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NELDA CUELLAR
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STATE OF NEW MEXICO
COUNTY OF LEA
FIFTH JUDICIAL DISTRICT

REPUBLICAN PARTY OF NEW MEXICO,
DAVID GALLEGOS, TIMOTHY JENNINGS,
DINAH VARGAS, MANUEL GONZALES, JR.,
BOBBY and DEE ANN KIMBRO, and
PEARL GARCIA,

      Plaintiffs,

      v.

                    Cause No.
                    D-506-CV-2022-00041

MAGGIE TOLOUSE OLIVER, in her official capacity
as New Mexico Secretary of State, MICHELLE LUJAN
GRISHAM, in her official capacity as Governor of New
Mexico, HOWIE MORALES, in his official capacity as
New Mexico Lieutenant Governor and President of the
New Mexico Senate, MIMI STEWART, in her official
capacity as President Pro Tempore of the New Mexico
Senate, and JAVIER MARTINEZ, in his official
capacity as Speaker of the New Mexico House of
Representatives,

      Defendants.

PLAINTIFFS' OPPOSITION TO LEGISLATIVE DEFENDANTS' MOTION TO EXCLUDE THE EXPERT TESTIMONY OF SEAN P. TRENDE

Plaintiffs the Republican Party of New Mexico and a bipartisan group of New Mexico voters (collectively, "Plaintiffs") hereby file this Opposition To Legislative Defendants' Motion To Exclude The Expert Testimony of Sean P. Trende. The expert report submitted by Mr. Trende[1] powerfully shows that SB1 is an egregious partisan gerrymander through *both* independent methods of proof that Justice Kagan endorsed in *Rucho v. Common Cause*, 139 S. Ct. 2484 (2019). *See Grisham v. Van*

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[1] Yesterday, Mr. Trende successfully defended his dissertation for his doctoral program at The Ohio State University. Accordingly, Mr. Trende will obtain his doctoral degree and the title "Doctor" on December 17, 2023. Supplemental Declaration of Sean P. Trende, ¶ 27 (Sept. 26, 2023) ("Trende Suppl. Decl.")

Soelen, No.S-1-SC-39481 (N.M. Sept. 22, 2023) (hereinafter "Opinion"). First, Mr. Trende's report meticulously demonstrates that Senate Bill 1 ("SB1") is an extremely partisan, near-perfect gerrymander, through a variety of qualitative analyses. Second, using a sophisticated simulation analysis—the same one Mr. Trende used successfully as the lead expert in cases invalidating the gerrymandered maps in New York and Maryland this redistricting cycle—Mr. Trende generated 2,040,000 simulated, partisan-neutral maps, showing that SB1 is an extreme outlier.

Legislative Defendants have no serious answer to Mr. Trende's independently sufficient qualitative analyses, and while they file their Motion to try to exclude Mr. Trende's simulation analysis, their arguments fall flat. Legislative Defendants claim that Mr. Trende's simulations-based conclusions are inadmissible because he did not save the 2,040,000 maps that he generated for purposes of his expert report. But Mr. Trende's approach of reporting the overall partisan distribution of the simulations, and not analyzing specific maps within that extremely large sample, is just what those trained in his method recommend—including Dr. Kosuke Imai, who pioneered the simulation approach that Mr. Trende uses. In any event, Legislative Defendants' claimed indignation that they wanted the 2,040,000 maps that Mr. Trende used in assessing the overall partisan distribution of the simulations in his report is now irrelevant because when Mr. Trende re-ran his algorithm, this provided Legislative Defendants with a full set of 2,040,000 maps, and those maps' partisan distribution leads to the exact same conclusions as Mr. Trende reported from

his first 2,040,000 maps run. So even if Legislative Defendants for some reason wanted to analyze individual maps within the set—contrary to what Dr. Imai recommends would be appropriate—they now have 2,040,000 maps to look at, which maps lead to the exact same conclusion as Mr. Trende articulated in his expert report.

STATEMENT

A. Plaintiffs submitted the expert report of Mr. Trende to support their conclusion that the Legislature acted with partisan intent and effect in adopting SB1. *See* Expert Report Of Sean P. Trende (Aug. 11, 2013) ("Trende Rep."); Opinion at 48. Mr. Trende is a renowned redistricting expert, Trende Rep.1–4 & Ex.1, who was also appointed by the Virginia Supreme Court to serve as a special master for its redistricting process, *id*. at 3–4. Most recently, and most relevant, Mr. Trende has used his simulation analysis in partisan-gerrymandering cases in both New York and Maryland, *id*. at 8, and that simulation analysis served as key evidence supporting invalidation of those maps as partisan gerrymanders, *Harkenrider v. Hochul*, 197 N.E.3d 437, 443, 453 (N.Y. 2022); *Szeliga v. Lamone*, No.C-02-CV-21-001816, 2022 WL 2132194, at *1, *29–33, *46 (Anne Arundel Cnty. Md. Cir. Ct. Mar. 25, 2022).

In his report here, Mr. Trende prepared *both* a qualitative-evidence analysis *and* a sophisticated-social-science analysis, which both independently demonstrate that SB1 is an extreme partisan gerrymander. *See* Trende Rep.31–74.

The qualitative-evidence analysis in Mr. Trende's report shows that SB1 has impermissible partisan effects, just like the qualitative data discussed by Justice Kagan with respect to the challenged Maryland map in *Benisek v. Lamone*, 348 F. Supp. 3d 493, 497–507 (D. Md. 2018), *vacated and remanded sub nom. Rucho*, 139

S. Ct. 2484, the companion case to *Rucho*, 139 S. Ct. at 2518–19 (Kagan, J., dissenting). That is because, with SB1, the Legislature made substantial, partisan shifts of voters between districts, ultimately balancing the Democratic-Party composition in each of the State's three congressional districts to maximize the Democratic Party's chance of winning all three districts. Trende.Rep.42 (addressing all three districts, using two different metrics); *id.* at 33–35, 42–43. That is a near-perfect gerrymander because a partisan mapdrawer needs to "rob Peter to pay Paul" to make any one district more Democratic, *id.* at 41; *see also id.* at 14–15, so "the best-case scenario for a [Democratic] gerrymanderer" in New Mexico looking to sweep all congressional races "would be drawing three districts" with a Democratic-party composition of "54.29%," *id.* at 14 (relying upon 2020 presidential election vote data). Finally, Mr. Trende found that the voter-registration data, Opinion at 46–47, leads to the same conclusion, as SB1 shifted District 2 from being roughly even registration between Republicans and Democrats, to a 13% registration advantage for Democrats, Trende Rep.38.

The sophisticated social-science analysis in Mr. Trende's report independently confirms that SB1 is an egregious partisan gerrymander. Trende Rep.43–75. Mr. Trende randomly generated one million maps that "incorporate [New Mexico's] physical and political geography and meet its declared districting criteria, except for partisan gain." *Rucho*, 139 S. Ct. at 2518 (Kagan, J., dissenting); *see* Trende.Rep.43–44. Mr. Trende instructed the simulation to "respect county subdivisions," "keep districts modestly compact," and "keep populations equal." Trende Rep.44. These

simulations had an average "Gerrymandering Index" of roughly 1.3%. *Id.* at 46. SB1, on the other hand, had a Gerrymandering Index of 6.4%, over four standard deviations from the mean, thereby demonstrating that SB1 is an extreme gerrymander. *Id.* Mr. Trende then prepared an additional million simulated maps that only moved the precincts that the SB1 drafters also moved between districts. *Id.* at 54–60. These simulated maps had an average Gerrymandering Index of 0.62%, whereas SB1 had a Gerrymandering Index of 2.95%, over seven standard deviations from the mean. *Id.* at 54. Finally, Mr. Trende ran three sets of additional simulations of 10,000 maps to confirm his results in various respects. *Id.* at 61–77.

Following Plaintiffs' production of Mr. Trende's expert report, Mr. Trende also provided Legislative Defendants with the code he used to produce his simulated maps. Because Mr. Trende, per his "usual practice," did not save the individual simulated maps, Plaintiffs' counsel requested, at Legislative Defendants' counsel's insistence, that Mr. Trende re-run his simulations so that Plaintiffs could provide Legislative Defendants with the individual maps. Trende Suppl. Decl. ¶ 4. Mr. Trende did so, thus producing an additional 2,040,000 maps for Legislative Defendants. *Id.* Legislative Defendants then scheduled a follow-up deposition, at which Mr. Trende learned that the code that he ran did not replicate the first batch of maps, but rather created a new set of 2,040,000 simulations. *Id.* ¶ 6. Although Mr. Trende inserted a command in his code known as "setting a seed" that normally would ensure that "anyone running the simulations would produce the exact same maps," *id.* ¶ 4, that "setting a seed did not work for this particular application if a

computer utilized more than 1 processing core," *id.* ¶ 6. So, in re-running the code, Mr. Trende actually produced to Legislative Defendants a second set of 2,040,000 maps. This second set of maps, unsurprisingly, generate the same partisan distribution as the first set, thereby further confirming Mr. Trende's conclusions because now 4,080,000 confirm that SB1 is an extreme partisan outlier. *Id.* ¶ 7. This second set of maps also rendered immaterial the fact that Mr. Trende did not save his original set of maps, as the "second set of 2,040,000 simulations also demonstrates that the [challenged map] is an extreme outlier" and "only strengthens the case against the [challenged map]." *Id.* (emphasis omitted), *see also id.* ¶¶ 9–25. Indeed, as Mr. Trende explains, even "had [he] *only* considered the second set of simulations, none of [his] conclusions in this matter would have changed." *Id.* ¶ 7.

B. Legislative Defendants have now moved to exclude one portion of Mr. Trende's expert report, namely, Mr. Trende's sophisticated social-science analysis, based largely upon the fact that Mr. Trende did not save the first set of 2,040,000 maps. Legislative Defs.' Opposed Mot. To Exclude The Unreliable Simulation-Based Expert Test. Of Sean P. Trende (Sept. 20, 2023) ("Leg.Mot.").

LEGAL STANDARD

Rule 11-702 of the New Mexico Rules of Evidence provides that "[a] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue." Rule 11-702 NMRA. Rule 11-702 establishes "three requirements" for expert testimony to be admissible: "'(1) that the expert be qualified;

(2) that the testimony be of assistance to the trier of fact; and (3) that the expert's testimony be about scientific, technical, or other specialized knowledge with a reliable basis.'" *Acosta v. Shell W. Expl. & Prod., Inc.*, 2016-NMSC-012, ¶ 22, 370 P.3d 761 (quoting *State v. Downey*, 2008-NMSC-061, ¶ 25, 145 N.M. 232, 195 P.3d 1244). The second and third element are at issue here.

Rule 11-702's second prong, "that the testimony be of assistance to the trier of fact," *id.* (citation omitted), "'goes primarily to relevance' as '[e]xpert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful,'" *id.* ¶ 23 (brackets in original) (quoting *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 591 (1993)). To be relevant, the expert testimony must be "sufficiently tied to the facts of the case," such that it "will aid the jury in resolving a factual dispute." *Downey*, 2008-NMSC-061, ¶ 30 (citation omitted). That is, the methodology underlying the expert's opinions must "'fit[ ]'" the "facts of the case" and any assumptions grounded in the evidentiary record, "thereby prov[ing] what it purports to prove." *Id.*

Rule 11-702's third element, "that the expert's testimony be about scientific, technical, or other specialized knowledge with a reliable basis," addresses the reliability of expert testimony, which is also key for the testimony to be helpful to the trier of fact. *Acosta*, 2016-NMSC-012, ¶ 22 (citation omitted); *see also Downey*, 2008-NMSC-061, ¶ 25. A number of factors may be "pertinent to the trial court's determination of whether [ ] scientific evidence is reliable," including: "(1) whether a theory or technique can be (and has been) tested; (2) whether the theory or technique

has been subjected to peer review and publication; (3) the known potential rate of error in using a particular scientific technique and the existence and maintenance of standards controlling the technique's operation; . . . (4) whether the theory or technique has been generally accepted in the particular scientific field"; and (5) "whether the scientific technique is based upon well-recognized scientific principle and whether it is capable of supporting opinions based upon reasonable probability rather than conjecture." *State v. Anderson*, 1994-NMSC-089, ¶ 15, 118 N.M. 284, 881 P.2d 29 (citation omitted).

ARGUMENT

I. **Mr. Trende's Method Of Looking At The Overall Partisanship Distribution Of The Simulated Maps Is Reliable, And Legislative Defendants' Feigned Desire to Look At Individual Maps Within The Simulation Set Is Contrary To The State Of The Art And Irrelevant Because Mr. Trende Gave Them An Additional Set of 2,040,00 Maps That Generates The Exact Same Conclusions**

A. Mr. Trende's sophisticated social-science analysis satisfies each of the three requirements for admissibility under Rule 11-702. First, Mr. Trende is an eminently "qualified" redistricting expert, *Acosta*, 2016-NMSC-012, ¶ 22 (citations omitted), including with respect to simulation analysis that comprises his sophisticated social-science analysis here, as he has presented such analysis in multiple prior partisan-gerrymandering cases, *supra* p.3. Second, Mr. Trende's simulation analysis provides "assistance to" this Court as "the trier of fact," *Acosta*, 2016-NMSC-012, ¶ 22 (citations omitted), as it gives an objective measure of the extreme partisanship of SB1, using the "extreme outlier approach" endorsed by Justice Kagan in her *Rucho* dissent, *Rucho*, 139 S. Ct. at 2518 (Kagan, J., dissenting), without inserting partisan

considerations within his simulations, unlike the simulations of Legislative Defendants' simulation expert, *see* Pls.' Opposed Mot. To Exclude Expert Report And Expert Test. Of Dr. Jowei Chen at 8–14 (Sept. 22, 2023). Finally, Mr. Trende's simulation analysis rests on "scientific, technical, or other specialized knowledge with a reliable basis," *Acosta*, 2016-NMSC-012, ¶ 22 (citations omitted), using a "broadly accepted 'package' in [the program] R called 'redist,' which generates a representative sample of districts," Trende Rep.17 (citing, among another authorities, Cory McCartan & Kosuke Imai, *Sequential Monte Carlo for Sampling Balanced and Compact Redistricting Plans,* Annals of Applied Stat., (forthcoming 2023)).

B. Legislative Defendants argue that Mr. Trende's expert testimony as to his simulation analysis fails the third element of Rule 11-702 because Mr. Trende did not produce the 2,040,000 individual simulated maps underlying his expert report and the code capable of fully replicating those maps.[2] Legislative Defendants' arguments both misunderstand the scientifically appropriate method for analyzing a large set of maps in a simulation analysis and are irrelevant, in any event, because Mr. Trende has produced yet a second set of 2,040,000 maps, which second set leads to the exact same conclusion as the set of maps that Mr. Trende analyzed in his expert report.

Legislative Defendants' objection to Mr. Trende's simulation-based opinions is contrary to the state-of-the-art redistricting simulation methodology that Mr. Trende

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[2] While Legislative Defendants suggest that "there is ample evidence that Mr. Trende is not qualified to render opinions regarding simulation analysis," Leg.Mot.6, their purported bases for this criticism are wrong for the reasons discussed below, *see infra* Part II, and, in any event, they expressly confine their Motion to "the reliability of Mr. Trende's expert opinions because of his decision to destroy the facts and data underlying his opinions," Leg.Mot.6.

employed in preparing his sophisticated social-science analysis. As Mr. Trende explains in his Supplemental Declaration, analysts "who use [the] simulation approach on which [Mr. Trende] relied" do not ordinarily "examine individual maps when performing the analysis," as the relevant data point is the "overall distribution." Trende Suppl. Decl. ¶¶ 2–3. The creator of Mr. Trende's simulation approach, Dr. Imai, has explained this very point, noting that, "[i]n order to use the simulation for evaluation," *"one should never look at a single or a particular map[ ]," but rather must "look at the distribution of plans."* *Id.* ¶ 3 (citation omitted) (emphasis added).[3] Mr. Trende, consistent with this state of the art and thus his "usual practice," "did not save the individual maps." Trende Suppl. Decl. ¶ 2. Accordingly, Legislative Defendants' unusual request to see the individual maps that Mr. Trende generated is wholly unnecessary (and, indeed, nonsensical) for the type of analysis that Mr. Trende performed and, moreover, Legislative Defendants do not even try to explain what they would have done with the individual 2,040,000 maps that would have been permissible under Mr. Trende's state-of-the-art simulation method. *See generally* Leg.Mot.3–5, 6–7.

In any event, even if this Court were to conclude that it was error for Mr. Trende not to save and then produce his first set of 2,040,000 maps, Mr. Trende fully redressed Legislative Defendants' manufactured concerns by producing a second set of 2,040,000 maps to Legislative Defendants. Trende Suppl. Decl. ¶ 4. This

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[3] Legislative Defendants themselves rely favorably upon Dr. Imai's scholarship in their Response To Plaintiffs' Motion To Exclude The Expert Report And Expert Testimony Of Dr. Jowei Chen (Sept. 25, 2023).

second set of 2,040,000 maps has a partisanship distribution that is substantially the same to the simulated maps underlying Mr. Trende's simulation-based opinions. *Id.* ¶¶ 7, 9–25. For example, for the one-million simulated maps that used the presidential vote share to measure partisanship, Mr. Trende's expert report noted that 0.11% of the simulated maps had more extreme gerrymandering than the challenged map. *Id.* ¶ 10. That number was the same in the new production. *Id.* For the one-million simulated maps that looked only at those precincts that were swapped between the challenged map and the 2012-2020 plan, Mr. Trende's expert report noted that the gerrymandering index was "over seven" standard deviations from the mean. *Id.* ¶ 11. That number was 7.170 for the new production. *Id.*; *see also id.* ¶¶ 15–24. A review of the gerrymandering index plot figures produced by the original simulated maps as compared to the new batch similarly shows no material difference in the data generated by these two sets of maps and "leads to precisely the same conclusions as [Mr. Trende] la[id] out in [his expert] report," *id.* ¶¶ 15–25, namely, that the challenged map is an "outlier" and was likely drawn in "heav[y]" reliance on political considerations, *id.* ¶ 1; *see id.* ¶ 7 ("[H]ad I *only* considered the second set of simulations, none of my conclusions in this matter would have changed[.]"). The second set of maps, if such a set were necessary, thus provides a more than sufficient basis for holding that the simulations underlying Mr. Trende's expert report were "reliable." *Acosta*, 2016-NMSC-012, ¶ 22 (citation omitted); *see also Downey*, 2008-NMSC-061, ¶ 25; Rule 11-702 NMRA.

C. For the same reasons, Legislative Defendants' request that this Court exclude Mr. Trende's simulation-based opinions as a punishment for Mr. Trende's decision not to save his initial run of 2,040,000 maps is a nonstarter.

As a threshold matter, Legislative Defendants do not claim that Mr. Trende failed to save the individual maps in order to intentionally keep them from Legislative Defendants; rather, their complaint is merely with Mr. Trende's "usual practice." Trende Suppl. Decl. ¶ 2; *see State v. Chouinard*, 1981-NMSC-096, ¶ 16, 96 N.M. 658, 634 P.2d 680; *Rest. Mgmt. Co. v. Kidde-Fenwal, Inc.*, 1999-NMCA-101, ¶ 13, 127 N.M. 708, 986 P.2d 504. Again, as Mr. Trende has explained, it is his "usual practice" not to save individual maps because "neither [he] nor others who use" the simulation approach "examine individual maps when performing the analysis." Trende Suppl. Decl. ¶ 2. Thus, while Legislative Defendants recognize that evidence exclusion is generally appropriate only where the opposing party has acted "deliberate[ly] or in bad faith," Leg.Mot.8, they do not contend that Mr. Trende acted deliberately here, *Chouinard*, 1981-NMSC-096, ¶¶ 14–16. Legislative Defendants' requested exclusion remedy is thus inappropriate. *See id.*; *Rest. Mgmt. Co.*, 1999-NMCA-101, ¶ 14.

In any event, Legislative Defendants cannot credibly claim that the original batch of simulated maps is "material" to any arguments that they would want to make in this case, including because Mr. Trende produced a second set of maps that does just what his first set of maps do and shows the same results. *See Chouinard*, 1981-NMSC-096, ¶ 16. As Mr. Trende has explained, the individual simulated maps

are not themselves relevant to the simulation analysis under the state-of-art simulation methodology; rather, what matters for purposes of this analysis is the "overall distribution." Trende Suppl. Decl. ¶ 3. But to the extent the individual maps were material to whether Mr. Trende properly performed the analysis in his expert report, Mr. Trende has since provided Legislative Defendants with a set of 2,040,000 simulated maps that lead to all of the same conclusions put forth in Mr. Trende's expert report. *Id.* ¶ 7. Legislative Defendants do not contend that Mr. Trende's opinions would be any different had he formed them on the basis of the new production rather than on the original batch of simulated maps—nor could they, given that Mr. Trende's Supplemental Declaration makes clear that the second set of maps "only strengthens the case against" Senate Bill 1. *Id.* (emphasis omitted).

For similar reasons, Legislative Defendants cannot claim that they have suffered any prejudice from Mr. Trende's standard practice of not saving the individual maps underlying his expert reports. Mr. Trende's standard practice has no "effect" on Legislative Defendants' "ability to defend against Plaintiffs' claims," *Rest. Mgmt. Co.*, 1999-NMCA-101, ¶ 15, as, again, only the "overall distribution"— not the individuals maps—is relevant to assessing whether Senate Bill 1 is an outlier, Trende Suppl. Decl. ¶¶ 2–3, and Legislative Defendants have, in any event, a second set of substantially similar maps in their possession, *id.* ¶¶ 7, 9–14. Thus, while Legislative Defendants assert that Mr. Trende's usual practice is "profoundly prejudicial," Leg.Mot.9, they do not explain how they are prejudiced, Trende Suppl. Decl. ¶¶ 7–14. Further, and contrary to Legislative Defendants' claim, Mr. Trende

has not "admitted" that Legislative Defendants "would be prejudiced" absent access to the original batch of maps. Leg.Mot.9. Rather, Mr. Trende has confirmed that the new production of simulated maps produces substantially the same results, Trende Suppl. Decl. ¶¶ 9–24, and that his expert opinions would be the same even if he had "*only* considered the second set of simulations," *id.* ¶ 7; *see Rest. Mgmt. Co.*, 1999-NMCA-101, ¶ 15; *Choinard*, 1981-NMSC-096, ¶ 16.

II. Legislative Defendants' Remaining Quibbles With Mr. Trende's Report Provide No Basis For Exclusion

Legislative Defendants also suggest that Mr. Trende's simulation-based opinions are unreliable based upon minor inconsistencies between his expert report and his deposition testimony, as well as a mix-up in the computer scripts that Plaintiffs produced to Legislative Defendants. Leg.Mot.3–4. This too is wrong.

Legislative Defendants complain that Mr. Trende's expert report states that he performed his simulations "at home on a Dell Alienware desktop with an i9 processor," whereas Mr. Trende later confirmed that he "performed his simulations on a 16-core AMD processor." *Id.* at 3 (citations omitted). Legislative Defendants do not explain how the type of computer that Mr. Trende used to create his simulations is relevant to whether those simulations are reliable. *See id.* at 3, 6–7. And as Mr. Trende himself explained to Legislative Defendants, this minor inconsistency was "probably a leftover from having done it on a laptop once and forgetting that [he] didn't get an Intel chip on this, [he] got an AMD chip," which is "functionally equivalent" to "the i9." Leg.Mot. Exh. C.15 (Deposition of Sean P. Trende, Vol.2, 153:21–24).

As to Mr. Trende's purported "inconsisten[cies] regarding the number of simulations [he] performed," Legislative Defendants point to only one such inconsistency in Mr. Trende's expert report, which is an obvious "'typo.'" Leg.Mot.3 (citation omitted). Specifically, on page 47 of his expert report, Mr. Trende states that he created "50,000 simulated maps," despite having created one million such maps. Trende.Rep.47. This is a clear typo, and Legislative Defendants' decision to waste this Court's time by bringing it up in a motion is unseemly gamesmanship.

Finally, Legislative Defendants take issue with the fact that Mr. Trende initially produced computer code that was only capable of generating sets of 100,000 maps, rather than 1,000,000 maps. Leg.Mot.3–4. But as Mr. Trende has explained, this is a "trivial" issue "that any beginning coder could address in a matter of seconds," and he did in fact "produce[ ] code with the number of simulations set to 1,000,000 shortly after the deposition." Trende Suppl. Decl.2 n.2. In any event, this complaint is ultimately irrelevant as, again, Legislative Defendants now have access to over two-million additional maps produced with Mr. Trende's code.

CONCLUSION

This Court should deny Legislative Defendants' Motion To Exclude The Expert Testimony of Sean P. Trende.

Dated: September 26, 2023

Respectfully Submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and complete copy of the foregoing will be served on all counsel via the e-filing system.

Dated: September 26, 2023

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STATE OF NEW MEXICO
COUNTY OF LEA
FIFTH JUDICIAL DISTRICT

REPUBLICAN PARTY OF NEW MEXICO,
DAVID GALLEGOS, TIMOTHY JENNINGS,
DINAH VARGAS, MANUEL GONZALES, JR.,
BOBBY and DEE ANN KIMBRO, and
PEARL GARCIA,

      Plaintiffs,

      v.

MAGGIE TOLOUSE OLIVER, in her official capacity as New
Mexico Secretary of State, MICHELLE LUJAN GRISHAM, in
her official capacity as Governor of New Mexico, HOWIE
MORALES, in his official capacity as New Mexico Lieutenant
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capacity as Speaker of the New Mexico House of Representatives,

      Defendants.

Cause No.
D-506-CV-2022-00041

SUPPLEMENTAL DECLARATION OF SEAN P. TRENDE

1.   In the course of preparing my initial expert report in this matter, I utilized a desktop computer to generate millions of simulated maps. I was able to look at the overall partisanship of these maps and to compare them to the partisanship of the Enacted Map. On this basis, following the approach I and others have used in similar matters, I was able to determine that Enacted Map was an outlier that would be extremely unlikely to have been produced as the result of a drawing process that did not rely heavily on partisan considerations.

