

**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,)

No. 15-cv-421-bbc

Plaintiffs,)

v.)

GERALD C. NICHOL, THOMAS BARLAND,)
JOHN FRANKE, HAROLD V. FROEHLICH,)
KEVIN J. KENNEDY, ELSA LAMELAS, and)
TIMOTHY VOCKE,)

Defendants.)

**MEMORANDUM IN SUPPORT OF PLAINTIFFS' MOTION IN LIMINE TO
EXCLUDE THE TESTIMONY OF SEAN P. TRENDE**

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TABLE OF CONTENTS

INTRODUCTION 1

BACKGROUND 4

LEGAL STANDARD 4

ARGUMENT 5

 I. Trende is Not Qualified to Render an Opinion Concerning the Efficiency Gap as a Metric and Geographic Clustering in the State of Wisconsin 4

 II. Trende’s Opinions Analyzing Geographic Clustering in the State of Wisconsin and the Performance of the Efficiency Gap Metric are Scientifically Unreliable, Irrelevant, and Inadmissible 8

 A. Trende’s Opinion That the Efficiency Gap in Wisconsin is an Unavoidable Result of the “Natural Clustering” of Democratic Voters in a Few Counties is Based on Severely Flawed Analyses with No Foundation in the Literature 9

 B. Trende’s Opinion that the Efficiency Gap is an Inaccurate Predictor of Partisan Gerrymandering Relies on an Error-Filled Analysis of State Assembly and Congressional Plans and a Misunderstanding of Plaintiffs’ Proposed Test 22

 C. Trende’s Remaining Opinions Are Baseless and Demonstrate a Fundamental Misunderstanding of Quantitative Analysis 26

CONCLUSION 30

TABLE OF AUTHORITIES

Cases	Page(s)
<i>Ammons v. Aramark Unif. Servs., Inc.</i> , 368 F.3d 809 (7th Cir. 2004).....	29
<i>Ancho v. Pentek Corp.</i> , 157 F. 3d 512 (7th Cir. 1998)	5
<i>Chapman v. Maytag Corp.</i> , 297 F. 3d 682 (7th Cir. 2002)	12, 15, 29
<i>Clark v. Takata Corp.</i> , 192 F.3d 750 (7th Cir. 1999).....	8, 14
<i>Cummins v. Lyle Indus.</i> , 93 F.3d 362 (7th Cir. 1996)	12, 15
<i>Deimer v. Cincinnati Sub-Zero Prods., Inc.</i> , 58 F.3d 341 (7th Cir. 1995).....	4, 12, 22
<i>Daubert v. Merrell Dow Pharm., Inc.</i> , 509 U.S. 579 (1993)	1, 6, 8, 9, 13, 20
<i>Fuesting v. Zimmer, Inc.</i> , 421 F.3d 528 (7th Cir. 2005).....	8
<i>Gen. Elec. Co. v. Joiner</i> , 522 U.S. 136 (1997)	19
<i>Happel v. Walmart Stores, Inc.</i> , 602 F.3d 820, 824 (7th Cir. 2010)	4
<i>Koppell v. N.Y. State Bd. of Elections</i> , 97 F.Supp. 2d 477 (S.D.N.Y. 2000).....	5
<i>Korte v. Exxonmobil Coal USA, Inc.</i> , No. 05-1168, 2006 WL 41284 (7th Cir. 2006).....	20
<i>Lennon v. Norfolk & Western Ry. Co.</i> , 123 F. Supp. 2d 1143 (N.D. Ind. 2000)	25
<i>Lewis v. CITGO Petroleum Corp.</i> , 561 F.3d 698 (7th Cir. 2009).....	4

<i>O’Conner v. Commonwealth Edison Co.</i> , 13 F.3d 1090 (7th Cir. 1994).....	13
<i>Phillips v. Raymond Corp.</i> , 364 F. Supp. 2d 730 (N.D. Ill. 2005).....	6
<i>Porter v. Whitehall Labs. Inc.</i> , 9 F.3d 607 (7th Cir. 1992).....	13
<i>Rosen v. Ciba-Geigy Corp.</i> , 78 F.3d 316 (7th Cir. 1996).....	8, 14
<i>Solfest v. Arctic Cat Inc.</i> , No. 07-cv-427 slc, 2008 WL 4615447 (W.D. Wis. 2008).....	5
<i>Shreve v. Sears, Roebuck & Co.</i> , 166 F. Supp. 2d 378 (D. Md. 2001).....	6
<i>Thomas J. Kline, Inc. v. Lorillard, Inc.</i> , 878 F.2d 791 (4th Cir. 1989).....	5
<i>U.S. v. Lea</i> , 249 F. 3d 632 (7th Cir. 2001).....	19
Rules	
Federal Rules of Evidence 702.....	1, 4, 15
Federal Rules of Evidence 702, Advisory Committee Notes to the 2000 Amendment.....	19
Other Authorities	
Anselin, Luc, <i>Local Indicators of Spatial Association – LISA</i> , 27 Geographical Analysis 93 (1995).....	16
Jowei Chen & Jonathan Rodden, <i>Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures</i> , 57 Q. J. Pol. Sci. 200 (2013).....	8
Denton, Nancy A. & Douglas S. Massey, <i>Hypersegregation in U.S. Metropolitan Areas: Black and Hispanic Segregation Along Five Dimensions</i> , 26 Demography 373 (1989).....	11

Friedman, John N. & Richard T. Holden,
Optimal Gerrymandering: Sometimes Pack, but Never Crack, 98 Am. Econ. Rev. 113 (2008)..... 8

Fryer, Jr., Roland G. & Richard Holden,
Measuring the Compactness of Political Districting Plans, 54 J. L. & Econ. 493, 515 (2011)..... 8

Gelman, Andrew & Gary King,
A Unified Method of Evaluating Electoral Systems and Redistricting Plans, 38 Am. J. Pol. Sci. 514 (1994)..... 8, 28

Glaeser, Edward L. & Jacob Vigdor,
The End of the Segregated Century: Racial Separation in America’s Neighborhoods, 1890-2010, Manhattan Institute Civic Report No. 66 (2012)..... 11

McGhee, Eric M.
Measuring Partisan Bias in Single-Member District Electoral Systems, 39 Legis. Stud. Q. 55, 56 (2014)..... 7

McGhee, Eric M. & Nicholas O. Stephanopoulos,
Partisan Gerrymandering and the Efficiency Gap, 82 U. Chi. L. Rev. 831 (2015)..... 7, 8, 24, 25

Reardon, Sean F. & David O’Sullivan,
Measures of Spatial Segregation, 34 Soc. Methodology 121 (2004)..... 11

D.M. Smith & W.N. Venables,
An Introduction to R (2015)..... 7

Tam Cho, Wendy K.,
Contagion Effects and Ethnic Contribution Networks, 47 Am. J. Pol. Sci. 368 (2003)..... 10

INTRODUCTION

Pursuant to Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), plaintiffs respectfully request that this Court exclude the Declaration of Sean P. Trende that was filed in support of defendants' motion for summary judgment (Trende Decl. (Dkt. 55)) and preclude Trende from offering his opinions at trial.

As demonstrated below, Trende is not qualified to offer the various opinions set forth in his declaration, nor are those opinions the product of a reliable, scientific methodology. Trende does not have the training necessary to qualify him to opine either on the causes of the pro-Republican efficiency gap exhibited by Wisconsin's Current Plan or on the methodologies used and opinions offered by plaintiffs' experts. Furthermore, Trende's opinions suffer from a host of methodological flaws that make them utterly useless to assist the Court either at the summary judgment stage or at trial.

BACKGROUND

Trende works as a "senior elections analyst" "tracking, analyzing, and writing about elections" for a website called Real Clear Politics. Trende Decl. (Dkt. 55), ¶ 42. Trende does not hold a Ph.D. and is not a political scientist.¹ His writings about politics are primarily published online and are aimed at "a lay audience." Trende Decl. (Dkt. 55), ¶ 45. Trende admits that he does not write in a rigorous setting, stating: "...I'm not writing for an audience where some of the more technical terms would be helpful. Quite frankly, not in litigation either." Trende Dep. (Dkt. 66), at 51:18-21. Unlike plaintiffs' experts, Trende has never written a peer-reviewed

¹ Trende holds a J.D. and a master's degree in political science, but his master's thesis was on the U.S. Supreme Court, not state legislative districts, partisan gerrymandering, or geographic clustering. Trende Decl. (CV of Sean P. Trende) (Dkt. 55-1). In addition, his master's thesis was never published. Trende Dep. (Dkt. 66), at 8:20-22.

article in political science or any other field, let alone about partisan gerrymandering, state legislative districts, or geographic clustering. *Id.* (Dkt. 66), at 5:10-12, 24-25; 6:1-2; 7:4-7.

