		
2010	15%	17%		
2012	14%	12%	0.68	0.69
2014	23%	20%	0.75	0.68

(Mayer Rebuttal Rpt. (Dkt. 64) at pp. 17-18.)

DEFENDANTS' RESPONSE: **Undisputed** that the table displays the scores as computed by Professor Mayer.

54. At all times, Democratic and Republican voters were about equally isolated and about equally clustered. In some years, Democratic voters were slightly more isolated (2008, 2012, 2014) and clustered (2014). In other years, Republican voters were slightly more isolated (2004, 2006, 2010) and clustered (2012). (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 17-18.)

DEFENDANTS' RESPONSE: **Disputed.** Mayer's results are based on his use of the isolation index and Global Morans I. The defendants do not dispute that in some years, Democratic voters were slightly more isolated as measured using the isolation index (2008, 2012, 2014) and clustered using Global Morans I (2014). In other years, Republican voters were slightly more isolated using the isolation index (2004, 2006, 2010) and clustered using Global Morans I (2012). (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 17-18.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute.** They concede that, as measured by Global Moran's I and the Isolation Index, there are no large or consistent differences in the levels of geographic clustering and isolation of Democratic and Republican voters in Wisconsin.

55. In his rebuttal report, Professor Mayer compares the partisan distribution of Wisconsin's wards with that of the Current Plan's districts.

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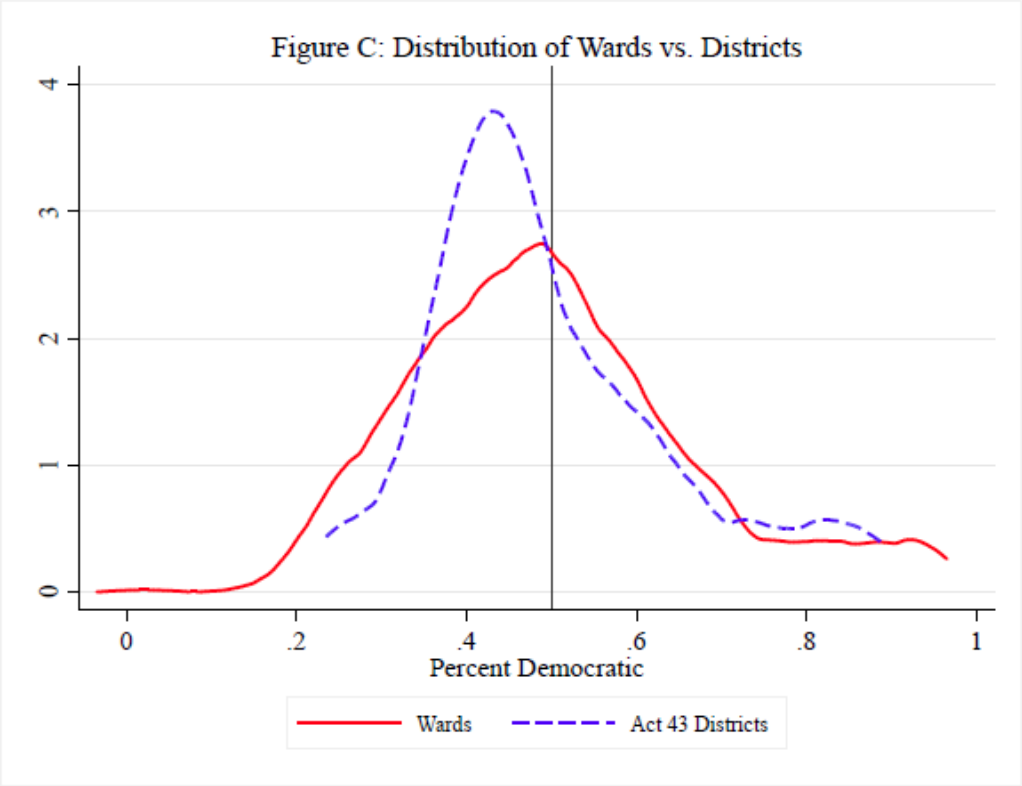

(Mayer Rebuttal Rpt. (Dkt. 64) at pp. 11-12.)

DEFENDANTS' RESPONSE: Undisputed.

56. Both packing and cracking are evident in the Current Plan's district distribution, which peaks at around 42% Democratic and has a long Democratic tail. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 11-12.)

DEFENDANTS' RESPONSE: 56: Disputed. The cited evidence does not support the proposed finding. Mayer himself says that "inferences at one level of geography frequently do not hold at other levels of aggregation." (Mayer Rebuttal Rep. (Dkt. 64) at 12.) Mayer offers no reason why the distribution of wards would match the distribution of districts when wards are aggregated into districts or why the fact that the distribution of wards does not match the distribution of districts is evidence of packing and cracking.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. The Current Plan's district distribution's peak at around 42% Democratic is strong evidence of cracking, and the distribution's long Democratic tail is strong evidence of packing. Additionally, defendants cite Professor Mayer's statement for the wrong proposition. Professor Goedert tries to claim that the partisan composition of the wards in Wisconsin shows that there is a natural political

geography that favors Republicans, but Professor Mayer explains that one cannot determine whether *districts* have a natural geographic bias by analyzing *ward*-level data. Professor Mayer explains this as a Modified Areal Unit Problem. (Mayer Rebuttal Rpt. (Dkt. 64) at p. 11.)

Given the information that Professor Goedert provides, however, Professor Mayer is able to show that Wisconsin's ward and district distributions are highly dissimilar, with the latter being much more tilted in the Republicans' direction. This "reveals that Act 43's designers were able to distort a fairly neutral ward distribution into a far more advantageous district distribution, through gerrymandering." (Mayer Rebuttal Rpt. (Dkt. 64) at p. 12.)

57. The current ward distribution for Wisconsin is almost perfectly symmetric in its shape, and its peak is very close to 50% Democratic. (Mayer Rebuttal Rpt. (Dkt. 64) at 11-12.)

DEFENDANTS' RESPONSE: Disputed. Mayer's Figure C shows has there are a substantial number of wards with over 80% Democratic vote and even over 90% of the vote, whereas there are no Republican wards with over 85% of the vote and very few over 80%. (Mayer Rebuttal Rpt. (Dkt. 64) at 12, Fig. C.) In addition, the slope of the line gradually decreases from the peak going to the left (Republican wards) whereas the slope drops more sharply going to the right (Democratic wards). (Mayer Rebuttal Rpt. (Dkt. 64) at 12, Fig. C.) This shows there are many more wards that are packed with Democrats than there are wards packed with Republicans and more wards that are 50%–60% Republican than wards that are 50%–60% Democratic. (Mayer Rebuttal Rpt. (Dkt. 64) at 12, Fig. C.)

PLAINTIFFS' REPLY: Raises a dispute material to legal issues pending before the Court and cannot be resolved at summary judgment. The degree of symmetry in the ward distribution is a fact that will need to be determined by the Court after the presentation of expert testimony at trial. Defendants do not seem to dispute that the Current Plan's *district* distribution is far more pro-Republican than the distribution of Wisconsin's current *wards*.

58. In combination, the histograms at APFOF ¶ 54 above "reveal that Act 43's designers were able to distort a fairly neutral ward distribution into a far more advantageous district distribution, through gerrymandering." (Mayer Rebuttal Rpt. (Dkt. 64) at p. 12; Goedert Dep. (Dkt. 65) at 166:7-13, 169:3- 15.)

DEFENDANTS' RESPONSE: Disputed. The distribution of wards is not neutral. Mayer's Figure C shows has there are a substantial number of wards with over 80% Democratic vote and even over 90% of the vote, whereas there are no Republican wards with over 85% of the vote and very few over 80%. (Mayer Rebuttal Rpt. (Dkt. 64) at 12, Fig. C.) In addition, the slope of the line gradually decreases from the peak going to the left (Republican wards) whereas the slope drops more sharply going to the right (Democratic wards). (Mayer Rebuttal Rpt. (Dkt. 64) at 12, Fig. C.)

Mayer himself says that "inferences at one level of geography frequently do not hold at other levels of aggregation." (Mayer Rebuttal Rep. (Dkt. 64) at 12.) Mayer offers no reason why the distribution of wards would match the distribution of districts when wards are aggregated into districts or why the fact that the distribution of wards does not match the distribution of districts is evidence of packing and cracking. Thus, Mayer has no basis to opine that the change in the distribution of wards to the distribution of districts is due to gerrymandering.

> **PLAINTIFFS' REPLY: Raises a dispute material to legal issues pending before the Court and cannot be resolved at summary judgment.** The degree of symmetry in the ward distribution is a fact that will need to be determined by the Court after the presentation of expert testimony at trial. Defendants do not seem to dispute that the Current Plan's *district* distribution is far more pro-Republican than the distribution of Wisconsin's current *wards*. Defendants also do not dispute that the Current Plan's *district* distribution is far more pro-Republican than the distribution of Wisconsin's current *wards*. Nor do defendants not offer any explanation other than intentional gerrymandering for the difference between the two distributions. And the Modified Areal Unit Problem is inapplicable where, as here, data on *both* relevant levels of geography is available.

59. In violation of usual practice, the current ward boundaries were determined after the Current Plan's districts had already been drawn (Jason Stein & Patrick Marley, GOP Redistricting Maps Make Dramatic Changes, Milwaukee Journal-Sentinel (July 8, 2011), Earle Decl. Ex. D (Dkt. 57-4).)

DEFENDANTS' RESPONSE: Disputed. The evidence cited to support this finding is inadmissible hearsay because it is a newspaper article. See Fed. R. Evid. 802.

Defendants further dispute that there could be a "usual practice" regarding the timing of passing a districting plan in relation to the time when ward boundaries are determined because the Current Plan was the first time that Assembly Districts had been drawn by the legislature, rather than a court, since the 1970s. See, supra, ¶¶ 44-47.

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** The Court may take notice of the publicly available records from the Wisconsin Legislative Council that explain the change from the "usual practice" in the law regarding the timing of passing a district plan in relation to when the ward boundaries are determined, created by 2011 Act 39: "Current law specifies the number of inhabitants that are required in each ward. Act 39 provides an exception to this requirement for wards created to effect an act of the Legislature redistricting legislative or congressional districts. This is publicly available at: https://docs.legis.wisconsin.gov/2011/related/lcactmemo/act039.pdf.

60. The partisan index used by defense expert Sean Trende, is used "almost exclusively by political commentators," and is used "less frequently in academic research." (Mayer Rebuttal Rpt. (Dkt. 64) at p. 5.)

DEFENDANTS' RESPONSE: Disputed. The cited evidence admits that the partisan index is used in academic research, thus it is incorrect to say it is used "almost exclusively by political commentators." Mayer admits that academics use the partisan index "as a basic descriptive statistic used to classify districts as competitive or not." (Mayer Rebuttal Rpt. (Dkt. 64) at 5.) Defendants do not dispute that the partisan index is used by political commentators.

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to the fact that the partisan index used by Trende is only used in academia "as a basic descriptive statistic used to classify districts as competitive or not." Defendants cite no evidence that the partisan index is used for *clustering* analysis anywhere in academia. (Mayer Rebuttal Rpt. (Dkt. 64) at p. 5.)

61. Trende admits that he cannot "identify any peer-reviewed studies that have analyzed the geographic clustering of Democratic and Republican voters by examining trends in County Partisan Indices" (Trende Dep. (Dkt. 66) at 56:2- 6.)

DEFENDANTS' RESPONSE: Undisputed.

62. Trende admits that the maps he uses do not adjust for Wisconsin counties' very different populations (Trende Dep. (Dkt. 66:7-17) at 58; Goedert Dep. (Dkt. 65) at 185:19-186:4.)

DEFENDANTS' RESPONSE: Undisputed.

63. Trende admits that the maps he uses are based on presidential rather than state legislative election results, covering only two elections (Trende Dep. (Dkt. 66) at 56:9-58:9.)

DEFENDANTS' RESPONSE: Disputed. Defendants do not dispute that Trende's are based on presidential election results. His maps of the West South Central Region and Virginia covered three elections, 1996, 2004 and 2008, and his maps of Wisconsin covered four elections (1988, 1996, 2004 and 2012). (Trende Rep. (Dkt. 55) ¶¶ 66, 70, 79-81, 83-85.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to the fact that Trende's analysis is based solely on presidential election results. Defendants also do not contest that in their brief, they only refer to Trende's analysis for 1996 and 2012. (Defs.' Br. at 27 ("Trende analyzes the differences in the election results in 1996 and 2012"); *id.* at 28 ("Trende also calculates the Partisan Index (PI) of each county in Wisconsin in 1996 and 2012.")

64. Trende admits that the maps he uses do not generate any "quantitative scores for Democratic and Republican clustering," but rather must be "eyeball[ed]" by the viewer. (Trende Dep. (Dkt. 66) at 59:2-8; Trende Decl. (Dkt. 55) ¶ 25.)

DEFENDANTS' RESPONSE: Disputed. Trende did not say that his maps are meant to be "eyeball[ed]," this was a statement by counsel with which he did not agree. (Trende Dep. (Dkt. 66) at 59:2-8.) Trende testified that "a court can look at [the map] and pretty clearly see what's going on in the state." (Trende Dep. (Dkt. 66) at 59:15-17.) Defendants

do not dispute that his maps do not generate a quantitative score for Democratic and Republican clustering.

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** as to the fact that Trende does not provide any quantitative measure of partisan clustering. Whether one calls his method an "eyeball" test or a test where one "can look [at the map] and pretty clearly see what's going on," the fact remains that this method is not quantitative, nor used in any peer-reviewed studies. (Trende Dep. (Dkt. 66) at 51:6-11; 59:15-17; Defs.' APFOF Resp. (Dkt. 76) no. 38.)

65. Trende admits that while "there are about 10 adjacent red counties in the southeast corner of the state," it is impossible to identify "any clusters of 10 very blue counties anywhere in the state." (Trende Dep. (Dkt. 66) at 62:22- 63:2.)

DEFENDANTS' RESPONSE: Undisputed.

IV. The Volume of Plans at Risk of Failing Plaintiffs' Proposed Test

66. Professor Goedert has recommended a proxy for partisan intent: whether a single party had unified control over redistricting, in the sense of holding majorities in both legislative chambers as well as the state's governorship. (Goedert, Gerrymandering or Geography, supra, Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 3; Goedert Dep. (Dkt. 65) at 39:19-40:5. ("The definition of partisan gerrymandering I use in my work is . . . a redistricting plan which is done under the complete control of one party. . ..[with] control over both houses of the state legislature and the governorship.").)