2.   On August 11, 2023, I produced to Defendants my expert report and the computer code I used to generate the analyses presented in my report. As is my usual practice, I did not save the individual maps. The reason is that neither I nor others who use simulation approach on which I relied typically examine individual maps when performing the analysis. While I may run a small sample set early in the process to make sure that the maps are behaving as expected—that the

underlying shapefile doesn't have missing precinct data or something of that nature—I do not examine maps in the full sample. Doing so would make little sense in the context of how the technique is supposed to work.

3.   In fact, Dr. Kosuke Imai, who developed the simulation approach on which I relied, has been emphatic that one should not examine maps individually, but rather should pay attention to the overall distribution. In his previous sworn trial testimony, he stated: "So one thing that's very important, and I think is incorrect in the Dr. Voss report, is that *one should never look at a single or a particular maps simulated plans* [sic], right? In order to use the simulation for evaluation, you *have to look at the distribution of plans*. So -- in not, like, a one specific plan, but all 10,000 of them." Trial Tr. 51:1-51:7, *Graham v. Adams*, No. 22-CI-47(Ky. Cir. Ct. Apr. 5, 2022) (testimony of Kosuke Imai) (emphasis added), attached as **Exhibit A**.

4.   I was asked by counsel to re-run my simulations and make the results available to counsel for Defendants. I did so, producing precinct assignment files[1] for 2,040,000 maps, which I believed to be the same as the 2,040,000 maps created by the initial simulations. This is because, due to a command I insert in my code known as "setting a seed," I believed that anyone running the simulations would produce the exact same maps.[2] This is the typical way coders ensure that

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[1] A precinct assignment file gives a number that matches every precinct in an area with a district on a map. It does this for every map that is generated. This is the same way that Dr. Chen produces his maps.

[2] In my deposition of September 6, 2023, counsel for Defendants also raised concerns that the code I produced only created 100,000 maps instead of 1,000,000. It does appear that, at some point after my initial analysis was completed but prior to production, the number of maps produced was reset to 100,000. While I can't recall exactly why I did this, I likely did it during my pre-production review. Before production I will typically restart the computer and then re-run the code to ensure it will still run cleanly after everything is wiped from the computer's memory (e.g., in the environment in which a different analyst would run it). I likely reduced the number of simulations so that this process would be completed faster and forgot to change it back. Regardless, this is a trivial matter that any beginning coder could address in a matter of seconds. I also produced code with the number of simulations set to 1,000,000 shortly after the deposition.

outcomes are fully reproduceable, and I have never encountered an application where setting a seed does not result in fully reproduceable outcomes before.

5. Counsel for Defendants requested an additional deposition, to take place within 48 hours. I complied and was prepared to answer to the best of my abilities any questions about the process used to generate the maps, the output from that process, or any other questions counsel may have had.

6. Over the course of this deposition, counsel produced documentation that suggested that setting a seed did not work for this particular application if a computer utilized more than 1 processing core. The documentation he showed me suggested that the output might not be "fully" reproduceable, but the documentation did not explain what "fully" means in that context. Deposition of Sean P. Trende, Vol.2 at 158:23, 162:22 (discussing deposition exhibits 25 and 26), attached as **Exhibit B**.

7. Examining the output from the produced maps (that is, the second set of 2 million maps produced to counsel) leads to three important conclusions.

   a. *The simulation outcomes are similar, and in the case of larger simulations, nearly identical, to the ones from the initial report.* This is unsurprising. The entire purpose of the simulation exercise is to explore the set of maps that would be produced by neutral mapmakers under a given set of constraints. Just as public opinion polls become more precise as the number of individuals selected increases, so too does the estimate of the distribution of politics-neutral plans become more precise as the number of individuals selected increases. Thus, a reproduced set of 1,000,000 plans should vary very little from run to run.

b. *The conclusions I would draw from the set of simulations produced to counsel are the same as those found in the Trende Report.* Because the second set of 2,040,000 simulations also demonstrates that the Enacted Map is an extreme outlier, examining these maps in the way that Dr. Imai described above would not lead an expert to different conclusions about the nature of the Enacted Map than those the Trende Report suggests. In fact, had I *only* considered the second set of simulations, none of my conclusions in this matter would have changed.

c. *This only strengthens the case against the Enacted Map.* The fact that a second run of 2,040,000 maps leads to the same conclusions as the first run of 2,040,000 maps only demonstrates how robust the initial findings are.

8. One way to demonstrate this is to examine the results for the simulation set analyzed in the report and compare them to the results from the simulation set produced to Defendants' counsel.

9. The following table reports the results of simulations that were reported in the initial expert report. It also reports the results from the simulations that were produced to counsel.

Comparison of Report Ensemble Results to Produced Ensemble Results				
	St. Dev. of GI From Mean		Percent of Plans in Ensemble More Extreme	
Scenario	Report	Production	Report	Production
1 million simulations -- POTUS	over 4	4.107	0.11%	0.11%
1 million simulations -- Truncated	over 7	7.170	0.00%	0.00%
10,000 simulations -- Registration	over 3	3.227	1.92%	2.15%
10,000 simulations -- Registration Truncated	Not Reported	4.160	1.20%	0.00%
10,000 simulations -- Citizens' Map	6.67	6.600	0.00%	0.00%

10.   As you can see, there is very little difference, if any, between the larger sets, and only slight differences between the smaller sets. For the 1 million simulations using presidential vote share as the measure of partisanship, the report states that the gerrymandering index produced was "over four" standard deviations from the mean. In the production set, the gerrymandering index was 4.107 standard deviations from the mean. In the report set, 0.11% of the maps in the ensemble had more extreme gerrymandering indices than the Enacted Plan; in the production set, the number is the same.

11.   Likewise, for the 1 million simulations that examined only those precincts that were swapped between the Enacted Plan and the 2012-2020 plan, the report states that the gerrymandering index produced was "over seven" standard deviations from the mean. In the production set, the gerrymandering index was 7.170 standard deviations from the mean. In the report set, none of the maps in the ensemble had more extreme gerrymandering indices than the Enacted Plan; in the production set, the number is the same.

12.   The sets of 10,000 simulations show slightly more variation; that is to be expected. (That is why a set of say, 1,000 maps, would not be as reliable as a set of 1,000,000 maps.) But none of the bottom lines change. For the 10,000 simulations examining party registration, the initial report states that the gerrymandering index for the Enacted Map was "over 3" standard deviations from the mean of the ensembles; in the production set, the gerrymandering index of the Enacted Map is 3.227 standard deviations from the mean. The report further concludes that 1.92% of the maps were more extreme than the Enacted Map; the production set concludes that 2.15% of the maps were more extreme than the Enacted Map.

13.   Likewise, in the ensemble of truncated maps that were run using registration as a measure of partisan identification, 1.2% of the maps had a gerrymandering index that was more extreme than the Enacted Plan in the report, while none were more extreme in the produced maps.

14.   Finally, looking only at the precincts that were swapped between Citizen's Plan H and the Enacted Plan, the Enacted Plan had a gerrymandering index that was 6.67 standard deviations from the mean in the report and 6.6 standard deviations from the mean in the produced maps. Neither set had any maps with gerrymandering indices more extreme than the Enacted Map.

15.   We can also compare the figures. For simplicity's sake, I will only provide the gerrymandering index plots, since they are effectively summary figures for the dotplots and boxplots.

16.   We start with the gerrymandering index plots for the report set and the production set. The report set is on the left, while the production set is on the right.
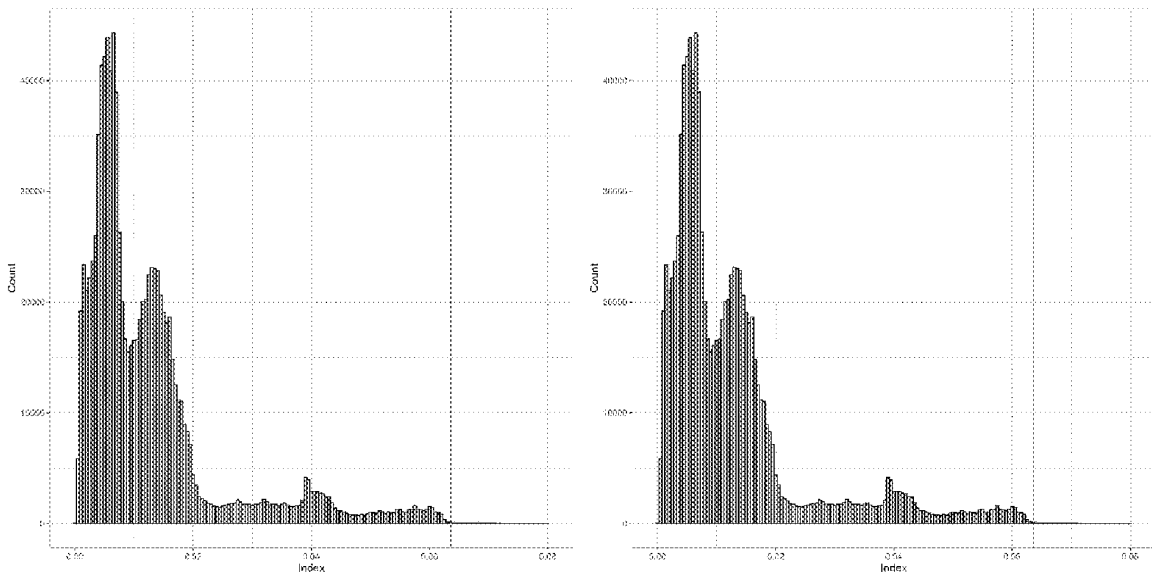
17.   Second, we look at the sets using the partisan index as the measure of partisanship.
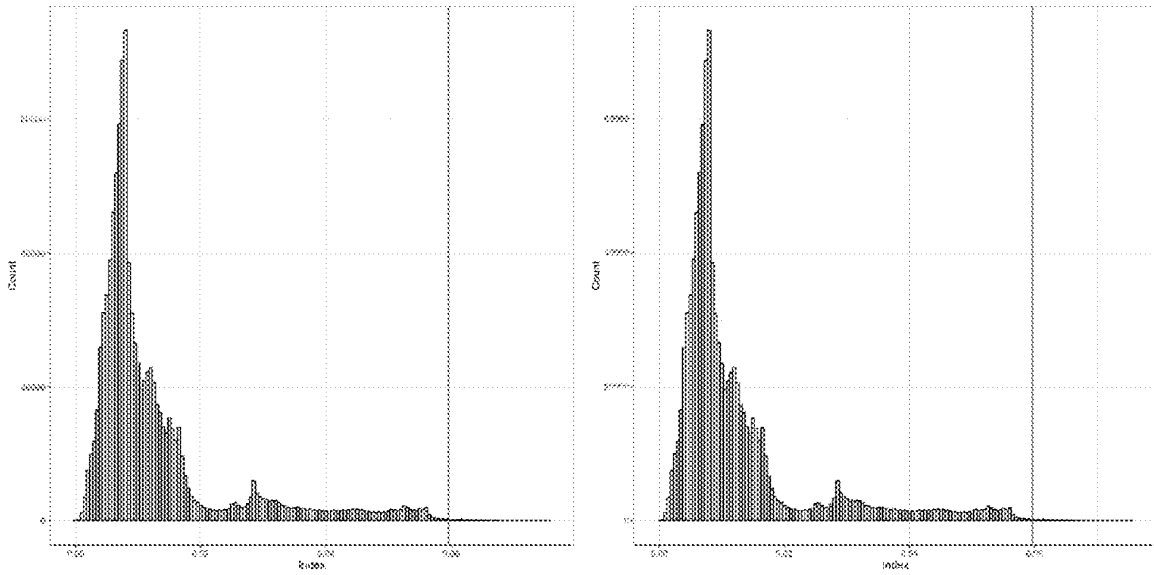
18.   In both instances, there are no differences that would be relevant to the research question I was undertaking.

19.   Next, I look at the truncated maps—that is, the maps that examined only the precincts that changed between the 2012-2020 map and the Enacted Map. Once again, the image from the report is on the left, while the image from the produced simulations is on the right. There may be slight differences, but they are hard to detect.
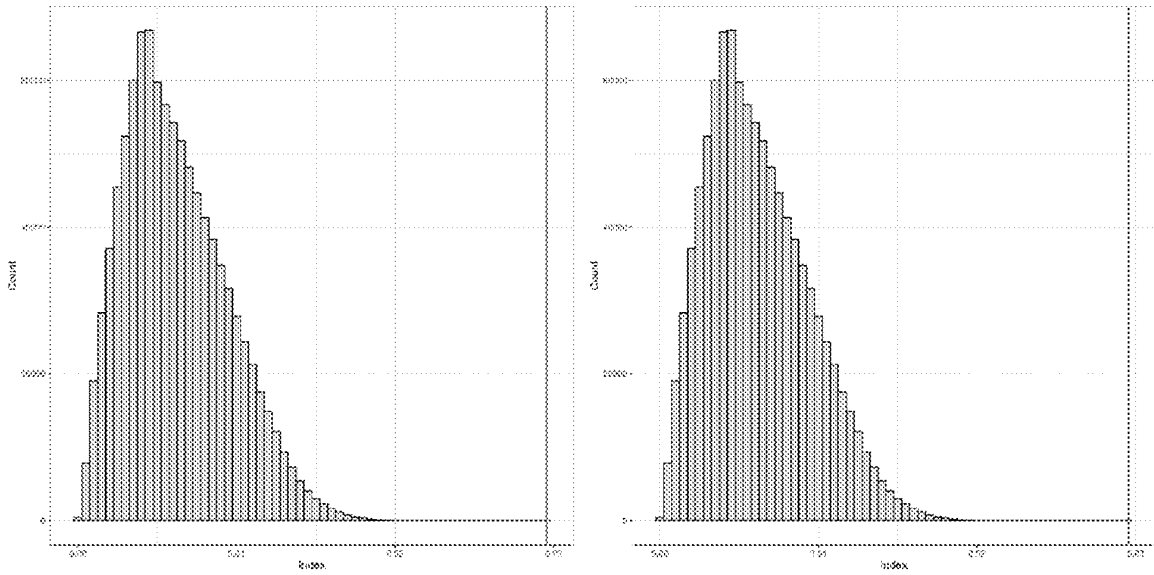
20.   These are the images using the partisan index to measure partisanship.
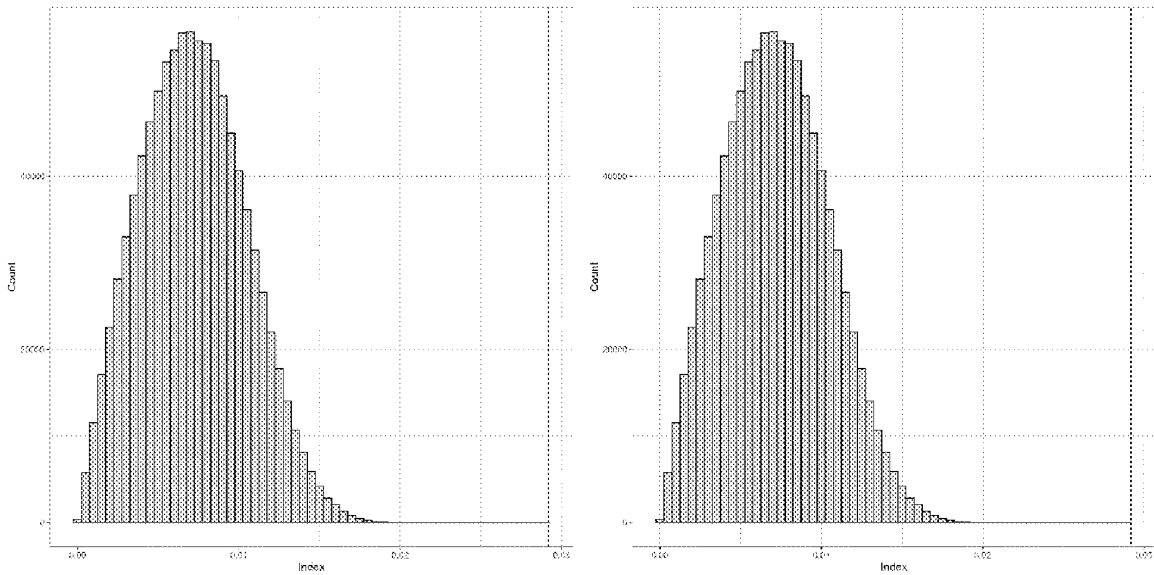
21.   The remaining simulation sets involved just 10,000 simulations. Unsurprisingly, the differences, while still modest, are more pronounced. Here, we compare the set of 10,000 simulations run on the full map, using registration as the metric for partisanship. The image from

the report is on the left while the image from the production set is on the right. You can see the same "peaks and valleys" beginning to emerge between the sets, demonstrating the stability of the findings between the sets. If left to run for 1,000,000 simulations, those peaks and valleys would become even more stable.
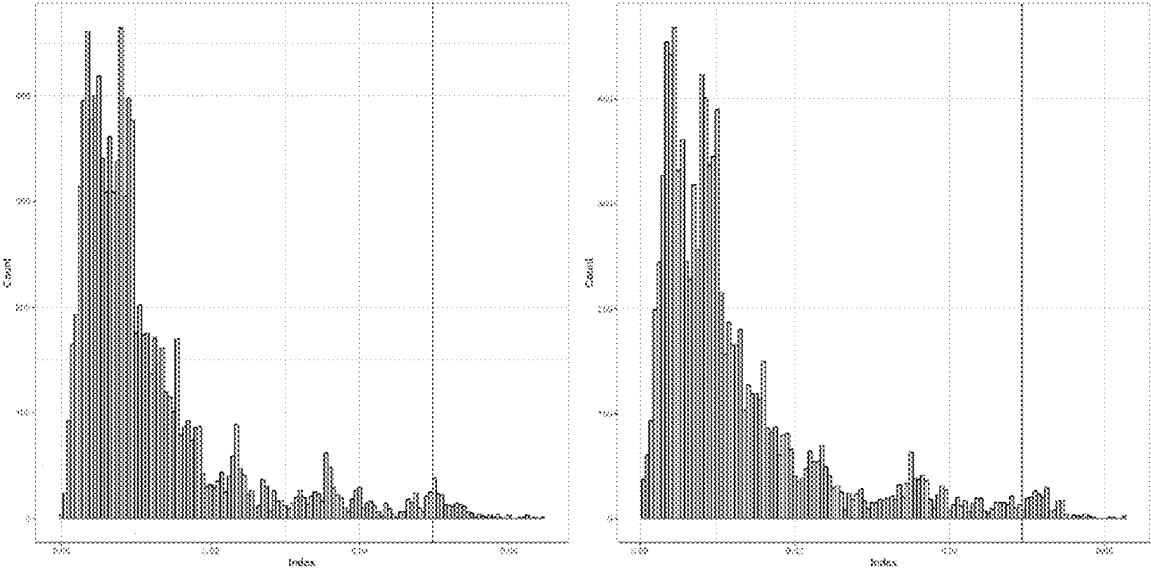
22.   Here, we examine the precincts that were exchanged between the 2012-2020 map and the Enacted Map, using registration as the measure of partisanship.
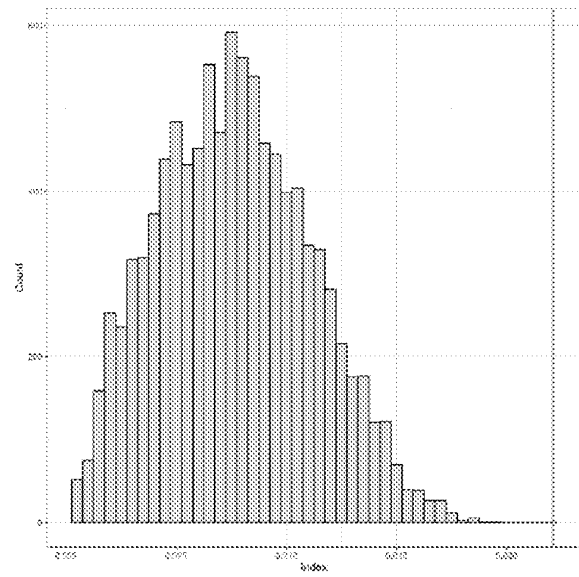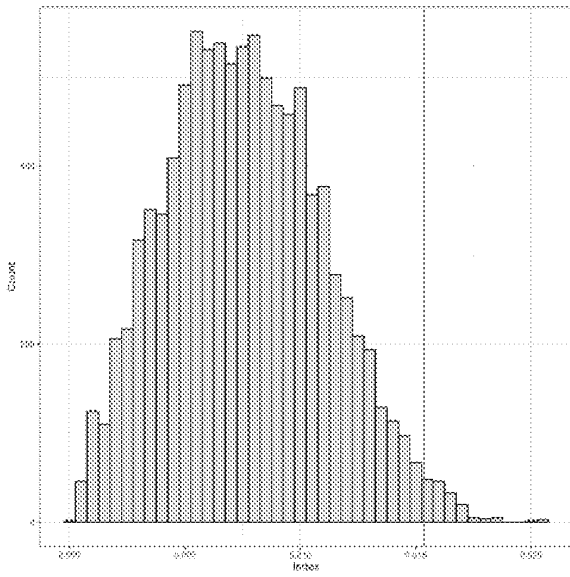
23.   Third, we examine the precincts that were swapped between Plan H and the Enacted

Plan.
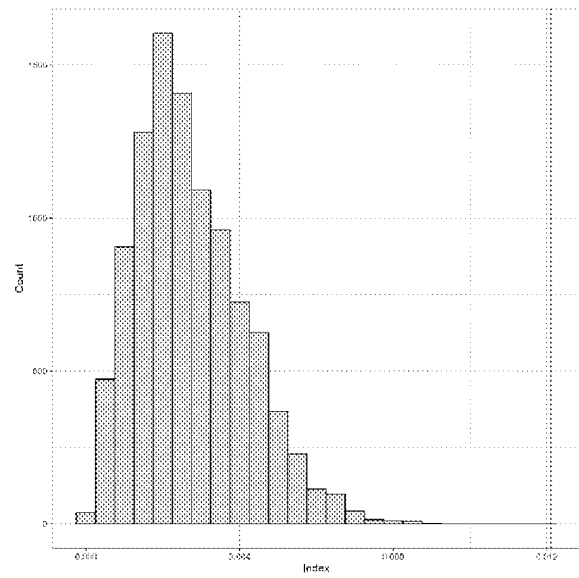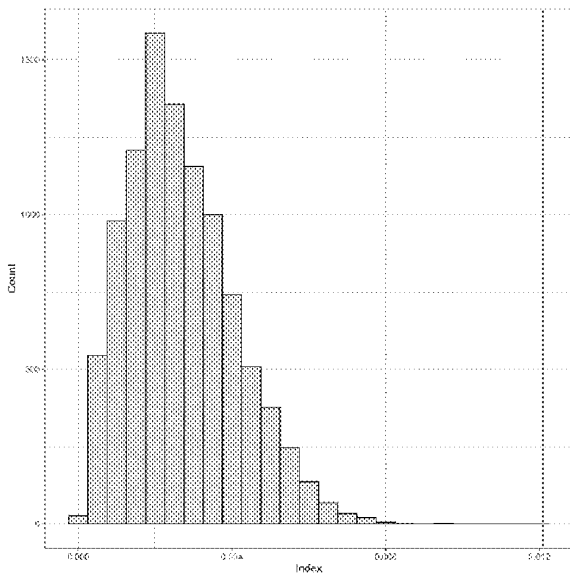
24.   Finally, we examine the simulations that were run keeping Indian Reservations

intact.
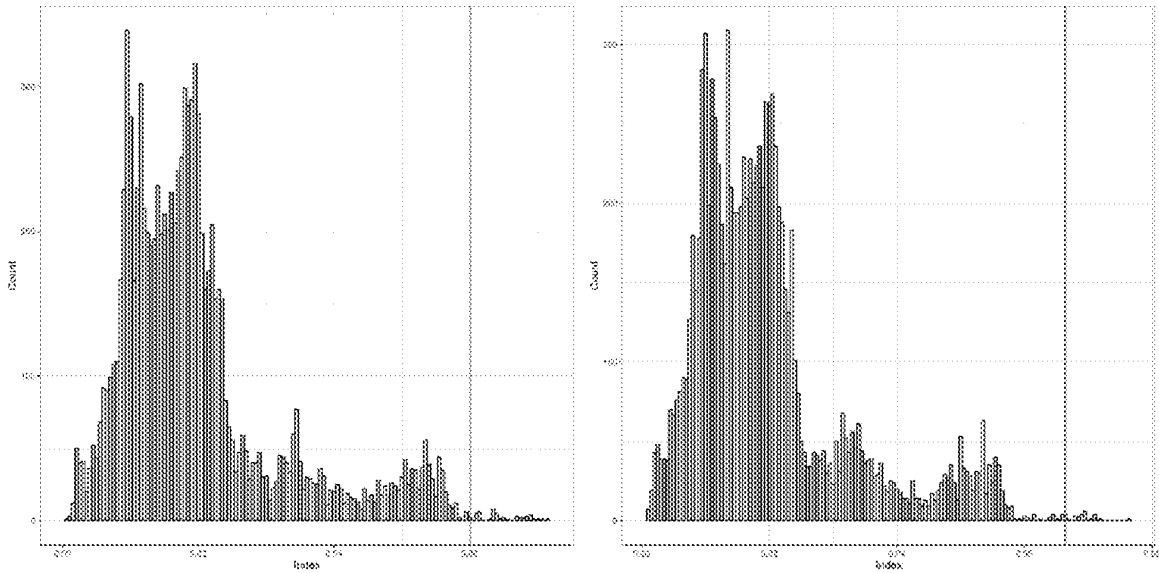
25.   Critically, but not surprisingly, an analysis of the production set that Defendants' counsel received leads to precisely the same conclusions as I lay out in my report. In the simulations with an exceptionally large number of simulations, any potential differences between the production set and the set utilized for the report are insignificant.