Trende's primary mission is to support defendants' hypothesis that the pro-Republican tilt of the Current Map is the product of geography, rather than gerrymandering. Trende claims that "over the course of the past two decades, Wisconsin's Democratic vote has increasingly found itself relegated to Milwaukee County, the southwestern portion of the state, and a few counties in the northwestern portion of the state. This, in turn, shifts [] the baseline of Wisconsin maps rightward." Trende Decl. (Dkt. 55), ¶ 100. In support, he offers two analyses of demographic patterns in Wisconsin: a "simple visual inspection" study and a "nearest neighbor" analysis.

Trende's first study (found in ¶¶ 72-90 of his declaration), which he describes as a "simple visual inspection of maps of Wisconsin precincts and counties over time," presents a series of color-coded Wisconsin maps based on what he refers to as the "Partisan Index (PI)" or "PVI" on the county level for the years 1988, 1996, 2004, 2012, and 1996-2004, 2004-2012, and 1996-2012. *Id.* (Dkt. 55), ¶ 79-85. Trende defines the PI as "the share of the state that voted for the Republican presidential candidate [subtracted] from the share of the nation that voted for the Republican presidential candidate."² *Id.* (Dkt. 55), ¶ 72. Trende does not analyze this series of maps in any quantitative way, but rather claims that it is "pretty clear from looking at the maps" that Democratic voters in Wisconsin became clustered "to fewer counties, and those counties were clustered in geographically compact regions." Trende Dep. (Dkt. 66) at 59:5-6; Ex. 1, Trende Decl. (Dkt. 55), ¶ 85.

² Third parties and independent candidates are excluded from this calculation. Trende Decl. (Dkt. 55), ¶ 72.

Trende's quantitative "nearest neighbor" analysis (described in Trende Decl. (Dkt. 55), ¶¶ 91-105) purports to show that the clustering of Democratic voters in Wisconsin has increased over time. Trende explains his "nearest neighbor" analysis as a "two-step process" that first asks "are there more heavily Democratic wards today than there were a decade ago?" and then looks for "whether the heavily Democratic wards are located more closely together than heavily Republican wards." *Id.* (Dkt. 55), ¶ 91. To answer the first question, Trende looks at what he describes as top-of-the-ticket races in the state and calculates "the average Democratic lean of wards that leaned toward Democrats over the course of the past decade." *Id.* (Dkt. 55), at ¶ 92-93. To answer the second, he sorts "the wards for each cycle into partisan-filtered maps, using the partisan index as a guide to the state's overall partisanship" and then calculates the distance to the nearest "similar" neighbor for each ward. *Id.* (Dkt. 55), ¶ 96-97. He then considers the median of the smallest distances between wards, which supposedly measures whether adherents of either party have become more clustered over time in Wisconsin. *Id.* (Dkt. 55), ¶ 97.

Trende also offers the opinion that the efficiency gap is an inaccurate measure of partisan gerrymandering because it includes maps that "are clearly not partisan gerrymanders, while absolving maps where legislators clearly acted overwhelmingly with partisan intent." *Id.* (Dkt. 55), ¶ 106. In an attempt to support this conclusion, Trende analyzes a series of seventeen state Assembly plans that had efficiency gaps favoring the same party over their lifespan (obtained from Professor Simon Jackman's original expert report), which he concludes were not all gerrymanders. *Id.* (Dkt. 55), ¶¶ 106-14. He then looks at several state congressional plans, some of which he claims had large efficiency gaps even though they were not gerrymanders, and others he claims were gerrymanders with small efficiency gaps. *Id.* (Dkt. 55), ¶¶ 115-24.

Finally, Trende criticizes the methodologies employed by plaintiffs' experts on various grounds, in support of his opinion that the efficiency gap is an unreliable metric to use to measure partisan gerrymandering.

For the reasons outlined below, Trende is not qualified to give any of these opinions and all of them suffer from serious methodological flaws that render them inadmissible.

LEGAL STANDARD

Under Federal Rule of Evidence 702 and *Daubert*, expert testimony cannot be admitted unless it is qualified, reliable, and relevant. In assessing the reliability of an expert report, a court must consider factors such as (1) whether the proffered conclusion lends itself to verification by the scientific method through testing; (2) whether it has been subjected to peer review; (3) whether it has been evaluated in light of the potential error rate of the scientific technique; and (4) whether it is consistent with the generally accepted method for gathering the relevant scientific evidence. *Deimer v. Cincinnati Sub-Zero Products, Inc.*, 58 F.3d 341, 344 (7th Cir. 1995). The proponent of the testimony bears the burden of establishing its admissibility under Rule 702 by a preponderance of the evidence. *Lewis v. CITGO Petroleum Corp.*, 561 F.3d 698, 705 (7th Cir. 2009).

ARGUMENT

I. Trende is Not Qualified to Render an Opinion Concerning the Efficiency Gap as a Metric and Geographic Clustering in the State of Wisconsin

Only “a witness qualified as an expert by knowledge, skill, experience, training or education” may submit an opinion. *Happel v. Walmart Stores, Inc.*, 602 F.3d 820, 824 (7th Cir. 2010) (quoting Fed. R. Evid. 702). Trende lacks any of these hallmarks of expertise.

Education and training. Trende does not possess the requisite education and training to be an expert in this case. As noted above, he is neither a Ph.D. nor a political scientist, has no

particular training in the kinds of issues involved in this case, and has *never* written a peer-reviewed article in political science or any other field, let alone about partisan gerrymandering, state legislative districts, or geographic clustering. Trende Dep. (Dkt. 66) at 5:10-12, 24-25; 6:1-2; 7:4-7. His background is plainly insufficient to qualify him as an expert in this case. *Thomas J. Kline, Inc. v. Lorillard, Inc.*, 878 F.2d 791, 799-800 (4th Cir. 1989) (district court abused its discretion by permitting testimony from a proffered expert on credit and price discrimination who had a “master’s degree in business administration,” but was “not an economist,” and whose only published work “had nothing to do with price discrimination, credit, or antitrust generally”).

Relevant experience, skills, or knowledge. Trende also lacks the specific experience necessary to offer an expert opinion on the particular issues in this case. An expert must possess “some special skill, knowledge or experience to formulate that opinion (that is, an opinion informed by the witness’ expertise) rather than simply an opinion by a purported expert.” *Ancho v. Pentek Corp.*, 157 F. 3d 512, 518 (7th Cir. 1998). Thus, in an election law case, even a political scientist who has “significant political experience” should be excluded if he lacks “particular expertise” on specific types of election practices, and his work has “neither been tested nor subject to peer review.” *Koppell v. N.Y. State Bd. of Elections*, 97 F.Supp. 2d 477, 481-82 (S.D.N.Y. 2000) (excluding expert report where it was not methodologically sound, had not been subjected to peer review, and was not based on particular expertise); *Solfest v. Arctic Cat Inc.*, No. 07-cv-427 slc, 2008 WL 4615447, at *3 (W.D. Wis. 2008) (finding expert not qualified because “having a general background in mechanical engineering does not qualify an

expert witness to testify as an expert regarding everything within the field of mechanical engineering”) (citing *Shreve v. Sears, Roebuck & Co*, 166 F. Supp. 2d 378, 392 (D. Md. 2001)).³

Trende admittedly has *no* prior experience analyzing state legislative districts, partisan gerrymandering, or geographic clustering in Wisconsin, and little experience doing so elsewhere. Trende says he has written about geographic clustering and partisan gerrymandering in non-peer-reviewed forums for a lay audience, but admits that prior to working on this case, he has *never* studied or written about state legislative districts in Wisconsin, redistricting of state legislative districts in Wisconsin, or the geographic location of Democratic and Republican voters in Wisconsin. Trende Dep. (Dkt. 66) at 7:4-24. Trende’s main responsibilities at Real Clear Politics do not include studying or writing about state legislative redistricting or partisan gerrymandering at the state Assembly level, as the “focus is on federal races,” and Real Clear Politics does not even “have a page for state legislatures, what we think the outcome is going to be.” *Id.* (Dkt. 66) at 19:14-22.