DEFENDANTS' RESPONSE: 66: Disputed. Professor Goedert has not "recommended a proxy for partisan intent." Goedert testified that in his research, his "criteria for what I would code as a partisan gerrymander is that the process -- the normal political process was controlled by one party." (Goedert Dep. (Dkt. 65) at 60:10-12.) He does so because his "work studies the electoral impact of a plan." (Goedert Dep. (Dkt. 65) at 42:12.) He did not testify that his coding methodology be used in a legal sense as "a proxy for partisan intent."

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute**. In his work, Professor Goedert has sought to determine the impact of "intentional gerrymandering" versus other factors on the partisan asymmetry of district plans. (Goedert, *Gerrymandering or Geography*, *supra*, at 1, 5.) Defendants do not dispute that Goedert defined as partisan gerrymanders those plans that were enacted under unified control by a single party.

67. There are 206 distinct plans in Professor Jackman's database. (Jackman Rpt. (Dkt. 62) at p. 7.)

DEFENDANTS' RESPONSE: Undisputed.

68. Of the 206 plans in Professor Jackman's database, 70 plans (or 34%) had initial efficiency gaps above 7%. (Jackman Rpt. (Dkt. 62) at p. 7.)

DEFENDANTS' RESPONSE: Undisputed.

69. Of the 70 plans in Professor Jackman's database that had initial efficiency gaps over 7%, 43 plans (or 21%) had initial efficiency gaps above 7% and unified control over redistricting by a single party. (Jackman Rpt. (Dkt. 62) at p. 7; Jackman Rebuttal Rpt. (Dkt. 63) at pp. 18-20; Jackman Decl. Ex. F (Dkt. 58-6).)

DEFENDANTS' RESPONSE: Undisputed.

70. If the threshold is increased to 10%, 32 plans in Professor Jackman's database (or 16%) had initial efficiency gaps of above 10%. (Jackman Rpt. (Dkt. 62) at p. 7.)

DEFENDANTS' RESPONSE: Undisputed.

71. Of the 32 plans in Professor Jackman's database that had an initial efficiency gap over

10%, 20 plans (or 10%) had initial efficiency gaps this large and unified control over redistricting by a single party. (Jackman Rpt. (Dkt. 62) at p. 7; Jackman Rebuttal Rpt. (Dkt. 63) at pp. 18-20; Jackman Decl. Ex. F (Dkt. 58-6).)

DEFENDANTS' RESPONSE: Undisputed.

72. Of the 43 current plans in Professor Jackman's database, 16 plans (or 37%) had initial efficiency gaps above 7%. (Jackman Rpt. (Dkt. 62) at p. 7.)

DEFENDANTS' RESPONSE: Undisputed.

73. 7 Of the 16 plans in Professor Jackman's database that are current and have efficiency gaps over 7%, 11 plans (or 26%) had initial efficiency gaps above 7% and unified control over redistricting by a single party. (Jackman Rpt. (Dkt. 62) at p. 7; Jackman Rebuttal Rpt. (Dkt. 63) at pp. 18-20; Jackman Decl. Ex. F (Dkt. 58-6).)

DEFENDANTS' RESPONSE: Undisputed.

74. Of the 43 current plans in Professor Jackman's database, 11 plans (or 26%) had initial efficiency gaps above 10%. (Jackman Rpt. (Dkt. 62) at p. 7.)

DEFENDANTS' RESPONSE: Undisputed.

75. Of the 11 plans in Professor Jackman's database that are current and have efficiency gaps over 7%, 7 plans (or 16%) had initial efficiency gaps this large and unified control over redistricting by a single party. (Jackman Rpt. (Dkt. 62) at p. 7; Jackman Rebuttal Rpt. (Dkt. 63) at pp. 18-20; Jackman Decl. Ex. F (Dkt. 58-6).)

DEFENDANTS' RESPONSE: Undisputed.

76. Professor Goedert finds that a single party with unified control over redistricting does not always seek to benefit itself. (Goedert Rpt. (Dkt. 51) at p. 10 ("In the 2000's decade, Democrats controlled all branches of state government in California, but instead of crafting an aggressively partisan congressional map, worked closely with Republicans in the legislature to draw districts that would protect incumbents of both parties.").)

DEFENDANTS' RESPONSE: Undisputed.

77. The reapportionment revolution of the 1960s resulted in the invalidation of almost every state house, state senate, and congressional plan in the country, and "[b]oth state legislative and congressional districts were redrawn more comprehensively—by far—than at any previous time in our nation's history." (Gary W. Cox & Jonathan N. Katz, Elbridge Gerry's Salamander (2002), Jackman Decl. Ex. J (Dkt. 620) at p. 4.)

DEFENDANTS' RESPONSE: Undisputed.

78. The Supreme Court's decision in *Thornburg v. Gingles*, 478 U.S. 30 (1986), construing Section 2 of the Voting Rights Act, spawned at least 800 lawsuits over the next

generation. (Ellen D. Katz et al., Documenting Discrimination in Voting: Judicial Findings Under Section 2 of the Voting Rights Act, 39 U. Mich. J.L. Reform 643, 655 (2006), Earle Decl. Ex. B (Dkt. 57-2) at p. 655.)

DEFENDANTS' RESPONSE: Disputed. This fact is not based on admissible evidence. The article cited references an ACLU report which compiled 331 lawsuits. (Earle Decl. Ex. B (Dkt. 57-2) at p. 655.) The 800 number is based on an extrapolating the results of a study done by the ACLU of Georgia and South Carolina as to the number of published versus unpublished decisions, "[i]nsofar as this ratio of filings is at all representative." (Earle Decl. Ex. B (Dkt. 57-2) at p. 655.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** Courts often look to law review articles as persuasive authority. For example, the Katz study was cited by the Supreme Court in *Shelby Cnty. v. Holder*, 133 S. Ct. 2612, 2642-43 (2013).

79. In just the current redistricting cycle (i.e., new legislative districts based on the 2010 census), 224 cases were filed in 42 states, resulting in 23 plans being invalidated or designed by the courts. (Litigation in the 2010 Cycle, All About Redistricting, http://redistricting.lls.edu/cases.php.)

DEFENDANTS' RESPONSE: Undisputed.

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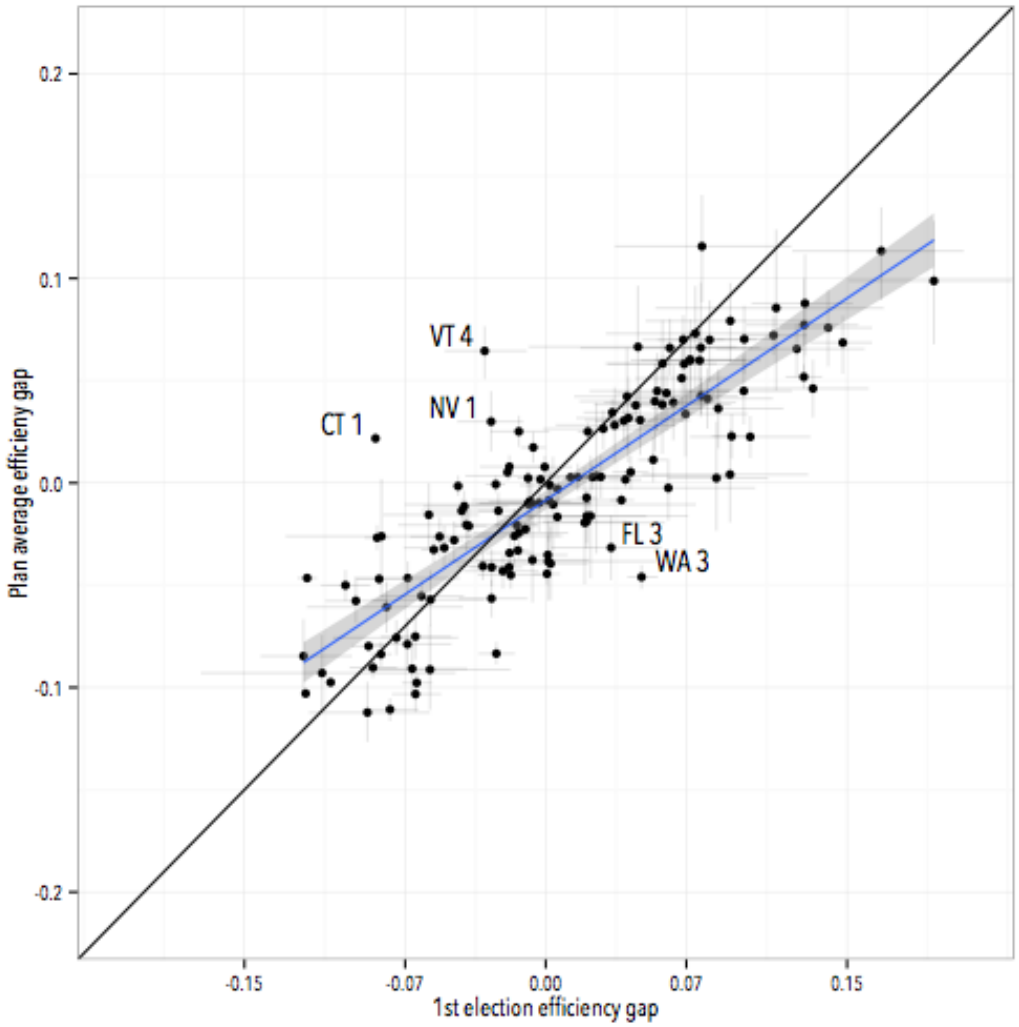
ATTORNEY WORK PRODUCT

V. The Reliability of the First Efficiency Gap Recorded Under a Plan

80. The below scatter plot displays the relationship between state house plans' initial and average efficiency gap values from 1972 to 2010 (including only plans with at least three recorded efficiency gaps, for which the average is more meaningful.)



(Jackman Rebuttal Rpt. (Dkt. 63) at pp. 15-17.)

DEFENDANTS' RESPONSE: Undisputed.

81. Plans' initial efficiency gaps explain fully three-fourths of the variation in their average efficiency gaps. (Jackman Rebuttal Rpt. (Dkt. 63) at pp. 15-17.)

DEFENDANTS' RESPONSE: Disputed. Jackman opines that "[t]he variation in plan-average efficiency gaps explained by this regression is quite large, about 73%; after taking into account the uncertainty in the EG scores (stemming from the imputation procedures used for uncontested districts; see my initial report) a 95% confidence interval on the variance explained measure ranges from 67% to 74% (the uncertainty has the

consequence of tending to make the regression fit slightly less well). That is, even given the uncertainty that accompanies EG measures due to uncontestedness, the relationship between first election EG and plan-average EG is quite strong." (Jackman Rebuttal Rpt. (Dkt. 63) at 15.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute**. Both sides agree that "the relationship between the first election EG and plan-average EG is quite strong," and that Professor Jackman finds that the "variation in plan-average efficiency gaps explained by [the] regression is quite large, about 73%." (Jackman Rebuttal Rpt. (Dkt. 63) at pp. 15-17.)

82. For an initial efficiency gap of 7% in a Republican direction, for example, the average efficiency gap is predicted to be 5.3%, and there is more than a 96% likelihood that the average will be pro-Republican. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 16.)

DEFENDANTS' RESPONSE: Disputed. Jackman performed historical research on plans from the 1970s to the 2010s. His research shows that, in looking at historical results, "a first-election EG of -.07 is typically associated with a plan-average EG of about -0.053 (95% CI -0.111 to 0.004); the probability that the resulting, expected plan-average EG is negative is 96.5%." (Jackman Rebuttal Rpt. (Dkt. 63) at 16.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** Defendants do not dispute that the average efficiency gap for a plan with an initial efficiency gap of at least 7% in the Republican direction is predicted to be 5.3%, and that there is a 96.5% probability that the average for that plan will be pro-Republican. Both sides agree that Professor Jackman's analysis covers the 1972-2010 period.

83. For an initial efficiency gap of 7% in a Democratic direction, the average efficiency gap is forecast to be 3.7%, and there is roughly a 90% likelihood that the average will be pro-Democratic. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 16.)

DEFENDANTS' RESPONSE: Disputed. Jackman performed historical research on plans from the 1970s to the 2010s. His research shows that, in looking at historical results, "a first-election EG of .07 we typically see a plan- average EG of about 0.037 (95% CI -0.021 to 0.093); the probability that the resulting, expected plan-average EG is positive is 89.8%." (Jackman Rebuttal Rpt. (Dkt. 63) at 16.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** Defendants do not dispute that the average efficiency gap for a plan with an initial efficiency gap of at least 7% in the Democratic direction is predicted to be 3.7%, and that there is an 89.8% (to one decimal place) probability that the average for that plan will be pro-Democratic. Both sides agree that Professor Jackman's analysis covers the 1972-2010 period.

84. Wisconsin's Current Plan, which opened with a pro-Republican efficiency gap of 13.3%, it is likely have an average efficiency gap of 9.5% over its lifetime, with more than a 99.9% likelihood of exhibiting a pro-Republican mean. (Jackman Rebuttal Rpt. (Dkt. 63)

at p. 16.)

DEFENDANTS' RESPONSE: Disputed. Jackman performed historical research on plans from the 1970s to the 2010s. Jackman opines that "The analysis of historical data discussed above—and graphed in Figure 7—indicates that the plan-average EG for this plan will be -0.095 (95% CI -0.152 to -0.032)." (Jackman Rebuttal Rpt. (Dkt. 63) at p. 16.) He further opines that "[t]he probability that the Wisconsin plan—if left undisturbed— will turn out to have a positive, pro-Democratic, average efficiency gap is for all practical purposes zero (less than 0.1%)." (Jackman Rebuttal Rpt. (Dkt. 63) at p. 16.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Defendants do not dispute that according to Professor Jackman's analysis of plans from 1972 to 2010, Wisconsin's Current Plan had an efficiency gap in the first election of 13.3%, is likely to have an average pro-Republican efficiency gap of 9.5%, and has a less than 0.1% chance of producing a pro-Democratic efficiency gap over the plan's lifetime. (Jackman Rpt (Dkt. 62) at pp. 4, 72; Jackman Rebuttal Rpt. (Dkt. 63) at p. 16.)

85. Professor Jackman carried out the sensitivity testing recommended by Professor Goedert, which he called "an important acknowledgement of the fluctuations observed in efficiency gap as electoral tides shift." (Goedert Rpt. (Dkt. 51) at p.15; Jackman Decl. Ex. D (Dkt. 58-4).)