26.   As stated earlier, the fact that a second run of the simulations produces substantially similar outputs is testimony to the robustness of the simulations and the reliability of my conclusion. Over the course of 4,040,000 maps, with multiple sets of constraints applied, *only a handful* are more extreme than the Enacted Plan.

27.   Finally, on September 25, 2023, I successfully defended my dissertation for my doctoral program at The Ohio State University. Accordingly, I will now obtain my doctoral degree and the title "Doctor" on December 17, 2023.

I declare under penalty of perjury under the laws of the State of New Mexico that the foregoing is true and correct. See N.M. R. Civ. P. Dist. Ct.1-011(B).

Dated: September 26, 2023

/s/ Sean P. Trende
SEAN P. TRENDE

CERTIFICATE OF SERVICE

I hereby certify that a true and complete copy of the foregoing will be served on all counsel via the e-filing system.

Dated: September 26, 2023

/s/Carter B. Harrison, IV
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EXHIBIT A
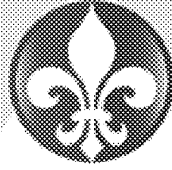
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CIVIL ACTION NO. 22-CI-47

GRAHAM, ET AL.

V.

ADAMS, ET AL.,

TRIAL DAY 1

DATE:

April 05, 2022

1   FRANKLIN CIRCUIT COURT

2 CIVIL ACTION NO.: 22-CI-47

3

4

5   GRAHAM, ET AL.,

6   Plaintiffs

7

8   V.

9

10   ADAMS, ET AL.,

11   Defendants

12

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16   TRIAL DAY 1

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 1                              INDEX