Trende claims that he has drawn “complete maps of every congressional district ever drawn” using Adobe Illustrator. Trende Decl. (Dkt. 55), ¶ 43. However, congressional districts are irrelevant to this case, and Adobe Illustrator is not GIS software (which Trende describes as “too expensive”), and thus cannot account for population numbers or any other legal requirement for redistricting. Trende Dep. (Dkt. 66) at 62:2-4. Trende also claims to have drawn state legislative maps “out of curiosity” using Dave’s Redistricting App. *Id.* (Dkt. 66), at 20:14; 60:14-17, 61:12-19. However, this in no way establishes that Trende has experience with state legislative redistricting, including drawing congressional or state maps that comply with all

³ See also *Phillips v. Raymond Corp.*, 364 F. Supp. 2d 730, 734 (N.D. Ill. 2005) (An expert must possess “sufficient specialized expertise to render his opinion on the topic ... reliable, as required by *Daubert*. [An expert's] competence in the general field [at issue] must extend to his specific testimony on the matter before the Court”).

relevant legal requirements, or any kind of relevant experience with state geographic concentrations of voters or lack thereof.

Trende also does not have the relevant experience, skills, or knowledge to conduct a quantitative analysis of the partisan concentration of voters. Trende uses R, a software platform that can perform statistical and quantitative modeling and analyses, to calculate the PVI and conduct his “nearest neighbor” analysis.⁴ Trende admits that he has no formal training in R, and says he learned R code by “us[ing] it.” *Id.* (Dkt. 66), at 110:24. However, the R analysis he performed in his report is filled with basic methodological and data errors (as is his entire quantitative analysis), and was “adapted” from R code drafted by his assistant for use on Louisiana maps. *Id.* (Dkt. 66), at 112:10-18. Trende admits that plaintiffs’ expert, Professor Jackman, has a greater expertise in statistical analysis than he does, and that Professor Jackman is “...clearly more qualified” to write R packages.⁵ *Id.* (Dkt. 66), at 9:12-25; 10:1-15.

Furthermore, Trende did not even *review* the relevant literature regarding partisan gerrymandering and geographic clustering after he was retained as an expert for the state, and has not even *heard of* the generally accepted methods in political science for measuring spatial concentration.⁶ *Id.* (Dkt. 66), at 54:21-23; 55:1-6; 60:7-13; 110:1-22.

⁴ For more information on R, *see* D.M. Smith & W.N. Venables, *An Introduction to R* (2015), <https://cran.r-project.org/doc/manuals/R-intro.pdf>. (Decl. of Annabelle Harless, filed herewith, Ex. A.)

⁵ Professor Jackman is a Professor of Political Science at Stanford University and Principal Investigator at the American National Election Studies. *See* Curriculum Vitae of Simon Jackman, Ph.D. (“Jackman CV”) (Dkt. 58-2). Both Trende and another of Defendants’ experts, Professor Nicholas Goedert, acknowledged Professor Jackman as one of the leading political scientists in the field of quantitative methodology and in developing statistical packages for use in political science. *See* Trende Dep. (Dkt. 66), at 9:20-10:15; Deposition of Nicholas Goedert (“Goedert Dep.”) (Dkt. 65), at 23:2-16.

⁶ For a discussion of many of the main articles on measuring partisan gerrymandering, *see* Eric M. McGhee, *Measuring Partisan Bias in Single-Member District Electoral Systems*, 39 *Legis. Stud. Q.* 55, 56 (2014) (Dkt. 58-7); *see also* Rebuttal Report of Simon Jackman, Ph.D. (Dkt. 63),

II. Trende’s Opinions Analyzing Geographic Clustering in the State of Wisconsin and the Performance of the Efficiency Gap Metric are Scientifically Unreliable, Irrelevant, and Inadmissible

In its gatekeeper role, the district court must also “assess the reliability of the methodology the expert has employed in arriving at his opinion” (emphasis in original). *Fuesting v. Zimmer, Inc.*, 421 F.3d 528, 535 (7th Cir. 2005). Even “a supremely qualified expert cannot waltz into the courtroom and render opinions unless those opinions are reliable and relevant under the test set forth by the Supreme Court in *Daubert*.” *Clark v. Takata Corp.*, 192 F.3d 750, 759 n. 5 (7th Cir. 1999); *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 318 (7th Cir. 1996) (excluding expert testimony because it lacked scientific rigor, stating “the courtroom is not the place for scientific guesswork, even of the inspired sort.”). *Id.* at 319.

Not surprisingly, given Trende’s lack of qualifications, training and knowledge in the area, his methodologies are fundamentally flawed and unreliable and his work is filled with

at 27. Trende has *never* heard of most of this literature, including Andrew Gelman and Gary King’s measure of partisan symmetry, Roland Fryer and Richard Holden’s work on simulating district plans, John Friedman and Richard Holden’s work on how to construct an optimal gerrymander, and Nicholas Stephanopoulos and Eric McGhee’s work on calculating the efficiency gap in congressional plans. Trende Dep. (Dkt. 66) at 110:1-22; 86:4-6; Andrew Gelman & Gary King, *A Unified Method of Evaluating Electoral Systems and Redistricting Plans*, 38 Am. J. Pol. Sci. 514 (1994) (Decl. of Annabelle Harless, filed herewith, Ex. C); Roland G. Fryer, Jr. & Richard Holden, *Measuring the Compactness of Political Districting Plans*, 54 J. L. & Econ. 493 (2011) (Dkt. 65-1); John N. Friedman & Richard T. Holden, *Optimal Gerrymandering: Sometimes Pack, but Never Crack*, 98 Am. Econ. Rev. 113 (2008) (Decl. of Annabelle Harless, filed herewith, Ex. D); Eric M. McGhee & Nicholas O. Stephanopoulos, *Partisan Gerrymandering and the Efficiency Gap*, 82 U. Chi. L. Rev. 831 (2015). For a discussion of the main literature on spatial concentration measures, see footnotes 8 and 9 below.

Trende does cite a chart from one article in his declaration, Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 57 Q. J. Pol. Sci. 200 (2013) (Dkt. 49-13), to support his view that “the Democratic vote is heavily concentrated in cities.” Trende Decl. (Dkt. 55), ¶ 90. However, even if that proposition were true, the chart offers no support for Trende’s hypothesis that “natural packing” of Democrats in Wisconsin results in an inevitable Republican-leaning efficiency gap, much less for the unorthodox methods Trende uses to conduct his two analyses. Indeed, the fact that Trende cited only one article that tends to support his view, rather than conducting an objective and thorough literature review, highlights the unreliability of his methodology and opinions.

errors. Part A discusses Trende's opinion that an increased clustering of Democratic voters in Wisconsin leads to Wisconsin's Republican-leaning efficiency gap. Part B deals with his opinion that the efficiency gap is an inaccurate predictor of partisan gerrymandering. Part C covers Trende's remaining opinions.

A. Trende's Opinion That the Efficiency Gap in Wisconsin is an Unavoidable Result of the "Natural Clustering" of Democratic Voters in a Few Counties is Based on Severely Flawed Analyses with No Foundation in the Literature.

Trende's opinion on the extent of geographic clustering of voters in Wisconsin is based primarily on his "simple visual inspection" study, which relies on the PI/PVI measure to conduct an examination of Wisconsin maps over time, and his "nearest neighbor" analysis, which also utilizes the PI/PVI to purportedly measure whether "heavily Democratic wards are located more closely together than heavily Republican wards." Trende Decl. (Dkt. 55), ¶¶ 72-89, 91. As explained below, both of Trende's analyses are laden with material defects, have never been subjected to peer review, are not consistent with generally accepted standards in the field of quantitative methods, and are based on irrelevant material. His "nearest neighbor" analysis is further suspect because it does not report any potential error rate. These defects render Trende's analyses unreliable under *Daubert*.