DEFENDANTS' RESPONSE: Disputed. Goedert opined that Jackman had not carried out the sensitivity testing recommended by Stephanopoulos and McGhee, who recommended "shifting the actual election results by 7.5% in each direction for congressional plans, and 5.5% in each direction for legislative plans, and calculating the gaps for each shift." (Goedert Rpt. (Dkt. 51) at 13.) Jackman did "conduct sensitivity testing here of exactly the kind earlier carried out by Stephanopoulos & McGhee (pp. 889-90, 898-99) and recommended by Goedert," although he only conducted uniform swing of 5% in each direction rather than the recommended 5.5%. (Jackman Decl. Ex. D (Dkt. 58-4) at 1.) Goedert further opined that the sensitivity testing recommended by Stephanopoulos and McGhee "may not be sufficient to simulate the plausible range of election results than may be observed with a decade." (Goedert Rpt. (Dkt. 51) at 15.) Jackman, however, did not go beyond the sensitivity testing recommended by Stephanopoulos and McGhee. (Jackman Decl. Ex. D (Dkt. 58-4) at 1.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether Professor Jackman performed sensitivity testing using a 5% swing in either direction in the manner suggested by Stephanopoulos & McGhee and Professor Goedert. Professor Jackman chose to swing the vote by 5% in either direction because this is a "quite large set of swings by the standards of state legislative elections. For instance, swings in Wisconsin state legislative elections from 1972 to 2014 are estimated to range between -7.6 percentage points from 2008 to 2010 (Democratic share of two-party vote), averaged by district and +5.0

percentage points from 2004 to 2006." (Jackman Decl. Ex. D (Dkt. 58-4) at pp. 1-2; Goedert Rpt. (Dkt. 51) at 15.)

86. Professor Jackman also used the uniform swing methodology employed and endorsed by Professor Goedert. (Goedert Rpt. (Dkt. 51) at p. 22; Goedert Dep. (Dkt. 65) at 123:12-20; Jackman Decl. Ex. D (Dkt. 58-4).)

DEFENDANTS' RESPONSE: Undisputed.

59. Professor Jackman shifted the actual 2012 and 2014 election results by up to five points in each direction, and then recorded the efficiency gaps produced by each shift. (Jackman Decl. Ex. D (Dkt. 58-4) at pp. 1-2.)

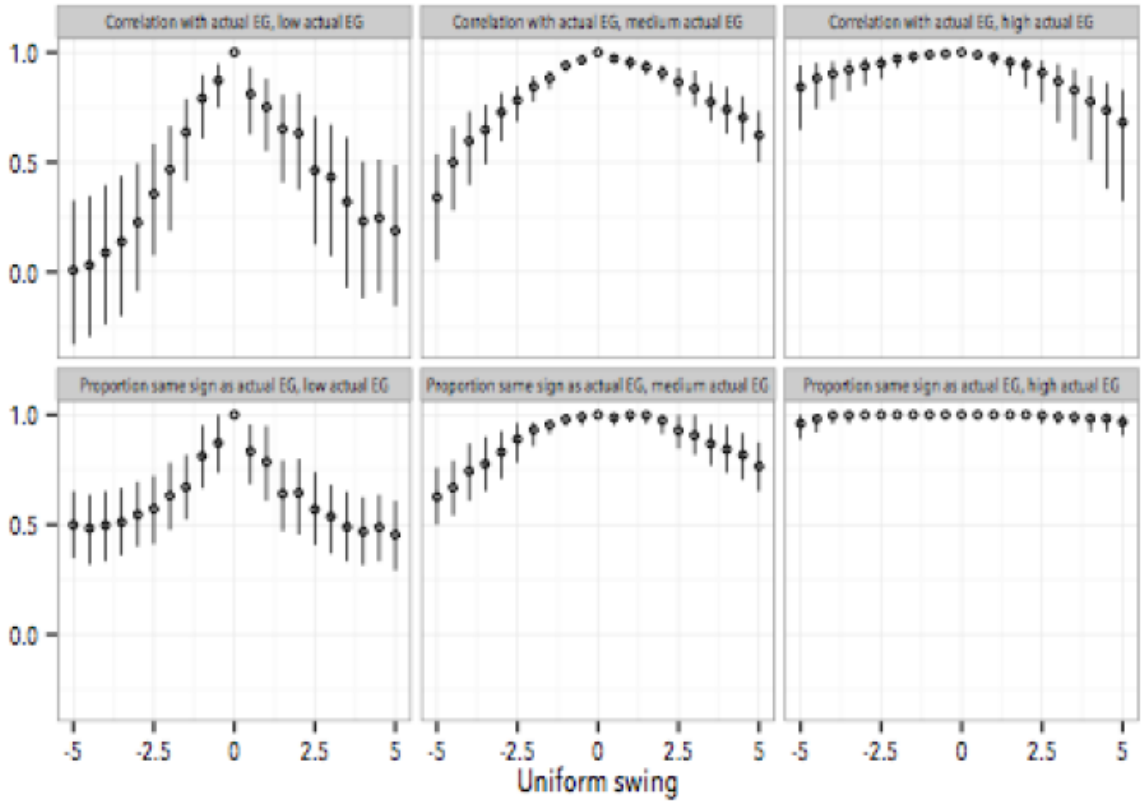
DEFENDANTS' RESPONSE: Undisputed.

88. Election swings of this magnitude encompass "the vast majority of state legislative elections from 1972 to 2012," and thus illustrate how the current plans would perform under almost all plausible electoral conditions. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 2; Goedert Dep. (Dkt. 65) at 126:16- 127:10.)

DEFENDANTS' RESPONSE: Disputed. As Goedert opined, the plus/minus 5.5% uniform swing `recommended by Stephanopoulos and McGhee "this shift may not be sufficient to simulate the plausible range of election results than may be observed with a decade." (Goedert Rpt. (Dkt. 51) at 15.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. While defendants do not state what would be a "plausible range of election results that may be observed within a decade," Professor Jackman explains that he chose to swing the vote by 5% in either direction because it is a "quite large set of swings by the standards of state legislative elections. For instance, swings in Wisconsin state legislative elections from 1972 to 2014 are estimated to range between -7.6 percentage points from 2008 to 2010 (Democratic share of two-party vote), averaged by district and +5.0 percentage points from 2004 to 2006." (Jackman Decl. Ex. D (Dkt. 58-4) at pp. 1-2.)

89. The below figure divides the current plans' actual efficiency gaps into three categories: small (absolute value below 3%), medium (absolute value between 3% and 7%), and large (absolute value above 7%). For each category, the figure then shows the correlation between the plans' actual and predicted efficiency gaps, as well as the proportion of actual and predicted efficiency gaps with the same sign, given different vote swings.



(Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

DEFENDANTS' RESPONSE: Disputed. The defendants do not dispute the first sentence of the proposed finding. For each category, the figure then shows the correlation between the plans' actual and simulated efficiency gaps, as well as the proportion of actual and simulated efficiency gaps with the same sign, given different vote swings. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. The defendants prefer to use the word "simulated" instead of "predicted," but there is no material difference between these words here. The comparison shown in the chart is that between a plan's actual and simulated or predicted efficiency gap. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

90. The chart in APFOF ¶ 89 shows that for plans with large actual efficiency gaps, the correlation between their actual and predicted values is very high (always above 0.7 and usually above 0.9) for all vote swings. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

DEFENDANTS' RESPONSE: Disputed. The chart in APFOF ¶ 89 shows the correlation between the actual efficiency gap and the simulated efficiency gap. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.) The chart in the top right shows the correlation between the actual EG and simulated EG.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. The defendants prefer to use the word "simulated" instead of "predicted," but there is no material difference between these words here. The chart in the top right shows the correlation between the actual EG and predicted EG for high values of the EG (that is where the efficiency gap is greater than an absolute value of 0.07). (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

91. The chart in APFOF ¶ 89 shows that for plans with large actual efficiency gaps, the proportion of their actual and predicted efficiency gaps with the same sign is even higher—nearly 100% for all vote swings. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

DEFENDANTS' RESPONSE: Disputed. The chart in APFOF ¶ 89 shows the correlation between the actual efficiency gap and the simulated efficiency gap. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.) The chart in the bottom right corner shows that the proportion of simulated plans with the same sign is nearly 100%. The chart in APFOF ¶ 89 shows the correlation between the actual efficiency gap and the simulated efficiency gap. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. The defendants prefer to use the word "simulated" instead of "predicted," but there is no material difference between these words here. Defendants are wrong that the charts in APFOF ¶ 89 all show the correlation between the actual efficiency gap and the simulated efficiency gap, since in fact only the charts in the top row of the figure in APFOF ¶ 89 show the correlation, while the charts in the bottom row show the *proportion* of simulated efficiency gaps with the same sign as the actual efficiency gaps. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

92. Professor Jackman found that a 7% threshold would drive down the rate of false positives to minute levels, below 5%. A slightly higher threshold of around 8% would reduce the rate of false positives all the way to zero. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 12.)

DEFENDANTS' RESPONSE: 92: Disputed. For Jackman's sensitivity testing, "[i]n each instance the test is whether the first EG observed under a plan exceeds a given threshold value. The outcome of interest is whether the plan's remaining efficiency gaps have the same sign as the EG from the first election." (Jackman Rebuttal Rpt. (Dkt. 63) at 6.) Thus, his definition of "false positive" is a plan is a plan that exceeds the threshold in its first election, yet goes on to produce an EG of the opposite sign. (Jackman Rebuttal Rpt. (Dkt. 63) at 6-7.) With this proper understanding of what counts as a "false positive" under Jackman's analysis, the defendants do not dispute the proposed finding.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute because the definition of false positive used by defendants is accurate.

93. Professor Jackman calculated, for different efficiency gap thresholds, the proportion of plans that either (1) would fall below the threshold or (2) if above the threshold, would exhibit an efficiency gap of the same sign throughout their lifetimes. On the Republican side the proportion is roughly 96% for an efficiency gap threshold of 7%. On the

Democratic side a 7% efficiency gap threshold is associated with an almost identical confidence rate of 93% (Jackman Rpt. (Dkt. 62) at p. 67.)

DEFENDANTS' RESPONSE: 93: Disputed. Professor Jackman calculated, for different efficiency gap thresholds, the proportion of plans that either (1) fell below the threshold in their first election or (2) if above the threshold in their first election, exhibited an efficiency gap of the same sign throughout their lifetimes. On the Republican side the proportion is roughly 96% for an efficiency gap threshold of 7%. On the Democratic side, the proportion is roughly 93% for a 7% efficiency gap threshold. (Jackman Rpt. (Dkt. 62) at p. 67.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to the facts listed in this paragraph; the only dispute by the defendants is whether 93% is "almost identical" to 96%, and that is not a dispute that is either "genuine" or "material."

VI. Efficiency Gap Calculations for Wisconsin's Current Plan and Demonstration Plan

94. Professor Mayer's Demonstration Plan's efficiency gap "cannot be estimated by simply rearranging the votes cast in actual Assembly contests into a new district configuration, as the votes cast for specific Assembly candidates in each district are a function of the electoral environment in that district and whether a race is even contested by both parties." (Mayer Rpt. (Dkt. 54) at pp. 5-6.)

DEFENDANTS' RESPONSE: Undisputed.

95. "A large literature has developed around the problem of estimating the likely election results in redistricting plan alternatives." (Mayer Rpt. (Dkt. 54) at p. 6.)

DEFENDANTS' RESPONSE: Undisputed.

96. The key insight of the literature on estimating the likely election results in redistricting plan alternatives is that exogenous variables such as presidential election results can be used to predict election results at the level of the map at issue. There is no dispute among scholars that this sort of modeling is the appropriate (in fact, the only) way to assess proposed maps under which no elections have been held. (Bruce E. Cain, Assessing the Partisan Effects of Redistricting, 79 Am. Pol. Sci. Rev. 320 (1985), Jackman Decl. Ex. K (Dkt. 621); Andrew Gelman & Gary King, Estimating the Electoral Consequences of Legislative Redistricting, 85 J. Am. Stat. Ass'n 274 (1990), Jackman Decl. Ex. I (Dkt. 58- 9).)

DEFENDANTS' RESPONSE: Undisputed.

97. This is why the Legislature's consultant, Professor Keith Gaddie, used the exact same method to predict the Current Plan's election results. (Goedert Dep. Ex. 25 (Dkt. 65-4).)

DEFENDANTS' RESPONSE: Disputed. The cited evidence does not support the contention that Gaddie "used the exact same method to predict the Current Plan's election results." The document cited says Gaddie used "a regression analysis of the Assembly vote from 2006, 2008, and 2010, and it is based on prior election indicators of future election performance." (Goedert Dep. Ex. 25 (Dkt. 65-4).) It does not establish that Gaddie used the same method that Mayer used and, in fact, shows the method was different because it was based on the results of three elections whereas Mayer's model was based solely on the results of the 2012 election. (Dkt. 67 ¶ 11.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** Defendants do not contest the fact that Professor Mayer and Professor Gaddie both used regression analyses based on election results to predict the electoral performance of hypothetical district plans, and that both scholars assumed that all races would be contested without incumbents. (Mayer Rpt. (Dkt. 54) at p. 22.)

98. Professor Mayer's model incorrectly predicted the winners in only two districts: District 51 (actual Republican vote: 51.9% vs. predicted Republican vote: 49.9%) and District 70 (actual Republican vote: 49.7% vs. predicted Republican vote: 50.1%). (Mayer Rpt. (Dkt.

54) at pp. 24-25; Mayer Dep. (Dkt. 52) at 87:22.)

DEFENDANTS' RESPONSE: Disputed. The model Mayer used to calculate the efficiency gap under Act 43 incorrectly predicted the winners in five districts. (Mayer Rep. (Dkt. 54) 51; Mayer Dep. Ex. 5.) Defendants do not dispute the proposed finding as it relates to Mayer's "initial model" contained in Table 3 of his report, which was not used to calculate the efficiency gap.

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** Defendants agree that the initial version of Professor Mayer's model, which took incumbency into account, made only two incorrect winner predictions and perfectly predicted the overall partisan breakdown of the Current Plan's contested districts. (Mayer Rpt. (Dkt. 54) at pp. 24-25.)

99. Professor Mayer's incorrect predictions for the Wisconsin Assembly races in 2012 are balanced, one for each party, meaning that in the aggregate, Professor Mayer's model forecast the partisan distribution of contested districts (56 Republican, 16 Democratic) with perfect accuracy. (Mayer Rpt. (Dkt. 54) at pp. 24-25.)