 2                                                      Page

 3

 4    PROCEEDINGS                                          3

 5

 6    Kosuke Imai:

 7    DIRECT EXAMINATION BY MS. HINKLE                     7

 8    CROSS EXAMINATION BY MS. BECKER                     92

 9    BY MR. BECKER:                                     127

10    BY MS. BECKER:                                     128

11    REDIRECT EXAMINATION BY MS. HINKLE                 153

12

13    Trey Hieneman:

14    DIRECT EXAMINATION BY MR. ABATE                    157

15    CROSS EXAMINATION BY MR. MADDOX                    195

16

17

18

19

20

21

22

23

24

25
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1            PROCEEDINGS
2        JUDGE WINGATE:  -- every time you turn around.
3   I don't remember doing that when I was a youngster.
4   But, anyway, they like to get up really early.  All
5   right.  Now, I thought that we would probably -- you
6   don't need to do openings or anything.  I thought
7   you'd just go right into your witnesses, and we'd go
8   from there.  Is that all right, Michael?
9        MR. ABATE:  (Inaudible), Your Honor.
10        JUDGE WINGATE:  Okay.  I'll probably call you
11   all your first names because I know you.  Okay?  All
12   right.  You can call your first witness.
13        MR. MADDOX:  Your Honor?
14        JUDGE WINGATE:  Yes.
15        MR. MADDOX:  Just two quick housekeeping
16   measures.
17        JUDGE WINGATE:  Sure.
18        MR. MADDOX:  So, the first one is, yesterday,
19   we filed a motion -- or response to the motion to
20   dismiss.  We don't intend to argue that today, but I
21   wanted you to know that it is in the record.
22        JUDGE WINGATE:  Okay.
23        MR. MADDOX:  At the end of the proceeding this
24   week, we would expect to ask for judgment on our
25   cross claim and counter claim.  The second one is,
```

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1 we have prepared a written statement of the joint

2 stipulation that was reached at the last oral

3 hearing.

4   JUDGE WINGATE: Okay.

5   MR. MADDOX: So, we would, you know, tender

6 that to the Court. And we have included in a

7 binder, for everyone's use, certain printed

8 materials that we think would be helpful that come

9 from either the LRC website or the Secretary of

10 State's website, both of which have been stipulated

11 as admissible by all parties. I think that's right.

12 Casey?

13   MS. HINKLE: No objection, right.

14   JUDGE WINGATE: What's your name again?

15   MS. HINKLE: Casey Hinkle, Your Honor.

16   JUDGE WINGATE: I'm sorry?

17   MS. HINKLE: Casey Hinkle.

18   JUDGE WINGATE: Casey. Okay. So, you had

19 these stipulations written out?

20   MS. HINKLE: I believe --

21   MR. MADDOX: Yes, Your Honor.

22   JUDGE WINGATE: Okay. Let's see what they look

23 like.

24   MR. MADDOX: And Alex is going to give it to

25 the Court. We've not yet filed it. We're tendering

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1   it here in open court. He's also giving you a

2   notebook that we've already provided to the

3   plaintiff's Counsel, that includes relevant

4   materials from the websites.

5   JUDGE WINGATE: Okay. Can I just do the joint

6   stipulation as Exhibit 1? Would that be all right

7   for you-all?

8   MR. MADDOX: That would be that be great.

9   JUDGE WINGATE: Okay. Unless you've got your

10   --

11   MS. HINKLE: I did pre-mark a couple things,

12   but that's okay.

13   JUDGE WINGATE: You did? Okay. Well, listen.

14   If you've pre-marked stuff, let's go with your

15   pre-marked stuff, and then we'll do this at break --

16   MS. HINKLE: Okay.

17   JUDGE WINGATE: -- in between your case, if

18   that works. All right. All right. You may begin.

19   MS. HINKLE: Your Honor, similarly, I wanted to

20   bring your attention. There's a couple of binders

21   that we put over there as well.

22   JUDGE WINGATE: Is that your binder?

23   MS. HINKLE: It's our binders. Yes. And we --

24   there's an empty binder for the witness's use, to

25   keep things organized as he may receive a lot of

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1 paper.

2   JUDGE WINGATE: Well, just go back and forth

3 and take it to them. How's that?

4   MS. HINKLE: That's fine.

5   JUDGE WINGATE: Or you can put your witness

6 binders on up the witness stand, if you want to go

7 ahead and do that.

8   MS. HINKLE: Okay. You'd like the witness to

9 be seated here?

10   JUDGE WINGATE: Yeah. That's where they're

11 going to be.

12   MS. HINKLE: Okay. Great. Great.

13   JUDGE WINGATE: All right? So, however

14 you-all want to do it.

15   MS. HINKLE: All right. Well, the --

16   JUDGE WINGATE: I designed this courtroom, so

17 if you all hate it, it was designed by me. Okay?

18   MR. MADDOX: We love it, Your Honor.

19   JUDGE WINGATE: And if you know it , well, it's

20 sort of like if you're in a jury trial where you

21 say, "Voir dire, "Voir dare," you know? And I said,

22 how do you say that, to one lawyer, one time. And

23 he said, however you say it is correct, Judge. But,

24 anyway, it's designed just like the historical

25 court, and that's -- you know, that's why. All

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1   right. You ready to go?

2   MS. HINKLE: Yes, Your Honor.

3   JUDGE WINGATE: All right.

4   MS. HINKLE: The plaintiffs call Dr. Kosuke

5   Imai.

6   JUDGE WINGATE: Okay.

7   MS. HINKLE: Yes.

8   JUDGE WINGATE: Okay. Please raise your right

9   hand. Okay? Do you swear or affirm the testimony

10   you're about to give in this court today is the

11   truth and nothing but the truth?

12   THE WITNESS: Yes.

13   JUDGE WINGATE: Okay. Now, how do you say your

14   name again?

15   THE WITNESS: Kosuke Imai.

16   JUDGE WINGATE: Okay. Thank you.

17   THE WITNESS: Thank you.

18   MS. HINKLE: And Your Honor, would you prefer

19   the witness sit, so that you can see his face, or he

20   can face the audience? Okay.

21   JUDGE WINGATE: Nope. I'm seeing him on -- I'm

22   watching him on my monitor.

23   MS. HINKLE: I see. Thank you.

24   DIRECT EXAMINATION

25   BY MS. HINKLE:

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1 Q   Good morning, Dr. Imai.

2 A   Good morning.

3 Q   Would you please state your name for the

4 record?

5 A   Kosuke Imai.

6 Q   And where do you live, Dr. Imai?

7 A   I live in Newton, Massachusetts.

8 Q   Okay. And what is your current occupation?

9 A   I'm a professor in the department of

10 government and also in the department of statistics, at

11 Harvard University.

12   MR. MADDOX: Your Honor, may I interrupt? I'm

13 having a hard time hearing him. Would you object if

14 I moved over into the jury box so that I could --

15   JUDGE WINGATE: Nope. Any of you-all need to

16 move over to the jury box? That's fine.

17   MS. HINKLE: And will you let us know if the

18 courtroom microphone's not picking him up clearly?

19   JUDGE WINGATE: Yeah. I don't -- he -- you

20 just have to sort of speak in the microphone.

21   THE WITNESS: Oh, okay.

22   JUDGE WINGATE: The microphone is on, even

23 though the lights are not there.

24   MS. HINKLE: Okay. Thanks.

25   THE WITNESS: Okay.

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1   JUDGE WINGATE: All right.

2   MS. HINKLE: Yeah.

3   JUDGE WINGATE: Who's 18? Which one is 18,

4   L-E-X 18? She's telling me that you're blocking the

5   camera. There we go. Is that okay?

6   CLERK: Can Dr. Imai speak really fast?

7   MS. HINKLE: Just to test the microphone.

8   JUDGE WINGATE: Can you say something, so we

9   can see if the cameras are okay?

10   THE WITNESS: I'm Kosuke Imai.

11   JUDGE WINGATE: That's perfect.

12   COURT REPORTER: Yes.

13   JUDGE WINGATE: All right. Thank you. That's

14   all. That's all you need to do.

15   MS. HINKLE: Okay.

16   THE WITNESS: Okay.

17   BY MS. HINKLE:

18   Q   So, Dr. Imai, you flew in from Newton,

19   Massachusetts, you said. And you explained that you're

20   a professor at Harvard; is that right?

21   A   Uh-huh. That's right.

22   Q   I'm going to ask you a little bit more about

23   your academic background and qualifications, because

24   you've been retained as an expert witness for the

25   plaintiffs in this matter, right?

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1   A   That's correct.

2   MS. HINKLE: So, Your Honor, if I could

3   approach the witness?

4   JUDGE WINGATE: Sure.

5   MS. HINKLE: I have Dr. Imai's CV, which he may

6   want to reference during his testimony. And --

7   JUDGE WINGATE: You got one for me?

8   MS. HINKLE: Your Honor, this is a copy for

9   you.

10   JUDGE WINGATE: Okay. Thank you.

11   MR. MADDOX: Alex.

12   MS. HINKLE: And Morgan.

13   MR. MADDOX: The plaintiff's -- the plaintiff's

14   book.

15   MS. HINKLE: You have to use the binder.

16   THE WITNESS: Oh, okay.

17   MS. HINKLE: You can use this binder, if you'd

18   like, to keep things organized that way.

19   THE WITNESS: All right. Okay. Sure. Yeah.

20   BY MS. HINKLE:

21   Q   And we've marked Dr. Imai's CV as Exhibit 1

22   for identification at this point. Dr. Imai, is this an

23   accurate and up-to-date CV that you prepared?

24   A   Yes. I believe so.

25   Q   And does this reflect your academic training

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1   and certain other of your experience?

2   A   Yes. I do. It does.

3   MS. HINKLE: Okay. We would move to introduce

4   this as Exhibit 1.

5   THE WITNESS: Okay.

6   JUDGE WINGATE: You have any objection to his

7   CV?

8   MR. MADDOX: No objection, Your Honor.

9   JUDGE WINGATE: Okay. So, ordered.

10   (PLAINTIFF'S EXHIBIT 1 ADMITTED INTO

11   EVIDENCE)

12   BY MS. HINKLE:

13   Q   And Dr. Imai, can you start by telling us

14   where you did your undergraduate studies?

15   A   I did my undergraduate studies at the

16   University of Tokyo.

17   Q   And what did you study there? What subjects?

18   A   Major is, you know, liberal arts, which

19   combines variety of subjects from mathematics to social

20   sciences of your choice, basically.

21   Q   Okay. And did you continue your studies after

22   that degree?

23   A   That's correct.

24   Q   Where did you study next?

25   A   I did the graduate degree at Harvard.

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1   Q   And what was the subject matter of that

2 degree?

3   A   So I did study both statistics and political

4 science. In statistics -- I received master's degree in

5 statistics and then PhD, subsequently, in political

6 science.

7   Q   And did you have a concentration within those

8 fields of study?

9   A   Yes. I mean, you know, statistics in general

10 and application of statistics to social science

11 problems, questions. Sometimes they call political

12 methodology. It's a statistical methods for political

13 science.

14   Q   And what drew your interest in those topics?

15 Why did you choose that as your concentration?

16   A   Oh, yeah. That's a good question. I was

17 always interested in mathematics, computer science, you

18 know, from young age, and -- but I was also interested

19 in social problems, politics, economics, sociology. So

20 this is a way to combine my interest in mathematics and

21 data with the substantive interest in societal problems.

22   Q   Okay. Your CV lists various honors and

23 awards, I think, on pages 2 and 3. One is a recognition

24 by Clarivate Analytics as a highly-cited researcher. Can

25 you explain to us what that means?

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1   A   Yeah. So this organization is a premier

2 organization that keeps track citation counts of

3 academic journals. And I was named for -- you know, one

4 of the few people who had, I think, produced multiple

5 papers of high citation impact. So that's -- I've

6 received that honor for last four years, since such

7 honor existed.

8   **Q   Okay. And you received a PhD degree from**

9 **Harvard, right?**

10   A   That's correct.

11   **Q   And that was in 2002?**

12   A   Uh-huh -- 2003. Yes.

13   **Q   Okay. What did you do, after you received**

14 **that degree?**

15   A   Yeah. So I started teaching at Princeton

16 University. First as an instructor, and then assistant

17 professor, associate professor, and then eventually

18 promoted to professor -- full professor.

19   **Q   And what classes did you teach?**

20   A   Yes. So I teach, you know, statistics from

21 undergraduate level to graduate level, mostly targeting

22 students who are majoring in political science, public

23 policy, you know, some engineering students who are

24 interested in social problems as well. So those are the

25 subjects that I teach.

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1   Q   Okay. I saw a reference on your CV to

2 Princeton's program in, "Statistics and Machine

3 Learning." Can you describe for us what that is?

4   A   Yeah. Sure. As you know, like last ten

5 years, many universities have invested data science

6 programs. So, Princeton was also, you know, no

7 exception. They wanted to build the program that

8 combines a variety of disciplines from social sciences,

9 to engineering, and even humanities. So there was an

10 interdisciplinary program they are building, and I was

11 program director, trying to coordinate, you know,

12 variety of educational and other efforts in -- in the

13 area of data science.

14   Q   Thank you. And the position that you had with

15 Princeton, was that a tenure track position?

16   A   Yes. So I started as a tenure track assistant

17 -- you know, instructor and an assistant professor, and

18 then promoted to -- associate professor is tenured, and

19 then full professor is tenured.

20   Q   So, you've received tenure at Princeton?

21   A   Yes.

22   Q   And you, at some point, became a professor at

23 Harvard University?

24   A   Right. That's right. So I was recruited by

25 Harvard in 2018.

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1   Q   And so you moved there in 2018. What is your

2 position at Harvard?

3   A   So I hold the position -- the tenured full

4 professor position in both government department, which

5 is the political science department at Harvard, and

6 statistics department. And this is actually the first

7 such joint appointment in the history of Harvard.

8   Q   And is this a tenured position?

9   A   Yes.

10   Q   I saw a reference on your CV to Harvard's,

11 "Institute for Quantitative Social Science." Can you

12 explain to us what that is?

13   A   Yeah. So Institute of Quantitative Social

14 Science is interdisciplinary institute at Harvard, which

15 basically brings all the people who studies statistics,

16 machine learning, computer science, and focusing on

17 social science problems. And so, I'm part of that

18 institute.

19   Q   Okay. What is your role with the institute?

20   A   You know, I'm just a member of the institute.

21 I actively participate and organize workshops, you know,

22 advise graduate students, and -- yeah. I play a variety

23 of roles there.

24   Q   And I assume you do research as an academic?

25   A   Yes. I do.

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1   Q   What are your main areas of research?

2   A   Yeah. So my main areas of research -- there

3   are two of them. One is what we call causal inference.

4   This is studying cause and effects. And in my case, I

5   really focus on the cause and effects of public policy,

6   different programs, government programs, non-government

7   organizational (phonetic) activities. The second area

8   of interest, which is perhaps more relevant for this

9   case, is computational social science. So this is the

10   area where you develop computational algorithms, to

11   address and study social problems such as redistricting.

12   Q   And have you published any books in your

13   academic career?

14   A   Yes. I have published book with the Princeton

15   University Press in 2017, I think. And this is a

16   textbook for quantitative social science. So this is

17   introductory textbook for undergraduate students and

18   beginning graduate students, who are interested in

19   studying statistics and machine learning for social

20   science programs that's been widely, widely used across

21   major universities, in their teaching curriculum.

22   Q   And in addition to the textbook, you've also

23   written various articles, Right?

24   A   Yes. I have.

25   Q   And are those listed in your CV?

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1   A   Yes. they're all listed in my CV.

2   Q   Okay. And are these articles -- have they

3 been published in journals that are peer reviewed?

4   A   Yes. So, I have, I think, more than 30

5 (phonetic) peer review journal publications.

6   Q   Okay. And those, I think, are listed on pages

7 4 through 9 of your CV; is that right?

8   A   Yeah. Yeah. I think so, if you say. Yeah.

9 That's right.

10   Q   Okay. Does Harvard have a society for --

11 excuse me. Are you familiar with an organization called

12 the, "Society for Political Methodology"?

13   A   Yes. It is -- the Society for Political

14 Methodology is our international organization. It's a

15 premier academic society that -- basically, the main --

16 for the scholars to study using statistics and, you

17 know, machine learning to study political science,

18 basically.

19   Q   And are you a member of that society?

20   A   Yes. I'm a member of the society. And I also

21 served as the president from 2017 to 2019 of that

22 society.

23   Q   And how did you become president of that

24 society? Was there an election or something?

25   A   Yeah. I was elected as the president.

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1   Q   And who are the members of that society?

2   A   So the members of the society, there are more

3   than 1,000 academic scholars, basically. Many of them

4   are based in the United States, but there are many

5   others who are based in Europe and Asia. So it's an

6   international organization.

7   Q   Thank you. And Dr. Imai, you're here today to

8   testify about redistricting. I'd like to start just by

9   generally asking, what type of analysis you used to

10   analyze the redistricting questions that are presented

11   by this case?

12   A   So I specialize in simulation algorithms. I

13   have developed several such algorithms in the past. So

14   I use those algorithms to evaluate redistricting plans.

15   And that's the type of analysis I have expertise in, and

16   I - I conducted for this case.

17   Q   Okay. And I'd like to ask you to explain, in

18   a general sense, if you can, how the simulation analysis

19   works. Do you start with certain inputs?

20   A   Yeah. So usually, the -- the goals of

21   simulation analysis is to evaluate certain

22   characteristics of the proposed or enacted plan. And to

23   do that, what the simulation algorithm does is that you

24   specify a set of inputs. So the inputs include the

25   data. So data is often come from the census -- the

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1 population data. And then, also a set of criteria. So

2 you might be interested in, you know, a set of legal

3 criteria. For example, you want the districts to be

4 continuous or districts to have equal population, you

5 know, or maybe that you want districts to be compact. So

6 you will input the data as well as a set of these

7 criteria. So, that's the choice of analysts. And then,

8 what the algorithm does is it will generate a

9 representative set of -- of the plans, the redistricting

10 plan. So alternative redistricting plans that are

11 consistent with those criteria you specified, based on

12 the data you input. So that's basically what the

13 simulation algorithm does.

14   **Q   Okay. And can you talk a little bit more**

15 **about the criteria or constraints that you feed into the**

16 **algorithm? Are there certain hard constraints? You**

17 **know, can you assign weight to them? If you could**

18 **explain that to the Court, please.**

19   A   Yeah. So that's a good -- a very good

20 question. So there are two types of constraints that

21 you can basically put in. Okay. So the first type is

22 what I -- what I might call hard constraints. So these

23 are the constraints that ensures that every single

24 simulated plan will satisfy. So for example, in my

25 algorithm, I'll put, like, continuity as a hard

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1 constraint. That is, every plan the algorithm simulates

2 has a continuous district. There's no plan that will

3 have discontinuous, you know, simulated plan. The other

4 set of constraints, you can think of it as soft

5 constraints. So these are the constraints that often

6 satisfied by the -- by the various degree. So you can

7 think of like -- a good example of this is, like,

8 compactness. So compactness is a measure of continuum.

9 It's not a dichotomy of whether a district is -- at

10 least, mathematically -- a district is compact or not

11 compact. There's more compact or less compact. So in

12 these soft constraints, you basically provide the

13 different degree of weights. So how much compactness

14 you want to, you know, impose, relative to some other

15 constraints.

16   **Q   Okay. And can you describe a little more for**

17 **us what the output of the simulation algorithm is?**

18   A   Yeah. Simulation algorithms is -- literally,

19 the output is many maps. And what's very important

20 about the characteristics of these maps is that they are

21 representative of the alternative plans that are

22 consistent with the set of criteria specified. So think

23 of this as, you know, like a simulated survey sampling,

24 right? There are many, many districts you could draw

25 under a set of constraints. It's impossible, actually.

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1   Astronomical number. So it's impossible to enumerate

2   every single possible map. So instead of trying to do

3   that, because that's computationally impossible, what we

4   try to do is we'll try to obtain the representative

5   sample of -- of that set. And that way, we can

6   characterize what that set will look like by just using

7   this -- this sample that we obtain. And this is very

8   similar to surveys. Like, instead of interviewing 200

9   million American voters, you sample, say, 1,000 people

10   or 2,000 people. And the reason why do that is because

11   that sample is representative of the population of

12   American voters. So we can understand the opinion, for

13   example, by just analyzing the survey sample.

14   Q   And what are the applications for the

15   simulation algorithm? What can it be used to do?

16   A   Yeah. So the main application of the

17   simulation algorithm -- redistricting algorithms, is to

18   evaluate, you know, the characteristic, whether it's a

19   partisanship or some other -- a partisan bias or some

20   other characteristic ratio or dimension of the enacted

21   plan. What's -- yeah. So that's -- that's sort of --

22   the evaluation is, you know, is the main goal of the

23   simulation algorithm.

24   Q   Can the simulation algorithm be used to create

25   a map that might be enacted into law?

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1   A   So, no. So my opinion is that the simulation

2 algorithm is used to evaluate, you know, how biased a

3 particular map is. But it's not designed to generate

4 the map that can then -- somebody can -- some state can

5 take it and then enact it as a map. That's a role for

6 the policy makers.

7   Q   Okay. And I think you mentioned that the map

8 can be used to evaluate -- or excuse me -- the algorithm

9 can be used to evaluate an enacted plan. By what

10 measures? In other words, what could the algorithm be

11 used to test for?

12   A   Right. So you can basically -- once you've

13 obtained the simulated plan, that's representative of

14 the plans that are consistent with the constraints you

15 placed, then you can compare that with enacted plan. And

16 then see whether the enacted plan, you know, for

17 example, favors a particular party in comparison to the

18 simulated plan. Right. So, if the enacted plan is

19 favoring particular party way more than the simulated

20 plan, you think that there is something beyond the set

21 of factors you specified that read through that bias.

22   Q   And how long have simulation algorithms been

23 used to evaluate redistricting plans?

24   A   Yeah. That's a very good question. I think,

25 in the court -- in academic literature, I've been

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1   studying the simulation algorithms for ten years. I was

2   one of the first academic researchers who really started

3   developing the Monte Carlo methods, which has these

4   representativeness (phonetic) characteristics --

5   mathematical characteristics. But I think that, in the

6   court, my understanding is that, over the last five, six

7   years, the simulation algorithms have been used in -- in

8   a variety of courts across the country.

9   **Q   If you know, how were redistricting plans**

10   **evaluated prior to the innovation of the simulation**

11   **algorithm approach?**

12   A   Yeah. So that's the -- I think the biggest

13   advantage of the simulation algorithm over traditional

14   sort of way of evaluating redistricting plans -- by

15   traditional way, I mean that, usually what researchers

16   have done in the past is to compute some bias metrics

17   for the enacted plan, for example. And then you say,

18   okay, compared to this bias metric -- like, let's

19   compare this, you know, metric with bias metrics of some

20   other plans. So those plans may come from

21   Massachusetts, or New York, or Ohio, or somewhere else.

22   And compared to those plans, this plan that we are

23   trying to evaluate is biased. But as you can -- you

24   know, all probably can tell, such a comparison is

25   problematic because, well, Kentucky is very different

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1   from Massachusetts. I think everybody agrees on that.

2   And so that, you know, you're not comparing apples and

3   apples, right? You're really comparing -- you don't

4   know why some -- whether a particular plan is biased if

5   you're just comparing that with other state -- plans

6   from other states. You can do the same thing within the

7   same state. Like, you can compare it with the previous

8   plan. But that could also be problematic because rules

9   can change, or the population could change. So things

10   could change. And so, you don't -- you're not really

11   comparing the same thing. So what -- the major

12   advantage of the simulation algorithm is basically you

13   use this data -- same data, right -- in my case, 2020

14   census data -- and same set of rules. right? Same set

15   of rules that Kentucky requires. And then be able to

16   generate alternate plans that are consistent with those

17   data and -- and rules. Instead of comparing with some

18   other states, some other different rules, or the

19   previous, you know, plan. So that's the major

20   advantage. And I think that's why, at least in the

21   academic circles, this became -- this has become the

22   dominant method to evaluate the redistricting plans.

23   **Q   And are there different types of algorithms**

24   **that are used?**

25   A   Yes. The different types of algorithm that

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1   are used to do this, they all belong to something called

2   Monte Carlo methods. So, it's a big family of methods.

3   It's called Monte Carlo methods. Monte Carlo methods

4   basically guarantees that there's a mathematical

5   guarantee for the representativeness of the plans that

6   you obtain. As I said, it's impossible to enumerate all

7   plans. So you -- you obtain a, you know, random sample,

8   a representative plan. They're -- within the Monte

9   Carlo family, there are two types of algorithms. One is

10   called Markov chain Monte Carlo. So, Markov chain Monte

11   Carlo is you start with a particular map, and then we

12   call this merge and split. So, you randomly pick two

13   districts that are adjacent to each other and then

14   split. And then you randomly pick two districts

15   adjacent to each other, merge them, and split. That's

16   why it's -- we call merge split. And we repeat this

17   many, many times to obtain different maps. But it's

18   done in a way that the resulting -- resulting simulated

19   plans are actually representative of the population of

20   the plans you're interested in. The second one is a

21   Sequential Monte Carlo, or some people prefer SMC. SMC

22   starts from the blank state -- okay. And then creates

23   one district at a time -- so you create one district.

24   You randomly create one district, and then you create

25   another district, and you create another district until

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1   you create all the necessary districts. Okay. So,

2   instead of starting -- okay. MCMC, you start from the -

3   - the particular map and then start changing it. The

4   SMC, you start from the blank state, and then you start

5   creating the districts. But both are designed to sample

6   from -- you know, obtain representative sample from the

7   population of plans that you're interested in. So they

8   serve the same purpose. It's just the different

9   techniques to achieve that goal.

10   Q   With respect to the MCMC method, the Markov

11   chain Monte Carlo method that starts from an existing

12   map, if that's the starting point for the algorithm,

13   won't that starting point map always look like an

14   outlier, in any analysis that you do?

15   A   No. No. So that's -- well, that's incorrect

16   in couple ways. So, first, Markov chain Monte Carlo has

17   a mathematical guarantee that, you know, the -- the

18   resulting plans are representative. And typically, what

19   we do is we worry about -- you know, starting with the,

20   say, enacted plan. The next plan will be different from

21   enacted plan, but it might be actually very similar

22   because we're just sort of merging the districts, and

23   then spreading them in different ways. So what we do is

24   something called burn-in. We just discard the initial

25   set of plans -- certain number of plans, so that there

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1   is less impact of the initial plan on the resulting --

2   you know, resulting simulated plans. So this is a --

3   this type of practice is already established. It's not

4   like -- Markov chain Monte Carlo has been around for

5   many decades, and there is an established practice to

6   make sure that initial plan does not have impact on the

7   -- on the resulting plans that you obtain.

8   Q   And so, discarding those initial plans that

9   are created is called, "Burn-in"?

10   A   Yeah. It's called burn-in. And we do that --

11   I do that in my report, the analysis is in my report, as

12   well.

13   Q   Okay. And are the two different types of

14   algorithms that you've described, Sequential Monte Carlo

15   and then the Markov chain Monte Carlo, are they designed

16   to do different things?

17   A   In theory, they're designed to do the same

18   thing. Now, in practice, you know, redistricting can --

19   you know, redistricting case can be quite different from

20   state to state, like some states are larger. State

21   House district, we have 100 districts instead of six

22   districts in the congressional case. So, you know, some

23   states, there are population centers. And some states

24   impose complex rules. So depending on the situation,

25   you want to be able to use different algorithm. And,

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1 you know, I can get into more detail of that, but, you

2 know, based on my experience and expertise, I decide, in

3 which case -- which algorithm is more appropriate, given

4 a particular setting that I'm analyzing.

5   Q   And did you use both types of algorithms, for

6 the analysis you did in this case?

7   A   That's right. So for the House districts, I

8 used the merge split algorithm, which is MCMC algorithm.

9 And then, for the congressional district, I used

10 Sequential Monte Carlo.

11   Q   And can you just tell us why you chose to use

12 the MCMC approach for the House map in this situation?

13   A   Yeah. So the House map has 100 districts, as

14 I mentioned. And then, also, as a part of analysis,

15 there is the sort of somewhat complicated restrictions

16 on how the county splits should be -- should be done.

17 And so these type of, you know, large number of

18 districts with somewhat complex constraints, the merge

19 split is -- is a better way of sampling the simulated

20 plans. For the congressional district, that there's

21 only six districts. There have to be a small number of

22 districts. And there are sort of fewer rules that I

23 needed to impose. And so, for those cases, the

24 Sequential Monte Carlo is very effective because, unlike

25 merge split, which sort of sequentially alters the

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1   district -- districting plan, you know, SMC spits out a

2   simulated plan one at a time. So it's -- they're

3   independent. Like, each one is separately generated. So

4   it's a more efficient way of obtaining a sample.

5   Q   Have you had any role in developing the

6   methods you've just described for us, the two types of

7   algorithms, as used to evaluate redistricting plans?

8   A   Yeah. So I have, you know, published, you

9   know, a few articles that develop both type of methods,

10   MCMC, as well as SMC.

11   Q   And do you use a particular or type of

12   software to effectuate the -- or run the algorithm?

13   A   Yes. So I use the software package called,

14   "Redis" (phonetic). It's the -- based on the R

15   programming language, which is one of the popular

16   statistical programming languages. And this is the

17   software my collaborators and I have developed over a

18   few years.

19   Q   And is the Redis software package something

20   that anyone can use?

21   A   Yes. So, one of the things I wanted to do --

22   and this is part of my academic principle, is to make

23   the methods available to everyone for free. So the

24   reason is that it allows other researchers to duplicate

25   and reproduce my results, which is important for

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1   scientific transparency and, you know, improvement. But

2   also, it allows other policy makers to use this. And

3   it's all free and open source. So open source means

4   that the code is available. So anyone can look at the

5   code that underlies the pack -- algorithm. And, you

6   know, if there's a mistake, they can point that out. Or

7   if there is improvement that can be made, they can do

8   that as well. And so that's -- unlike commercial

9   software, where the source code is not available. These

10   are open source, free for download by anyone.

11   Q   And do you do anything to track how much the

12   Redis software package has been used by others?

13   A   All right. So I don't track download counts,

14   but somebody else does. And so there is a web page that

15   keeps track of download counts, you know, from several

16   repository where this software is Housed. And according

17   to their accounts, there are more than 30,000 times been

18   -- that software has been downloaded.

19   Q   Are you aware of any other academics or

20   professionals that study redistricting, using these same

21   methodologies that you've innovated and described for

22   the court today?

23   A   Yeah. So I've seen, you know, papers that --

24   by some other researchers who use this package, as well

25   as other expert witness in other cases, who use this

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1 package.

2   Q   And there's something in your CV called the

3 "Algorithm-Assisted Redistricting Methodology Project,"

4 which is a mouthful.

5   A   Yeah.

6   Q   Is that -- what is that organization or

7 project? And can you describe for us what it does?

8   A   Yeah. It's a project that I had, you know, at

9 Harvard, which basically has a group of graduate

10 students, undergraduate students who are interested in

11 using simulation methods to, you know, evaluating

12 redistricting plans, not only in the United States, but

13 also in other countries as well. So it's a research

14 group that -- that I lead.

15   Q   And Dr. Imai, do you have any prior experience

16 serving as an expert witness in litigation matters?

17   A   Yes. I served on several cases.

18   Q   And are those matters listed at the end of

19 your CVA? I believe on pages 25 and 26.

20   A   Yes. I believe so. Yes.

21   Q   And it looks like there's seven cases listed

22 there, including this one as number seven?

23   A   Yep. That's right.

24   Q   Did all of those cases involve redistricting

25 proposals?

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1   A   That's right.

2   Q   And what type of analysis, in general, did you

3 do in those other cases? Was it -- is it similar to the

4 simulation analysis you did here?

5   A   Yes. I only do simulation analysis. I'm the

6 simulation guy.

7   Q   Okay. So that's the only subject matter or

8 expertise --

9   A   Yeah.

10   Q   -- that you've served in?

11   A   Yeah. That's my expertise. I feel

12 comfortable with saying (phonetic) that.

13   Q   To your knowledge, have you ever had your

14 expert report, or your opinions excluded by a court, in

15 one of these cases?

16   A   I'm not aware of that.

17   Q   Are you aware of any challenge to your expert

18 qualifications in any of those cases?

19   A   I'm not aware of that,

20   MS. HINKLE: Your Honor, we would offer

21   Dr. Imai as an expert witness in computational

22   science, and in particular, so simulation analysis

23   used to evaluate legislative redistricting

24   proposals.

25   JUDGE WINGATE: Okay.

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1   MS. BECKER: No objection, Judge.

2   JUDGE WINGATE: Okay. So, ordered.

3 BY MS. HINKLE:

4   Q   So, Dr. Imai, you've been retained as an

5 expert witness by the plaintiffs in this case, right?

6   A   That's correct.

7   Q   And are you being paid for your services?

8   A   Yes.

9   Q   Is the fee that you're charging for your

10 services in this case, a standard fee that you charge?

11   A   That's correct.

12   Q   Does the compensation that you receive in this

13 case depend in any way on the opinions that you reach?

14   A   No.

15   Q   I also wanted to ask you, are you registered

16 to vote in the United States?

17   A   No.

18   Q   And have you -- often in these disputes,

19 there's sort of a Democratic Party side and a Republican

20 Party side in redistricting litigation. Were you

21 engaged by the Democratic side, in all the cases that

22 are listed in your CV?

23   A   Yeah. Democratic side. Yes. But not

24 necessarily Democratic Party for all the cases.

25   Q   Would you be willing to work for the

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1 Republican side in one of these disputes?

2   A   Sure.

3   Q   Have you ever been asked to do so?

4   A   Yeah. I've been reached out once by -- by a

5 lawyer representing -- I'm not sure if the Republican

6 Party or Republican side, but at that time,

7 unfortunately, I was already engaged by the other side,

8 so...

9   Q   In the same case?

10   A   Same case, I had to decline.

11   Q   Have you ever turned down an expert engagement

12 due to the political affiliation of the party requesting

13 your services?

14   A   No.

15   Q   Have you ever turned down an expert engagement