1. Trende's "Simple Visual Inspection" Study Is Wholly Unreliable.

Trende utilizes his first analysis, his "simple visual inspection" study, to attempt to show that the "natural concentration" of Democratic voters in a small number of counties in Wisconsin results in a Republican-leaning effect, which the efficiency gap metric supposedly does not account for. Trende's study is based on a series of color-coded Wisconsin maps, which show the PI/PVI measure at the county level through a subset of years. Trende Decl. (Dkt. 55), ¶ 79. However, Trende's "simple visual inspection" study is extremely unreliable, because it has no

root in the accepted standards of the field of political science and is seriously methodologically flawed.

First, the PI/PVI measure Trende utilizes in both his “simple visual inspection” study and his “nearest neighbor” analysis “is a quantity that is not commonly used in the academic literature, and when it is, it is used largely as a simple descriptive statistic” to describe whether districts are competitive, not to measure the geographic concentration of voters at a state legislative level. *See* Rebuttal Report of Kenneth R. Mayer, Ph.D., dated December 21, 2015 (“Mayer Rebuttal”) (Dkt. 64) at 4.⁷ Trende’s use of the measure at the state level is unorthodox, because “[t]he PVI is used almost exclusively by political commentators to describe congressional districts...it is not used in the context of state legislative redistricting.” *Id.* (Dkt. 64), at 5. Trende offers no support for using the PI/PVI to measure ward partisanship. As Professor Mayer explains, “given that there are far more widely used and relevant measures of district level partisanship, his reliance on it in this context is unsupportable.” *Id.* (Dkt. 64), at 6.

Trende did not use any generally accepted measures of the spatial concentration of groups and in fact testified that he had *never even heard* of two of the most common measures—the Global Moran’s I⁸ and the Isolation Index.⁹ Trende Dep. (Dkt. 66) at 54:21–55:4; Mayer

⁷ Professor Mayer is a Professor of Political Science at the University of Wisconsin-Madison. *See* Curriculum Vitae of Kenneth R. Mayer, Ph.D. (“Mayer CV”) (Dkt. 59-1).

⁸ Moran’s I “is a measure of spatial autocorrelation, or how values of a variable in space correlate with values in a nearby space.” In the case of Wisconsin, the Global Moran’s I tells us how likely members of one political group are to live clustered next to others of the same group. Mayer Rebuttal (Dkt. 64) at 16. Professor Mayer’s rebuttal report lists the extensive literature using Moran’s I to measure spatial concentration. *Id.* (Dkt. 64) at 16, 30-31. *See, e.g.,* Luc Anselin, *Local Indicators of Spatial Association – LISA*, 27 *Geographical Analysis* 93 (1995) (Decl. of Annabelle Harless, filed herewith, Ex. E); *see also* Wendy K. Tam Cho, *Contagion Effects and Ethnic Contribution Networks*, 47 *Am. J. Pol. Sci.* 368 (2003) (Decl. of Annabelle Harless, filed herewith, Ex. F.)

⁹ The Isolation Index “indicates, for the average member of a group residing in a certain geographic unit (such as a ward), what share of the member’s neighbors in the unit belong to the

Rebuttal (Dkt. 64), at 16. Professor Mayer explained that Global Moran’s I and the Isolation Index are widely “used by geographers and demographers to study spatial patterns,” and are “directly applicable to the issue of measuring the geographic concentration of Democrats and Republicans in Wisconsin.” Mayer Rebuttal (Dkt. 64), at 16. When these measures are used to analyze the geographic concentration of Democrats and Republicans in Wisconsin from 2004-2014, they produce a result that contradicts Trende’s opinion, showing that “both parties’ supporters are almost identical in their geographic isolation over the last decade, and there is no clear temporal pattern.” *Id.* (Dkt. 64) at 17. Using the kind of methodology that social scientists use, Professor Mayer concluded that “there is no evidence that Democrats are more geographically clustered than Republicans.” *Id.* (Dkt. 64) at 18.¹⁰

Not only is Trende’s use of the PI/PVI measure unorthodox, his overall “simple visual inspection” study should also be rejected because it has never been subjected to peer review and is unsupported by any peer-reviewed literature in the field of political science. “Unsubstantiated testimony, such as this, does not ensure that ‘the experts’ opinion has a reliable basis in knowledge and experience of his discipline.” *Chapman v. Maytag Corp.*, 297 F. 3d 682, 688 (7th Cir. 2002) (excluding expert testimony where expert’s theory was “novel and unsupported

same group. It measures how geographically isolated a group is...” In the case of Wisconsin, the Isolation Index “tells us to what extent the average Democrat (or Republican) lives in a ward that is more heavily Democratic (or Republican) than the state as a whole.” Mayer Rebuttal (Dkt. 64) at 16. Professor Mayer’s rebuttal report lists the extensive literature using the Isolation Index to measure spatial concentration. *Id.* (Dkt. 64) at 16, 30-31. *See, e.g.*, Edward Glaeser & Jacob Vigdor, *The End of the Segregated Century: Racial Separation in America’s Neighborhoods, 1890-2010*, Manhattan Institute Civic Report NO. 66 (2012) (Dkt. 59-4); *see also* Sean F. Reardon & David O’Sullivan, *Measures of Spatial Segregation*, 34 Soc. Methodology 121 (2004) (Decl. of Annabelle Harless, filed herewith, Ex. G); *see also* Nancy A. Denton & Douglas S. Massey, *Hypersegregation in U.S. Metropolitan Areas: Black and Hispanic Segregation Along Five Dimensions*, 26 Demography 373 (1989) (Decl. of Annabelle Harless, filed herewith, Ex. H.)

¹⁰ This critique of the PI/PVI applies equally to Trende’s “nearest neighbor” analysis, to the extent it relies on the PVI.

by any article, text, study, scientific literature or scientific data produced by others in his field” and expert had “not published any writings or studies concerning” his theory) (quoting *Cummins v. Lyle Indus.*, 93 F.3d 362, 370 (7th Cir. 1996)) (affirming exclusion of expert testimony where expert had not subjected any writing or study concerning the topic of his opinion to the peer review process) (quoting *Deimer v. Cincinnati Sub-Zero Prods., Inc.*, 58 F.3d 341, 345 (7th Cir. 1995)).

Significantly, Trende could not cite a single study, peer-reviewed or otherwise, analyzing the geographic clustering of Democratic and Republican voters by examining trends in counties won by each party’s presidential candidate. Trende Dep. (Dkt. 66) at 51:6-11; 56:2-8. He also could not cite any peer-reviewed study that supports measuring the extent of clustering simply by “eyeballing” a set of maps. *Id.* (Dkt. 66) at 59:9-17. Further, Trende “neither explains the relevance of the *county* vote to the issue of geographic distribution and legislative redistricting, nor why the county vote pattern in 1988 or 1996 is germane to the environment in 2012” Mayer Rebuttal (Dkt. 64) at 4 (emphasis in original). Instead the best Trende could do was to say that “...if there are, you know, glaring problems, other than political scientists haven’t used it, with the methodology, I’m sure the adversarial process will reveal it in the reply briefs.” Trende Dep. (Dkt. 66) at 51:24-52:2.

Second, Trende’s “simple visual inspection” study has several serious methodological flaws. For example, Trende confusingly uses the “PI” and “PVI” measures in his report as interchangeable measurements. Before conducting his study, Trende explains the PI measure briefly, but then inexplicably labels some of maps with “PI” and some with “PVI.” Trende Decl. (Dk. 55), ¶¶ 71-86. Trende never explained why he used these measures interchangeably, cavalierly saying in his deposition that “[w]ell, Partisan Index and Partisan Vote Index are

slightly different, but we will just call it PVI.” Trende Dep. (Dkt. 66) at 55:18-19. The fact that Trende uses these measures interchangeably without explaining why that is an acceptable technique is sloppy and confusing, highlighting the unreliability of his methodology.