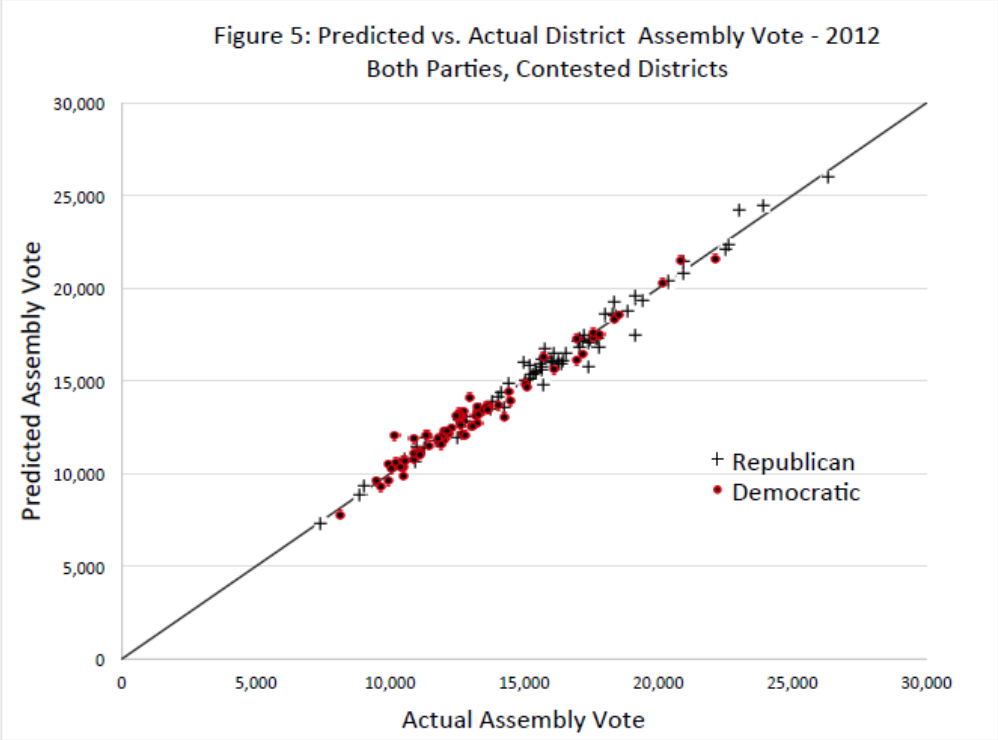
DEFENDANTS' RESPONSE: Disputed. The model Mayer used to calculate the efficiency gap under Act 43 incorrectly predicted the winners in five districts, four Republicans and one Democrat. (Mayer Rep. (Dkt. 54) 51; Mayer Dep. Ex. 5.) Defendants do not dispute the proposed finding as it relates to Mayer's "initial model" contained in Table 3 of his report, which was not used to calculate the efficiency gap.

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** Defendants agree that the initial version of Professor Mayer's model, which took incumbency into account, made only two incorrect winner predictions and perfectly predicted the overall partisan breakdown of the Current Plan's contested districts. (Mayer Rpt. (Dkt. 54) at pp. 24-25.)

100. The R-squared value for Professor Mayer's model of the Republican Assembly Votes regression is 0.99, and the R-squared value for Professor Mayer's model of the Democratic Assembly Votes regression is 0.98. (Mayer Rpt. (Dkt. 54) at pp. 24-25; Mayer Dep. (Dkt. 52) at 125:11-17.)

DEFENDANTS' RESPONSE: 100: Undisputed, but only as it relates to Mayer's "initial model" contained in Table 3 of his report, which was not used to calculate the efficiency gap.

101. The model's precision is apparent in the below scatter plot, which compares the actual Assembly vote to the predicted Assembly vote for all contested districts. The fit between the actual and predicted values is more or less perfect, with the two sets of scores tightly hugging the regression line.



(Mayer Rpt. (Dkt. 54) at p. 23.)

DEFENDANTS' RESPONSE: 101: Undisputed, but only as it relates to Mayer's "initial model" contained in Table 3 of his report, which was not used to calculate the efficiency gap.

102. Table 8 of Professor Mayer's report shows a later permutation of his model that "sets all incumbency variables to zero." (Mayer Rpt. (Dkt. 54) at p. 29.)

DEFENDANTS' RESPONSE: 102: Undisputed.

103. Professor Mayer created the model whose results are shown in Table 8 for the same reason that the Legislature's consultant, Professor Gaddie, did: to determine "what the vote would usually do without an incumbent in the district." (Mayer Rebuttal Rpt. (Dkt. 64) at p. 22; Goedert Dep. Ex. 25 (Dkt. 65-4).)

DEFENDANTS' RESPONSE: 103: Undisputed.

104. Professor Mayer also created the model to account for the facts that "incumbents can be defeated, retire, run for higher office, or switch parties over a plan's decade-long lifespan," and that "[a] map's authors will typically want to ensure that their projections do not depend on particular incumbents continuing to run in particular districts." (Mayer Rebuttal Rpt. (Dkt. 64) at p. 24.)

DEFENDANTS' RESPONSE: 104: Disputed. Defendants do not dispute that Professor Mayer also created the model to account for the facts that "incumbents can be defeated,

retire, run for higher office, or switch parties over a plan's decade-long lifespan. Defendants dispute the finding that "[a] map's authors will typically want to ensure that their projections do not depend on particular incumbents continuing to run in particular districts" because it is not based on admissible evidence. Mayer has no personal knowledge of this fact and has not explained how he is an expert in what a map's authors will typically want. Fed. R. Evid. 602, 702.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Professor Mayer is an expert in the area of American politics, elections, and election administration. (Mayer Rpt. (Dkt. 54) at p. 2.) He has personal knowledge of what a map's authors typically want, as he has helped draw legislative maps in previous redistricting cycles and he drew the Latino Voting Rights Act district for the plaintiffs in *Baldus* that was adopted by the federal court. (Mayer Decl. (59-1) at p. 2.) He also has consulted in several cases involving redistricting, including at the city, county, and state level. Given his experience drawing maps and consulting on maps, Professor Mayer's views on this subject are admissible under Fed. R. Evid. 702, and no motion has been made to exclude any of his testimony. Additionally, the Legislature's consultant, Professor Gaddie, calculated "what the vote would usually do without an incumbent in the district" for the same reasons as Professor Mayer. (Mayer Rebuttal Rpt. (Dkt. 64) at p. 22.)

105. The "no incumbents" version of the model was not intended to predict the winners of the Current Plan's districts in 2012. To make such predictions, it would render an analysis unreliable to discard relevant information about candidates, and the first form of the model, discussed above, did not do so. (Mayer Dep. (Dkt. 52) at 52:19-53:19.)

DEFENDANTS' RESPONSE: Undisputed.

106. The "no incumbents" version of the model was intended to determine how the parties would fare in contested districts without incumbents, thus enabling an apples-to-apples comparison between the Current Plan and the Demonstration Plan. "This is a more accurate method of determining the baseline partisanship of a district, as it removes the effect of incumbents, who may or may not be running in an alternative plan. This baseline process is standard in the discipline, and was used by the expert retained by the state legislature." (Mayer Rpt. (Dkt. 54) at p. 31; Mayer Dep. (Dkt. 52) at 63:15-24, 70:4-17.)

DEFENDANTS' RESPONSE: Undisputed.

107. Using Professor Gaddie's correct estimate for District 86 (55.08% Republican), the Current Plan's predicted efficiency gap rises from 12.36% to 13.29% due to the addition of one more Republican seat. (Mayer Rpt. (Dkt. 54) at p. 31; Mayer Dep. (Dkt. 52) at 63:15-24, 70:4-17.)

DEFENDANTS' RESPONSE: Disputed. Using Professor Gaddie's correct estimate for District 86 (55.08% Republican), when Mayer applies Gaddie's percentages to the total vote Mayer predicted in each district, the Current Plan's predicted efficiency gap rises

from 12.36% to 13.29% due to the addition of one more Republican seat. (Dkt. 67 ¶ 55; Mayer Rpt. (Dkt. 54) at p. 31; Mayer Dep. (Dkt. 52) at 63:15-24, 70:4- 17.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute** of the key fact that if the correct estimates produced by Professor Gaddie are used to calculate the efficiency gap, the Current Plan's efficiency gap rises from 12.36% to 13.29% due to the addition of one more Republican seat. (Mayer Rpt. (Dkt. 54) at p. 31; Mayer Dep. (Dkt. 52) at 63:15-24, 70:4-17.)

108. Because "election results in Wisconsin (and in most states) are extremely highly correlated from one election to the next," predicted efficiency gaps will be very similar no matter which elections they are based on. (Mayer Rebuttal Rpt. (Dkt. 64) at p. 23.)

DEFENDANTS' RESPONSE: Disputed. It is unclear what a "predicted efficiency gap" refers to in this proposed finding. In Wisconsin in the 2000s, the efficiency gaps ranged from -4% to -12%. (Dkt. 67 ¶ 206.)

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** The fact remains that election results are sufficiently highly correlated from one election to the next to be similarly useful as predictors of future election outcomes, not that the efficiency gap will fall within a particular range for those elections. (Mayer Rebuttal Rpt. (Dkt. 64) at p. 23.)

109. Wisconsin's "2008 county level presidential vote and the 2012 county level presidential vote are almost perfectly correlated (r^2=0.96)"). (Mayer Dep. (Dkt. 52) at 75:3-15.)

DEFENDANTS' RESPONSE: Undisputed.

110. With respect to incumbency, Professor Mayer "used the actual incumbents who ran in the plan's districts" for the Current Plan, and "geocoded incumbents' home addresses and then identified which districts had incumbents residing in them" for the Demonstration Plan. (Mayer Rebuttal Rpt. (Dkt. 64) at p. 24; Goedert Dep. (Dkt. 65) at 145:21-25.)

DEFENDANTS' RESPONSE: Undisputed.

111. Incorporating incumbency caused the Current Plan's efficiency gap to rise from 11.7% to 13.0%. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 24-25.)

DEFENDANTS' RESPONSE: Undisputed.

112. Incorporating incumbency caused the Demonstration Plan's efficiency gap rose from 2.2% to 3.7%. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 24-25.)

DEFENDANTS' RESPONSE: Undisputed.

113. The gulf between the efficiency gaps of the Current Plan and the Demonstration Plan remained essentially unchanged (9.5% without incumbency, 9.3% with incumbency). (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 24-25.)

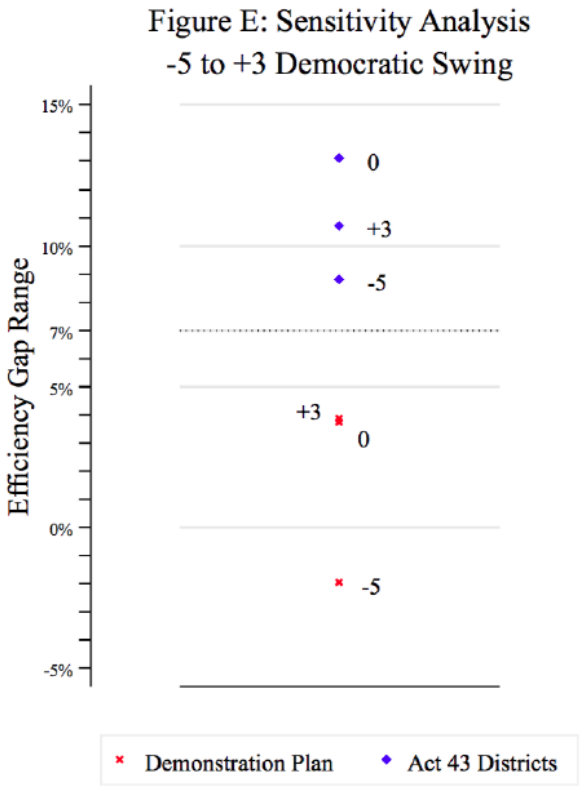
DEFENDANTS' RESPONSE: Undisputed.

114. Professor Mayer used the uniform swing methodology endorsed by Professor Goedert to simulate the largest Democratic and Republican wave elections of the past three decades: 2006 (with a Democratic vote share 3% higher than in 2012) and 2010 (with a Democratic vote share 5% lower than in 2012). (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 26-27.)

DEFENDANTS' RESPONSE: Disputed. Professor Jackman opines that, in a uniform swing analysis, "[a] new hypothetical election is considered in which all vote shares move up or down by a predetermined quantity (i.e., the "swing"); since all districts move by the same amount, this technique is known as uniform swing." (Dkt. 58-4:1.) Applying this method to Mayer's Demonstration Plan yields vastly different results from what Mayer calculates. The Demonstration Plan has 18 districts that are between 50%–55% Democratic when using the no-incumbent baseline. (Dkt. 67 ¶ 93.) Using a uniform swing of 5% lower Democratic vote share, the Democrats should lose all of these seats, resulting in a change from 51 seats to 33 seats. (See Dkt. 58-4:1.) Mayer does not explain how the Democrats would still win 48 seats under the Demonstration Plan on 5% less vote share. (Mayer Rebuttal Rpt. (Dkt. 64) at 6.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Professor Mayer used exactly the methodology recommended by defendants and their experts in carrying out his sensitivity testing. That is, he used the assumption of uniform swing, he simulated swings equivalent to both Democratic and Republican wave elections, he assumed that districts were contested, and he took into account "which districts will be contested by which incumbents." (Goedert Rpt. (Dkt. 51) at pp. 16-17.) Defendants offer no reason to doubt the results of this sensitivity testing.

115. The outcomes of Professor Mayer's sensitivity testing are displayed in the below chart



(Mayer Rebuttal Rpt. (Dkt.59-2) at pp. 26-27.)

DEFENDANTS' RESPONSE: Undisputed on the understanding that Mayer is presenting pro-Republican efficiency gaps as positive even though the plaintiffs have consistently presented pro-Republican efficiency gaps as negative.

116. The results of the uniform swing analysis conducted by Professor Mayer for the Current Plan show that its efficiency gap varies from 8.8% (in the Republican wave scenario) to 10.7% (in the Democratic wave scenario) to 13.0% (in 2012). (Mayer Rebuttal Rpt. (Dkt.59-2) at pp. 26-27.)

DEFENDANTS' RESPONSE: Disputed. Given that it does not appear that Mayer truly performed a uniform swing analysis, supra ¶ 114, the defendants dispute that the numbers in the proposed finding represent the result of a "uniform swing analysis." The defendants do not dispute that Mayer purports to show that the efficiency gap of the Current Plan varies from 8.8% (in the Republican wave scenario) to 10.7% (in the Democratic wave scenario) to 13.0% (in 2012).

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Professor Mayer used exactly the methodology recommended by defendants and their experts in carrying out his sensitivity testing. That is, he used the assumption of uniform swing, he simulated swings equivalent to both Democratic and Republican wave elections, he assumed that districts were contested, and he took into account "which districts will be contested by which incumbents." (Goedert

Rpt. (Dkt. 51) at pp. 16-17.) Defendants offer no reason to dispute the results of this sensitivity testing.

117. The results of the uniform swing analysis conducted by Professor Mayer for the Demonstration Plan show that its efficiency gap varies from -2.0% (in the Republican wave scenario) to 3.7% (in 2012) to 3.9% (in the Democratic wave scenario). (Mayer Rebuttal Rpt. (Dkt.59-2) at pp. 26-27.)