16 at all?

17   A   Yes. I have.

18   Q   And can you describe for us the circumstances

19 in that situation?

20   A   Right. So I have, you know, declined one case

21 I just mentioned, I was already engaged by the other

22 side. I had to decline. I also declined the engagement

23 offer from the Democratic side, in cases where I felt

24 that the case they were trying to make didn't exist.

25   Q   In other words, where there wasn't good

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1 evidence of --

2   A   Right. So if I feel that empirical evidence

3 is not strong enough to support the case they're trying

4 to make, I don't feel comfortable presenting my, you

5 know, analysis, so --

6   Q   And that's happened before?

7   A   That happened before. Yes.

8   Q   So when you were retained in this case, what

9 were you asked to do?

10   A   So I was asked to basically, analyze, and

11 evaluate, enact a plan -- both House and congressional

12 plan, using simulation operations.

13   Q   And did you produce a written report that

14 reflects your opinions?

15   A   Yes. I did.

16   MS. HINKLE: Your Honor, may I approach?

17   JUDGE WINGATE: Yes.

18   Q   Dr. Imai, if you could look at this document,

19 and let me know if that is a accurate copy of your

20 expert report in this case?

21   A   Yes, yes. That's the report I authored.

22   Q   And do you adopt the opinions, that are

23 reflected in that report --

24   A   Yes.

25   Q   -- as your opinions in this case?

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1   MS. HINKLE: I would move to introduce

2   Dr. Imai's expert report as Exhibit 2.

3   JUDGE WINGATE: Okay. Any objection?

4   MR. MADDOX: No objection, Your Honor.

5   JUDGE WINGATE: Okay. Thank you.

6   (PLAINTIFF'S EXHIBIT 2 ADMITTED INTO

7   EVIDENCE)

8   BY MS. HINKLE:

9   Q   So, Dr. Imai, I'd like to ask you in a little

10 more detail, what you did to evaluate the plans for this

11 case. Did you have data, regarding Kentucky's

12 population that you used for the simulation analysis?

13   A   Yes.

14   Q   And where did you get that data?

15   A   I obtained that from Census Bureau.

16   Q   And did you get -- did you use any data,

17 regarding prior elections for purposes of your analysis?

18   A   Yes. I did. So I used 2016 and 2019

19 statewide elections data.

20   Q   And where did you get the elections data that

21 you used?

22   A   So this is called VEST, Voting And Election

23 Science Team, that their data is hosted at the Harvard

24 Dataverse. Although, the researchers who run this

25 effort of collecting the present level data are at the

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1   University of Florida and other universities.

2   Q   Did you say it's the, "Voting and Election

3   Science Team"? Is that the source?

4   A   Yeah. Voting -- it's called VEST Voting and

5   Election Science Team. I think that's the full name.

6   Q   And to your knowledge, is that a widely used

7   source of election status?

8   A   Yes. So this is sort of the go-to source for

9   academic researchers, and it's available -- publicly

10   available, and anyone can download that data as well.

11   Just like the census data that I used.

12   Q   Was the election data that you used available

13   at the precinct level?

14   A   Yes.

15   Q   And with respect to the population data that

16   you obtained from the census, how granular was that

17   data?

18   A   So, census data, you know, the most granular

19   level is available at the block level. However, because

20   election data is the, you know, smallest unit for which

21   election data available is precincts. So normally what

22   academic researchers do and what I followed, is to

23   aggregate the census data population data to the

24   precinct level, and then analyze the precinct level data

25   sets.

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1   Q   So you mentioned that you used election

2 results from 2016 and 2019 in Kentucky, which races did

3 you use?

4   A   Okay. So that's a great question. So, 2016,

5 it was US presidential election and senate election. In

6 2019, there were six statewide elections I used

7 governor, lieutenant governor attorney general,

8 secretary of state, auditor, treasurer, and agricultural

9 commissioner.

10   Q   And why did you choose those elections?

11   A   So these elections are all statewide elections

12 for which the election data available at the precinct

13 level, to the best of my knowledge. And the reason why

14 the academic researchers typically use statewide

15 elections is because when you do a simulation, you're

16 trying to generate lots of districts that are obviously

17 different boundaries from the, you know, district

18 boundaries that were in previous plan, under which the -

19 - those elections were held. So if you look at, for

20 example, like congressional election -- for example,

21 like congressional election returns or the State House

22 returns, those are based on the actual, you know,

23 district boundaries of the previous plans. And what we

24 want to know is, like, what the partisanship would look

25 like under different redistricting plan. So to do that,

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1   we use the statewide elections where the district

2   boundaries within the state doesn't exist. So we can

3   more accurately measure the partisanship of the

4   districts that are under the simulated plans. So that's

5   -- you know, that's the general practice.

6   Q   **Does the algorithm that you use do anything to**

7   **predict future election results or voting choices that**

8   **voters may make?**

9   A   No. I think of it as measuring the

10   partisanship -- partisan lean of each district under,

11   you know, an active plan, as well as under a simulated

12   plan. I don't think of this as a forecasting model or

13   exercise. In fact, you know, those -- those models

14   would require different type of inputs and statistical

15   methods to do that. So for me, the -- these past

16   elections are a way to measure the partisanship and

17   partisan lean of different districting plans.

18   Q   **So does the algorithm just assume that voters**

19   **will vote the same way they have in these past**

20   **elections?**

21   A   Well, it's more like algorithm will take the

22   previous election results as a way to measure what the

23   partisanship of the resulting district will look like.

24   You know, actually the algorithm itself doesn't use the

25   partisanship, right? So, it's -- algorithm uses the

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1 population. Like, obviously my analysis only based on

2 population data, cause you don't want to bias the

3 results in, you know, towards one party or another. And

4 so the algorithm, itself doesn't use any partisanship

5 information. But when you evaluate the enacted plan

6 relative to the simulated plan, we going to measure

7 partisanship using the past election data. And that's -

8 - you know, that's what typically is done in this type

9 of analysis.

10   Q   Okay. So, one of the redistricting plans you

11 evaluated was for the Kentucky State House of

12 Representatives, what type of algorithm did you use to

13 evaluate the House map?

14   A   Yeah. So this is the House map I used, the

15 Markov chain Monte Carlo. So that's the one that I

16 used, the merge split algorithm.

17   Q   And you explained to us why you made that

18 choice. Is that choice something that other academics

19 have also made? In other words, is there agreement in

20 your field, that the MCMC type of algorithm, is best

21 suited for something like the House plan?

22   A   That's a good question. I hate to sort of

23 characterize as a general agreement just because, you

24 know -- you know, America -- US is a federalism, and

25 each state has such a unique set of rules and political

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1   geography. So I think it really, you know, depends on

2   the set of circumstances you're in and trying to, you

3   know -- also the goal -- goals of analysis could be

4   different depending on the case, right? So it could be

5   House (phonetic) in a gerrymandering case, or it could

6   be racial gerrymandering case. And different cases

7   bring different analyses, which may -- based on

8   different algorithms.

9   Q   Okay. So can you describe for the Court, what

10   criteria you fed into the algorithm for your State House

11   analysis?

12   A   Sure. So what's nice about the simulation

13   algorithms is that it's very transparent, in terms of

14   inputs. So, you know, you reach the inputs, and they go

15   in, and the plans come out. So, the set of inputs I

16   used is basically I told the simulation algorithm to

17   generate a total of 100 contiguous districts and -- for

18   the House. And we -- I also set the population

19   deviation to be plus or minus 5 percent for the House.

20   So at most 5 percent deviation from the equal population

21   criteria. And I made sure that the districts are also

22   reached as compact, as the enacted plan. On average,

23   based on this sort of set of measures that academics use

24   to measure compactness, we try to minimize the number of

25   counties that are being split by the districts. I also

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1   made sure that the simulator House plan have fewer

2   county boundaries that split, in comparison to the

3   enacted plan on average. They also made sure that the

4   simulator House plan have fewer districts with more than

5   two counties, right? So the districts comprised with

6   more than two counties, in comparison to the enacted

7   plan. So there are fewer of those. And I also made

8   sure that the simulated plans have fewer counties with

9   more than two districts. So some -- another way to

10 think of this is exactly (phonetic) as a county. And if

11 there's more than two districts as part of that county,

12 I try to minimize -- you know, reduce that number of

13 such counties. And importantly, that I did not use

14 partisanship or racial information in the -- in the --

15 in the simulation algorithm.

16   **Q   Why didn't you feed the algorithm any partisan**

17 **criterion?**

18   A   Right. So the purpose of this analysis is to

19 evaluate the parts and bias of the enacted plan. So

20 what you want to do then is to compare that enacted plan

21 with the alternate plans that are consistent with all

22 the rules, but, you know, you don't want to partisanship

23 to generate the biased plans. So I don't use

24 partisanship when analyzing the partisan bias of the

25 enacted plan.

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1   Q   And why did you not feed the algorithm any

2 information about the race of voters in Kentucky?

3   A   Right. So that also depends on the purpose of

4 the analysis, but use of race can be, you know, biased,

5 in terms of like racial gerrymandering. And also, that

6 for some analysis, like in -- you know, depending on the

7 case, you may consider like, you know, certain type of

8 majority minority districts, for example, to be created

9 in certain parts of the state. But in those cases,

10 you'd have to, you know -- typically the -- there has to

11 be a VRA claim, and there has to be some minorities that

12 establishes, you know, where and, you know, the majority

13 minority districts where that should be located, and

14 what should be the percentage. So, in this case, I

15 focused on analysis of partisan bias (Inaudible).

16   Q   And you made a reference to the VRA, is that

17 the Voting Rights Act?

18   A   That's right, Voting Rights Act.

19   Q   Okay. And how many simulated plans did your

20 algorithm generate for the House map?

21   A   So I basically generated a total of, you know,

22 10,000 simulated plans for me to analyze.

23   Q   And you mentioned the technique earlier called

24 burn-in.

25   A   Right.

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1   Q   Is that something that you used here?

2   A   That's right. So, you know, in practice, what

3 you do is you generate more than what you want. So in

4 this case, I want to generate 10,000. So you generate

5 more than that. So in my case, I generated 72,000 and

6 burn-in basically discouraged the initial simulated

7 plans. I discarded, I think, 1,000 of them for each --

8 each chain, like the parallel chains that goes in. And

9 then there's also a technique called thinning, to make

10 sure that each simulated plan are not too dependent. So

11 I use that technique too, and this is a very sort of

12 standard general technique in the MCMC literature, to

13 obtain the final 10,000 simulated plans.

14   **Q   Okay. Why not use as your set of simulations,**

15 **the original 72,000? Is there some reason that you need**

16 **to thin down to 10,000?**

17   A   Right. So -- yeah. So this is, again, like,

18 a standard practice in MCMC literature, but, you know,

19 the burn-IN is designed to reduce the impact of the

20 initial plan. So initial 1,000 plan has been distorted.

21 And thinning is a way to reduce the dependency of -- of

22 the plan. And so that's what I did.

23   **Q   And I'd like to get into what your analysis**

24 **showed, with respect to the Kentucky House plan.**

25   A   Sure.

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1 Q   And we're going to use some terminology today,

2 and I want to make sure everyone understands what we

3 mean. You mentioned before that you applied a criteria

4 to require the number of county splits to be minimized.

5 We might call those, "Split counties." Does that mean

6 that all of your simulated plans have 23 split counties?

7 A   Right. So in the -- for the House plan, the

8 enacted plan actually has 23 counties that are being

9 split. We could call this split counties and the

10 simulated plan, all of them also have 23 exact. So in

11 that sense, you know, simulated plan are equal --

12 Q   And is that the minimum number of counties

13 that need to be split?

14 A   I think so. Yeah.

15 Q   And you did some further analysis of the 23

16 counties that were split, right?

17 A   That's correct.

18 Q   And your report references something called,

19 "Multi-split counties." Can you just explain how you're

20 using that term?

21 A   Right. So 23 counties that are being split is

22 the total number of counties that are split in some way,

23 but you can imagine the county can be split in many

24 different ways. Like county can split into say two

25 districts, or county can split into three or four

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1 districts. Okay. So instead of just counting how many

2 -- you know, counting how many counties are being split

3 you in some way, I looked out father as to exactly how

4 those counties are being split, so -- yeah.

5   Q   And does figure 1 in your expert report, which

6 is on page 9, does that reflect your analysis of multi-

7 splits?

8   A   Right. So that this is one analysis idea,

9 which based basically counting the number of counties --

10 like computing the number of counties that contain more

11 than two districts. So instead of having one county

12 split, you know, into two districts, it might split into

13 three districts or four districts. So lots of splits

14 within the county. So, figure 1 presents that.

15   Q   And can you describe for us what this figure

16 shows?

17   A   Sure. So figure 1 is -- first, I think you

18 can look at red line. So this is enacted plan. So

19 enacted plan have 18 counties, that has more than two

20 districts. Okay. So under enacted plan, there are 18

21 counties that are not just splitting into two districts,

22 but three or four or more. Okay. Under simulated

23 plans, on average, there are 15 counties. So on

24 average, three counties or less of such -- such

25 counties. And, you know, it ranges from 13 to 17.

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1   Q   Okay. And is this the analysis that informed

2 your opinion that the House plan unnecessarily splits a

3 greater number of counties into more than two districts?

4   A   That's right. So this figure shows that it's

5 possible to generate many, many maps and reduce things

6 (phonetic), so I can even generate more that have a

7 fewer number of counties that has more than two

8 districts than -- you know, compared to the enacted

9 plan.

10   Q   Okay. And you also counted the number of

11 House districts that include all part of more than two

12 counties.

13   A   That's right. Yeah. So that's another way of

14 thinking about how the counties are being split. You

15 know, previous one is that look at the county, and then

16 count how many districts are in the county. Another way

17 of thinking about it, like, look at the district and

18 then count how many counties are in the district. And

19 so, you can count the number of districts that has more

20 than two -- two counties. And -- yeah --

21   Q   Is that analysis shown in figure 2 of your

22 report, which is on page 10?

23   A   Yes. That's correct.

24   Q   And can you show us what this analysis

25 reflects?

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1   A   Right. So again, this is similar to figure 1.

2   So I forgot to mention that these gray bars are

3   histograms. So it tells you relative (phonetic)

4   frequency under simulated plants, how often different

5   number of districts with more than two counties

6   happened. And so under the enacted plan, there's 31

7   Districts that has more than two counties, whereas on

8   the simulated plans, you know, on average, there are 24

9   such districts, which is basically seven districts fewer

10 than the enacted plan on average. And, you know, it

11 ranges from 21 to 30.

12 **Q   And is that difference statistically**

13 **significant in your view?**

14 A   Yes. In fact, now my 10,000 simulated plans

15 has as many districts or more, with more than two

16 districts. So in that sense, it's outlier. The enacted

17 plan is an outlier, has way more districts with more

18 than two counties than any of the 10,000 simulated

19 plans.

20 **Q   And I think you also looked at the total**

21 **number of county splits in the enacted plan compared to**

22 **your simulated plans.**

23 A   That's correct.

24 **Q   And I think that's figure 9 of your report,**

25 **right?**

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1   A   Yes.

2   Q   Which is on page 22. And can you just for us

3 what this is quantifying or showing us?

4   A   Right. So you know, this is just accounting

5 for each -- again, it's for each county, you count the

6 number of districts, and then you add that number up

7 across all counties in the state. And under enacted

8 plan, there are 80 such splits. additional splits, more

9 than necessary. And then this video shows that, on

10 average, the simulated plan has a fewer additional

11 county splits.

12   Q   Okay. Dr. Imai, are you aware that the

13 defendants in this case have retained and disclosed some

14 expert opinions?

15   A   Yes.

16   Q   And have you had an opportunity to review the

17 defendant's disclosed experts, which are Sean P. Trende

18 and Dr. Stephen Voss and his report?

19   A   Yes. I have to had a chance to look at their

20 reports.

21   Q   I'm going to ask you now about one of the

22 critiques of your analysis in Dr. Voss' report. He

23 claimed that, avoiding multi-splits in your algorithm

24 that caused urban counties to be carved up, such that

25 urban centers are represented by more districts.

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1   MR. MADDOX: Your Honor, we have a question

2   about this procedure. Whatever he's about to

3   testify to has not been disclosed in any prior

4   report. So this is outside the scope of what has

5   been disclosed by Dr. Imai, and we think it's

6   inappropriate.

7   MS. HINKLE: And Your Honor, we would respond

8   that it's within the scope of his initial opinions.

9   He's just explaining why critiques that have been

10   lobbed at his analysis are incorrect, so...

11   JUDGE WINGATE: I agree with you. I think it's

12   a -- overruled. I think that your Dr. Voss can

13   critique Imai, and Dr. Imai can critique Dr. Voss.

14   I think that's fair enough. Okay? Thank you.

15 BY MS. HINKLE:

16   Q   Okay. So Dr. Voss asserted that in one of his

17 maps that he assessed is best for Democrats, that only

18 had 13 splits, that there were certain cities, Bowling

19 Green, Owensboro, and Hopkinsville that are split up

20 excessively, I think, is the assertion. And he actually

21 said that he saw that across your set of simulated

22 plans. Did you do anything to evaluate that critique by

23 Dr. Voss?

24   A   Yes.

25   Q   And can you describe for us what you did?

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1   A   Yean. So one thing that's very important, and

2 I think is incorrect in the Dr. Voss report, is that one

3 should never look at a single or a particular maps

4 simulated plans, right? In order to use the simulation

5 for evaluation, you have to look at the distribution of

6 plans. So -- in not, like, a one specific plan, but all

7 10,000 of them. And to see, you know, in this case, how

8 often -- if you look at across all 10,000, how often

9 does a particular city will be being split among them?

10 So this is very similar to survey something, again,

11 like, just an example of that. Where, you know, if you

12 are interested in opinion of American voters and you

13 sample 1,000 voters, you don't want to just look at one

14 person who you happen to interview to infer what the

15 Americans think of a whole. And so it's always

16 important to look at the, you know, all 10,000 plans and

17 then see if there's a tendency that imposing these

18 county split constraints will have some impact on a

19 particular aspect of the plans you're interested in. And

20 when I look at Bowling Green, Owensboro --

21   Q   Hopkinsville --

22   A   Hopkinsville, the -- basically these three

23 constraints have no material impact on how often these

24 cities are being split. So there's no empirical

25 evidence that shows that these additional constraints

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1 have impact on these -- these cities that -- as he

2 asserts.

3   Q   I just want to make clear what you did, make

4 sure I understood what you said. So you removed the

5 multi-split constraints that you fed into your

6 algorithm, and then looked at those three cities,

7 Bowling Green, Owensboro, and Hopkinsville. And you

8 observed what? That there was no material change in the

9 number of splits in those urban centers?

10   A   Yeah. And it -- actually, that's exactly what

11 Dr. Voss did. So Dr. Voss basically took my code and

12 then removed that particular constraint, and then

13 actually simulated plans, which I duplicated, I got the

14 exact same simulated plans. However, he did look at how

15 often these plans split these cities. He just picked

16 one map, and then said, look at this map, this map

17 splits this city many times, this city many times, this

18 city many times. What I did is took the output of what

19 he did, and then actually look at how often these 10,000

20 maps split this city, and this city, this city. And

21 when I compared that with my initial simulation, which

22 had a multi-split, you know, constraint, there's no

23 statistically significant difference. So what that

24 suggests is that this particular constraint that -- that

25 -- he removed has no material impact on -- on those

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1   splits of those cities. And this is -- you know,

2   another advantage of simulation algorithm is that

3   actually you can add a constraint or remove it, and then

4   figure out whether that has any systematic impact. You

5   know, the maps you're going to get is going to be

6   different from the maps you get if you had -- you know,

7   it's a random algorithm, so it will generate different

8   maps. But you need to look at, you know, whether these

9   two sets of maps have different characteristics and

10   tendencies (phonetic).

11   Q   So the algorithm allows you to isolate --

12   A   Yeah.

13   Q   -- the impact of particular criteria?

14   A   Yeah. And Dr. Voss could have done that.

15   Q   Did you do any partisan bias analysis of the

16   enacted House plan?

17   A   Yes. I did.

18   Q   And what did you do to evaluate that?

19   A   Yeah. So I looked at the -- you know, the --

20   for each district, I look at the parts and view

21   (phonetic) of that district based on those six elections

22   that I mentioned. Two elections from 2016 and, you

23   know, six elections -- statewide elections from the --

24   2019.

25   Q   And I'd like to ask you a little bit about the

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1   analysis that's reflected in figure 3 in your report.

2   A   Sure.

3   Q   Which is on page 11 of the report. And this

4   is one that we have enlarged, in hopes that the Court,

5   and everyone else will be able to see it as Dr. Imai

6   explains for us. What's being shown.

7   MR. ABATE: Right here?

8   MS. HINKLE: Yeah. Thanks.

9   JUDGE WINGATE: Oh, we can see you. You're

10   good.

11   MS. HINKLE: Okay.

12   BY MS. HINKLE:

13   Q   And Dr. Imai, if you'd like to come closer.

14   A   Yes.

15   Q   So to point things out --

16   JUDGE WINGATE: You can get up here, point to

17   what you're -- it'll pick you up with her

18   microphone.

19   THE WITNESS: Yeah. Thank you.

20   MS. HINKLE: And Your Honor, if you could let

21   us know if you're having any trouble seeing this, we

22   may move it closer, so that you --

23   JUDGE WINGATE: I can see it.

24   MS. HINKLE: Okay.

25   BY MS. HINKLE:

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1   Q   Dr. Imai, can you walk us through what's being

2 depicted here on figure 3?

3   A   Okay. So this is a somewhat complicated

4 figure, but I'll try to explain. So what I did is, for

5 each plan, I ordered districts by Democratic vote share.

6 So from the least Democratic district to the most

7 Democratic district -- you know, 100 districts of them.

8 And first I wanted to sort of ignore --

9   JUDGE WINGATE: Let me ask you this, are you

10   doing registration? Is that how you get this?

11   THE WITNESS: Yeah. That's a very good

12   question. So it's based on the vote share --

13   average vote share across the past elections, so --

14   JUDGE WINGATE: Okay. So you're not just doing

15   Democratic registration, you're doing voting

16   patterns?

17   THE WITNESS: Voting patterns. Yes. Exactly,

18   right at the precinct level. So because it's

19   measured at the precinct level, I can aggregate to

20   the district level to know whether a particular

21   district has, you know, 40 percent of Democratic

22   vote share versus, you know, 60 percent Republican

23   vote share, on average, across the past elections

24   for which I have data. Okay. So first I wanted to

25   know what these funny boxes and then focus on these

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1   red dots. So these red dots are basically enacted

2   (phonetic) plan. In the House, there are 100

3   districts, so five (phonetic) to 100 of their dots,

4   nobody can't see anything. So, I focus on

5   competitive districts that are closest to 50/50,

6   prime (phonetic), which is the dotted line. So, all

7   this --

8   Q   Dr. Imai, sorry to interrupt. I just want to

9   clarify one thing. There's reference to district

10   numbers along the bottom of this graph. Are those the

11   districts of the State House Representative districts?

12   A   Yes. Yeah. So these numbers are not the

13   particular district number. It's a 73rd and most

14   Democratic, you know, the -- so the higher -- higher,

15   the number is more Democratic it is, and lower the

16   number is, the least Democratic. So, D1 would be the

17   least Democratic district D100 would be the most

18   Democratic district. And I'm focusing on from 73 to the

19   84 that are closest to, you know, its most competitive

20   district based on the past election results. So what

21   you see first is these red dots. And then on the y-

22   axis, you see the Democratic vote share. So anything

23   below the 50 percent is Republican leaning and anything

24   above the 50 percent is Democratic leaning. And what

25   you see for these -- these dots are enacted plan. So,

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1 for example, you know, the 77th District, based on the

2 order by Democratic vote share on the enacted plan, the

3 vote share is about -- Democratic vote share is about

4 47.5 percent -- point. And so one thing I wanted to

5 notice is the pattern. Okay. So below 50 percent, you

6 see these red dots -- you know, sort of flat --

7 flattened here, and then there's a big gap, about 2.6

8 percentage point, going from this particular 79th

9 District, the older district, to the 80th District.

10 Which now closest like Democratic -- you know, these

11 districts are Democratic-leaning, because it's about 50

12 percent. Okay. So what this -- what this shows is that

13 for the Democratic-leaning districts, these four

14 districts remains particularly -- relatively

15 competitive, close to 50 percent. And yet, the

16 Republican-leaning districts tend to be far away from

17 the 50 percent. Okay. So tends to be more safe. In

18 fact, this district that's the closest to 50 percent is

19 -- it's right in the middle, 48 percent. So this would

20 be considered as relatively safe Republican district.

21 Okay. So, --

22   JUDGE WINGATE: Casey, could he -- just, this

23   district, was that D 79?

24   THE WITNESS: Yes. D79. That's right.

25   MS. HINKLE: That's right. Yeah.

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1              JUDGE WINGATE:  Yeah.

2    BY MS. HINKLE:

3         A     And this jump, going from the D79 to D80, this

4    big jump is in the academic literature considered --

5    called this type of pattern as signature of

6    gerrymandering, because basically the close Republican-

7    leaning districts in this case are made -- made safer,

8    whereas the close Democratic-leaning districts are made

9    to be competitive.  Now, what I did then, is to compare

10   this with a simulated pattern (phonetic).  Okay.  So,

11   not only just sort of seeing this pattern, which is --

12   you know, it's often called the signature of

13   gerrymandering in the literature, I want to know whether

14   this is unusual.  Like, I want to know whether a

15   simulated plan also have this pattern.  Okay.  Well,

16   simulated pattern, because there's 10,000 plans, I have

17   this box spot.  So box spot basically shows that this

18   box contains 50 percent of simulated plan, so 5,000 of

19   them out of 10,000.  And then these lines, which called

20   whiskers, are called typical range -- typical range of

21   simulated plan.  Okay.  And this is actually median. And

22   what you see is that simulated plan has no gap, right?

23   It's very smoothly shift -- changing, in terms of vote

24   (phonetic) share, from, you know, 73 to 84.  And there's

25   no, you know, jump anywhere.  In fact, these two
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1   districts -- or maybe even these three districts, 78,

2   79, 80, they tend to be Democratic-leaning on average,

3   whereas in under enacted plan, these are safe Republican

4   seats. So what this comparison shows -- and then if you

5   look at the Democratic-leaning districts that are very

6   close to 50 percent, you see that these, under enacted

7   plan, this is much closer to the -- to the 50 percent

8   line compared to the simulated plan. So, what this

9   shows is, you know, under enacted plan, Democratic-

10   leaning districts are being made competitive -- more

11   competitive than the simulation would show otherwise --

12   would show. And the Republican-leaning districts are

13   being made safer, relative to the simulated plan.

14   Q   Do you draw any conclusions from the data

15   that's reflected on figure 3?

16   A   Right. So this figure shows the evidence of

17   partisan gerrymandering. Favoring the Republican Party,

18   by making Republican-leaning districts safer, and making

19   the Democratic-leaning districts more competitive than -

20   - compared to simulated plans.

21   Q   And Dr. Imai, can you comment on the strength

22   of that conclusion or opinion?

23   A   Right. So in, you know, if you think of the

24   statistical outliers -- like these are statistical

25   outliers, right, beyond these -- you know, typical range

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1 that you might -- you know, typical simulated plan

2 range. And what you see is that not only just the one

3 district, but the pattern of several districts that are

4 being made safer than the -- the simulated plan would

5 indicate. And again -- here again, it's all of these

6 four districts are being made more competitive in

7 comparison to the simulated plan. So this pattern as a

8 whole -- so I, you know, as a statistician, I don't want

9 to just -- put all my basket -- all my eggs in one

10 basket, but if you look at the multiple districts, you

11 see the pattern of partisan gerrymandering.

12   MR. MADDOX: I'm sorry, can you -- if you look

13   at which districts? Marginal -- did you say

14   marginal?

15   THE WITNESS: If you look at these districts

16   that are, you know, closer to the 50 percent.

17   MR. MADDOX: I really -- I just didn't

18   understand the word.

19   JUDGE WINGATE: Multiple. Multiple.

20   THE WITNESS: Oh, multiple.

21   MR. MADDOX: Multiple. Thank you.

22   THE WITNESS: Yeah.

23 BY MS. HINKLE:

24   Q   And Dr. Imai, is -- the opinion that you just

25 described, is that dependent on your observations about

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1   the enacted plan having more counties with multi-splits

2   than the simulated plans, or are those separate

3   opinions?

4   A   Not -- yeah. They're separate opinions. You

5   know, they're obviously related, but they're separate

6   opinions.

7   Q   And this analysis is -- reflects your

8   evaluation of Kentucky as a whole, right? All 100

9   districts?

10   A   Right. Focusing on -- you know, relatively

11   competitive districts where you know -- that

12   redistricting could make a difference.

13   Q   Did you do any local analysis of partisan bias

14   in the House map?

15   A   Yes. I did.

16   MS. HINKLE: Wonder if I might want to take

17   this down?

18   JUDGE WINGATE: Yes. So let me ask one more

19   question. These are 12 -- are these 12 specific

20   districts that are the closest to being competitive

21   without the --

22   THE WITNESS: That's correct. You know, under

23   the enacted plan, those are specific districts that

24   are close to, you know, competitive districts, as

25   you -- you said. Under simulated plans, they're not

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1   necessarily the same districts, because it's a

2   different plans, so the most competitive district

3   may not be in the same location. It could be at

4   different parts of the state, but it tells you how

5   the competitive district fare, in terms of

6   partisanship in comparison between the enacted plan

7   and the simulated plan.

8   JUDGE WINGATE: Good.

9   THE WITNESS: And -- yeah, that's the analysis.

10   And this is -- under the standard analysis the

11   academic researchers do when evaluating the partisan

12   bias of the enacted plan.

13   BY MS. HINKLE:

14   Q   You mentioned a term in your testimony about

15   figure 4 called, "The signature of gerrymandering," is

16   that an accepted term in academic literature?

17   A   It's a term that has been published, not by

18   myself, other researchers in -- in the article and the

19   (Inaudible) journal.

20   Q   And it's commonly understood to refer to what

21   you've --

22   MR. MADDOX: Objection, Your Honor. She's

23   leading the witness.

24   JUDGE WINGATE: He's an expert witness. It's

25   all right. I'll let you lead too, Vic.

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1   MR. MADDOX: Thank you.   I'll take you up on

2   it.

3   JUDGE WINGATE: Okay.

4   BY MS. HINKLE:

5   Q   All right.   So, I'd like to move on now to

6   talk about your local --

7   A   Okay.

8   Q   -- analysis that you did.   I think you looked

9   at Jefferson County and Fayette County, right?

10   A   That's right.

11   Q   And can you describe generally for us, what

12   you observed when you looked at those two localities?

13   A   Yeah.   What you observe is a pattern of

14   combining basically, the Democratic voters in the urban

15   area with the Republicans -- Republican voters in the

16   rural area, to create the more Republican-leaning

17   districts.

18   Q   And is your analysis of Jefferson County

19   reflected on figure 4 of your expert report, that's on

20   page 13?   And I have that one in the large size as well.

21   MS. HINKEL: Here's your copy.

22   JUDGE WINGATE: All right.

23   MR. MADDOX: Sorry.

24   MS. HINKLE: Does that work?

25   MR. MADDOX: Okay.

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1   MS. HINKLE: Okay.

2 BY MS. HINKLE:

3   A   So this map shows Jefferson County and the

4 surrounding area. And on the left, the maps are colored

5 by -- again, the Democratic voter share based on the

6 past elections under enacted plan. So on the enacted

7 plan, you can see, like, districts, you know, 42, 43,

8 and 30 are very, very Democratic, 34, 41, 40, 44

9 reasonably Democratic. And then, you know, in the rural

10 area, much more Republican -- Republican districts. And

11 the gray line are county lines -- county boundary line -

12 - boundaries. And solid black line are the district

13 boundary lines on the enacted plan. So, one thing you

14 notice is -- let's look at, like, District 48, for

15 example. So, District 48 takes the sort of urban area

16 of voters and then combines with part of Oldham. So it

17 sort of crosses the county border and spills into this

18 rural county, and that has very strong

19 Republican-leaning tendency. If you look at District

20 33, that's another example where you take the urban

21 districts -- urban precincts, and then combine it with

22 the rural districts. In this case, this particular

23 district cross into two other counties. So it's part of

24 Jefferson, but it's also a part of Oldham and part of

25 Shelby. So these are the two districts who --

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1   basically, I see this pattern in other places where the

2   urban -- urban precincts are combined with the strong

3   Republican voter base of the rural -- rural counties.

4   And as a result, the district becomes more Republican.

5   So, if you look at the 48 and 33, that color is a little

6   bit pink, which means that now these two districts,

7   despite the fact that there are -- Democratic voters

8   live here, becomes Republican-leaning. Now, we don't

9   want to just look at this, and we want to compare this

10   with the simulated plans. The question is, is this

11   unusual, or is this -- does this have to happen because

12   of all this population constraints, and continuity

13   (phonetic), and so on. So on the right, you see the

14   same exact map, except now coloring is based on the

15   average simulated plan. So -- at the precinct level.

16   So what you can see this -- is that for each precinct,

17   wherever you look at it, you can ask yourself, okay, on

18   average, how -- how Democratic that district is --