Third, Trende bases his entire “simple visual inspection” study on the idea that a reader is supposed to be able to tell how “clustered” Democratic and Republican voters are in his series of county Partisan Index maps (in paragraphs 71-89 of his report) just by “looking at the maps.” *Id.* at 59:2-8. Based on his own personal observation of the maps, Trende asserts that “there is little doubt that the Democratic vote in Wisconsin is also increasingly concentrated in fewer counties.” Trende Decl. (Dkt. 55), ¶ 71. But personal observation is not a generally accepted standard in the field of political science, nor is it enough to substantiate the opinion of an expert witness in court. *O’Conner v. Commonwealth Edison Co.*, 13 F.3d 1090, 1107 (7th Cir. 1994) (holding that a physician who relied only on personal observation without examining the relevant literature or conducting any scientific study or experiment to justify his conclusions did not meet the *Daubert* standard); *Porter v. Whitehall Labs. Inc.*, 9 F.3d 607 (7th Cir. 1992) (affirming exclusion where expert’s opinion was based on personal observation rather than a methodology based on scientific evidence).

Indeed, Trende himself could not successfully use this “eyeballing” method to read *his own maps*. When asked at his deposition where his maps showed the biggest partisan cluster in Wisconsin was, he said it appeared to be the “large partisan cluster in the southeast in the Republican suburbs” but continued, “without measuring it, it’s hard to say, but I think it’s probably larger than the cluster that is in the southwest around Dane and LaCrosse.” Trende Dep. (Dkt. 66) at 65:18 – 66:2. A reasonable person “eyeballing” the maps (reproduced in ¶ 87 of Trende’s declaration) could readily conclude that Republicans look just as clustered as

Democrats. A methodology in which the conclusion is in the eye of the beholder is, by definition, unscientific and unreliable and therefore inadmissible as well.

Finally, Trende’s “simple visual inspection” study is irrelevant and unhelpful to the trier of fact. Even if Trende’s study did somehow show that Democratic voters have become increasingly concentrated to a small number of Wisconsin counties, it is not a quantitative analysis. Thus, it does not help the court understand whether this alleged effect has any measurable impact on Wisconsin’s efficiency gap, much less how much of this effect is due to partisan gerrymandering versus geographic clustering of voters. Trende simply asserts that there is an effect, though he could not say how much.¹¹ *Clark*, 192 F.3d at 759 (“[W]here the proffered expert offers nothing more than a ‘bottom line’ conclusion, he does not assist the trier of fact”) (citing *Rosen*, 78 F.3d at 318–19). As a result, Trende’s study in no way helps the court to assess the impact of an alleged “natural clustering” of Democratic voters on Wisconsin’s efficiency gap.

2. Trende’s “Nearest Neighbor” Analysis Is Wholly Unreliable.

Trende’s second study, which he also used to support his opinion that Republicans in Wisconsin hold a “natural” geographic advantage, is his “nearest neighbor” analysis. Trende’s “nearest neighbor” analysis essentially looks for “whether the heavily Democratic wards are located more closely together than heavily Republican wards.” Trende Decl. (Dkt. 55), ¶ 91. To do this, Trende calculates the “average Democratic lean of wards that leaned towards Democrats” from 2002-2014, and conducts the same calculation for Republican wards. *Id.* (Dkt. 55), ¶¶ 93-95. Trende next uses the PVI to assign each ward to a quantile, and then he finds the

¹¹ Trende admitted at his deposition that he could not convert any of the information from the maps into quantitative scores for Democratic and Republican clustering, and that he cannot measure how much, if any, impact the alleged clustering of voters in Wisconsin has on the efficiency gap. Trende Dep. (Dkt. 66) at 59:18-21; 49:23 – 44:3.

closest ward that shares the same PVI quantile. He repeats this for every ward, for every election between 2002-2014, and then calculates a median distance between wards of the same PVI quantiles. *Id.* (Dkt. 55), ¶ 97. He claims that the resulting analysis shows that Democratic wards are closer together than Republican wards. *Id.* But like his “simple visual inspection” analysis, Trende’s “nearest neighbor” analysis is not based in the literature and is wholly unreliable.

First, Trende’s “nearest neighbor” analysis has no basis in peer-reviewed literature or the generally accepted standards of quantitative methods. Trende did not cite any peer-reviewed study that uses the PVI to describe state legislative redistricting in his report, and also could not come up with any such study at his deposition. Trende Dep. (Dkt. 66) at 55:11-14. Trende also could not think of a *single study* that analyzed the geographic clustering of Democratic and Republican voters by examining trends in wards’ average partisan leans. *Id.* (Dkt. 66) at 71:23–72:2. He also could not cite even one study that looked at the geographic clustering of Democratic and Republican voters by examining the median distance between wards of the same partisan composition. *Id.* (Dkt. 66) at 79:5-10.

Indeed, as explained above, Trende had *not even heard of* the generally accepted, peer-reviewed methods for measuring geographic concentrations of groups. *Id.* (Dkt. 66) at 54:21-23; 55:1-6; 60:7-13; 110:1-22. *See Cummins*, 93 F.3d at 369 (“Rule 702 is designed to ensure that, when expert witnesses testify in court, they adhere to the same standards of intellectual rigor that are demanded in their professional work. This objective can be accomplished in a number of different ways, including through the review of experimental, statistical, or other scientific data generated by others in the field”); *Chapman*, 297 F. 3d at 688 (excluding expert’s opinions because the expert “presented no proof that his theory is generally accepted in the scientific community”) (citations omitted).

Second, Trende’s “nearest neighbor” analysis also has severe methodological flaws. For example, Trende inconsistently calculates the PVI measure he relies on for his “nearest neighbor” analysis. In calculating the PVI, Trende says that he uses the top-of-the-ticket races in each year. Trende Decl. (Dkt. 55), ¶ 92. But in 2002, 2010, and 2014 he used the gubernatorial election as the top-ticket race, while in 2006 he used the *U.S. Senate election* as the top-ticket race, even though there was a gubernatorial election that year as well. Trende Dep. (Dkt. 66) at 71:1; Mayer Rebuttal (Dkt. 64) at 5.

Trende has no justification for haphazardly defining which elections were used as top-ticket races, and this “inconsistency could well affect Trende’s results, as the vote percentages were vastly different” in the 2006 gubernatorial and U.S. Senate races in Wisconsin. Mayer Rebuttal at 5. In 2006, “Democrats garnered 53.8% of the two-party vote in the gubernatorial election, but 60.5% in the Senate race.” *Id.* (Dkt. 64) at n. 4. “While scholars may differ on whether a gubernatorial or U.S. Senate election is the correct top-ticket race, there is no justification whatsoever for being inconsistent.” *Id.* (Dkt. 64) at 5.

Third, Trende also makes another error in his calculation of the PVI measure. Trende says he calculates the PVI for 2002-2014 as a way to measure how close “heavily” Democratic wards are to each other versus “heavily” Republican wards. Trende Decl. (Dkt. 55), ¶¶ 96-98. However, in attempting to calculate the 2014 PVI number for his analysis, Trende subtracted the *2014 statewide percentages* from the 2012 ward totals, instead of properly subtracting the *2012 statewide percentages* from the 2012 ward totals.¹² Mayer Rebuttal (Dkt. 64) at 5; Ex. 1,

¹² Trende’s mistake in his R code calculation of the 2014 PVI is evident from the file he disclosed prior to his deposition titled “Wisconsin_clustering_computation.R” (Decl. of Annabelle Harless, filed herewith, Ex. B.) The relevant code section, with his error highlighted in yellow, is below:

```
map_2014=readOGR("Wards_Final_Geo_111312_2014_ED.shp",
```

Trende's "Wisconsin_clustering_computation.R" file. This is a material error that makes his entire 2014 PVI number, as well as his "nearest neighbor" analysis, inaccurate and unreliable.

Fourth, Trende does not take into account the fact that the wards in Wisconsin vary widely in size. Trende Dep. (Dkt. 66) at 75:6-19. This is methodologically improper and even fatal to Trende's analysis, because ward areas in Wisconsin vary widely, ranging from the City of Middleton (ward 19) with 690 people in an area of 0.0071 mi² to the Town of Winter (ward 2, Sawyer County) with 565 people in an area of 227.7 mi². Mayer Rebuttal (Dkt. 64) at 8. Given that Trende is purportedly measuring geographic distances between the centers of wards, that measurement is greatly impacted by how large the wards are. *Id.* (Dkt. 64).