DEFENDANTS' RESPONSE: Disputed. Given that it does not appear that Mayer truly performed a uniform swing analysis, supra ¶ 114, the defendants dispute that the numbers in the proposed finding represent the result of a "uniform swing analysis." Further, the plaintiffs have consistently referred to pro-Republican efficiency gaps as negative, whereas this proposed finding treats a pro-Republican efficiency gap as positive. The defendants do not dispute that Mayer purports to show that the efficiency gap of the Demonstration Plan varies from 2.0% (in the Republican wave scenario) to -3.7% (in 2012) to -3.9% (in the Democratic wave scenario).

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Professor Mayer used exactly the methodology recommended by defendants and their experts in carrying out his sensitivity testing. That is, he used the assumption of uniform swing, he simulated swings equivalent to both Democratic and Republican wave elections, he assumed that districts were contested, and he took into account "which districts will be contested by which incumbents." (Goedert Rpt. (Dkt. 51) at pp. 16-17.) Defendants offer no reason to dispute the results of this sensitivity testing.

118. At all times under the uniform swing analysis conducted by Professor Mayer, the Current Plan's efficiency gap is greater than |7%|, and the Demonstration Plan's is well below that absolute value. (Mayer Rebuttal Rpt. (Dkt. 64) at pp. 26-28.)

DEFENDANTS' RESPONSE: Disputed. Given that it does not appear that Mayer truly performed a uniform swing analysis, supra ¶ 114, the defendants dispute that the numbers in the proposed finding represent the result of a "uniform swing analysis." The defendants do not dispute that Mayer purports to show the Current Plan's efficiency gap is greater than |7%|, and the Demonstration Plan's is well below that absolute value.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Professor Mayer used exactly the methodology recommended by defendants and their experts in carrying out his sensitivity testing. That is, he used the assumption of uniform swing, he simulated swings equivalent to both Democratic and Republican wave elections, he assumed that districts were contested, and he took into account "which districts will be contested by which incumbents." (Goedert Rpt. (Dkt. 51) at pp. 16-17.) Defendants offer no reason to dispute the results of this sensitivity testing.

VII. General Properties of the Efficiency Gap

119. Eric McGhee compiled a set of 501 state house elections from 1970 to 2003, and then constructed a pair of very simple models. In both cases, party seat share was the dependent variable, and party vote share was one of the independent variables. The other independent variable was either partisan bias (an older measure of partisan symmetry) or the efficiency gap. Partisan bias turned out to be a relatively poor predictor of party seat share, with a coefficient of only 0.246. But the efficiency gap turned out to be a perfect predictor, with a coefficient of exactly 2.0. (Eric McGhee, Measuring Partisan Bias in Single-Member District Electoral Systems, 39 Legis. Stud. Q. 55 (2014), Jackman Decl. Ex. G (Dkt. 58-7) at p. 67.)

DEFENDANTS' RESPONSE: Disputed. The defendants dispute that "the efficiency gap" was an independent variable and that the efficiency gap "turned out to be a perfect predictor, with a coefficient of exactly 2.0." The cited article uses a dependent variable of "vote share," not the efficiency gap. (Eric McGhee, Measuring Partisan Bias in Single-Member District Electoral Systems, 39 Legis. Stud. Q. 55 (2014), Jackman Decl. Ex. G (Dkt. 58-7) at p. 67.) The defendants do not dispute the proposed finding as it relates to partisan bias.

> **PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute.** McGhee used the term "relative wasted votes" for what is now called the efficiency gap in his Legis. Stud. Q. article. McGhee found that "if [relative wasted votes] is inserted into the basic model in Table 1, it perfectly predicts seat share with a coefficient of 1.0 for relative wasted votes and 2.0 for vote share" (Eric McGhee, *Measuring Partisan Bias in Single-Member District Electoral Systems*, 39 Legis. Stud. Q. 55 (2014), Jackman Decl. Ex. G (Dkt. 58-7) at p. 67-69.)

120. In its full form, as calculated by Professor Mayer, the efficiency gap aggregates the parties' wasted votes district by district. (Mayer Rpt. (Dkt. 54) at pp. 5-6.)

DEFENDANTS' RESPONSE: Undisputed to the extent that it recognizes that Mayer did not aggregate "votes" which were actually cast in any election.

121. However, this district-by-district aggregation is unnecessary when districts have equal turnout. In this case, the efficiency gap can be calculated using the formula $(S - 0.5) - 2(V - 0.5)$, where S is a party's statewide seat share and V is a party's statewide vote share. (Jackman Rpt. (Dkt. 62) at p. 16.)

DEFENDANTS' RESPONSE: Undisputed.

122. This formula is not a different measure of the efficiency gap, as it produces exactly the same values as district-by-district aggregation when there is equal district turnout. This is why defendants' expert, Professor Goedert, "concur[s] that this shortcut is an appropriate and useful summary measure of [the] efficiency gap." (Goedert Rpt. (Dkt. 51) at 5; Goedert Dep. (Dkt. 65) at 70:17-71:1.)

DEFENDANTS' RESPONSE: Disputed. Defendants do not dispute that it "it produces

exactly the same values as district-by-district aggregation when there is equal district turnout." It is a different method when districts do not have equal turnout. This is why Goedert refers to it as only a "summary measure of efficiency gap." 1. (Goedert Rpt. (Dkt. 51) at 5; Goedert Dep. (Dkt. 65) at 70:17-71:1.)

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute that the methods used by Professors Mayer and Jackman produce exactly the same values when districts have equal turnout.

123. Districts are never exactly equal in their turnout. But America's very strict equal population rule—the most rigid in the world—ensures that they are never too different either. (Nicholas O. Stephanopoulos, Our Electoral Exceptionalism, 80 U. Chi. L. Rev. 769 (2013), Earle Decl. Ex. 1 (Dkt. 57-1) at pp. 797, 806.)

DEFENDANTS' RESPONSE: Undisputed.

124. In 2012, the Current Plan had an efficiency gap of -11.7% using the full method and -9.9% using the simplified method, a difference of only 1.8%. Similarly, the Demonstration Plan had an efficiency gap of -2.2% using the full method and -0.8% using the simplified method, a difference of only 1.4%. (Mayer Rpt. (Dkt. 54) at p. 46; Jackman Rpt. (Dkt. 62) at p. 71.)

DEFENDANTS' RESPONSE: Disputed. In 2012, the Current Plan had an every district was contested and no incumbents were running. (Supra, ¶ 106; Mayer Rpt. (Dkt. 54) 46.) Using the simplified method, Jackman's report says the efficiency gap in Wisconsin "is estimated to be -.13" or -13%. (Jackman Rpt. (Dkt. 62) 71.)

In 2012, the Demonstration Plan under the full method using Mayer's model assuming every district was contested and no incumbents were running is predicted to produce an efficiency gap of -2.20. (Mayer Rpt. (Dkt. 54) at p. 46.) The defendants do not dispute that the Demonstration Plan under the simplified method using Mayer's model assuming every district was contested and no incumbents were running is predicted to produce an efficiency gap of -1.4.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Plaintiffs' references were to Professor Mayer's, not Professor Jackman's, results. Only Professor Mayer's results allow the efficiency gap to be calculated using both the simplified and the full methods since only those results include district-by-district vote estimates. The figures provided by plaintiffs were confirmed by defendants' own expert. (Decl. of Sean Trende (Dkt. 55) ¶ 59.)

125. There were three cases in Professor Jackman's database of state house elections in which all races were contested: Michigan in 1996; Michigan in 2014; and Minnesota in 2008. Professor Jackman also identified six successive state senate elections in Michigan in which all races were contested, from 1994 to 2014. (Jackman Rpt. (Dkt. 62) at p. 25; Jackman Dep. (Dkt. 53) at 61:12-62:17; Jackman Decl. Ex. E (Dkt. 58-5).)

DEFENDANTS' RESPONSE: 125: Disputed. Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether analysis based on Professor Jackman's election results database was timely produced to the defendants and is admissible. As Professor Jackman explained in his report, this database is "a large, canonical data set on candidacies and results in state legislative elections, 1967 to the present available from the Inter-University Consortium for Political and Social Research (ICPSR study number 34297); I use a release of the data updated through 2014, maintained by Karl Klarner (Indiana State University and Harvard University)." The results up to and including 2012 are publicly available at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34297. The full database was produced to defendants, pursuant to Fed. R. Civ. P. 26(b)(4)(C)(ii), on November 10 in response to the Subpoena to Testify at a Deposition in a Civil Action issued to Simon Jackman in this case, dated 10/26/2015. Accordingly, the defendants and their experts have had Professor Jackman's full database since November 10, 2015.

The purpose of an expert report is "to provide adequate notice of the substance of the expert's forthcoming testimony and to give the opposing party time to prepare for a response." *Meyers v. Nat'l R.R. Passenger Corp. (Amtrak)*, 619 F.3d 729, 734 (7th Cir. 2010) (*citing Walsh v. Chez*, 583 F.3d 990, 993 (7th Cir.2009); *Jenkins v. Bartlett*, 487 F.3d 482, 487 (7th Cir.2007).) In this case, the data relied on was produced to the defendants on November 10, 2015, and the additional calculations based on the data were released on January 25, 2016, nearly two months before the oral argument on the motion for summary judgment, six weeks before the second deposition of Professor Simon Jackman, __ weeks before the discovery cutoff, and __ weeks before the commencement of trial. The current circumstance is clearly distinguishable from cases where courts have excluded expert analyses because they were revealed to the other side "only a few days before the start of trial" and the Court found this would have placed "a heavy burden of meeting the new evidence at trial with its own experts' analysis." *Finley v. Marathon Oil Co.,* 75 F.3d 1225, 1230-31 (7th Cir. 1996).

126. The efficiency gap for the Michigan House in the 1996 election using the full method was -6.7%, using the simplified method was -7.5%, and therefore the difference was 0.8%. (Jackman Decl. (Dkt. 58-5) at pp. 1-5.)

DEFENDANTS' RESPONSE: Disputed. Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether analysis based on Professor Jackman's election results database was timely produced to the defendants and is admissible. As Professor Jackman explained in his report, this database is "a large, canonical data set on candidacies and results in state legislative elections, 1967 to the present available from the Inter-University Consortium for Political and Social Research (ICPSR study number 34297); I use a release of the data updated through 2014, maintained by Karl Klarner (Indiana State University and Harvard University)." The results up to and including 2012 are publicly available at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34297. The full database was produced to defendants, pursuant to Fed. R. Civ. P. 26(b)(4)(C)(ii), on November 10 in response to the Subpoena to Testify at a Deposition in a Civil Action issued to Simon Jackman in this case, dated 10/26/2015. Accordingly, the defendants and their experts have had Professor Jackman's full database since November 10, 2015.

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127. The efficiency gap for the Michigan House in the 2014 election using the full method was -13.4%, using the simplified method was -13.1%, and therefore the difference was 0.3%. (Jackman Decl. (Dkt. 58-5) at pp. 5-10.)

DEFENDANTS' RESPONSE: Disputed. Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether analysis based on Professor Jackman's election results database was timely produced to the defendants and is admissible. As Professor Jackman explained in his report, this database is "a large, canonical data set on candidacies and results in state legislative elections, 1967 to the present available

from the Inter-University Consortium for Political and Social Research (ICPSR study number 34297); I use a release of the data updated through 2014, maintained by Karl Klarner (Indiana State University and Harvard University)." The results up to and including 2012 are publicly available at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34297. The full database was produced to defendants, pursuant to Fed. R. Civ. P. 26(b)(4)(C)(ii), on November 10 in response to the Subpoena to Testify at a Deposition in a Civil Action issued to Simon Jackman in this case, dated 10/26/2015. Accordingly, the defendants and their experts have had Professor Jackman's full database since November 10, 2015.

The purpose of an expert report is "to provide adequate notice of the substance of the expert's forthcoming testimony and to give the opposing party time to prepare for a response." *Meyers v. Nat'l R.R. Passenger Corp. (Amtrak)*, 619 F.3d 729, 734 (7th Cir. 2010) (*citing Walsh v. Chez*, 583 F.3d 990, 993 (7th Cir.2009); *Jenkins v. Bartlett*, 487 F.3d 482, 487 (7th Cir.2007).) In this case, the data relied on was produced to the defendants on November 10, 2015, and the additional calculations based on the data were released on January 25, 2016, nearly two months before the oral argument on the motion for summary judgment, six weeks before the second deposition of Professor Simon Jackman, __ weeks before the discovery cutoff, and __ weeks before the commencement of trial. The current circumstance is clearly distinguishable from cases where courts have excluded expert analyses because they were revealed to the other side "only a few days before the start of trial" and the Court found this would have placed "a heavy burden of meeting the new evidence at trial with its own experts' analysis." *Finley v. Marathon Oil Co.,* 75 F.3d 1225, 1230-31 (7th Cir. 1996).

128. The efficiency gap for the Minnesota House in the 2008 election using the full method was -0.8%, using the simplified method was 1.4%, and therefore the difference was -0.6%. (Jackman Decl. (Dkt. 58-5) at pp. 10-16.)

DEFENDANTS' RESPONSE: **Disputed.** Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** as to whether analysis based on Professor Jackman's election results database was timely produced to the defendants and is admissible. As Professor Jackman explained in his report, this database is "a large, canonical data set on candidacies and results in state legislative elections, 1967 to the present available from the Inter-University Consortium for Political and Social Research (ICPSR study number 34297); I use a release of the data updated through 2014, maintained by Karl Klarner (Indiana State University and Harvard University)." The results up to and including 2012 are publicly available at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34297. The full database

was produced to defendants, pursuant to Fed. R. Civ. P. 26(b)(4)(C)(ii), on November 10 in response to the Subpoena to Testify at a Deposition in a Civil Action issued to Simon Jackman in this case, dated 10/26/2015. Accordingly, the defendants and their experts have had Professor Jackman's full database since November 10, 2015.

The purpose of an expert report is "to provide adequate notice of the substance of the expert's forthcoming testimony and to give the opposing party time to prepare for a response." *Meyers v. Nat'l R.R. Passenger Corp. (Amtrak)*, 619 F.3d 729, 734 (7th Cir. 2010) (*citing Walsh v. Chez*, 583 F.3d 990, 993 (7th Cir.2009); *Jenkins v. Bartlett*, 487 F.3d 482, 487 (7th Cir.2007).) In this case, the data relied on was produced to the defendants on November 10, 2015, and the additional calculations based on the data were released on January 25, 2016, nearly two months before the oral argument on the motion for summary judgment, six weeks before the second deposition of Professor Simon Jackman, __ weeks before the discovery cutoff, and __ weeks before the commencement of trial. The current circumstance is clearly distinguishable from cases where courts have excluded expert analyses because they were revealed to the other side "only a few days before the start of trial" and the Court found this would have placed "a heavy burden of meeting the new evidence at trial with its own experts' analysis." *Finley v. Marathon Oil Co.,* 75 F.3d 1225, 1230-31 (7th Cir. 1996).