19   precinct to belong to, under the simulated plan. So

20   what you see -- so let's look at 48 and 33. So if you

21   look at 48, you see that slightly blue area here, which

22   means that these voters tend to belong to the district

23   that's slightly Democratic- leaning -- yeah, under the

24   simulated plan. Even though these voters on the enacted

25   plan is actually a part of District 48, which is

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1   Republican-leaning. Now, going towards closer to more

2   rural area, these voters tend to belong to a more

3   competitive district. So white means Democrats and

4   Republicans are very close. And yet, under the enacted

5   plan, they're a part of 48, which is Republican-leaning.

6   And this area, which is a part of Oldham, part of --

7   District 48. These borders actually tend to belong to

8   more Republican district. That makes sense, because

9   these areas are heavily Republican, so typically these

10 voters could be a part of the district that is within

11 Oldham. However, because these voters combined with the

12 urban voters, 48 becomes essentially, Republican-leaning

13 district. The same pattern appears in District 33. So,

14 if you look at the District 33 in the urban area, these

15 voters mostly are Democratic. They tend to belong to the

16 much more competitive district under simulated plan.

17 But when they're combined with the Republican voters in

18 the Oldham County and the Shelby County, then the

19 District 33 as a whole under the enacted plan, becomes -

20 - becomes Republican- leaning. So, this pattern of, you

21 know, combining basically the urban Democratic voters

22 with often the rural county, by crossing the county

23 border and creating a district, leads to, you know,

24 Democratic voters belonging to more Republican-leaning

25 districts, in comparison to the simulated plan. And you

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1   see some of these patterns, you know, even like District

2   29, for example, these voters belong to more competitive

3   districts. And yet, under the simulated plan, they

4   would be part of the Republican district. So that's --

5   the Jefferson.

6   Q   **Do you have an opinion of what this pattern**

7   **shows?**

8   A   Right. So this pattern basically shows the

9   strategy of combining the Democratic urban voters with

10   the Republican rural voters, to create a

11   Republican-leaning district.

12   Q   **Okay. And you did a similar analysis for**

13   **Fayette County, where Lexington is, right?**

14   A   That's -- that's correct.

15   Q   **And your analysis of Fayette County is shown**

16   **in figure 5, which is on page 15 of your report.**

17   MS. HINKLE: Just going to try to hold this up a

18   little straighter.

19   Q   **So, Dr. Imai, can you walk us through your**

20   **analysis of Fayette County, as shown in figure 5?**

21   A   Sure. So this is the same sort of set of

22   figures that I just showed you for Jefferson. So on the

23   left, you have enacted plan, and on the right, you have

24   average simulation plan. Under the enacted plan, the

25   District 77, which is -- I think it's the most

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1   Democratic-leaning district in the state. And, you

2   know, so that in a sort of -- in the very urban areas,

3   there's, like, a group of Democratic districts that's

4   created, but I wanted to focus on, like, District 88 and

5   District 45. So 88 takes the, sort of, surrounding

6   environs (phonetic) of this county and then spills over

7   into Scott. Then this -- this is the heavy Republican

8   area. So by combining some of the Democratic voters who

9   live in these areas with the large number of Republican

10   voters in Scott County, this 88 becomes Republican-

11   leaning. Similarly, if you look at the 45, 45 takes

12   some of the Democratic voters who live here and then

13   combine it with a large number of Republican voters who

14   live in the Jessamine County, again, by crossing the

15   county line. And this creates a Republican-leaning

16   district, even though there are many Democratic voters

17   live there. Now, compare this with the simulated plan.

18   So, under the simulated plan, the voters who live in

19   this area -- which under the enacted plan called it, the

20   District 88 -- they are more likely to belong to

21   Democratic-leaning district. So -- I'm, you know --

22   most -- in many cases, these voters who live around here

23   is most likely to belong to the Democratic-leaning

24   district. However, under enacted plan, because it's

25   combined with this large area of Scott County, the 88

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1   becomes Republican-leaning. Similarly, the voters who

2   live in 45 District under the enacted plan, these voters

3   are more likely to belong to the competitive districts.

4   That's why it's white under the simulated plan. And

5   yet, because of -- under the enacted plan, District 45

6   combines these voters with a large number of Republican

7   voters in Jessamine County. The 45 becomes a

8   Republican-leaning district. So this is again, the same

9   pattern as Jefferson, where the urban Democratic voters

10   are combined with rural Republican voters, to create

11   additional Republican-leaning district. And this is a

12   achieved by packing Democratic voters in the center

13   city. And you can see that these blue lines -- blue

14   color is much darker than the blue colors under the

15   simulated plan. So these voters in the center city

16   generally belong to Democratic district, because that's

17   where they live. However, under enacted plan, they are

18   carved in a way that packs the Democratic voters -- but

19   which then reduces the Democratic vote share or lean of

20   the surrounding county, which helps create additional

21   Republican-leaning districts, so...

22   Q   Thank you. Dr. Imai --

23   MS. HINKLE: Yeah. Thanks.

24   Q   Did you -- I noted it in the rebuttal reports,

25   there was a suggestion that maybe the multi-split

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1   constraint that you fed into your algorithm impacted

2   your observations, with respect to partisan bias. Did

3   you do anything to investigate that critique?

4   A   Right. So I saw that critique that

5   multi-spread constraint that I imposed may have a

6   partisan implication. And as I said in the previous

7   criticism, it's very important to look at all the

8   simulated plans instead of just one or two simulated

9   plans that were chosen in the rebuttal report. So what

10   I did is just take the simulated plan, the -- you know,

11   the --

12   Dr. Voss or Trende, I can't remember which, but they

13   generated, and then look at that -- basically, he

14   created these figures, right -- same set of figures. And

15   I see no material difference, no statistical difference.

16   Q   Okay. One of the rebuttal experts,

17   Mr. Trende, stated in his report that he calculated

18   something called, "Efficiency gap," on all of the maps

19   in your simulated set of 10,000 alternative House maps,

20   and asserted that the efficiency gap looks within normal

21   range on the enacted plan, under the analysis that he

22   did. Did you do anything to analyze Mr. Trende's

23   opinions in that regard?

24   A   Yes. I did.

25   Q   And can you describe for us what you did?

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1   A   So first efficiency gap is a measure of

2 partisan bias. It's a measure that's used quite often

3 in academic literature, as well as in many court cases.

4 It's not the only measure, but it's one way to measure

5 parts and bias of a particular -- particular plan.

6 Should I explain what that is?

7   Q   Sure.

8   A   So the idea is that, you know, if -- if

9 packing -- so it's trying to capture packing and

10 cracking. So packing means, that you try to pack, you

11 know, opposing party voters, supporters into one

12 district, so that they have -- they have less -- you

13 know, fewer chance of getting other districts -- the

14 candidates elected in other districts. So they look at

15 the wasted votes, so how many votes are cast that's

16 beyond 50 percent? So that's unnecessary wasted votes.

17 The other part of this efficiency gap is that cracking,

18 which basically tries to crack the stronghold of the

19 opposing party supporters, so that you -- you know,

20 divide the supporters of a particular party into two

21 districts. So in those cases, you might lose election

22 by, say, close margin, but not quite enough. And so

23 those votes get wasted. So they look at the -- how the

24 wasted votes differ between Democrats and Republicans.

25 So that's a measure that's -- you know, one measure of

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1   partisan bias. It's not the only measure. There are

2   other measures as well. But what Mr. Trende did in his

3   rebuttal report -- and he calculated efficiency gap

4   under enacted plan, and then compared that with the

5   simulated plans. You calculate the efficiency gap for

6   each simulated plan, and then look at the distribution

7   of simulated plan -- efficiency gap on the simulated

8   plan, and then compare that with the efficiency gap of

9   the enacted plan. So that's a -- that's a good thing,

10   in the sense that it's comparing the enacted plan with

11   the simulated plan. Like, not just the one plan -- one

12   simulated plan, but looking at the 10,000 simulated

13   plans. So -- so I -- that's a good thing. However,

14   what he did is to choose one particular election to

15   compute this efficiency gap, and he chose 2016

16   presidential election. Okay. When I look at the other

17   elections -- so I can basically repeat the same

18   exercise, but usually in the academic literature, you

19   don't want to rely on the single election, because

20   single election -- as you know, has many different

21   factors going in. Some candidates may be extremely

22   popular or less popular. There may be some other events

23   that happen during the campaign that could influence it.

24   So most of the academic literature, when investigating

25   the partisan bias of a particular plan, you look at wide

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1 range of races, and then average them out. So when you

2 average across different races, many of these factors

3 may cancel. And you get the general pattern of

4 partisanship, instead of relying on a particular

5 election. And so when I did that -- in fact, if I just

6 take 2016 -- not just the US presidential election, but

7 also Senate race, right? So those are two statewide

8 races for the -- for which data is available for 2016,

9 then his results go away. In fact, the analysis shows

10 that enacted plan is an outlier favoring the Republican

11 Party, as measured as using efficiency gap. If I use

12 2019 election, there are six of them. I get the same

13 results. The enacted plan is actually an outlier

14 favoring the Republican Party, based on the efficiency

15 gap measure. If I take all the elections, 2016, 2019

16 together, and then compute the efficiency gap, I get the

17 same exact results. The enacted plan is an outlier

18 favoring the Republican Party over Democratic Party. So

19 what Mr. Trende did was to choose this particular

20 election, and was able to show well, in that case, you

21 know, the enacted plan is within the simulated range.

22 But as soon as you take more elections and combine them

23 -- which is the right way to do because you don't want

24 to rely on again, a particular election, then -- like

25 his analysis -- you know, his result is -- it goes away.

1   Q   I'd like to move on to your evaluation of the

2 enacted congressional map. Did you analyze Kentucky's

3 enacted congressional map --

4   A   Yes. I did.

5   Q   -- as part of your expert engagement. And --

6 what type of algorithm did you use to evaluate this map?

7   A   So for this -- the congressional analysis, I

8 did -- I used the SMC, that's the Sequential Monte Carlo

9 algorithm.

10   Q   And that's the approach that starts with a

11 blank slate, right?

12   A   That's right. That's a start -- yeah -- that

13 one start with a blank slate and then start building the

14 district one at a time.

15   Q   And what criteria did you feed into your

16 algorithm, when you were evaluating the congressional

17 map?

18   A   So I made sure that the algorithm creates a

19 total of six continuous districts. That's the number of

20 congressional districts. And I used the overall

21 population deviation of plus, minus 0.1 percent. So

22 that's the -- at most, the simulated plan have the

23 maximum deviation of plus, minus 0.1 percent.

24   Q   Do you know, in terms of real people, what

25 plus or minus 0.1 percent is?

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1   A   Yeah. That's a good question. Yeah. So the

2 choice of this is based on the fact that I'm working

3 with the precinct-level data. So precinct-level data

4 is, you know, on average, I think -- maybe 2,000

5 population, or something along those lines. And plus,

6 minus 1 [sic] percent is usually between 700 to 800

7 people -- in Kentucky.

8   Q   And it's plus or minus 0.1 percent, right?

9   A   Plus, minus 0.1 percent. Yes.

10   Q   And why not require your algorithm to require

11 absolute equality among the districts?

12   A   Right. So in the -- you know, when the states

13 -- many states enact their congressional plan, they

14 often go down to one person difference. So the

15 population based on the census is different from the --

16 another district, at most one or two people, right?

17 However, for simulation analysis, which is designed to

18 evaluate the characteristics. It's not designed to

19 generate the plan that someone can pick and enact --

20 because we are based working on the precinct-level data,

21 we don't have ability to go down to one person, right?

22 So one person would require census block level data for

23 which election results are not available. So the fact

24 that we use, as in many partisan analysis of -- in

25 academic literature, we use precinct-level data. And

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1   for that, the 0.1 percent is -- is appropriate deviation

2   because, you know, going down to one person is not

3   possible, just data-wise.

4   Q   Did you also include a compactness criteria in

5   the algorithm, for purposes of congressional map?

6   A   Yes.   Yes.   Generally, these algorithm are

7   designed to generate compact districts, because if you

8   think about, you know, all possible districts, then

9   you'd have many snake-looking districts that we -- we

10   would not care.   So, we focus on -- these algorithm are

11   designed to generate relatively compact districts.

12   Q   And Mr. Trende's rebuttal report indicates,

13   that you used a compactness parameter of one; is that

14   right?

15   A   That's correct.

16   Q   And he thought that maybe a map drawer would

17   choose 0.5 or two, as opposed to one, as a compactness

18   measure.   Do you have any reaction to that?

19   A   So map drawers should not be using the

20   algorithm to generate the enacted plan, so they should

21   never choose the parameter.   But if the point is to say,

22   more realistic choice is the compactness parameter, it

23   should be 0.5 or two, that's inaccurate.   Because I've

24   analyzed many others states as part of my academic

25   research -- and of, you know, part of expert witness

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1 work, but you never choose those extreme values. That

2 would be really pushing the algorithm too far to, you

3 know, keep these theoretical guarantees that I

4 described, that are very important part of the

5 algorithm. So, typically we would -- may change like

6 1.1, 1.05, 0.97, 0.95 to make it a little bit more

7 compact, a little bit less compact. But never the range

8 of 0.5 or two that's suggested by Mr. Trende.

9   Q   Okay. And did you feed any criteria relating

10 to county splits into the algorithm, for purposes of

11 evaluating the congressional map?

12   A   Yes. I did.

13   Q   Can you describe those for us?

14   A   Yeah. So I made sure that the simulated plans

15 have fewer than the number of counties that are being

16 spread under the enacted plan.

17   Q   And again, did you use any partisan criteria,

18 as part of the criteria for the algorithm?

19   A   No. And I should also note that each county

20 is spread, you know, at most once, because that's the

21 important part of the criteria. So the simulation -- I

22 instructed the simulation algorithm to just do that.

23   Q   And did you use any racial criteria, as part

24 of the algorithm?

25   A   No.

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1   Q   How many simulated plans did you generate, for

2 purposes of evaluating the congressional map?

3   A   10,000. And that choice is just motivated by

4 statistical efficiency. Like, if you have 10,000,

5 that's -- that's actually way more sufficient to yield

6 accurate conclusions.

7   Q   Okay.

8   A   And, you know, obviously, I could generate

9 more, but that's generally pointless, at that point.

10   Q   When you're generating the simulated plans, is

11 it possible to freeze a particular district? In other

12 words, to lock in one district and then simulate the

13 remainder?

14   A   Yeah. That's possible.

15   Q   And is that something that you would recommend

16 doing and evaluating -- a map using the simulation

17 algorithms?

18   A   Depends on the context. So for example, you

19 know, in some cases where a particular district boundary

20 is at dispute -- so, you know, if you have say two

21 districts, and the boundary between those two districts

22 is in dispute, then you could freeze the rest of the

23 state, and then generate those two districts to see how

24 unusual those boundaries are.

25   Q   If you were trying to measure the compactness

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1   of an enacted plan, what impact would freezing a

2   particular district have?

3   A   Right. So that you have to be careful,

4   because freezing one district, will basically freeze

5   that district boundary surrounding it. So that has an

6   impact on compactness of the surrounding district. And

7   so the conclusion has to be, you know -- you have to be

8   very careful, right, because it has that -- freezing

9   that one district will have an impact on compactness of

10 other districts, that are neighboring with the -- with

11 the frozen district.

12   Q   Did you consider Kentucky's historical

13 congressional maps, in developing your algorithm?

14   A   No.

15   Q   And why not?

16   A   So typically, when I evaluate the partisan

17 bias of the enacted plan, I do not bring in the previous

18 maps. The reason is that, we don't know what went to

19 the previous maps, what factors were considered to

20 create the previous maps. And so one of the important

21 aspect of simulation algorithm is transparency. So if -

22 - you know, you specify a set of criteria, and under

23 that criteria, the algorithm will generate the plans. So

24 when you -- if you input the previous plan, whatever the

25 consideration that was used to generate that plan, would

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1   affect the results and may bias my conclusion in one way

2   or another. So when -- if I evaluate the partisan, you

3   know, bias of an enacted plan, I don't use the previous

4   maps.

5   Q   And Kentucky currently has one Democratic

6   representative and five Republican representatives in

7   the US Congress. Why not add a criteria to your

8   algorithm that would ensure at least one Democratic

9   representative from Kentucky?

10   A   Yeah. Because that would bias my conclusion.

11   That would be sort of encouraging partisan

12   gerrymandering. So I, you know -- in order to evaluate

13   the partisan bias, you don't use the partisan

14   information, right? That would be a bad idea.

15   Q   Okay. And you focused your analysis of the

16   congressional map on Franklin County, right?

17   A   Yes.

18   Q   Why did you do that?

19   A   Franklin County is notable because it's part

20   of this District 1 that travels from the west side of

21   the state, all the way to the center of the state. And

22   Franklin county is a, you know, important part of that

23   district and dispute.

24   MS. HINKLE: And I don't seek to introduce this

25   map through this witness. But I want the Court to

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1   be aware that we have included maps of the districts

2   in the front of your binders --

3   JUDGE WINGATE: Yes.

4   MS. HINKLE: -- if you'd like to look at that.

5   And if it's all right, Your Honor, I'd like to give

6   the witness one of those as well, to reference as

7   needed.

8   JUDGE WINGATE: That's all right.

9   BY MS. HINKLE:

10   Q   So that is -- is that the enacted

11   congressional map?

12   A   That's correct.

13   Q   So, what was the first step in your analysis

14   of looking at the enacted congressional map?

15   A   All right. So, the first step of analysis was

16   to evaluate the compactness of this district.

17   Q   And how did you do that?

18   A   Well -- so, you know, one could look at it and

19   then see it's not compact. But because I'm a simulation

20   expert, what I do is, I'm going to compare the

21   compactness of District 1 under the enacted plan with

22   simulated plans, the compactness of the district that

23   contains the Franklin County under the simulated plan.

24   And you never know that this shape may be necessary in

25   order to comply with, you know, population and other

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1 criteria. So you always want to be able to -- you know,

2 you want to -- you want to be able to compare this with

3 a simulated plan that comply with all this other set of

4 requirement, and then see if this is an outlier.

5   Q   And did you use the full set of 10,000

6 simulated plans to do this analysis?

7   A   No. I subset it to the 93 percent of the

8 simulated plan, so most of it, but -- which did not

9 split the Franklin County.

10   Q   And why did you make that choice?

11   A   Because the enacted plan that's not spread to

12 Franklin County, and I wanted to make sure that -- you

13 know, that I'm comparing apples and orange -- apples

14 instead of comparing two different -- completely

15 different districts.

16   Q   And you compared the compactness of the

17 enacted first district with those in your simulated

18 plan, right?

19   A   That's right.

20   Q   What compactness measure did you use?

21   A   So I used the measure called Polsby-Popper

22 compactness score, which is one of the very standard

23 metric of compactness measure. I also used the Reock

24 measure, which is a related measure that's again, used

25 in academic literature.

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1   Q   And is your analysis of the compactness of the

2 first district reflected in figure 6 of your report on

3 page 17?

4   A   That's correct.

5   Q   And can you describe for us what this shows?

6   A   Right. So this figure shows, again, the

7 compactness of enacted plan, which is the red line, and

8 compactness of the district that contains Franklin

9 County as a whole, which is shown as a histogram, the

10 gray bars. And the Polsby-Popper compactness score is

11 the larger the value is, the more compact it is. So, if

12 the value is smaller, that means less compact. And as

13 you can see, almost all the simulated plans generate the

14 district that contains the Franklin County as a whole,

15 that is much more compact than the District 1 of the

16 enacted plan. In fact, more than 99 percent of the

17 simulated plans can generate the district -- the

18 corresponding district that is more compact than the

19 District 1 in the enacted plan. Which led me to

20 conclude that District 1 is outlier, in terms of the

21 lack of compactness of that -- of that shape.

22   Q   So you're measuring the compactness, looking

23 just at District 1, right?

24   A   That's right.

25   Q   Does the compactness of one district affect

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1   other districts?

2   A   Yes.

3   Q   In other words, is there necessarily a

4   tradeoff in the compactness, if you change the

5   compactness level of one district versus another?

6   A   I see. So compactness of one district affects

7   the compactness of the other districts because if you

8   change the district boundaries of one district, you

9   know, the district boundaries of the surrounding

10   district have to change, and then that will also lead to

11   the change in other districts. So in a sense, they're

12   all related. However, there is no general tradeoff

13   between -- like, if you make one district more compact,

14   you have to make another district less compact or vice

15   versa. In fact, you can create a map that all the

16   districts are non-compact. You can imagine, just like

17   make a lot of snakes, and that will lead to the map that

18   has many, many districts that are non-compact. So they

19   are related, but there's no general tradeoff, right? In

20   fact, what the simulation shows, it is possible to

21   create -- because this simulation actually makes sure

22   that the average compactness level is the same as the

23   enacted plan. So my simulated plan, on average --

24   average across districts, have the same compactness

25   level as the enacted plan, right? But the enacted plan

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1 creates this District 1 that it's highly non-compact.

2 What the simulation idea shows, is that even if you keep

3 the overall compactness -- average compactness the same,

4 I don't need to create this highly non-compact district.

5 I can create the district that are much more compact

6 across -- across the board on, you know -- on average,

7 basically.

8   Q   So if you made the first district in

9 Kentucky's map more compact, does that necessarily mean

10 that the other districts become less compact?

11   A   No. And that's exactly what the simulation

12 shows, right? So it's possible to make the District 1

13 more compact, without changing the overall level of

14 compactness of the map.

15   Q   Okay. Dr. Voss' rebuttal report suggests that

16 your relaxed -- as he describes it, a relaxed standard

17 for population equality caused your simulation to

18 produce more compact maps. You've described for us why

19 you used the population measure that you did, but could

20 you -- could you tell us what you did, if anything, to

21 investigate Dr. Voss' critique, in this regard?

22   A   Yes. So the Dr. Voss critique on my choice of

23 population deviation -- which is 0.1 percent, about 700

24 to 800 people difference across -- from the ideal target

25 population was positive to me because in his report, he

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1 says I -- you know, this choice is too big. So the 0.1

2 percent is too large. But as I explained at -- if

3 you're using the precinct-level data, which is the

4 analysis that I'm conducting, then the 0.1 percent, 700

5 to 800 people, is appropriate choice because the

6 precinct is not as small as the census blocks

7 (phonetic). Okay?. And he says that in the report, he

8 chose -- you know, he pinched -- he reduced that

9 population deviation, but then he cites number 0.001,

10 which is 0.1 percent, which is exactly what I did,

11 right? So that was puzzling to me because he's saying

12 that, well, I picked a too -- too big a number and he

13 says I set it -- you know, he set it to 0.001, but

14 that's exactly the same number I chose. So I was a

15 little confused. But then when I looked at his code, he

16 actually set it to 0.00001, which is basically 0.001

17 percent, or seven or eight people. Okay? So instead of

18 choosing 700, 800 people, which I did because of the

19 size of the precinct, he chose -- in the return of the

20 analysis he conducted in his report, he chose 0.001

21 percent which is seven to eight person -- people. Okay?

22   Q   And can you describe for the impact that

23 choice has on the algorithm?

24   A   Right. So first of all, that's not

25 appropriate choice because precincts are much bigger.

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1   Precincts are not the size of seven, eight, six, five

2   people. On average, I think, you need a couple thousand

3   people. And so, if you set the tolerance (phonetic) --

4   population tolerance to that low, there are so few

5   precincts that you'll be able to move to generate the

6   plans. And so when I rerun his algorithm -- the

7   software that I wrote, generates lots of warning.

8   Basically, it says this is not a good choice, and it has

9   some potential impact on the theoretical properties of

10 the algorithm because you're choosing too tight a

11 population threshold, given the dataset that you're

12 analyzing, and so that's one concern. So that any

13 results that might come out from such a tight population

14 threshold, when the pop -- data itself is precinct-level

15 data. There may not be mathematical guarantee that --

16 that make these algorithms so attractive and powerful.

17 How -- in addition, when I actually run this, right,

18 even though it gives lots of warnings, you still get --

19 generate 10,000 plans. And I look -- I recreated the

20 figures that are in my report, using those output.

21 There's no material difference. So this is, again --

22 okay. What's important is to look at the distribution

23 of the plans as a whole. So you cannot just choose one

24 particular plan of 10,000 and draw some general

25 conclusions. In order to general -- draw general

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1   conclusions, you need to look at the entire simulated

2   output. And when you do that, the population deviation,

3   at least of his choice, has no material impact on the

4   conclusions that I drew.

5   Q   And did you do anything to analyze the

6   partisan bias in Kentucky's congressional map?

7   A   Yes. I did.

8   Q   And can you describe for us what you did to do

9   that?

10   A   Right. So for this analysis, I looked at the

11   Democratic vote share of the districts that contain

12   Franklin County. So, that's basically for -- for the

13   enacted plan, that's District 1.

14   Q   And is your analysis, in this regard,

15   reflected in figure 7 on page 18 of your report?

16   A   That's right.

17   Q   And can you please describe for us what this

18   figure 7 shows?

19   A   Right. So the figure 7, just like previous

20   figures, focus on the districts that contain Franklin

21   County as a whole. So for -- under the enacted plan,

22   this would be District 1. And District 1, under the

23   enacted plan, has, you know, Democratic share of votes

24   around 35 percent. And the gray histogram on basically

25   shows what would be the Democratic vote share of this

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1　corresponding district under simulated plan. And what

2　you see here is that under simulated plan, the Franklin

3　County will belong to the district that is much more

4　Democratic. Okay? So -- compared to the enacted plan.

5　So enacted plan is basically making Franklin County a

6　part of -- much more Republican-leaning district, in

7　comparison to the simulated plans.

8　　　　Q　And is your observation shown in figure 7, is

9　that statistically significant?

10　　　　A　Yes. Again, it's more than 99 percent of the

11　plans have higher Democratic vote share for the

12　corresponding district than the enacted plan. So I say

13　this is statistical. All right.

14　　　　Q　And is your opinion, with regard to the

15　partisan impact of the enacted plan dependent on your

16　observations with respect to compactness of the enacted

17　congressional plan? Are these separate?

18　　　　A　They're separate conclusions. You know,

19　obviously, they're related because the way that District

20　1 is constructed is this, you know -- combining the

21　highly Republican-leading counties with

22　Democratic-leading county, to make additional Republican

23　district.

24　　　　Q　Are you giving an opinion today, that Franklin

25　county should be in a -- in a district that's

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1   represented by a Democratic representative?

2   A   No.

3   Q   When you were developing the criteria for your

4   algorithm, were you attempting to create a map that

5   might elect two Democratic representatives from

6   Kentucky?

7   A   No. Because my goal is to evaluate the

8   partisan bias of the plan. So I did not use partisan

9   information as input to my algorithm.

10   MS. HINKLE: Can you give me a minute?

11   JUDGE WINGATE: Are we at a good breaking point

12   for lunch?

13   MS. HINKLE: I think we are.

14   JUDGE WINGATE: Huh?

15   MS. HINKLE: We are, Your Honor. Thank you.

16   JUDGE WINGATE: Okay.

17   MR. MADDOX: Your Honor, I -- may I ask is if

18   Mr. Imai's examination has concluded or do you have

19   further questions?

20   JUDGE WINGATE: No. She's got further

21   questions. I'm just -- want to go to lunch.

22   MR. MADDOX: Yeah. I understand. I thought

23   maybe she was done.

24   MS. HINKLE: Well, if you would give me a

25   minute to confer, I can do that.

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1   JUDGE WINGATE: Yeah. Why don't we just see if

2   you're -- yeah. If you're -- if you've got a couple

3   more questions, that's all right.

4   MS. HINKLE: You know, I'd like to reserve the

5   chance to ask a few more questions after lunch, if I

6   may?

7   JUDGE WINGATE: Yes, ma'am. You-all can talk

8   over lunch, and it looks like you're getting pretty

9   close to the end.

10   MS. HINKLE: I am certainly very close.

11   JUDGE WINGATE: Okay. All right. Usually, I

12   give an hour and 15 for lunch. So we will return at

13   1:30. Okay? 1:30. Thank you all.

14   MR. ABATE: Your Honor, is it --

15   JUDGE WINGATE: You all need to talk to me

16   about anything? You can come up here.

17   MR. ABATE: Yeah. We were just wondering

18 if it's possible to do a slightly shorter break? I

19 don't know how long cross examination will last.

20 Dr. Imai does have his -- a plan to return to the

21 airport tonight --

22   JUDGE WINGATE: Why don't you just go down to

23   Buffalo Trace and do a tour or something? Yeah.

24   What time does his plane leave?

25   (OFF THE RECORD)

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1   JUDGE WINGATE: We're on the record. Okay.

2   You're still under oath, Doctor, okay? All right.

3   You may continue.

4   MS. HINKLE: We have no further questions on

5   direct exam.

6   JUDGE WINGATE: Okay. No further questions.

7   Very good. All right. Very good.

8   CROSS EXAMINATION

9 BY MS. BECKER:

10   Q   Good afternoon, Doctor. I'm Heather Becker. I

11 represent the Commonwealth. I want to understand two

12 points from your testimony. Using your ensemble and the

13 vote share that you calculated, it's true that 76 of

14 Kentucky's House districts lean in favor of Republicans,

15 right?

16   A   I don't recall the exact number.

17   MS. BECKER: Okay. Can I use your box bar

18   (phonetic)?

19   MS. HINKLE: Sure.

20   MS. BECKER: This is going to be okay for the

21   cameras?

22   CLERK: Yeah.

23 BY MS. BECKER:

24   Q   So, again, looking at your chart, 76 of

25 Kentucky's House districts lean in favor of Republican -

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1   - of the Republican Party, right?

2   A   That's a different -- you mean that 76 out of

3   100?

4   Q   Uh-huh.

5   A   That's not necessarily the case because --

6   should I explain the reason or...?

7   Q   Sure.

8   A   So each of these (Inaudible) is a distribution

9   of, you know, the district for -- like -- like older

10 (phonetic) at 76. So, it doesn't mean like every single

11 point. You cannot really compare across districts. So

12 it's possible that in -- for a particular simulated

13 plan, you know, 78 or 74 of the districts are leaning

14 towards one party or another. So you'd want to

15 calculate the actual number, expect the number of --

16 than five (phonetic) districts under the simulated plan.

17 So, that would be a different prop (phonetic). This

18 prop wouldn't necessarily tell you that.

19   Q   So, right here --

20   A   Right.

21   Q   -- the average of your 76th ordered district,

22 falls -- the median, falls below the 50 percent line.

23   A   Right.

24   Q   You would say that leans Republican?

25   A   So, the average, 76 -- I guess, my question --

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1   maybe I'm not understanding your question. But average

2   Democratic -- listen, Democratic, you know, vote share

3   of the average 76 simulated plan is yes for what -- 49,

4   you know -- point, whatever there.

5   Q   And everything before it?

6   A   Well, that's -- everything before what? I

7   just want to be careful about what I'm trying to --

8   being asked.

9   Q   This is your ensemble?

10   A   Right.

11   Q   The average of your ensemble districts would

12   order at 76 leading Republican?

13   A   Right. Among the all 76, you know -- ordered

14   districts among the simulated, the average vote share

15   for that district is below 50 percent. Yes. That's

16   right.

17   Q   Okay. And taking the average vote share of

18   the district that contains Franklin County in your

19   congressional simulation, the average Democratic vote

20   share was 43 percent, right?

21   A   I don't memorize what is numbers. So I don't

22   -- so it's -- this is congressional, not the House?

23   Q   Yes.

24   A   Okay. What was the question again? Sorry.

25   Q   When you look at the average vote share of the

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1   district that contains Franklin County in your

2   congressional ensemble --

3   A   Oh, okay.

4   Q   -- it's 43 percent?

5   JUDGE WINGATE: You're talking about Republican

6   votes, right?

7   MS. BECKER: He does it ordered by a Democratic

8   vote share. So it would be a 43 percent democratic

9   vote share.

10   A   43 -- yeah. Yeah. Okay. Right. So 43.6

11   percent. You know, among the simulated plans that

12   contain -- for the -- for the district that contains

13   Franklin County, has a 43.6 percent on average

14   Democratic voter share. That's right.

15   BY MS. BECKER:

16   Q   Okay. So, I think that's the bottom line on

17   your report. What I want to do now is talk about how

18   you got there. So I want to make sure I understand.

19   Your ensemble for the House analysis contained 10,000

20   maps, right?

21   A   That's correct.

22   Q   And you generated a like number for your

23   congressional analysis?

24   A   I generated 10,000 simulated plans for

25   congressional analysis as well.

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1   Q   And your algorithms could have made many

2 different sets of 10,000, right?

3   A   Yes.

4   Q   Is 10,000 the universe of all the maps that

5 could have been created?

6   A   No.

7   Q   And you didn't look at any of the simulations

8 in your ensemble, did you?

9   A   What do you mean, "Look at"?

10   Q   You didn't look at -- you didn't generate maps

11 from your simulations? You didn't look at what they

12 looked like in real life?

13   A   I did -- I did look at some of them.

14   Q   Before you received our reports?

15   A   Right. I mean, not all of them, but some of