Ward size matters even more in Wisconsin, because "ward sizes are correlated with other relevant variables, particularly whether a ward is in a city, and most crucially, whether it is a Democratic or Republican ward." *Id.* (Dkt. 64). For example, wards in the City of Milwaukee have a mean area of just 0.29 mi² compared to the rest of the state (8.83 mi²), and Democratic wards, on average, are only half the size of Republican wards (5.91 mi² versus 10.96 mi²). *Id.* (Dkt. 64) at 9. Despite this large difference, Trende does not account for ward area in his analysis. As a result, Trende's method will *always* "show Democratic wards to be much closer than Republican wards, irrespective of whether this concentration is real or merely an artifact of ward area. To put it most simply, smaller Democratic wards will *always* appear closer than larger wards." *Id.* (Dkt. 64) (emphasis in original).

```
"Wards_Final_Geo_111312_2014_ED")□map_2014=spTransform(map_2014,
CRS("+proj=longlat +datum=WGS84"))
map_2014$r_share=map_2014$GOVREP14/(map_2014$GOVREP14 + map_2014$GOVDEM14)
map_2014$pvi=map_2012$r_share -
sum(map_2014$GOVREP14)/(sum(map_2014$GOVREP14) + sum(map_2014$GOVDEM14))
map_2014$pvi[which(is.nan(map_2014$pvi))]=0
```

Fifth, Trende fundamentally misrepresents what even his flawed data shows by relying on the *median* distance between wards rather than the *mean* distance between wards. That has the effect of “further exaggerat[ing] the difference between Republican ward distances and Democratic ward distances.” *Id.* (Dkt. 64). Trende says that he uses the median “because outlying wards, such as Menominee County, exert an undue amount of leverage on averages.” Trende Decl. (Dkt. 55), ¶ 97. However, “Menominee County will not exercise ‘an undue amount of leverage’ because it is an outlying ward. It will exercise an undue amount of leverage because it *has a very large area* (222.8 mi²), which is something Trende should, but does not, correct for.” Mayer Rebuttal (Dkt. 64) at 9 (emphasis in original).

In Wisconsin, the *mean* Republican ward area is 1.9 times larger than the average Democratic ward area.¹³ *Id.* (Dkt. 64). “But the *median* Republican ward is 6.2 times larger than the median Democratic ward” (emphasis in original).¹⁴ *Id.* (Dkt. 64). Thus, Trende’s usage of the median rather than the mean (for no methodologically sound reason) again enormously biases his “nearest neighbor” analysis in favor of his hypothesis that Democrats are more geographically concentrated in Wisconsin. If we look instead at the mean distances between “nearest neighbors,” the shape of the mean distance lines “show[s] that Republican and Democratic distances move precisely in parallel, and that strongly Democratic wards are significantly *farther apart* than weaker Democratic wards (as are strongly Republican wards).” *Id.* (Dkt. 64) at 11 (emphasis in original). This is the exact opposite of what Trende claims, and “it obliterates the core of Trende’s report: the assertion that the pro-Republican bias evident in Act 43 is the natural result of Democrats being more geographically concentrated.” *Id.* (Dkt. 64).

¹³ 10.96 mi² versus 5.91 mi².

¹⁴ 3.45 mi² versus 0.56 mi².

Sixth, when using wards, Trende did not make any adjustment in his analysis for the fact that Wisconsin had one set of wards between 2002-2010, and another set of wards between 2012-2014. Trende Dep. (Dkt. 66), at 76:9-22. In fact, despite knowing that Wisconsin's wards were redrawn prior to the 2012 election, when asked whether he adjusted for these new wards, Trende flatly stated "I don't know how you would make that adjustment." *Id.* (Dkt. 66) at 76:15. That Trende failed to adjust for this difference in wards, and had no idea how to do so, displays a serious misunderstanding of quantitative methods and further establishes the unreliability of his "nearest neighbor" analysis.

Trende's failure to take ward area into account, along with his use of the median distance between wards (rather than the mean) and his failure to adjust for different sets of wards, combine to fundamentally misrepresent what the data show and bias his analysis in favor of his conclusion that Democratic voters are more geographically concentrated in Wisconsin. Mayer Rebuttal (Dkt. 64) at 6. The result is that his "nearest neighbor" analysis is methodologically unsound, rendering his conclusions unreliable. *See Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997) ("[C]onclusions and methodology are not entirely distinct from one another...A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered."); Fed. R. Evid. 702 Advisory Comm. Notes, 2000 Amendment (courts should consider "[w]hether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion").

Seventh, Trende's "nearest neighbor" analysis is also unreliable due to his failure to account for the potential error rate. *U.S. v. Lea*, 249 F. 3d 632, 638-40 (7th Cir. 2001) (excluding expert testimony in part because expert did not provide sufficient error rates for the analysis he offered). In a quantitative analysis, accounting for an error rate is important in order to assess the

accuracy of, and confidence in, the model. Trende characterizes his “nearest neighbor” study as a quantitative analysis, but nowhere reports any kind of potential error rate, such as a standard deviation, confidence interval, or any other type of generally used error rate.¹⁵ Trende could have easily taken the potential error rate into account by simply entering an additional command into his R code. Mayer Rebuttal (Dkt. 64) at 3-5. His failure to do so speaks volumes about his own lack of qualifications and the unreliability of his methods and conclusions.

Finally, Trende’s “nearest neighbor” analysis also does not assist the court in “understand[ing] the evidence or [in] determin[ing] a fact in issue.” *Daubert*, 509 U.S. at 589. An expert’s testimony must have “a sufficient nexus with the facts of the case and with the relevant inquiry that it will actually assist the trier of fact in understanding the evidence and performing its function as fact-finder.” *Korte v. Exxonmobil Coal USA, Inc.*, No. 05-1168, 2006 WL 41284, at *2 (7th Cir. 2006). Because Trende offers only a cursory analysis based on multiple serious methodological and calculation errors, with no support in the relevant literature, his opinions are not helpful in assessing the efficiency gap as a metric or the extent of geographic clustering of Wisconsin voters by political party and any impact that may have on the efficiency gap.

To start, Trende is just wrong in asserting that the clustering of Democrats in certain areas of the state “shifts Wisconsin’s baseline of Wisconsin maps rightward.” To the contrary, “widely used and academically accepted metrics of concentration and isolation show that Democrats and Republicans are *both* highly segregated, and to about the same extent. Just as there are core areas of high Democratic strength in Milwaukee and Madison, there are similar Republican core areas in the ‘collar counties’ of Waukesha, Ozaukee, and Washington.” Mayer

¹⁵ Trende Decl. (Dkt. 55), ¶¶ 91-100.

Rebuttal (Dkt. 64) at 6-11, 16-22.¹⁶ Thus, any opinion that depends on the assertion that Democrats are naturally “packed,” while Republicans are not, is necessarily unreliable.

In any event, Trende offers no analysis to connect the distribution of Democrats and Republicans in the state to the map that was drawn by the Republican-controlled legislature or a map that could have been drawn. He does not attempt to show that Wisconsin’s efficiency gap was a result of the natural packing of Democratic voters in Wisconsin. Nor could he do so, because Trende *cannot even measure* how much, if any, of the efficiency gap was due to the geographic concentration or isolation of voters in Wisconsin versus intentional gerrymandering. Ex. 2, Trende Dep. (Dkt. 66), at 44:4-19. Trende also does not dispute Professor Mayer’s conclusion that “it was entirely possible to draw a neutral map that met or exceeded Act 43 on all legal dimensions.” Mayer Rebuttal (Dkt. 64) at 28.

Even if Trende’s analysis could contribute to an understanding of the efficiency gap in Wisconsin, there are two additional significant problems with the way he designed his “nearest neighbor” analysis that render it meaningless. First, Trende’s method measures only the proximity of *similar* wards to each other, which “is simply not a measure of geographic isolation or clustering.” Mayer Rebuttal (Dkt. 64) at 7. “It only tells us how far these wards tend to be from wards of the same partisan lean” and “tells us nothing about which wards are actually *adjacent* to wards of a certain PVI.” *Id.* (Dkt. 64). It is certainly possible that wards of the same partisan makeup could be far apart, but still easy to join into a district, or conversely, close together but very hard to join into a district.¹⁷ *Id.* (Dkt. 64). “Trende’s method cannot distinguish

¹⁶ At his deposition, Trende admitted that the largest partisan cluster in Wisconsin is the Republican suburbs in the southeastern portion of the state. Trende Dep. (Dkt. 66), at 65:18–66:2.