129. The efficiency gap for the Michigan Senate in the 1994 election using the full method was -3.5%, using the simplified method was -4.1%, and therefore the difference was 0.6%. (Jackman Decl. (Dkt. 58-5) at pp. 16-17.)

DEFENDANTS' RESPONSE: **Disputed.** Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. In addition, this analysis is based on elections to the

Michigan Senate when Jackman's reports only offered opinions on the elections to lower chambers of state legislatures. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** as to whether analysis based on Professor Jackman's election results database was timely produced to the defendants and is admissible. As Professor Jackman explained in his report, this database is "a large, canonical data set on candidacies and results in state legislative elections, 1967 to the present available from the Inter-University Consortium for Political and Social Research (ICPSR study number 34297); I use a release of the data updated through 2014, maintained by Karl Klarner (Indiana State University and Harvard University)." The results up to and including 2012 are publicly available at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34297. The full database was produced to defendants, pursuant to Fed. R. Civ. P. 26(b)(4)(C)(ii), on November 10 in response to the Subpoena to Testify at a Deposition in a Civil

Action issued to Simon Jackman in this case, dated 10/26/2015. Accordingly, the defendants and their experts have had Professor Jackman's full database since November 10, 2015.

The purpose of an expert report is "to provide adequate notice of the substance of the expert's forthcoming testimony and to give the opposing party time to prepare for a response." *Meyers v. Nat'l R.R. Passenger Corp. (Amtrak)*, 619 F.3d 729, 734 (7th Cir. 2010) (*citing Walsh v. Chez*, 583 F.3d 990, 993 (7th Cir.2009); *Jenkins v. Bartlett*, 487 F.3d 482, 487 (7th Cir.2007).) In this case, the data relied on was produced to the defendants on November 10, 2015, and the additional calculations based on the data were released on January 25, 2016, nearly two months before the oral argument on the motion for summary judgment, six weeks before the second deposition of Professor Simon Jackman, and months before the discovery cutoff and the commencement of trial. The current circumstance is clearly distinguishable from cases where courts have excluded expert analyses because they were revealed to the other side "only a few days before the start of trial" and the Court found this would have placed "a heavy burden of meeting the new evidence at trial with its own experts' analysis." *Finley v. Marathon Oil Co.,* 75 F.3d 1225, 1230-31 (7th Cir. 1996).

130. The efficiency gap for the Michigan Senate in the 1998 election using the full method was -9.7%, using the simplified method was -10.3%, and therefore the difference was 0.6%. (Jackman Decl. (Dkt. 58-5) at pp. 17-19)

DEFENDANTS' RESPONSE: Disputed. Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. In addition, this analysis is based on elections to the Michigan Senate when Jackman's reports only offered opinions on the elections to lower chambers of state legislatures. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

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131. The efficiency gap for the Michigan Senate in the 2002 election using the full method was -10.3%, using the simplified method was -10.4%, and therefore the difference was 0.1%. (Jackman Decl. (Dkt. 58-5) at pp. 19-20)

DEFENDANTS' RESPONSE: Disputed. Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. In addition, this analysis is based on elections to the Michigan Senate when Jackman's reports only offered opinions on the elections to lower chambers of state legislatures. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

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734 (7th Cir. 2010) (*citing Walsh v. Chez*, 583 F.3d 990, 993 (7th Cir.2009); *Jenkins v. Bartlett*, 487 F.3d 482, 487 (7th Cir.2007).) In this case, the data relied on was produced to the defendants on November 10, 2015, and the additional calculations based on the data were released on January 25, 2016, nearly two months before the oral argument on the motion for summary judgment, six weeks before the second deposition of Professor Simon Jackman and months before the discovery cutoff and the commencement of trial. The current circumstance is clearly distinguishable from cases where courts have excluded expert analyses because they were revealed to the other side "only a few days before the start of trial" and the Court found this would have placed "a heavy burden of meeting the new evidence at trial with its own experts' analysis." *Finley v. Marathon Oil Co.,* 75 F.3d 1225, 1230-31 (7th Cir. 1996).

132. The efficiency gap for the Michigan Senate in the 2006 election using the full method was -18.7%, using the simplified method was -18.4%, and therefore the difference was -0.3%. (Jackman Decl. (Dkt. 58-5) at pp. 20-22.)

DEFENDANTS' RESPONSE: Disputed. Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. In addition, this analysis is based on elections to the Michigan Senate when Jackman's reports only offered opinions on the elections to lower chambers of state legislatures. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

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> calculations based on the data were released on January 25, 2016, nearly two months before the oral argument on the motion for summary judgment, six weeks before the second deposition of Professor Simon Jackman, and months before the discovery cutoff and the commencement of trial. The current circumstance is clearly distinguishable from cases where courts have excluded expert analyses because they were revealed to the other side "only a few days before the start of trial" and the Court found this would have placed "a heavy burden of meeting the new evidence at trial with its own experts' analysis." *Finley v. Marathon Oil Co.,* 75 F.3d 1225, 1230-31 (7th Cir. 1996).133. The efficiency gap for the Michigan Senate in the 2010 election using the full method was -14.6%, using the simplified method was -14.4%, and therefore the difference was - 0.2%. (Jackman Decl. (Dkt. 58-5) at pp. 22-24)

DEFENDANTS' RESPONSE: **Disputed.** Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. In addition, this analysis is based on elections to the Michigan Senate when Jackman's reports only offered opinions on the elections to lower chambers of state legislatures. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

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clearly distinguishable from cases where courts have excluded expert analyses because they were revealed to the other side "only a few days before the start of trial" and the Court found this would have placed "a heavy burden of meeting the new evidence at trial with its own experts' analysis." *Finley v. Marathon Oil Co.,* 75 F.3d 1225, 1230-31 (7th Cir. 1996).

134. The efficiency gap for the Michigan Senate in the 2014 election using the full method was -22.8%, using the simplified method was -21.8%, and therefore the difference was 1.0%. Jackman Decl. (Dkt. 58-5) at pp. 24-25.)

DEFENDANTS' RESPONSE: Disputed. Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. In addition, this analysis is based on elections to the Michigan Senate when Jackman's reports only offered opinions on the elections to lower chambers of state legislatures. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute as to whether analysis based on Professor Jackman's election results database was timely produced to the defendants and is admissible. As Professor Jackman explained in his report, this database is "a large, canonical data set on candidacies and results in state legislative elections, 1967 to the present available from the Inter-University Consortium for Political and Social Research (ICPSR study number 34297); I use a release of the data updated through 2014, maintained by Karl Klarner (Indiana State University and Harvard University)." The results up to and including 2012 are publicly available at http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34297. The full database was produced to defendants, pursuant to Fed. R. Civ. P. 26(b)(4)(C)(ii), on November 10 in response to the Subpoena to Testify at a Deposition in a Civil Action issued to Simon Jackman in this case, dated 10/26/2015. Accordingly, the defendants and their experts have had Professor Jackman's full database since November 10, 2015.

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new evidence at trial with its own experts' analysis." *Finley v. Marathon Oil Co.,* 75 F.3d 1225, 1230-31 (7th Cir. 1996).

135. In elections in which all races were contested, there was a correlation of 0.997 between the full method's and the simplified method's efficiency gap calculations (and the two methods never varies by more than 1%) (Jackman Rpt. (Dkt.58-1) at p. 25; Jackman Dep. (Dkt. 53) at 40-41, 61-62; Jackman Decl. Ex. E (Dkt.58-5); PFOF ¶¶ 121-130.)

DEFENDANTS' RESPONSE: 135: Disputed. Jackman's opinions in this finding were not included in either his initial report or his rebuttal report, but are instead apparently found in pages of an exhibit attached to his declaration. In addition, this analysis is based on elections to the Michigan Senate when Jackman's reports only offered opinions on the elections to lower chambers of state legislatures. Defendants object to the plaintiffs' relying on expert opinions that are not contained in Jackman's reports under Fed. R. Civ. P. 26(a)(2)(B)(i).

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136. When the simplified method is used, the (S – 0.5) – 2(V – 0.5) formula implies that for the efficiency gap to be zero, there must be a 2:1 relationship between seat share and vote share (also known as "responsiveness"). (Jackman Rpt. (Dkt. 62) at pp. 17-18.)

DEFENDANTS' RESPONSE: Disputed. Defendants do not dispute that "[w]hen the simplified method is used, the (S – 0.5) – 2(V – 0.5) formula implies that for the efficiency gap to be zero, there must be a 2:1 relationship between seat share and vote share." Defendants object that this is "also known as 'responsiveness'" because the pages in the Jackman report cited do not refer to responsiveness. (Jackman Rpt. (Dkt. 62) 17-18.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute.** There are publicly available sources in which political scientists describe the relationship between the seat share and vote share as "responsiveness." *See, e.g.*, Bernard Grofman & Gary King, *The Future of Partisan Symmetry as a Judicial Test for Partisan Gerrymandering after* LULAC v. Perry, 6 Election L.J. 1, 9 (2007), *available at* http://gking.harvard.edu/files/jp.pdf ("Electoral responsiveness . . . quantifies this idea by asking how much the seat division between the parties change as the vote proportions change."). Professor Goedert also refers to the seat-vote relationship as "responsiveness" in his report. (Goedert Rpt. (Dkt. 51) at pp. 3, 10.)

137. As Professor Goedert has explained in his report and other work, a responsiveness of 2 "conform[s] with the observed average seat/votes curve in historical U.S. congressional and legislative elections." (Goedert Rpt. (Dkt. 51) at p. 6; Goedert Dep. (Dkt. 65) at 95:17-21.)

DEFENDANTS' RESPONSE: Undisputed.

138. At the congressional level, the seat/vote curve had "an average slope of 2.02 for the past 40 years." (Goedert, Gerrymandering or Geography, supra, at 7, Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 7.)

DEFENDANTS' RESPONSE: Undisputed.

139. Professor Goedert "assume[s] that a party should expect to win a proportion of seats in line with historical patterns" – fearing a responsiveness of 2 – and then compares the party's actual seat share "with the expected seat share under a 'fair map' with...a historically average seats-votes curve." (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Research & Pol., Apr.-Jun. 2014, Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 7.)

DEFENDANTS' RESPONSE: Disputed. In his research, Goedert "assess[es] the bias in maps of individual states" by "first establish[ing] how a 'fair' map might translate the popular vote for individual candidates." (Goedert Dep. Ex. 20 (Dkt. 65-2) 2.) He "assume[s] that a party should expect to win a proportion of seats in line with historical patterns found in modern congressional elections," which does have a responsiveness of 2. Goedert Dep. Ex. 20 (Dkt. 65-2) 2-3.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute.** Plaintiffs' proposed fact and defendants' response both acknowledge that Professor Goedert assumes that under a "fair map" a party should win a share of seats in line with a responsiveness of 2, which is the historically average seats-votes curve for modern congressional elections. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Research & Pol., Apr.-Jun. 2014, Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 7.)

140. The 10% population deviation threshold, used in one person, one vote cases, was set only after the Court first struck down plans with deviations of 20%, 26%, and 34%, and upheld plans with deviations of 8% and 10%, over roughly a decade. (Nicholas O. Stephanopoulos & Eric M. McGhee, Partisan Gerrymandering and the Efficiency Gap, 82 U. CHI. L. REV. 831, 890-91 (2015), publicly available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2457468.)

DEFENDANTS' RESPONSE: **Undisputed.**

141. In setting a test for partisan gerrymandering, with respect to the second prong of the proposed test, the Court could supplement any threshold with the sensitivity testing recommended by defendants' expert, Professor Goedert. (Goedert Rpt. (Dkt. 51) at p. 15.)

DEFENDANTS' RESPONSE: **Disputed.** This is a question of law, not a finding of fact.

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** that when asked how he would determine "what the likelihood that that efficiency gap would persist throughout potential future elections in the decade," defendants' expert, Professor Goedert, suggested using sensitivity testing with a uniform swing assumption. (Goedert Dep. (Dkt. 65) 122:3-123:25.)

142. Plaintiffs' Demonstration Plan complies at least as well with all federal and state requirements, but has an efficiency gap more than 80% smaller. (Mayer Rpt. (Dkt. 54) at pp. 37, 46.)

DEFENDANTS' RESPONSE: **Disputed.** The Demonstration Plan does not comply as well as the current plan with respect to the federal constitutional requirement of population deviation. The Demonstration Plan has population deviation of 0.86% whereas the current plan has population deviation of 0.76%. (Mayer Rpt. (Dkt. 54) 37.) In addition, Mayer has presented no evidence as to how his plan compares to the current plan in respect of the disenfranchisement of voters for State Senate seats (which are each made up of three Assembly districts) and have staggered elections. This is an equal protection issue that has been addressed in court decisions regarding Wisconsin's districting. *Baldus v. Members of Wisconsin Gov't Accountability Bd.*, 849 F. Supp. 2d 840, 852 (E.D. Wis. 2012); Baumgart, 2002 WL 34127471, at *3-7; *Prosser v. Elections Bd.*, 793 F. Supp. 859, 866 (W.D. Wis. 1992).

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** that both the Current Plan and the Demonstration plan have contiguous districts, have population deviations that are well within the 10% safe harbor established by the Supreme Court, *Connor v. Finch*, 431 U.S. 407, 418 (1977), and comply with the Voting Rights Act, 52 U.S.C. 10301, but that the Demonstration Plan splits fewer political subdivisions than the Current Plan and is much better in terms of district compactness and partisan symmetry. (Mayer Rpt. (Dkt. 54) at pp. 37, 46.)

There is also no genuine dispute that Professor Mayer has not attempted to determine how the Demonstration Plan compares to the Current Plan in terms of the disenfranchisement of voters for State Senate seats, and that such a comparison is infeasible because there is no federal legal test for when a plan is unlawful for this reason. In fact "[e]ach case, and each decade, should be assessed on its own record, and factors like the number of people moved, the overall population shifts in the state (both internally and from out-of-state), the impact on particular demographic groups, and comparable points, will all enter into the assessment." (*Baldus v. Members of Wisconsin Gov't Accountability Bd.*, 849 F. Supp. 2d 840, 852 (E.D. Wis. 2012).)

143. The California state legislative plan for 1972-1980 had an average efficiency gap of 2.5% (Jackman Rpt. (Dkt. 62) at p. 7.)

DEFENDANTS' RESPONSE: Undisputed.

144 The New Mexico state legislative plan for 2012-2014 had an average efficiency gap of -1.6% (Jackman Rpt. (Dkt. 62) at p. 7.)

DEFENDANTS' RESPONSE: Undisputed.

145. Roughly equal wasted votes, not any kind of seat-vote relationship, is the essence of the efficiency gap, and can be described as a measure of "relative wasted votes." (Eric McGhee, Measuring Partisan Bias in Single-Member District Electoral Systems, 39 Legis. Stud. Q. 55 (2014), Jackman Decl. Ex. G (Dkt. 58-7) at p. 68.)