16 them. Yes.

17   Q   All right. For your work in this case, you

18 used your Redis software, correct?

19   A   That's correct.

20   Q   And does -- you call it, "R"?

21   A   Yeah. R is the statistical programming

22 language that -- the Redis based off.

23   Q   Does R contain both your SMC and MCMC

24 algorithms?

25   A   S -- what do you mean, "Contain"?

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1   Q   Are they written into the R program?

2   A   It's part of the R package. Some parts are

3   written in, you know, C program just because it's

4   faster.

5   Q   I don't want to go through it in great detail,

6   but I would like to go through some of your code with

7   you. Okay?

8   A   Okay.

9   MS. BECKER: Can you go --

10 BY MS. BECKER:

11 Q   Are you familiar with this code?

12 A   This is the congress. This is the code for

13 the congressional simulation?

14 Q   So, this is the code you ran an R for your

15 congressional simulation analysis?

16 A   Uh-huh. Uh-huh.

17 Q   For right now, I'd like to mark it for

18 identification as Exhibit 1. Can you locate, for me, in

19 this document, where the algorithm you used to generate

20 your analysis is?

21 A   So the algorithm is in the package. So, this

22 is the code that caused (phonetic) the algorithm.

23 Q   So your algorithm's not in here?

24 A   Yeah. Algorithm is in the package Redis. So

25 Redis has a set of code that's, you know, contain that

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1   in that package. And this code caused the Redis.

2   Q   Okay. I'd like to look at the same document

3   for your House analysis.

4   A   Okay.

5   Q   So is this the House analysis -- the House

6   code analysis that you used?

7   A   Uh-huh.

8   Q   I'd like to mark this for identification as

9   Exhibit 2. Can you locate, in this document, where your

10   code is that you wrote for your analysis?

11   A   I'm not sure I'm understanding your question.

12   Q   The code that you used to generate your

13   simulation ensemble, where is it in this document?

14   A   Simulate? Yeah. So, this -- it's 03 -- or 03

15   simulate SHDMS.

16   Q   And it goes on for 44 pages?

17   A   Well, it depends on what you mean by, with --

18   so -- anyway. It has all -- all the prepping the data,

19   and setting of constraints, and all that is, you know,

20   prior to actually scoring (phonetic) the simulation

21   algorithm itself, to generate the simulated plan. So

22   there's a sort of prep part that has lots of lines of

23   code. In part, because of the custom constraint code

24   that, you know, have to have this county name and some

25   stuff.

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1   **Q   Is that pre-code located in the R package?**

2   A   So this code is not a part of the package.

3 This is the -- a code that caused the R package

4 function, which has the algorithm program, if that makes

5 sense.

6   **Q   I would also need to know what your R package**

7 **said, to know how to interpret this?**

8   A   What do you mean by, "Interpret"?

9   **Q   To be able to use this, I would also need to**

10 **know your R code, right?**

11   A   You need to be able to install the package and

12 -- to run this. That's right.

13   **Q   Well, let's look at your R code.**

14   JUDGE WINGATE: Heather, is the first one going

15   to be Exhibit 1 and then 2, then this 3?

16   MS. BECKER: Well, I guess, as a matter of

17 housekeeping, Judge, we do want to make sure that

18 our binder is numbered as 1, what we did at the very

19 beginning.

20   JUDGE WINGATE: Okay. Let me see here.

21   MS. BECKER: So, we could do that as 1 and then

22 I'll do -- the Congress code is 2. House code is 3.

23 And what Alex is handing you, the R code is 4.

24   JUDGE WINGATE: Well, what -- in your binder,

25 where are they listed?

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1   MS. BECKER: Those are not in our binder. These

2   are --

3   JUDGE WINGATE: Got you.

4   MS. BECKER: Those are just the stipulated

5   documents.

6   JUDGE WINGATE: Got you. Got you. Got you.

7   Got you. So, the first one you have is 1?

8   CLERK: No.

9   JUDGE WINGATE: No?

10   MS. BECKER: It would be 2.

11   JUDGE WINGATE: 2.

12   CLERK: District binder is 1, the stipulated

13   facts.

14   JUDGE WINGATE: The stipulated facts is 1?

15   MS. BECKER: Right.

16   JUDGE WINGATE: Now, I'm understanding. 2, 3,

17   and then 4 --

18   MS. BECKER: 2 would be the one that says, "Run

19   Congress." 3 would be the one that says, "Run

20   House." And then 4 will be the one that starts with

21   the "@RD name."

22   JUDGE WINGATE: Got you. This one right here.

23   MS. BECKER: All right. So --

24   JUDGE WINGATE: I got them now. All right. I'm

25   going put these all in here.

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1 BY MS. BECKER:

2   Q   So, the -- I'm going to -- let me just mark

3 that one as number 4. So the document we're on is

4 number 4. This is your -- this is your R code, correct?

5 The R package software?

6   A   I -- I think so. I mean -- I assume you print

7 it out from the Redis file. I mean, I don't memorize it

8 with line. So, you know, assuming that this was printed

9 out from the actual package. Yes.

10   Q   So once I have all three of these sets of

11 code, I'm ready to start your simulation process, yes?

12   A   You have to first, you know, install the

13 package. The package is a set of programming files. So

14 you have to, you know, download that and install. And

15 then once that's done, then yes, the other R files can

16 be used to generate the simulated plans.

17   Q   And so that's roughly 11 files, and 13

18 libraries, and roughly 90 pages of code that I would

19 need to have under my belt, before I could start what

20 you did?

21   A   Yes. But -- yeah. that's -- I mean, you have

22 to have them. Yes. Without them, it's -- you wouldn't

23 be able to run. That's correct. But you know, R,

24 itself, has many, many files. So if you -- you know, if

25 you -- if your definition is you have to have all these

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1   programs, then you have to have all R -- all the code

2   that's a backbone of R has to be printed out as well.

3   That would be, you know, hundreds of files.

4   Q   So, you say that you use R, so that anyone can

5   recreate your work?

6   A   That's correct.

7   Q   I would need an expert to tell me how to do

8   what we just walked through. I might need you.

9   A   Yeah. But others can -- not just me, but

10   others can also use it as well. So -- yeah. You may

11   need some expertise to use R and associate packages, but

12   yes, that's correct. But you don't need me, per se.

13   Like you could have somebody else who is familiar with R

14   and R packages.

15   Q   All right. You've never been appointed to

16   draw a redistricting plan, have you?

17   A   No.

18   Q   I have a couple questions about some of the

19   new analysis you unveiled today in your direct

20   testimony.

21   A   Sure.

22   Q   You reviewed Professor Voss' report. You

23   reviewed Mr. Trende's report. When did you form the

24   opinions that you shared today?

25   A   This weekend, I think, after I received and

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1 reviewed the -- you know, the report and the -- and the

2 code -- associated code and data.

3   Q   And did you disclose your opinions to your

4 Counsel?

5   A   What do you mean by, "Disclose"?

6   MS. HINKLE: I'm just going to object, to the

7   extent your question is trying to invade our

8   communications and work products.

9   MS. BECKER: Judge, I'm entitled to --

10   JUDGE WINGATE: No. It's not really that. It's

11   just when did you disclose, that's a typical

12   question. Yeah. You can answer that question,

13   Dr. Imai.

14   A   Okay. Yeah, I show the results -- I shared

15 the results of the analysis with Counsel.

16 BY MS. BECKER:

17   Q   When?

18   A   When? Sunday.

19   Q   Did you provide Counsel with any of the

20 underlying data for your conclusions?

21   A   I used the data I received from -- you know,

22 for the -- Dr. Voss and Dr. Trende's -- Mr. Trende's

23 analysis. So they -- the Counsel had those.

24   Q   I'd like to look at your CV really quickly.

25   A   Okay.

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1   Q   Counsel, on direct, asked you about your

2 publications. How many of your publications relate to

3 the work and analysis that you're doing here today?

4   A   Okay. Yes. Three of them relate very closely

5 to what I'm doing today. But there are -- there are

6 other -- there are other publications that are about

7 simulation algorithms and, you know, general area of

8 research. But three are specifically about

9 redistricting simulation algorithms.

10   Q   I'd like to talk about some of your -- some of

11 your report now.

12   A   Okay.

13   Q   So looking at your House analysis, the -- you

14 would agree that the input criteria that you choose are

15 important to the outcome?

16   A   Yes. I do agree.

17   Q   So they have to be chosen carefully?

18   A   That's -- that's correct.

19   Q   And if you use additional or other criteria

20 that could change your conclusions?

21   A   That could. Yes.

22   Q   So I want to look at page 7 of your report.

23 Down here in paragraph 16, you have several bulleted

24 points. These criteria -- these are the constraints

25 that you imposed in your simulations, right?

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1   A   Right. I mean, in the, you know, actual

2 constraint itself is mathematical but this described.

3   Q   Okay. So these are the criteria and then you

4 assign constraint levels to the criteria?

5   A   Right. So this is my attempt of, you know,

6 describing the constraints that I used.

7   Q   I think what you're talking about, you

8 described a little bit better on page 22. Can you turn

9 to the appendix of your report?

10   A   Right. That's the details.

11   Q   So you say that you set a county split

12 constraint at a level of ten. And you set a county

13 multi-split avoidance at a constraint of seven, and a

14 custom constraint at a level of ten.

15   A   This is paragraph 11, on page 22, is that --

16   Q   I'm sorry?

17   A   Is it -- this is paragraph 11 on page 22?

18   Q   10 and 11. Yes.

19   A   10 and 11. Yes.

20   Q   What's the significance of a constraint of

21 seven?

22   A   Do you mean statistical -- I'm just trying to

23 understand your question.

24   Q   Sure. You chose a constraint of seven.

25   A   Uh-huh.

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1   Q   If you -- no one told you to set it at seven,

2 you picked seven.

3   A   Oh, okay. How did I -- why did I choose

4 seven?

5   Q   Well, so I guess, two questions not to ask

6 compound. You picked seven, and what would the

7 difference have been if you picked one, or two, or five?

8   A   Oh, okay. I don't believe I tried those one

9 to five specific numbers, but the general principle to

10 choose this constraint is to -- at least in this case,

11 that trying to minimize the number of spreads, whatever

12 the constraints trying to, you know, reduce, to the

13 extent that algorithm is actually capable of doing that.

14 So algorithm has multiple diagnostics that basically

15 tells you whether -- you know, because if you make the

16 constraint too strong, obviously there wouldn't be any

17 primes -- or a very small number of primes that would be

18 able to satisfy that. So, you know, you reduce it to

19 the point where -- like, the algorithm's still

20 performing well. And the other thing is that there's

21 multiple constraints. So you have to, you know, reduce

22 each one of them to the extent that still the algorithm

23 is performing well, based on the general diagnostics

24 that's available.

25   Q   So you wanted your algorithm to discourage

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1   multi-splits and you felt that a constraint of seven

2   would accomplish that?

3   A   Right. And in pushing to below that, I felt

4   that we would start impacting the efficiency of the

5   algorithm. So, that's the -- you know, that's the level

6   I chose.

7   Q   And you didn't have any reason to believe that

8   the Kentucky General Assembly was drawing its plan with

9   a constraint to avoid multi-splits, at a level of seven,

10   did you?

11   A   No. So my -- yeah -- no.

12   Q   You said you didn't run it with a different

13   constraint level?

14   A   I did run it with different values. I didn't,

15   you know, record every single one of them, but I settled

16   on these values and -- because I found that these values

17   are still maintaining the efficiency of algorithm, while

18   reducing these con -- splits, as much as possible.

19   Q   And did you include that criterion because

20   Plaintiff's Counsel told you to?

21   A   Which one?

22   Q   The multi-split constraint?

23   A   Yeah. So the interpretation of the section

24   33, I did (Inaudible) on Counsel.

25   Q   Do you have an independent understanding of

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1   what Kentucky law requires?

2   A   No. I'm not a lawyer.

3   Q   Have you ever read the case Jensen v. State

4   Board of Elections?

5   A   No.

6   Q   You'd said that you tried different constraint

7   levels and that the algorithm was running efficiently at

8   seven. What does the efficiency of the algorithm mean?

9   A   Right. So algorithm can stuck if you increase

10   the strengths of the constraint too much. Because then

11   algorithm won't be able to find another plan that will

12   satisfy that constraint. So in this Markov chain Monte

13   Carlo and Sequential Monte Carlo literature, there are

14   set of diagnostics techniques that one can use to make

15   sure that algorithm are, you know, running efficiently.

16   Q   So I know what you told your algorithm to

17   consider. You didn't instruct your algorithm to

18   consider race?

19   A   No.

20   Q   You didn't instruct your algorithm to consider

21   communities of interest?

22   A   No.

23   Q   You didn't instruct your algorithm to consider

24   where schools are?

25   A   No.

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1   Q   You didn't instruct your algorithm to consider

2 where churches are?

3   A   No.

4   Q   You didn't instruct your algorithm to consider

5 where neighborhoods are?

6   A   No. No, to the extent --

7   Q   You didn't --

8   A   Sorry. So no to the -- yeah. I didn't

9 incorporate those factors directly, but that doesn't

10 necessarily mean that those, you know, say for example,

11 neighborhoods (phonetic) aren't kept together because

12 to, you know, to the extent the counties, for example,

13 corresponds to neighborhoods. And to that extent, the

14 simulated plans may have those characteristics. But I

15 didn't directly tell algorithm, keep this particular

16 neighborhood together or, you know, churches, or schools

17 in the certain districts. No.

18   Q   And you didn't instruct your algorithm to

19 consider the location of county seats?

20   A   No.

21   Q   You didn't instruct your algorithm to consider

22 the major transportation corridors in this state?

23   A   No.

24   Q   And you didn't instruct your algorithm to

25 consider where natural boundaries are, like rivers or

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1 mountains?

2   A   No.   But to the extent that they might

3 coincide with, you know, county boundaries.

4   Q   The county boundaries?

5   A   Yeah.   That's right.

6   Q   And you didn't instruct your algorithm to

7 consider where incumbents or candidates live?

8   A   No.

9   Q   And you didn't instruct your algorithm to

10 consider or try to prevent double bunking?

11   A   No.

12   Q   And you didn't instruct your algorithm to

13 consider maintaining the continuity of representation?

14   A   No.

15   Q   And you didn't instruct your algorithm to

16 consider core retention of districts?

17   A   No.

18   Q   So not a single one of the simulations in your

19 ensemble considers any of the things we just talked

20 about?

21   A   Not directly considers that.

22   Q   Wouldn't you agree though, that those are all

23 well-established, traditional redistricting criteria?

24   A   What do you mean by, "Traditional

25 redistricting criteria"?

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1   Q   That those are things courts have told us over

2 time, are reasonable for redistricters to consider when

3 enacting a plan?

4   A   I don't want to say these are the set of

5 traditional redistricting criteria. I think in the

6 academic literature reached, you know, things like

7 population, quality, compactness are considered a

8 traditional redistricting criteria. Other things that

9 you've listed may or may not. I don't really wish to

10 express opinion on exactly what counts as traditional

11 redistricting criteria.

12   Q   You can say, I don't know.

13   A   Oh, okay. Okay. Well, I know about them, but

14 I don't want express opinions on whether they count as

15 traditional redistricting criteria.

16   Q   But at the end of your simulation analysis --

17 or at least the first part of it, you conclude that

18 House bill two makes three additional splits to counties

19 more than the average necessary in your ensemble. I'm

20 looking at the chart on page 9 of report.

21   A   Right. Okay. You mean figure 1?

22   Q   Yes.

23   A   Okay. Right. So on average, a simulated plan

24 has, you know, 15 and enacted plan is 18. So the

25 difference is (Inaudible) --

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1   Q   We'll move on to the next step of your

2 analysis. You then went on to calculate the partisan

3 vote share. And you said, you used six statewide races

4 from 2019 in Kentucky, and two 2016, federal statewide

5 race. How did you weight those races?

6   A   Equally.

7   Q   So each of the six constitutional office races

8 are given the same weight -- so, is it a one-to-one or

9 did you --

10   A   One-to-one.

11   Q   The presidential and US Senate race, those are

12 both statewide races. Are state legislative races,

13 statewide races?

14   A   No.

15   Q   Are presidential races and US Senate races

16 good predictors for legislative races -- state

17 legislative races?

18   A   I haven't done analysis of Kentucky, you know,

19 election forecasting, so I don't know.

20   Q   So it's not your expert opinion that those

21 races are good predictions, because you couldn't form

22 that opinion?

23   A   I used them as a major of partisan -- you

24 know, partisanship at the precinct-level, as standard

25 (phonetic) in the academic literature.

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1   Q   So by selecting those races, you're assuming

2 that voting patterns and voting history don't change,

3 right?

4   A   No.

5   Q   So if someone who votes one way in the

6 presidential race, you assume votes the same in a Senate

7 race, the same in all six constitutional office races?

8   A   No. I don't make that assumption. I'm using

9 them as a measure of partnership at the precinct-level.

10 It has nothing to do with the voting -- you know,

11 prediction of voting behavior.

12   Q   But you would agree that voter preferences do

13 change?

14   A   Yes -- yeah. A little. Yeah. They could

15 change.

16   Q   And that the candidate quality could really

17 impact turnout or support for a particular candidate?

18   A   Sure.

19   Q   But you didn't consider candidate quality when

20 you were selecting your races?

21   A   So I used all the statewide elections for

22 which I had the precinct-level results. So I did not

23 consider candidate characteristics.

24   Q   And so you didn't consider the pertinent

25 races, when you were picking those particular returns to

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1   look at?

2   A   No.

3   Q   And specifically with your -- the selected

4   state races that you chose, you didn't do anything to

5   account for the clear outlier of the gubernatorial race,

6   did you?

7   A   No. That's the point of combining multiple

8   races. You don't want to rely on a particular race. And

9   so, by averaging all the different races, you tried to

10 get a good measure of partnership.

11   Q   But you certainly noticed that for all the

12 other five state constitutional offices, Republican

13 candidates, won handily?

14   A   I actually didn't even consult who won. I

15 took those election results, and took the average, and

16 this is standard practice.

17   Q   You. So the races you chose didn't

18 contemplate at all that Matt Bevin ran a terrible

19 campaign?

20   A   Nope. I didn't do that.

21   JUDGE WINGATE: Is that what you-all stipulated

22   for?

23   MR. MADDOX: We'll stipulate to that.

24 BY MS. BECKER:

25   Q   So, but when you included Andy Beshear's vote

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1   share in your calculation, you didn't consider that Matt

2   Bevin said, that teachers kill kids?

3   A   No.   I didn't even know about that, so...

4   Q   And you didn't know that he called teachers

5   thugs?

6   A   No.

7   Q   You didn't know that he threatened the

8   northern Kentucky population with a toll bridge?

9   A   Oh, no.

10   Q   And you didn't know that he removed expanded

11   public assistance to the Commonwealth?

12   A   No.

13   Q   You didn't know that large populations of the

14   Republican Party disliked Matt Bevin?

15   A   No.   I didn't know that.

16   Q   That.   So you didn't account for any of that

17   when you included Andy Beshear's high Democratic vote

18   share in your calculation?

19   A   No.   So the taking the, you know, average to -

20   - so that you try to get general measure of

21   partisanship, not specifically any candidate or any

22   race.

23   Q   I want to look back at -- we could look up

24   here if you like, but this is on page 11 of your report.

25   When you were characterizing where the Democratic-lean

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1   versus the Republican-lean breaks, you used the flat 50

2   line as the line of demarcation for that, right?

3   A   Yeah. That's right.

4   Q   But you don't have any reason to believe that

5   the statewide average vote share of Democrats at 50

6   percent is when Democrats and legislative races actually

7   start winning races?

8   A   Right. So, this is -- it's -- you know, it's

9   just the average vote share across multiple elections

10   that I looked at. So this is not a prediction of what

11   might happen in the next election. This is just measure

12   of, you know, possibly for one way or another.

13   Q   But I think what you said earlier, was that

14   you highlighted these particular elections because they

15   were the competitive ones. That suggests that the 50

16   percent line is important.

17   A   Right. I mean, in order to identify -- you

18   know, it is a measure of partnership. So when the

19   measure is close to 50/50, those are districts that tend

20   to be competitive in the next elections as well.

21   Q   But you have no reason to believe that's

22   actually true in Kentucky?

23   A   Well, you know, general tendency in many

24   states is that these type of averaging past election

25   results tend to correlate with the, you know, future

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1   election. Just to the extent that past election is

2   correlated with the future election.

3   Q   I'm talking about Kentucky.

4   A   Even Kentucky I -- but, you know, I haven't

5   done analysis in that sense. Right. Yeah.

6   Q   So, no --

7   A   I don't have a specific analysis to show you

8   that.

9   Q   And if the threshold that is appropriate is

10 somewhere closer to 51, 52 or 53 percent, would that

11 change your analysis?

12   A   Well, it may change the -- well, it doesn't

13 really change the analysis. The fact that those D76 to

14 the D79 is an outlier. That fact is not changed. It

15 doesn't matter how dotted line moves up and down. But

16 the fact that those D76 to D79 red dots are below the

17 simulated prime Democratic portion (phonetic), that fact

18 won't change. In fact, the simulate -- you know, that

19 box (Inaudible) and dots won't change. It just what's

20 going to change is just the dotted line going up and

21 down.

22   Q   So -- but D76 is not an outlier and D77 is not

23 an outlier?

24   A   Okay. Well -- yeah. Sorry. I'm just doing

25 the visual inspection here. But -- yeah. Anyway, the -

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1   - most -- the D76 and D77, you know, whether you call

2   this outlier or not, vast majority of (Inaudible) primes

3   have higher than prior vote share (phonetic) for those

4   districts. So that factor won't change.

5   Q   But it also wouldn't change that you're

6   predicting -- or guessing based off your vote share,

7   that the ordered District 76 and below are clearly

8   Republican districts?

9   A   Yeah. Each election may have some swings,

10   right, as -- as you all know. You know, some elections,

11   Democrats do better. In other elections, Republicans do

12   better. But what's important is the relative difference

13   between the red dots and the box bar (phonetic). And

14   that won't change, even if there's a uniform swing.

15   Q   But if the dotted line moves to 51 percent

16   median, District 77 and 78 are below that relevant line?

17   A   Right. If the dotted line moves to, you know,

18   52 percent -- and yes, those red line -- red dots become

19   below the dotted line. But what I'm saying is that the

20   fact that the enacted plan systematically deviates from

21   the simulated plan, that fact won't change. Because

22   remember simulation doesn't use election results at all.

23   So it's the -- you know, when you evaluate. That's when

24   the election results come in,

25   Q   Do you know how many seats Republicans

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 1   currently hold?

 2        A     In the House?

 3        Q     Yes.

 4        A     I don't remember exactly.

 5        Q     Do you know how many votes are needed to

 6   override a veto?

 7        A     I don't remember exactly.

 8        Q     Do you know how many votes are needed to pass

 9   a bill?

10        A     Don't want to -- I don't like to, you know --

11   yeah.  I don't remember exactly, so

12            MS. BECKER:  Need to do a little bit of setup.

13            JUDGE WINGATE:  Guess we're going to get some

14       color copies.  I'm glad to see that you-all have got

15       color copies.  Because, you know, I told you, we

16       don't' have color copiers in the judiciary.

17            MR. MADDOX:  You still don't have that copier,

18       Judge?

19            JUDGE WINGATE:  Uh-uh.  I even asked for one, I

20       said, you know, I need a color copier, I'm doing

21       this big case, you know.  And they said -- they

22       laughed, and they said, they'll give you the color

23       copies.

24            MR. ABATE:  Which one is this?

25            MS. BECKER:  This is old congressional -- the
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1   old -- Judge, if you got a color printer, Staples

2   won't be making a mint anymore.

3   JUDGE WINGATE: Okay. Now do I need both these

4   or is one for --

5   MS. BECKER: Well, there's one from Morgan.

6   JUDGE WINGATE: Here's one from Morgan. Okay.

7   I think I've got two here. I've got two here. Do I

8   need two?

9   CLERK: There should be a --

10   JUDGE WINGATE: Do I got the same ones?

11   CLERK: You've got the same ones.

12   JUDGE WINGATE: Thanks.

13   MS. BECKER: She said that, where this is,

14   might block the camera.

15   JUDGE WINGATE: Oh, got you.

16   MS. BECKER: Can you just say something, so she

17   can check the camera?

18   THE WITNESS: Hello.

19   MS. BECKER: We're not worried about the news.

20   We're worried about the record.

21   THE WITNESS: Oh, okay.

22   MS. BECKER: You're good on the record.

23   THE WITNESS: Okay.

24   BY MS. BECKER:

25   Q   So, in your opinion summary, you say that

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1 there are districts in Jefferson and Fayette County that

2 improperly adjoin Republican precincts to make seats

3 safer, right? You focus in on districts 33, 48, 88, and

4 45. I'm on page 13 of your report -- the beginning on

5 13.

6   A   Yes. I focus on -- yeah -- 33 and 48 in

7 Jefferson. And mention a couple other districts as

8 well.

9   JUDGE WINGATE: It looks like the 48 needs to

10   go into Oldham also. Am I reading that right?

11   MS. BECKER: That -- so that is my point.

12   JUDGE WINGATE: And the 33 looks like it used

13   to go into Oldham, just not as much -- or more -- 33

14   is more into Oldham, right? Now, under the new

15   plan?

16   MR. MADDOX: I'll just leave them here.

17 BY MS. BECKER:

18   Q   So, the Judge has beat me to the chase here,

19 but I want to look at District 48. So, this is the old

20 map. This is the map that was drawn in 2013. And so,

21 you can see District 48 here and District 48 over there.

22 They make the same cut into Oldham county. Are you

23 aware that on the new map, the only change here is one

24 precinct?

25   A   No. I'm not aware.

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1   Q   And Judge also noted that District 33 has

2 always gone into Oldham County. Can you see that here,

3 as well as over there?

4   A   I see that.

5   Q   And you understand that District 36 gained

6 population. So this portion had to be taken up

7 somewhere. And you see that was done with District 33.

8 And for the first time you understand Shelby County

9 exceeded the population of an ideal district, and it had

10 to shed population.

11   MS. HINKLE: Are you asking him if he knows

12   that or asking him to accept it?

13   MS. BECKER: I'm asking him if he knows that.

14   A   No.

15 BY MS. BECKER:

16   Q   And you see that part of Shelby County was

17 attached to 33?

18   A   Yeah. I see that. Yeah.

19   MS. BECKER: Can I use your Fayette County

20   insert?

21   MS. HINKLE: Sure.

22 BY MS. BECKER:

23   Q   And so over here you said that District 88 has

24 been made more Republican by adding Scott County. Do

25 you see how white shaded that portion of Scott County

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1   is? It's not a large portion of Republican voters.

2   A   Oh, you mean on the right map?

3   Q   Yes.

4   A   Yeah. So that is showing that on average,

5   across simulated plan, those white areas would have

6   belonged to a more competitive district. It's not

7   showing that both Democrats and Republicans live there

8   necessarily. It's showing that particular area would

9   have belonged to more competitive districts, under the

10   simulated plan.

11   Q   Okay. I want to look back at your CV.

12   A   Okay.

13   Q   Prior to 2012 [sic], you had not offered

14   expert testimony in any litigation.

15   A   Prior to 20 -- what year did you?

16   Q   2021.

17   A   Oh, yes. Correct.

18   Q   And that includes partisan gerrymandering

19   litigation?

20   A   Right. That's correct.

21   Q   Earlier, Counsel asked you if you had ever

22   declined a job, and you'd indicated that you had. What

23   jobs had you declined, beyond the one where you were

24   already retained by the other side?

25   A   I was -- yeah. I was asked by the lawyers --

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1   of the counsel representing New York Democrats for the

2   New York redistricting case, recently.

3   Q   And you'd indicated that you declined that job

4   because you didn't think they'd be able to prove their

5   case?

6   A   I didn't feel comfortable based on the

7   analysis I've done myself. I don't feel comfortable

8   proceeding with that case -- providing expert witness

9   case in that.

10   Q   Had you declined any other jobs?

11   A   Trying to remember. I don't think so. Oh,

12   but I don't want to -- yeah. I feel like I may have,

13   and I may not have, so -- because these, you know, these

14   are short conversations that happened, and I sort of

15   don't remember after that. So I may have, but not,

16   like, often.

17   Q   Did you decline any work in the Maryland

18   redistricting litigation?

19   A   I wasn't asked by -- approached by anyone in

20   the Maryland case.

21   Q   okay. I want to talk about your algorithms

22   now. You introduced your MCMC algorithm in 2020, right?

23   A   You mean -- are you talking about the specific

24   publication or...?

25   Q   Yes. Is that the first publication where you

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1 introduced that algorithm?

2   A   So in academia there's often a huge lag

3 between when you have a paper and then, you know,

4 there's (Inaudible). But the Journal of Computational

5 and Graphical Statistics paper, I think that's what

6 you're referring to. Is that what you're referring to?

7 I'm just trying to make sure it's 2020. It's not some

8 other years. Yeah. That's right. So, the Journal of

9 Computational and Graphical Statistics. Yeah. 2020 is

10 the publication year. Yes.

11   Q   Are you looking at number --

12   JUDGE WINGATE: Do what?

13   CLERK: I think something's wrong with the

14 system. Hold on.

15   MS. BECKER: Oh, yeah. It's going red.

16   JUDGE WINGATE: What did you just say?

17   CLERK: Give me a second.

18   JUDGE WINGATE: We've never had that happen.

19   CLERK: I don't know if it's, like,

20 overheating. It's making a loud noise. I can call

21 Amy if you want, or you can just pray it's

22 recording.

23   JUDGE WINGATE: Why don't you -- we'll just

24 keep it because it's lights are still on. Would you

25 just step out and talk to Amy, and see if she knows

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1   what it is?

2   CLERK: Yeah.

3   JUDGE WINGATE: I've never had that beep happen

4   in 23 years. Okay. You can continue whenever you

5   want.

6   MS. BECKER: I'm sorry, Judge. Did you say

7   that we could go, or no?

8   JUDGE WINGATE: Well, let's just wait. Let's

9   do this. Let's stop and just wait. Might be better

10   to wait and talk to Amy.

11   (OFF THE RECORD)

12   JUDGE WINGATE: -- not having yet. Okay. Okay.

13   You may continue.

14   MS. BECKER: Does it matter that it's still

15   red?

16   JUDGE WINGATE: What?

17   CLERK: We want it to be red.

18   MS. BECKER: Oh, you want it to be red? Okay.

19   CLERK: If it's yellow, it's bad. Or flashing.

20   BY MS. BECKER:

21   Q   I think when we stopped, we were talking about

22   on your CV, page 4, the article you have cited as number

23   12. We were talking about that as the first article,

24   where you introduced your MCMC algorithm in 2020?

25   A   That's right.

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1   Q   And that wasn't the only article you wrote

2   about the MCMC algorithm you were working on. You wrote

3   another one, right?

4   A   Yes.

5   Q   I'd like to hand you a copy of that.

6   MS BECKER: And Judge, I think we're on

7   Commonwealth Exhibit 5.

8   JUDGE WINGATE: Uh-huh, that's the one you're

9   on.

10   BY MR. BECKER:

11   Q   Professor, are you familiar with this article?

12   A   Yes.

13   Q   Did you write this article?

14   A   Yes. With collaborators.

15   Q   I'm sorry?

16   A   With collaborators. Yes.

17   Q   And it was published in the Journal of

18   Computational and Graphical Statistics?

19   A   That's correct.

20   Q   And it was published in 2020, sometime early

21   in that year?

22   A   Yeah. I don't know exactly when, you know, it

23   was -- yeah. I don't know exactly when it was published

24   back during that year.

25   MS. BECKER: I'd like to admit this as an

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1   exhibit, please.

2   JUDGE WINGATE: Okay. Let's -- how about we go

3   ahead and admit 1, 2, 3, 4 and 5 right now. Okay.

4   Is there any in objections, Michael, to any of

5   those, or Casey?

6   MS. HINKLE: No, Your Honor.

7   JUDGE WINGATE: Okay.

8   (COMMONWEALTH'S EXHIBIT 1 ADMITTED INTO

9   EVIDENCE)

10   (COMMONWEALTH'S EXHIBIT 2 ADMITTED INTO

11   EVIDENCE)

12   (COMMONWEALTH'S EXHIBIT 3 ADMITTED INTO

13   EVIDENCE)

14   (COMMONWEALTH'S EXHIBIT 4 ADMITTED INTO

15   EVIDENCE)

16   (COMMONWEALTH'S EXHIBIT 5 ADMITTED INTO

17   EVIDENCE)

18   BY MS. BECKER:

19   Q   And then -- so you continue to work on this

20   algorithm, you authored a second article, correct?

21   A   Yes. I've written multiple papers.

22   Q   But on this particular topic, the next article

23   you wrote was what you have at number 13, another 2020

24   article?

25   A   Yes. That's -- that's correct.

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1   Q   Are you familiar with this article?

2   A   Yes.

3   Q   You wrote this article?

4   A   Yes.

5   Q   And it was published in the Journal of

6 Statistics and Public Policy?

7   A   That's correct.

8   Q   In 2020?

9   A   That's correct.

10   MS. BECKER: Move to admit this as

11   Commonwealth's Exhibit 6.

12   JUDGE WINGATE: Okay. Any objection?

13   MS. HINKLE: No, Your Honor.

14   JUDGE WINGATE: Okay. It's admitted.

15   (COMMONWEALTH'S EXHIBIT 6 ADMITTED INTO

16   EVIDENCE)

17 BY MS. BECKER:

18   Q   I notice that you wrote this article, as well

19 as the one before with a gentleman by the name of

20 Benjamin Fifield.

21   A   Yes.

22   Q   What does he do now?

23   A   He's a data analytic -- analyst for ACLU.

24   Q   These papers were peer-reviewed?

25   A   That's correct.

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1   Q   And they were approved for publication?

2   A   That's correct.

3   Q   Did you introduce your SMC algorithm in 2021?

4   A   2020.

5   Q   2020 was the first draft?

6   A   Well, yes. So, these papers, you know, takes

7 time to be appearing in print. So the publication date

8 does not necessarily correspond to when the method was

9 developed.

10   Q   I want to make sure you heard my question. I

11 asked about your SMC algorithm.

12   A   Right. SMC, I think the first draft was 2020.

13   Q   Okay. I'd like to hand you a copy of your

14 working paper --

15   A   Okay.

16   Q   -- for that algorithm.

17   A   Okay.

18   Q   So this document, it says -- are you familiar

19 with this document?

20   A   Yes.

21   Q   Did you write this?

22   A   Yes.

23   Q   And your first draft was in 2020?

24   A   That's correct.

25   Q   And it says, "This draft, August 10, 2021"?

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```
1      A      That's correct.

2      Q      Was this article published in a journal?

3      A      It's in the review process.

4      Q      So it's in the peer-review process?

5      A      That's correct.

6      Q      So this is a working paper?

7      A      That's correct.

8             MS BECKER:  I'd like to move to admit this as a

9      Commonwealth's Exhibit 7.

10            JUDGE WINGATE:  Okay.  Do you have any

11     objection?

12            MS. HINKLE:  No.

13            JUDGE WINGATE:  Okay.

14               (COMMONWEALTH'S EXHIBIT 7 ADMITTED INTO

15               EVIDENCE)

16     BY MS. BECKER:

17            Q      I want to talk about some of your statements

18     in this working paper.  I'm looking on the first page in

19     the abstract.

20            A      Okay.

21            Q      Where it says, "For successful application."

22     I'm going to read it to you.  It says, "For successful

23     application, sampling methods must scale to large maps

24     with many districts, incorporate realistic legal

25     constraints, and accurately and efficiently sample from
```