¹⁷ Trende also admitted this at his deposition. Trende Dep. (Dkt. 66) at 76:16-77:14.

between these scenarios, and as a result it cannot tell us anything about the geographic patterns that actually matter for redistricting.” *Id.* (Dkt. 64).

Trende also does not define or explain what he means by a “similar partisan index,” which he uses in ¶ 97 of his declaration. Without specifying what range he includes in “similar,” “it is impossible to know whether his measure has any meaning,” because different ways of classifying “similar” will have very different results. Mayer Rebuttal (Dkt. 64) at 7-8. This is a very serious flaw, because “on this point alone, his method lacks validity or replicability.” *Id.* (Dkt. 64).¹⁸

In sum, both Trende’s “simple visual inspection” study and his “nearest neighbor” analysis, which is the only support he offers for his opinion that a “natural” concentration of Democrats in Wisconsin leads to an unknown level of Republican advantage,” should be excluded because they are completely unsupported by any peer-reviewed literature in the field of political science, are severely methodologically flawed, and do not help the court determine facts at issue in this case. Trende’s opinions and analysis are unreliable, and should be excluded. *Deimer*, 58 F.3d at 345 (excluding expert’s opinions where expert had “proffered unverified statements that were unsupported by any scientific method.”)

B. Trende’s Opinion that the Efficiency Gap is an Inaccurate Predictor of Partisan Gerrymandering Relies on an Error-Filled Analysis of State Assembly and Congressional Plans and a Misunderstanding of Plaintiffs’ Proposed Test.

Trende also opines that the efficiency gap metric is an inaccurate predictor of partisan gerrymandering because it “invites court scrutiny of maps that are clearly not partisan gerrymanders, while absolving maps where legislators clearly acted overwhelmingly with

¹⁸ It is telling that defendants did not cite Trende’s “nearest neighbor” analysis *anywhere* in their summary judgment brief, referring only to Trende’s “simple visual inspection” study.

partisan intent.” Trende Decl. (Dkt. 55), ¶ 106. To attempt to prove this, he performs an analysis of seventeen state Assembly plans and a series of congressional plans, which he says demonstrate the inaccuracy of the efficiency gap metric. *Id.* (Dkt. 55) ¶¶ 108-31. This analysis misunderstands plaintiffs’ legal test, and makes serious methodological and calculation errors that render it unreliable.

Trende analyzes a series of seventeen state legislative plans (Trende Decl. (Dkt. 55), ¶¶ 106-124) with an “‘unambiguous history’ of having a consistent efficiency gap sign over the lifespan of the plan” to argue that the efficiency gap is “both underinclusive and overinclusive.” *Id.* (Dkt. 55), ¶¶ 106-08. He claims that although these state legislative plans had large efficiency gaps, they were not all partisan gerrymanders. *Id.* (Dkt. 55), ¶ 109. But that analysis demonstrates a fundamental misunderstanding of the plaintiffs’ proposed legal test.

To begin with, neither plaintiffs’ experts nor plaintiffs argue that the state Assembly plans Trende uses as examples should all be held unconstitutional. Rebuttal Report of Simon Jackman, Ph.D., dated December 21, 2015 (“Jackman Rebuttal”) (Dkt. 63) at 22. To be unconstitutional, there would have to be proof that these seventeen plans “were designed with partisan intent (the first element of plaintiffs’ proposed test), that their initial efficiency gap exceeded a reasonable threshold (the second element), or that their efficiency gaps could have been avoided (the third element).” *Id.* (Dkt. 63). “[I]f we focus on the plans among the seventeen that likely *would* have failed plaintiffs’ proposed test (at least the first two elements), we see that both the test and the efficiency gap perform exceptionally well.” *Id.* (Dkt. 63) at 22. Five of the plans had unified control of one party over redistricting, from which we can infer the possibility of partisan intent, and an efficiency gap over 7%. It is these five plans as to which “judicial intervention may have been advisable” under plaintiffs’ proposed test—*not* the universe of

seventeen plans that Trende selected. *Id.* (Dkt. 63) at 23. Because Trende (like defendants themselves) ignores the partisan intent prong of plaintiffs' proposed test, his state Assembly plan study is unreliable and unhelpful in assessing the efficiency gap as a metric.

Trende also criticizes the efficiency gap based on his analysis of a series of state *congressional* plans. But state congressional plans "are entirely irrelevant to this case, which deals only with state legislative redistricting."¹⁹ *Id.* (Dkt. 63). Further, Trende makes three fundamental mistakes in regards to congressional plans, which "have serious substantive consequences that render his results entirely untrustworthy." *Id.* (Dkt. 63), at 23-24.

First, the generally accepted method for calculating the efficiency gap for a *congressional* plan is to convert the efficiency gap from a percentage to seats, but only when a state has at least eight congressional districts. *See* Eric M. McGhee & Nicholas O. Stephanopoulos, *Partisan Gerrymandering and the Efficiency Gap*, 82 U. Chi. L. Rev. 831, 868-69 (2015). Trende misapplies the methodology because he fails to convert the efficiency gap from percentage points to Congressional seats, which makes the efficiency gaps appear much larger than they would be if properly calculated. Jackman Rebuttal (Dkt. 63) at 24; Trende Dep. (Dkt. 66), at 86:4-6, 91:25-92:15. For example, Trende claims that Colorado's 2002 congressional plan had an efficiency gap of -9%, but when converted to seats, Colorado really had an efficiency gap of -6% in 2002. Trende Decl. (Dkt. 55), ¶ 116; Jackman Rebuttal (Dkt. 63) at 24. Trende says that Alabama in 2002, Arizona in 2012, Colorado in 2002 and 2012, Illinois in 2002, and Iowa in 2002 all had efficiency gaps above the proposed 7% threshold. Trende Decl. (Dkt. 55), ¶¶ 115-16, 118-19, 121-22. But when these numbers are converted to the correct

¹⁹ Plaintiffs' proposed test is addressed to Wisconsin's state Assembly plan, not its congressional plan, and proposes a standard only for state legislative redistricting. Neither Professor Mayer nor Professor Jackman provide any kind of analysis of congressional plans in their reports.

calculation (House seats), “*all* of these efficiency gaps become quite small, lower in all cases than the two-seat threshold proposed in the literature for congressional plans (Stephanopoulos and McGhee, 887-88)” Jackman Rebuttal (Dkt. 63) at 24 (emphasis in original).

Second, Trende improperly calculates the efficiency gap for small congressional delegations with fewer than eight seats. “[T]here is no authority in the literature for [t]his methodological choice[], and he is unable to cite any.” *Id.* (Dkt. 63). Trende looks at the congressional plans of Alabama in 2002, Iowa in 2002, and Colorado in 2002 and 2012, all of which had less than eight districts. “[B]ased on the literature, [these plans] should not be included in any efficiency gap analysis because of the measure’s lumpiness when applied to so few seats. Trende nowhere acknowledges this limitation, and indeed appears unaware of its existence.” *Id.* (Dkt. 63) at 25; *Lennon v. Norfolk & Western Ry. Co.*, 123 F. Supp. 2d 1143, 1154 (N.D. Ind. 2000) (excluding expert testimony where expert failed “to indicate awareness of the most recent literature and the most-widely recognized literature”). In fact, when Trende was asked at his deposition what the efficiency gap threshold is for congressional plans, he flatly stated “I don’t remember.” Trende Dep. (Dkt. 66) at 86:4-6.