DEFENDANTS' RESPONSE: Disputed. The simplified method of the efficiency gap judges plans based on how well they deliver seats in a way that each 1% increase in vote share leads to a 2% increase in seat share. (Dkt. 67 ¶ 123.) Thus, it does involve a particular seat-vote relationship.

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** that the essence of the efficiency gap is that it compares the relative number of wasted votes for each party (*see supra* ¶ 7).

There is also no genuine dispute that a particular seat-vote relationship follows if there is a zero efficiency gap, as explained by Professor Jackman:

Q: Does your calculation of the efficiency gap rely on a seats-votes curve?

> A: Strictly speaking, no, no, although a seats-votes curve is implied by the efficiency gap. If you assume the efficiency gap is zero, an underlying seats-votes curve is implied.
>
> (Jackman Dep. (Dkt. 53) 32:4-32:9.)

146. Professor Goedert explained in his report that the 2:1 seat-vote relationship "conform[s] with the observed average seat/votes curve in historical U.S. congressional and legislative elections." (Goedert Rpt. (Dkt. 51) at p. 6; Goedert Dep. (Dkt. 65) at 95:17-21.)

DEFENDANTS' RESPONSE: Undisputed.

147. Partisan bias denotes "the extent to which a majority party would fare better than the minority party, should their respective shares of the vote reverse," and so it is compatible with any seat-vote ratio. "An electoral system may have any degree of partisan bias, no matter what level of responsiveness happens to exist." (Bernard Grofman & Gary King, The Future of Partisan Symmetry as a Judicial Test for Partisan Gerrymandering After LULAC v. Perry, 6 Election L.J. 2, 6 (2007), http://gking.harvard.edu/files/jp.pdf, at p. 9.)

DEFENDANTS' RESPONSE: Undisputed.

148. Under the simplified method, the efficiency gap would be -7% if the party received 53% of the seats ((0.53 – 0.5) – 2(0.55 – 0.5)), and 7% if the party received 67% of the seats ((0.67 – 0.5) – 2(0.55 – 0.5)). The seat-vote relationship would be 0.6 in the first case ((0.53 – 0.5) / (0.55 – 0.5)), and 3.4 in the second case ((0.67 – 0.5) / (0.55 – 0.5)), relative to the benchmark of S = V = 0.5. (Andrew Gelman & Gary King, Estimating the Electoral Consequences of Legislative Redistricting, 85 J. AM. STAT. ASS'N 274 (1990), Jackman Decl. Ex. I (Dkt. 58-9) at p.9; Jackman Rpt. (Dkt. 62) at p. 16.)

DEFENDANTS' RESPONSE: 148: Disputed. The proposed finding does not specifically state the vote share involved. Assuming the 55% vote share indicated by the equation in the proposed finding, the defendants do not dispute the proposed finding.

> **PLAINTIFFS' REPLY**: **Defendants fail to create a genuine dispute** as to the findings if a 55% vote share is assumed.

149. Partisan bias is a relatively poor predictor of party seat share (McGhee, supra, at 67, Jackman Decl. Ex. G (Dkt. 58-7) at p. 67.)

DEFENDANTS' RESPONSE: Undisputed.

150. The more uncompetitive a state's election, the less accurate partisan bias becomes (Nicholas O. Stephanopoulos & Eric M. McGhee, Partisan Gerrymandering and the Efficiency Gap, 82 U. CHI. L. REV. 831, 858 (2015), publicly available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2457468.)

DEFENDANTS' RESPONSE: Undisputed.

151. Professor Gaddie, removed the effects of incumbency from his model, imputed election results in uncontested races, and assumed equal district turnout (Mayer Rebuttal Rpt. (Dkt. 64) at p. 22.)

DEFENDANTS' RESPONSE: Disputed. The cited evidence does not support the contention that Professor Gaddie "assumed equal district turnout." The defendants do not dispute that Gaddie's model attempted to "to create some measure of partisan competitiveness, an expected vote or what we call a normal vote, what the vote would usually do without an incumbent in the district." (Mayer Rebuttal Rpt. (Dkt. 64) at p. 22.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute.** Professor Gaddie ultimately arrived at expected Democratic and Republican *vote shares*—not actual votes—for each district in the Current Plan. (Mayer Dep. Ex. 7 (Dkt. 52-2).) These vote shares imply that turnout is assumed to be equal across districts.

152. Table 2 of Professor Mayer's Report sets out the results of his initial model, which predicts district vote shares with nearly perfect precision and does not remove incumbency effects. (Mayer Rpt. (Dkt. 54) at pp. 19-28.)

DEFENDANTS' RESPONSE: Disputed. The defendants do not dispute that Table 2 of Mayer's Report sets out the results of his initial model and does not remove incumbency effects. The defendants dispute that this model "predicts district vote shares with nearly perfect precision" because Mayer says his "average absolute error in the vote margin is 1.49%." (Mayer Rpt. (Dkt. 54) 25.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** that Table 2 of Professor Mayer's Report sets out the results of his initial model, which does not remove incumbency effects, and predicts district vote shares with an absolute error in the vote margin of only 1.49%.

153. All of Professor Jackman's calculations made no adjustments for incumbency. (Jackman Rpt. (Dkt. 62) at pp. 19-32.)

DEFENDANTS' RESPONSE: Undisputed.

154. Professor Jackman's sensitivity testing showed that maps throughout the nation with large efficiency gaps would remain highly asymmetric even given swings of up to five points in either party's direction. (Jackman Decl. Ex. D (Dkt. 58-4) at pp. 1-6.)

DEFENDANTS' RESPONSE: Disputed. Defendants dispute that the maps "would remain highly asymmetric." Jackman's chart shows a correlation of 0.7 in some instances, which does not correspond to a highly asymmetric map. (Jackman Decl. Ex. D (Dkt. 58-4) at 4.) Further, Wisconsin's own experience shows that electoral tides can significantly change the efficiency gap. Under the 2002 Plan, Wisconsin's efficiency gap started at -7.5% and ranged from -4% to - 12% through a range of electoral conditions.

(Dkt. 67 ¶¶ 211-16.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute.** Both sides agree that for plans with large initial efficiency gaps, there is approximately a 0.7 correlation between the initial gaps and the simulated gaps in the event of a five-point swing. Professor Jackman opines that "the correlation between actual and simulated efficiency gaps stays impressively large over the entire range of uniform swing levels considered here (top right panel of Figure 2)." (Jackman Decl. Ex. D (Dkt 58-4) at p. 5.)

155. The Republican leadership crafted the Current Plan the Republican- controlled Legislature passed the Current Plan with little debate (Compl. (Dkt. 1) ¶¶ 31-43.)

DEFENDANTS' RESPONSE: Disputed. The plaintiffs do not cite admissible evidence for this proposition. The allegations in their complaint are not admissible evidence.

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute.** The evidence of how quickly the legislation passed the House and Senate (introduced to the Senate on July 11, 2011; passed July 19, 2011, and introduced to the Assembly July 19, 2011; passed July 20, 2011) is publicly available at https://docs.legis.wisconsin.gov/2011/proposals/sb148. The court that already considered the Current Plan also deemed "almost laughable" the claim that the Plan was "not influenced by partisan factors." (*Baldus v. Members of Wisconsin Gov't Accountability Bd.*, 849 F. Supp. 2d 840, 851 (E.D. Wis. 2012).)

156. The increase in Republican unified control accounts for essentially all of the efficiency gap's movement in a Republican direction. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 20.)

DEFENDANTS' RESPONSE: Disputed. Jackman's analysis does not show the average efficiency gap of state house plans because Jackman's analysis did not consider plans enacted without unified partisan control. His rebuttal report says "The omitted category is any other institution responsible for redistricting, such as divided government, a court, or a commission." (Jackman Rebuttal Rep. (Dkt. 63) at 20.) Jackman says plans without partisan control accounted for 60% of plans in the 1990s and 40% of plans in the 2010s. (Jackman Rebuttal Rep. (Dkt. 63) at 18.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** that Professor Jackman's analysis shows that the average efficiency gap would barely have changed if the distribution of party control had remained constant from 1990 to 2010. Professor Jackman included *all* plans in his analysis. In his *regression model*, Professor Jackman properly omitted one of the three dummy variables for control over redistricting, namely the dummy variable for "any other institution responsible for redistricting, such as divided government, a court, or a commission." (Jackman Rebuttal Rep. (Dkt. 63) at 19.) It is an elementary statistical point and a logical inference that of a series of dummy variables that collectively account for all cases in the analysis, one must be omitted from the model. The coefficients for the remaining dummy variables then indicate their

impact relative to the omitted variable.

157. Partisan intent is often a driver of partisan impact, as shown by Professor Goedert's work finding that unified party control over redistricting leads to a large efficiency gap boost in favor of that party. (Goedert, Gerrymandering or Geography, supra, at 6, Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 6; Goedert, Disappearing Bias, supra, at 13, Goedert Dep. Ex. 21 (Dkt. 65-3) at 13.)

DEFENDANTS' RESPONSE: Disputed. Goedert's model does not predict an efficiency gap. The dependent variable in Goedert's model "is the deviation in democratic seats won from historical expectation given a certain vote share." (Goedert Dep. (Dkt. 60) at 77:9-11.) His model "ends up I think rather coincidentally being very close to efficiency gap when one party wins say between 40 and 60 percent of the vote." (Goedert Dep. (Dkt. 60) at 77:20-23.)

Goedert's model examines congressional elections. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 1, 5-6.) Therefore it cannot be used to determine anything with respect to state legislative elections, which the proposed finding implies.

Goedert's model is intended to "give a prediction about the average impact of" the dependent variables "given that the electoral conditions are identical to the electoral conditions in a particular election." (Goedert Dep. (Dkt. 60) at 76:22-25.)

Further, Goedert found that partisan control did not lead to a large boost in favor of Democrats, instead that "Democrats also underperformed under bipartisan maps, and gained only a small advantage from their own maps, suggesting their main issue is not gerrymandering, but districting itself." (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 1.)

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute**. Defendants' admit that one of the models used by Professor Goedert in his analysis of the congressional elections in 2012 and 2014 uses a measure essentially identical to the efficiency gap as the dependent variable. (*Supra* ¶ 28; Defs.' APFOF Resp. (Dkt. 76) ¶ 28.) Additionally, the only material difference here between congressional and state house plans is the number of districts in the plan. The predicted efficiency gap's *size* would likely be smaller for a state house plan given its larger number of districts, but the predicted efficiency gap's *partisan direction* would remain the same. (Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 57 Q.J. POL. SCI. 239, 252 (2013).) In other words, Professor Goedert's predictions for congressional plans are applicable to state house plans too, at least with respect to the partisan direction of the estimates.

Furthermore, two of Professor Goedert's three 2012 models show that Democrats

obtained a *larger* boost from unified control over redistricting than did Republicans. (Nicholas Goedert, Gerrymandering or Geography? How Democrats Won the Popular Vote But Lost the Congress in 2012, Res. & Pol. (2014), Goedert Dep. Ex. 20 (Dkt. 65-2) at p. 6.) Defendants are thus wrong to claim that "partisan control did not lead to a large boost in favor of Democrats."

158. At present, the motivation for many one-person, one-vote, Voting Rights Act, and state law claims is partisan dissatisfaction at being the victim of gerrymandering. Samuel Issacharoff finds that "the absence of any real constitutional vigilance over partisan gerrymandering" causes litigants to "squeeze all claims . . . into the suffocating category of race." (Samuel Issacharoff, Gerrymandering and Political Cartels, 116 Harv. L. Rev. 593, 630-31 (2002), Earle Decl. Ex. E (Dkt. 57-5) at pp. 630-31.)

DEFENDANTS' RESPONSE: **Disputed.** This finding of fact is not based on admissible evidence. The author of the article does not have first-hand knowledge of the motivation for legal claims. Fed. R. Evid. 602.

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** as to whether Professor Issacharoff has first-hand knowledge regarding the motivation for legal claims. Professor Issacharoff worked as a voting rights litigator and Acting Director of the Voting Rights Project at the Lawyers' Committee for Civil Rights Under Law for several years. He is also one of the nation's leading election law professors. His curriculum vitae is publicly available at https://its.law.nyu.edu/facultyprofiles/index.cfm?fuseaction=profile.full_cv&personid=23845. Further, in a manner analogous to the proposition contained in this proposed finding of fact, federal courts routinely cite law review articles as support for propositions of the type proposed by the Plaintiffs which are material to resolution of summary judgment motions. e.g. *Holstrom v. Metropolitan Life Insurance Company,* 615 F.3d 758, 768 (7th Cir. 2010)(citing *Metropolitan Life Insurance Co. v. Glenn*, 554 U.S. 105, 117-118, 128 S. Ct. 2343, 2351 (2008) as an example of judicial reliance on a law review article); *see also Burgess v. Watters,* 467 F.3d 676, 686 (7th Cir. 2006)(citing law review article to support propostion that Congress intended "civil laws" to mean laws that have to do with private rights and status.)

159. Richard H. Pildes observes that "[t]he 'right' claimed" in many "political cases" is "obviously a stalking horse for other interests." (Richard H. Pildes, The Theory of Political Competition, 85 Va. L. Rev. 1605, 1608 (1999), Earle Decl. Ex. F (Dkt. 57-6) at pp. 1608.)

DEFENDANTS' RESPONSE: **Disputed.** This finding of fact is not based on admissible evidence. The author of the article does not have first-hand knowledge of the motivation for legal claims. Fed. R. Evid. 602.

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute** as to whether Professor Pildes has first-hand knowledge regarding the motivation for legal claims. Professor Pildes has served as a court-appointed expert in several

votings rights cases, including a Voting Rights Act case, a case regarding the redistricting of the Ohio legislature (*Quilter v. Voinovich*, 507 U.S. 146 (1993)), and a racial gerrymandering case (*Hunt v. Cromartie*, 526 U.S. 541 (1999)). He also was Counsel of Record for an amicus brief filed on behalf of election law professors in the most recent partisan gerrymandering case before the Supreme Court (*LULAC* v. Perry, 126 S. Ct. 2594 (2006)). Professor Pildes is also one of the nation's leading election law professors. Further, in a manner analogous to the proposition contained in this proposed finding of fact, federal courts routinely cite law review articles as support for propositions of the type proposed by the Plaintiffs which are material to resolution of summary judgment motions. e.g. *Holstrom v. Metropolitan Life Insurance Company,* 615 F.3d 758, 768 (7th Cir. 2010)(citing *Metropolitan Life Insurance Co. v. Glenn*, 554 U.S. 105, 117-118, 128 S. Ct. 2343, 2351 (2008) as an example of judicial reliance on a law review article); *see also Burgess v. Watters,* 467 F.3d 676, 686 (7th Cir. 2006)(citing law review article to support propostion that Congress intended "civil laws" to mean laws that have to do with private rights and status.)