Finally, Trende makes another methodological mistake in his analysis of congressional plans. Whenever there were uncontested congressional races, Trende just *substituted* presidential election results for the missing congressional results. Trende Dep. (Dkt. 66) at 83:2-18. “[T]his is an exceptionally crude method that is guaranteed to produce errors, both because there is voter roll-off from the presidential to the congressional level and because voters may have different presidential and congressional preferences.” Jackman Rebuttal (Dkt. 63) at 25. The preferred method in the literature, and the approach used by Professor Jackman in his initial report, is to use presidential results as *inputs in a regression model* that predicts the outcomes of uncontested

congressional races. *Id.* (Dkt. 63). “[P]residential results cannot simply be plugged in without any adjustment, and no competent social scientist would have done so.” *Id.* (Dkt. 63). As a result, Trende’s congressional plan analysis “is marked by conceptual and methodological errors severe enough to render it useless” and it does not “meet[] accepted standards of social science rigor.” *Id.* (Dkt. 63) at 3.

C. Trende’s Remaining Opinions Are Baseless and Demonstrate a Fundamental Misunderstanding of Quantitative Analysis

Along with the opinions outlined above, Trende also offers a series of five opinions aimed at the efficiency gap as a metric. These opinions are also baseless and unreliable, demonstrating a fundamental misunderstanding of quantitative analysis.

First, Trende opines that plaintiffs’ “experts offer two different formulas for measuring [the efficiency] gap. This difference can be consequential.” Trende Decl. (Dkt. 55), ¶ 55. But Trende has no basis for concluding that this difference is in fact consequential. He claims that 1.4% out of a total range of 30% is a “substantial” amount of uncertainty between Professor Mayer’s and Professor Jackman’s calculations, “because that’s like 6 percent of the range.” Trende Dep. (Dkt. 66), at 113:19-22. In fact, it is 3.7% of the range.²⁰ As defendants’ other expert, Professor Nicholas Goedert, conceded, the “most common threshold” for an error rate is “five percent.” Goedert Dep. (Dkt. 65), at 70:11-12. A difference of 3.7% clearly falls within that threshold.²¹

²⁰ Trende thought the range of the lowest-value efficiency gap to the highest-value efficiency gap was 30 at his deposition, and said 1.4% is 6% of that range. However, it would actually be 4.6%, because .014 divided by .30 is .046 (or 4.6%), not 6%. But the range is actually 38 (*See* Expert Report of Simon Jackman, Ph.D., dated July 7, 2015 (Dkt. 62), at 35) (explaining that the lowest efficiency gap value is -0.18 (Delaware in 2000) and the highest is 0.20 (Georgia in 1984). Thus, 1.4% is actually 3.7% of the range of 38 (.014 divided by .38 is .037).

²¹ Trende’s attack on plaintiffs’ experts’ efficiency gap formulas also contains basic mathematical errors that further render his analysis unreliable and demonstrate a lack of understanding of

Second, Trende opines that “the imputation strategy employed [by Professor Simon Jackman and Professor Kenneth Mayer] to solve the problem of uncontested districts results in a skewing of efficiency gaps in Wisconsin.” Trende Decl. (Dkt. 55), ¶¶ 32, 135-39. As evidence, Trende points to two figures in Professor Mayer’s original expert report, which show that there is a close relationship between Republican presidential and state Assembly votes (Figure 2), but a different relationship between Democratic presidential and state Assembly votes (Figure 3). Trende says that in Figure 3, the “dots systematically fall below the line, often creating differences on the order of 10 percent.” Trende Decl. (Dkt. 55), ¶ 138.

Trende’s claim that Figure 3 shows that there is a bias in Professor Mayer’s or Professor Jackman’s imputation models betrays “a fundamental lack of understanding of multiple regression and the causes of bias in statistical models.” Mayer Rebuttal (Dkt. 64) at 20. As Professor Mayer points out, “the fact that the Democratic Assembly vote tends to fall below the presidential vote is completely irrelevant to any bias. In fact, regression analysis estimates the relationship between the two quantities by identifying the *slope* of the line that relates them, not how the relationship varies across a 45-degree line.” *Id.* (Dkt. 64) (emphasis in original). Directly contrary to Trende’s assertion, Figure 4 in Professor Mayer’s original report (which plots the predicted Assembly vote against the actual Assembly vote) shows that there is *no* bias in his regression results. *Id.* (Dkt. 64). As discussed above, unlike Trende, Professor Jackman utilized

quantitative methods and arithmetic. For example, Trende incorrectly reports that the efficiency gap for Professor Mayer’s demonstration plan is -.219, ten times the correct number of -.0219. Trende Dep. (Dkt. 66), at 109:12-21. Trende also says the difference between Professor Mayer’s estimated Act 43 efficiency gap and Professor Jackman’s estimated Act 43 efficiency gap is .0141, but it is actually .0184. Trende Decl. (Dkt. 55), ¶ 61. He also gets the difference between Professor Mayer’s demonstration plan efficiency gap calculation and Professor Jackman’s demonstration plan calculation wrong, reporting it as .0184 when it is really .0142. Ex. 1, Trende Decl. (Dkt. 55), ¶ 61.

the preferred approach in the academic literature for imputing uncontested races, by using “presidential results in as *inputs* to a regression model that *predicts* the outcomes of uncontested congressional races” (emphasis in original). Jackman Rebuttal (Dkt. 63) at 25. Trende’s opinion on the supposed bias in plaintiffs’ experts’ models results from a serious misunderstanding of multiple regression, which “no one with a solid understanding of quantitative methods or regression analysis would have made.” Mayer Rebuttal (Dkt. 64) at 21.

Third, Trende criticizes the EG metric on the ground that it “ignores important factors, such as incumbency, candidate quality, campaign spending, and recruiting advantages.” Trende Decl. (Dkt. 55), ¶¶ 140-43. But Trende overlooks the fact that Professor Mayer’s regression model *does* utilize “baseline estimates that, in effect, average out the effects of these factors (Gelman and King 1990; 1994).”²² Mayer Rebuttal (Dkt. 64) at 22. In addition, Trende cites no sources and offers no proof that these factors, even if they were not considered by Professor Mayer’s model, would have an impact on his estimates. Trende’s criticism “is uninformed and betrays a lack of knowledge of how hypothetical district plans are evaluated.” *Id.* (Dkt. 64).

Fourth, Trende argues that “efficiency gaps are sensitive to slight changes.” Trende Decl. (Dkt. 55), ¶ 143. However, the only source Trende cites for this opinion is a hypothetical example he created to show that a wave election in the first year after redistricting or a change in the number of votes in a few districts could have a sizeable influence on the efficiency gap. *Id.* (Dkt. 55), ¶¶ 143-48. However, “most wave elections over the last forty years have not taken place in the first election after redistricting.” Jackman Rebuttal (Dkt. 63) at 5. In addition, Trende’s opinion misunderstands plaintiffs’ proposed legal test. Even if a plan had a high

²² Professor Mayer’s regression model incorporates these factors “in its analysis of the relationship between the presidential vote (where none of these variables will affect the vote) and the Assembly vote (where they are all incorporated into the estimates).” Mayer Rebuttal (Dkt. 64) at 22.

efficiency gap after the first election, that alone would not be enough to render a plan unconstitutional. Plaintiffs would also have to prove partisan intent, and the state would have an opportunity to show that the plan's large efficiency gap was unavoidable. Further, Trende admits that this alleged shift "would not make a difference in terms of whether the Wisconsin map invited Court scrutiny..." Trende Decl. (Dkt. 55), ¶148. Thus, this opinion is sheer conjecture, resulting in an unhelpful assertion without proof. *Ammons v. Aramark Uniform Services, Inc.*, 368 F.3d 809, 816 (7th Cir. 2004) (affirming exclusion of expert opinions, stating "A court is expected to reject 'any subjective belief or speculation'" (quoting *Chapman*, 297 F. 3d at 687).

Fifth, Trende opines that an efficiency gap does "not foreclose[] a party from adequately participating in the political process..." Trende Decl. (Dkt. 55), ¶ 149. Once again, Trende provides no citation to the literature to support his assertion. And once again, he clearly does not understand plaintiffs' proposed test properly, assuming that only a large efficiency gap is necessary to render a plan unconstitutional and ignoring the requirement that there also be partisan intent and a finding that the large efficiency gap could not have been avoided. Jackman Rebuttal (Dkt. 63), at 25. Because it is based on a misunderstanding of the legal test at issue in this case, Trende's opinion is necessarily unhelpful to the trier of fact.

CONCLUSION

For the foregoing reasons, Trende's declaration should be stricken and Trende's testimony excluded at trial.

Respectfully submitted,

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