160. For decades, the vast majority of redistricting litigation has been resolved very early in the cycle. (Litigation in the 2010 Cycle, All About Redistricting, http://redistricting.lls.edu/cases.php (showing that more than 85% of redistricting suits in the 2010 cycle have already been resolved.)

DEFENDANTS' RESPONSE: Disputed. The cited evidence does not support the proposed finding as it relates to prior decades because it only deals with the 2010 cycle. Defendants do not dispute that more than 85% of redistricting suits in the 2010 cycle have already been resolved.

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute**. Defendants do not contest the resolution data for the current cycle. The citation provided in APFOF ¶ 160 also includes links to cases from the 2000s, 1990s, and 1980s, showing the year of the resolution of the cases. These can be accessed directly at: 2000s: http://www.senate.mn/departments/scr/redist/redsum2000/redsum2000.htm#AL; 1990s: http://www.senate.mn/departments/scr/redist/redout.htm; 1980s: http://www.senate.mn/departments/scr/redist/Redsum1980/redsum1980.htm.

161. In assessing what cutoff would be reasonable, Professor Jackman considered whether a plan's initial efficiency gap is "large relative to those observed in the previous 40 years of state legislative elections." (Jackman Rpt. (Dkt. 62) at p. 65.)

DEFENDANTS' RESPONSE: Undisputed.

162. In assessing what cutoff would be reasonable, Professor Jackman considered what proportion of plans either fall below a given threshold, or if above, would exhibit an efficiency gap of the same sign throughout their lifetimes. (Jackman Rpt. (Dkt. 62) at pp. 66-69.)

DEFENDANTS' RESPONSE: Undisputed.

163. In assessing what cutoff would be reasonable, Professor Jackman considered what a series of prognostic tests reveal about the reliability of different thresholds. (Jackman Rebuttal Report (Dkt. 63) at pp. 5-14.)

DEFENDANTS' RESPONSE: Disputed. The cited evidence is Jackman's rebuttal report. The defendants do not dispute that Jackman considered what a series of prognostic tests reveal about the reliability of different thresholds in his rebuttal report, but dispute that he considered this factor in his initial report when he determined the 7% EG threshold.

> **PLAINTIFFS' REPLY**: **Defendants fail to create a genuine dispute** that Professor Jackman considered various approaches for setting the threshold for the efficiency gap in *both* his original report and his rebuttal report. All of these approaches confirmed the reasonableness and conservatism of a 7% threshold. Professor Jackman devoted Section 10 of his initial report to the question of "what might determine a threshold for determining if the EG is a large and enduring characteristic of a plan." (Jackman Rpt (Dkt. 62) at pp. 56-69; Jackman Rebuttal Report (Dkt. 63) at pp. 5-14.)

164. In assessing what cutoff would be reasonable, Professor Jackman considered how a plan's initial efficiency gap is related to its average efficiency gap over its lifetime. (Jackman Rebuttal Report (Dkt. 63) at pp. 15-17.)

DEFENDANTS' RESPONSE: 164: Disputed. The cited evidence is Jackman's rebuttal report. The defendants do not dispute that Jackman considered how a plan's initial efficiency gap is related to its average efficiency gap over its lifetime in his rebuttal report, but dispute that he considered this factor in his initial report when he determined the 7% EG threshold.

> **PLAINTIFFS' REPLY**: **No genuine dispute** that Professor Jackman considered various approaches for setting the threshold for the efficiency gap in *both* his original report and his rebuttal report. All of these approaches confirmed the reasonableness and conservatism of a 7% threshold. Professor Jackman devoted Section 10 of his initial report to the question of "what might determine a threshold for determining if the EG is a large and enduring characteristic of a plan." (Jackman Rpt (Dkt. 62) at pp. 56-69; Jackman Rebuttal Report (Dkt. 63) at pp. 5-14.)

165. In assessing what cutoff would be reasonable, Professor Jackman considered what sensitivity testing demonstrates about the durability of plans' efficiency gaps in the current cycle. (Jackman Decl. Ex. D (Dkt. 58-4) at pp. 1-6.)

DEFENDANTS' RESPONSE: Disputed. The cited evidence is Jackman a declaration to Jackman's declaration. The defendants do not dispute that Jackman considered what sensitivity testing demonstrates about the durability of plans' efficiency gaps in the

current cycle for purposes of his declaration, but dispute that he considered this factor in his initial report when he determined the 7% EG threshold.

> **PLAINTIFFS' REPLY**: **Defendants fail to create a genuine dispute** that Professor Jackman considered various approaches for setting the threshold for the efficiency gap in *both* his original report and his rebuttal report. All of these approaches confirmed the reasonableness and conservatism of a 7% threshold. Professor Jackman devoted Section 10 of his initial report to the question of "what might determine a threshold for determining if the EG is a large and enduring characteristic of a plan." (Jackman Rpt (Dkt. 62) at pp. 56-69; Jackman Rebuttal Report (Dkt. 63) at pp. 5-14.)

166. In his initial report, Professor Jackman examined whether most variation in the efficiency gap is within plans (in which case the metric would not be very trustworthy) or between plans (in which case it would amount to a durable plan characteristic). His results confirmed the latter thesis. "About 76% of the variation in the EG estimates is between plan variation," indicating that "there is a moderate to strong 'plan-specific' component to variation in the EG scores," and that "the efficiency gap is measuring an enduring feature of a districting plan." (Jackman Rpt. (Dkt. 62) at pp. 48; Jackman Dep. (Dkt. 53) at 75:10-76:4.)

DEFENDANTS' RESPONSE: Undisputed.

167. About 95% of plans from 1972 to 2014 either had initial efficiency gaps below 7% or had larger initial efficiency gaps and never once favored the opposing party. (Jackman Rpt. (Dkt. 62) at p. 67; Goedert Dep. (Dkt. 51) at 120: 24-121:1.)

DEFENDANTS' RESPONSE: Undisputed.

168. Professor Jackman's prognostic tests indicate that there would be almost no false positives with a 7% threshold, that is, cases where a plan's average efficiency gap was expected to have the same sign as its initial efficiency gap, but this expectation turned out to be incorrect. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 12.)

DEFENDANTS' RESPONSE: Disputed. For Jackman's sensitivity testing, "[i]n each instance the test is whether the first EG observed under a plan exceeds a given threshold value. The outcome of interest is whether the plan's remaining efficiency gaps have the same sign as the EG from the first election." (Jackman Rebuttal Rpt. (Dkt. 63) at 6.) Thus, his definition of "false positive" is a plan is a plan that exceeds the threshold in its first election, yet goes on to produce an EG of the opposite sign. (Jackman Rebuttal Rpt. (Dkt. 63) at 6-7.) With this proper understanding of what counts as a "false positive" under Jackman's analysis, Jackman calculated that the rate of false positives at a 7% threshold would be under 5%. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 12.)

> **PLAINTIFFS' REPLY**: **Defendants fail to create a genuine dispute** that Professor Jackman calculated the rate of false positives at a 7% threshold to be under 5%. (Jackman Rebuttal Rpt. (Dkt. 63) at p. 12.)

169. There is a very strong relationship between a plan's initial efficiency gap and the size and sign of its average efficiency gap, with the former accounting for fully three-fourths of the variation in the latter. (Jackman Rebuttal Rpt. (Dkt. 63) at pp. 15-17.)

DEFENDANTS' RESPONSE: Disputed. Jackman's report provides that "Figure 7 shows the relationship between the first-election EG and the average EG observed over the entire plan. Note that we restrict this analysis to plans with at least three elections, so that the first election does not unduly contribute to the calculation of the average; this restriction has the consequence of omitting elections from the most recent round of redistricting after the 2010 Census, which have contributed at most two elections. The black diagonal line on the graph is a 45-degree line: if the relationship between first-election EG and plan-average EG were perfect, the data would all lie on this line. Instead we see a classic 'regression-to-the-mean' pattern, with a positive regression slope of less than one (as indeed we should, given that the first-election EG on the horizontal axis contributes to the average plotted on the vertical axis). But the relationship here is especially strong. The variation in plan-average efficiency gaps explained by this regression is quite large, about 73%; after taking into account the uncertainty in the EG scores (stemming from the imputation procedures used for uncontested districts; see my initial report) a 95% confidence interval on the variance explained measure ranges from 67% to 74% (the uncertainty has the consequence of tending to make the regression fit slightly less well)." (Jackman Rebuttal Rpt. (Dkt. 63) at 15.)

> **PLAINTIFFS' REPLY**: **Defendants fail to create a genuine dispute**. Both sides agree that "the relationship between the first election EG and plan-average EG is quite strong," and that Professor Jackman finds that the "variation in plan-average efficiency gaps explained by [the] regression is quite large, about 73%." (Jackman Rebuttal Rpt. (Dkt. 63) at pp. 15-17.)

170. This tight relationship applies not just retrospectively but also prospectively. If current plans with large efficiency gaps experienced electoral tides of up to five points in either direction, their new efficiency gaps would be extremely highly correlated with their original ones, and almost certain to have the same sign. (Jackman Decl. Ex. D (Dkt. 58-4) at p. 4.)

DEFENDANTS' RESPONSE: Disputed. The defendants do not dispute that Jackman found that plans with high efficiency gaps would be almost certain to have the same sign. Defendants dispute that the "new efficiency gaps would be extremely highly correlated with their original ones." Jackman's chart shows a correlation of 0.7 in some instances, which is not "extremely high[]." Further, Wisconsin's own experience shows that electoral tides can significantly change the efficiency gap. Under the 2002 Plan, Wisconsin's efficiency gap ranged from -4% to -12% through a range of electoral conditions. (Dkt. 67 ¶¶ 211-16.)

> **PLAINTIFFS' REPLY**: **Defendants fail to create a genuine dispute.** Both sides agree that for plans with large initial efficiency gaps, there is approximately a 0.7 correlation between the initial gaps and the simulated gaps in the event of a five-point swing. Professor Jackman opines that "the correlation between actual

and simulated efficiency gaps stays impressively large over the entire range of uniform swing levels considered here (top right panel of Figure 2)." (Jackman Decl. Ex. D (Dkt 58-4) at p. 5)

171. Because partisan bias is calculated based on counterfactual rather than actual elections, it is essentially unaffected by the electoral swings that in fact occur. (See McGhee, supra, Jackman Decl. Ex. G (Dkt. 58-7) at p. 73 (noting that partisan bias exhibits "more persistence through time"); Stephanopoulos & McGhee, supra, at 864 (observing that "partisan bias is fairly stable" because "it shifts all actual results to the point of the hypothetical election").

DEFENDANTS' RESPONSE: Undisputed.

172. Similar examples in the current cycle include Maine, where Republicans in full control of the state government authorized an advisory commission and then heeded its line drawing recommendations, and Vermont, where Democrats in full control did the same. (Maine, All About Redistricting, publicly available at http://redistricting.lls.edu/statesME.php; Vermont, All About Redistricting, publicly available at http://redistricting.lls.edu/states-VT.php.)

DEFENDANTS' RESPONSE: Undisputed.

173. The only suggestion of defendants not tried out by plaintiffs' experts is treating uncontested races as if they were decided by a margin of 100% to 0%. See Defs' Br. at 49. This crude approach is guaranteed to produce errors since the voters in uncontested races are never unanimously in favor of the winning party's candidate. (Jackman Rpt. (Dkt. 62) at p. 24; Stephanopoulos & McGhee, supra, at 867.) ("We strongly discourage analysts from . . . treating [uncontested races] as if they produced unanimous support for a party.")

DEFENDANTS' RESPONSE: Disputed. The defendants do not dispute that the plaintiffs did not treat uncontested races as if they were decided by a margin of 100% to 0%. Defendants dispute that this method would produce errors (at least any more errors than the methods used by the plaintiffs) in that they would be closer to the actual vote totals cast in uncontested races. Defendants dispute that the plaintiffs "tried out" all of the suggestions suggested by the defendants' experts because they did not adopt Goedert's actual uniform swing suggestion. Supra, ¶ 85.

PLAINTIFFS' REPLY: Defendants fail to create a genuine dispute. Defendants are apparently referring to Professor Mayer's sensitivity testing, as they do not dispute that Professor Jackman carried out the uniform swing analysis recommended by Professor Goedert. But Professor Mayer used exactly the methodology recommended by defendants and their experts in carrying out his sensitivity testing. That is, he used the assumption of uniform swing, he simulated swings equivalent to both Democratic and Republican wave elections, he assumed that districts were contested, and he took into account "which districts will be contested by which incumbents." (Goedert Rpt. (Dkt. 51) at pp. 16-17.).

Defendants offer no reason to doubt the results of this sensitivity testing.

There is also no genuine dispute as to whether treating uncontested races as if they were decided by a margin of 100% to 0% is guaranteed to produce errors. Defendants cite nothing in the record, nor any external authority, to support their contention that treating uncontested races in this way would produce fewer errors than plaintiffs' far more sophisticated approach. Plaintiffs' approach is supported by Jackman Rpt. (Dkt. 62) at p. 24; and Stephanopoulos & McGhee, *supra*, at 867.

174. In the current cycle, the Florida, Georgia, Indiana, Michigan, North Carolina, Ohio, Rhode Island, Tennessee, Vermont, Wisconsin, and Wyoming plans were all enacted by a single party with unified control over redistricting, and all exhibited efficiency gaps above 7% in 2012. Likewise, the Alaska, California, Colorado, Connecticut, Hawaii, Iowa, Kentucky, Maine, Minnesota, Montana, Nevada, New Mexico, and Washington plans were all enacted by some other institution (a court, a commission, or divided government), and all had efficiency gaps below 7% in 2012. (Jackman Rpt. (Dkt. 62) at pp. 7, 73; Jackman Rebuttal Rpt. (Dkt. 63) at pp. 18-20; Jackman Decl. Ex. F (Dkt. 58-6).)

DEFENDANTS' RESPONSE: Undisputed.

175. The efficiency gap is plaintiffs' measure of partisan effect, not of partisan intent. (Jackman Rebuttal Rpt. (Dkt. 63) at pp. 3-4.)

DEFENDANTS' RESPONSE: Disputed. This is a question of law, not a question of fact. Further, Professor Jackman is not an expert on legal questions, such as what the plaintiffs' legal standard is.

PLAINTIFFS' REPLY: **Defendants fail to create a genuine dispute as to whether** Professor Jackman is qualified to explain what the efficiency gap is measuring in political science terms. Professor Jackman finds in his rebuttal report that the efficiency gap is a measure of partisan effect, not partisan intent. (*Supra* ¶¶ 1, 2, 5, 8; Jackman Rebuttal Rpt. (Dkt. 63) at pp. 3-4.)

Dated this 16th day of February, 2016.

Respectfully submitted,

s/ Michele Odorizzi

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