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1   a selected target distribution. Unfortunately, most

2   existing methods struggle in at least one of these

3   areas." What, "Existing methods," were you talking

4   about?

5   A   This is a general statement. So it's not

6   specific -- particular, you know, algorithm, per se.

7   Q   You wrote this paper to address concerns with

8   the MCMC algorithms that were prevailing at the time,

9   right?

10   A   That's correct.

11   Q   And so you're saying here, that your MCMC

12   algorithm cannot in actuality sample from a specific

13   target distribution?

14   A   I didn't say that.

15   Q   You say, it suffers from one of these

16   weaknesses, correct?

17   A   Yes. But that's different from saying to not

18   sample. So it's -- in the context of academic research,

19   we always try to improve the existing algorithms and,

20   you know, that's -- that's the context. So we always

21   want to, you know, include what's out there. That's why

22   we do research.

23   Q   I want to read -- not the next sentence, but

24   the one after it. You write, "Because it samples

25   directly, the SMC algorithm can efficiently explore the

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1   relevant space of redistricting plans better than the

2   existing Markov chain Monte Carlo, MCMC algorithms, that

3   yield dependent samples," is that a true statement?

4   A   Statement is true, but it's not -- it's all

5   relative, right? We trying to improve the performance

6   of the existing algorithms.

7   Q   Will turn with me to the second page. I'm

8   looking at the fifth whole paragraph.

9   A   Page 1, or page 2?

10   Q   It's labeled as page 1.

11   A   Oh, page 1.

12   Q   But it's the second page of that document.

13   A   Okay. Okay.

14   Q   You say, "MCMC algorithms can, in theory,

15   sample from a specific target distribution and

16   incorporate constraints through the use of an energy

17   function. In practice however, existing algorithms

18   struggle to mix and traverse through a highly complex

19   space, making scalability difficult and accuracy hard to

20   prove. Some of these algorithms make proposals by

21   flipping precincts at the boundary of existing

22   districts, and rendering it difficult to transition

23   between points in the state space, especially as more

24   constraints are imposed." Did I read that accurately?

25   A   I think you did.

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1   Q   Now, the articles that you cite

2 parenthetically here, do you cite your own article in

3 both of those statements?

4   A   Yeah. I'm trying to prove myself, too, so...

5   Q   Can you turn with me to numbered page 3?

6   JUDGE WINGATE: Did you say page 30?

7   MS. BECKER: Yes.

8   Q   About midway through this page, you refer to

9 another expert in your field, Wendy Tam Cho, and her

10 criticisms of the existing MCMC algorithms. And in

11 response, you write the third full paragraph. I'm going

12 to read just a portion of it. "First, the distributions

13 that some of these algorithms sample from are not made

14 explicit, leaving open the possibility that the

15 generated ensemble is systematically different from the

16 true set of all valid plans. Second, even when the

17 distribution is known, the MCMC algorithms used to

18 sample from it may be prohibitively slow to mix, and

19 cannot yield a representative sample." Did I read that

20 correctly?

21   A   Yes. You did.

22   Q   Would you turn with me to page 13 of this

23 article. I'm not going to read all of this page, but

24 what I would like to ask you is a question, this

25 summarizes what's going on here. So what I read on this

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1   page, is that at least at two separate points, your MCMC

2   algorithm failed to yield reliable results, correct?

3   A   What do you mean by, "Your MCMC algorithm"?

4   Q   So throughout this article where you're citing

5   back to yourself, you call the comparison, "The state of

6   the art MCMC algorithm." And in the second paragraph on

7   page 13, you say, "The upper panel of figure 4A shows

8   the resulting density estimates. While the target

9   distribution is highly multimodal, there's a good

10   agreement between the SMC sample and the reference

11   distribution. In contrast, the MCMC samples fail to

12   accurately capture the left tail of the distribution,

13   and over sample certain values of the right tail," does

14   it say that?

15   A   Yeah, so this MCMC algorithm that I used in

16   this article is not the same as the one I developed. So

17   it's something that's different by a different author.

18   But, you know, these are comparisons of -- in the

19   academic article, you know, validation exercises to see

20   how challenging problems (phonetic) can be addressed,

21   you know, efficiently by one method over another, so...

22   Q   The last sentence on this page reads, "In

23   comparison, the MCMC algorithm was not able to sample

24   accurately from this target distribution in 20,000

25   iterations." Did I read that correctly?

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1   A   Yes. But this is not a general statement. So

2 it's -- in this particular example that are actually

3 somewhat contrived because here in these -- these

4 examples, you can actually enumerate the all possible

5 ways. So you can actually, you know -- know exact truth

6 -- true distribution is, and it's a very challenging

7 setup that we, you know, set these things up, so that --

8 to see how these different algorithms perform in these

9 specific applications. So -- and I don't want to take

10 this sentence out of context and, you know, make it into

11 a general statement.

12   Q   I want to look on page 14. It says in the

13 first paragraph, four lines down, you write, "Since the

14 merge split MCMC algorithm is not specifically designed

15 to enforce this hard constraint, we do not present its

16 results." In this paragraph where you're not presenting

17 the results because the algorithm is not designed to

18 enforce the hard constraint, isn't the hard constraint,

19 a hard multi-split (phonetic) constraint?

20   A   I'm sorry. Should I answer now?

21   Q   Yes.

22   A   So the multi-split constraint is not a hard

23 constraint that I used in the Kentucky case. It's not a

24 hard constraint. So this hard constraint I'm talking

25 about in this article is just the total number of

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1   counties being spread. So in SMC, you can actually turn

2   that into hard constraints, so that no simulated plans

3   have, you know, more than certain number of counties

4   that are being split. But multi-split constraint is

5   actually a soft constraint that I used.

6   JUDGE WINGATE: Jill, I used to fine people

7      $50, and give it to your domestic violence group.

8   Remember that?

9   MS. ROBINSON: Yeah. I do.

10   JUDGE WINGATE: Sorry.

11   MS. HINKLE: It's okay.

12   BY MS. BECKER:

13   Q   One final question. Can you turn with me to

14   page 15?

15   A   Okay.

16   Q   I'm looking at the last sentence of the

17   section that's on this page.

18   A   Uh-huh.

19   Q   Says, "This implies that SMC is several times

20   more effective than the state of the art MCMC algorithm,

21   in terms of run time per effective sample. Although

22   additional study is warranted, our results suggest that

23   the proposed algorithm may be substantially more

24   effective when applied to real world redistricting

25   problems." Did I read that accurately?

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1   A   Yes. You did.

2   Q   **And you stand by all the statements that you**

3 **made in this working paper?**

4   A   I do.

5   Q   **But you used your MCMC algorithm for your**

6 **State House analysis?**

7   A   Right. So, again, the -- which algorithm you

8 use depends on, you know, what you are studying. So the

9 reason why I used the MCMC algorithm for the state case

10 is that it better handles certain types of constraints

11 when the number of districts is large. And so the SMC -

12 - because SMC builds the one district at a time, as

13 opposed to MCMC algorithm, where you start with the

14 redistricting. So the SMC is unable to see, you know,

15 certain type of constraints that requires you to know

16 the entire redistricting plan itself. So, you know,

17 again, these are sort of statements that's applicable to

18 the particular applications I have in -- in this

19 specific paper. But, you know, again, I don't want to -

20 - I don't want anyone to generalize this statement to

21 any case out there in the world. You know, it has to be

22 considered for both -- both types of algorithms.

23   Q   **I appreciate your explanation. But I asked**

24 **you if you used your MCMC algorithm to do your State**

25 **House analysis; yes or no?**

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1   A   I did use MCMC algorithm for the State House.

2   Yes.

3   Q   Okay. I want to go back really quickly and

4   talk about specifically districts 48 and 33 on the new

5   map. You would agree with me, Professor, that District

6   48 on that map is more compact than District 48 on this

7   map, right?

8   A   Depends on how you measure compactness.

9   Q   Just give it the eyeball test. You don't have

10   your computer.

11   A   As a statistician, I don't do the eyeball

12   test.

13   Q   I want to talk about -- we talked earlier

14   about the population growth in District 36 and in

15   District 58, and how that impacted District 33. Are you

16   familiar with the community of interest that this area

17   covers?

18   A   I did not use community of interest in my

19   simulation algorithm.

20   Q   That's not my question. I'm asking you, if

21   you're familiar with the community of interest in this

22   area?

23   A   No.

24   Q   So you're not aware that there's a fire

25   station district in Peewee Valley that crosses the

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1   county line?

2   A   No.

3   Q   And you're not aware that this area is called

4   Peewee Valley, and there's a women's prison that's

5   actually located in Shelby County?

6   A   No.

7   Q   And that this area is intricately intertwined?

8   A   No.

9   Q   I want to go back to our discussion of Matt

10   Bevin.

11   A   Okay.

12   Q   So this is the 2019 gubernatorial race. Now

13   we talked about all the things that you didn't know

14   about him. Did you know that election was decided by

15   less than 5,000 votes?

16   A   No.

17   Q   And did you know that the other five elections

18   were decided by at least 100,000 votes difference?

19   A   No.

20   Q   Did you know that our Secretary of State ran

21   against a former Miss America? Well, she was the

22   winner, right? She won.

23   A   I have no idea.

24   JUDGE WINGATE: Did you know that Matt Bevin

25   attacked a very well-known judge here in Franklin

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1   County? During the break I saw Phillip (phonetic),

2   and he said to mention that.

3   MS. BECKER: I left that out of the list.

4   BY MS. BECKER:

5   Q   You would agree that an election that's won by

6   5,000 votes is an outlier, compared to five other

7   elections, at the same time, won by over 100,000 votes?

8   A   I mean, compared to those other elections, but

9   you know, many elections are close, just in general.

10   Q   Okay. I want to switch topics and talk about

11 your congressional analysis.

12   A   Okay.

13   Q   Your report only mentions Franklin County,

14 right?

15   A   That's correct.

16   Q   But there are other counties that switched

17 districts in the new congressional plan, right?

18   A   Right. But as I mentioned, I didn't consider

19 the previous map. So that's not part of the criteria.

20   Q   So you were told to focus on Franklin County?

21   A   What do you mean by, "Told"?

22   Q   You didn't look at the old map, but you

23 acknowledged that other counties switched. Why focus in

24 on Franklin County?

25   A   Oh, I see. Well, the Franklin County is --

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1   you know, if you look at the district one, it's the edge

2   of this lengthy district that -- you know, that's

3   comprising that District 1. So it's, you know, one

4   place upon instruction of Counsel, that's the part that

5   I focused upon.

6   Q   **So you didn't focus on Franklin County because**

7   **that's where the plaintiffs wanted to file suit?**

8   A   Oh, I wasn't aware of who filed suit about,

9   you know, where they are located or anything like that.

10   Q   **Do you know the compactness measure for the**

11 **other five districts in Senate Bill 3?**

12   A   I did look at it at some point. I don't have

13 it on top of my head.

14   Q   **Do you know the compactness measure for the**

15 **whole map?**

16   A   Oh, yeah. I looked at that as well, as I

17 think that's in the report in the appendix. Yeah. So

18 it's -- it's figure 10. So that's an overall

19 compactness score average of the plans. So the red line

20 is the enacted plan, and the histogram is the simulated

21 -- simulated plans. That's overall, not (Inaudible).

22   Q   **So you're saying figure 10 is the analysis of**

23 **the whole plan?**

24   A   Yeah. So this isn't (phonetic) entire

25 overall. Yeah. So the Polsby-Popper is an average

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1   across districts. And the other measure -- the other

2   compactness measure is a plan-wide measure. So there's

3   no specific district level measures.

4   Q   So what I see here, is that the enacted plan

5   falls right within the average range of your simulation,

6   for compactness of the plan as a whole?

7   A   Right. So -- exactly. That's the point. So

8   on average, I made sure that compactness of the

9   simulated plan is similar to the enacted plan. So

10   that's -- that's by design. But what I showed is that

11   even if you keep the overall level of compactness the

12   same, District 1 is highly non-compact.

13   Q   But you don't know the compactness measures of

14   the other five districts?

15   A   I did look at it at some point. I didn't

16   include it in the figure, but I did look at the

17   compactness of other districts as well. And if you take

18   the average, it will be the red line. So some are more

19   compact to offset the un-compactness of the District 1.

20   Q   It's true isn't it, that every other district

21   is more compact, over the last map?

22   A   Oh, again, I didn't look at the last maps. I

23   don't know -- I don't know the comparison.

24   Q   You only do a compactness measure using the

25   Polsby-Popper method, right?

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1   A   Yes. For this. But I also did the Reock,

2   which is actually more computationally intensive. That's

3   figure 13. That's only -- I did this only for District

4   13 -- sorry, District 1 in figure 13.

5   Q   Is the Polsby-Popper measure built into your

6   SMC algorithm?

7   A   No. And neither Reock, in this other measure

8   that's in figure 13. They're not part of the algorithm.

9   Q   Have you ever heard of -- let me make sure I

10   get the names right. Have you ever heard of Nicholas

11   Stephanopoulos and Eric McGhee?

12   A   Yes. Yes.

13   Q   Are they well-respected experts in your field?

14   A   Yes. Nick is my colleague at Harvard Law

15   School.

16   Q   So you don't want to say anything bad about

17   him, is that what you're saying?

18   A   He's a great scholar.

19   Q   Have you ever read their work, "The Measure of

20   a Metric"?

21   A   Yes. I am aware of that (Inaudible) paper.

22   Q   So are you familiar with their statement in

23   that article, where they say, "Scholars have not

24   selected a gold standard among the metrics," he's

25   talking about the Measures of Compactness, "But rather

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1 have managed to use them productively in research, by

2 combining multiple measures and adjusting weights for

3 each specific purpose"?

4   A   Okay. Well, I don't memorize what he wrote.

5 If he says that in the article, that must be what he --

6 he meant.

7   Q   But you didn't use any other metric beyond

8 primarily the Polsby-Popper and then Reock as a

9 crosscheck. You didn't use any of the other standard

10 available methods?

11   A   What other measures are you talking about?

12   Q   So, there's the Inverse Convex Hull.

13   A   Okay.

14   Q   The Schwartzberg method.

15   A   Okay.

16   Q   You didn't use either of those?

17   A   Yeah. No. But you know, the Polsby-Popper,

18 to be -- to be fair is the most commonly used method.

19 You know, obviously, compactness can be measured in

20 different ways.

21   Q   But the Polsby-Popper method does not like

22 sharp curves?

23   A   Right. So different measurements try to

24 capture different aspects of compactness. That's

25 correct.

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1   Q   So in a state where we have a lot of rivers

2   that are winding, and mountains that don't respect

3   straight lines, and bounded by a river, the

4   Polsby-Popper might not be the most favorable method to

5   use?

6   A   Well, one could debate the properness of

7   different compactness measures. But one advantage of

8   the simulation method is that -- you know, because you

9   are comparing -- so it's difficult to say, well, because

10   Polsby-Popper is 0.2, that's too low or too high. But

11   one advantage that simulation method offers is that

12   you're actually comparing with other alternative plans

13   using the same exact measure. So you're holding the

14   measurement constant, and then doing a comparison

15   accounting for all the geographical features, and rules,

16   and other things. So, you know, I do feel comfortable

17   using a simulation method and doing a comparison based

18   on Polsby-Popper or some other measures, whereas, you

19   know, interpreting these numbers as you pointed out, as

20   it is, might not be appropriate, depending on the state.

21   Q   The vast majority, if not all of your

22   congressional analysis, is premised on compactness, yes?

23   A   Well, first half is compactness, and the

24   second half is, you know, partisanship.

25   Q   Can you tell me the balance of weight you gave

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1   to your population equality constraint versus the weight

2   you gave to your compactness?

3   A   Oh, okay. In these algorithms, population

4   constraint is a hard constraint. So when you specify

5   it, the algorithm will generate the simulated plans that

6   always satisfy the population constraint. So we'll

7   never exceed that threshold, whereas compactness is a

8   relative (phonetic) measure. It's not a dichotomy.

9   Q   So when your algorithm is creating districts

10   in each of your simulations, it is forced to follow your

11   population constraint --

12   A   First. Yeah.

13   Q   -- but in doing so, is guided by your

14   compactness measure?

15   A   Yeah. That's one way to think about it.

16   Another way to think about it is to consider a set of

17   simulated plans that, you know, simulate -- consider a

18   set of alternative plans that satisfy population

19   constraint. And then among those consider compactness,

20   you know, try to say select -- give more weight to the

21   more compact districts, for example.

22   Q   I want to talk about your population

23   constraint.

24   A   Okay.

25   Q   You're aware that some congressional plans try

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1   to observe a strict one person deviation, right?

2   A   Yes. I am. I'm aware.

3   Q   But you didn't adopt that requirement in this

4   case?

5   A   That's correct.

6   Q   Are you aware that the enacted plan Senate

7   Bill 3 does just that, it's within one person equal

8   population?

9   A   I think I've seen that at one point.

10   Q   But your constraint was a plus or minus 0.1

11   percent, which I think I heard you say earlier, is a

12   spread of about 700 to 800 people?

13   A   That's right. That's maximum. So some plans

14   are much lower than that but that's the maximum allowed

15   deviation.

16   Q   You'd agree, that when the law requires as

17   mere as practicable, that one person is objectively

18   better than 800?

19   A   I'm not a lawyer, but one person is smaller

20   than 700 to 800.

21   Q   I want to go back to where we started.

22   A   Okay.

23   Q   You'd agree, that if the vast majority of

24   plans that are generated by your simulation method,

25   using what you call neutral redistricting criteria would

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1 produce the same seat share in the enacted plan, then

2 the conclusion that there's a partisan bias that is not

3 supported?

4   MS. HINKLE: Objection to form. I'm sorry. I

5   just didn't follow the question.

6   MS. BECKER: Sure.

7 BY MS. BECKER:

8   Q   So if the vast majority of the plans in your

9 ensemble have the same basic seat share as the enacted

10 plans, it's not right to assume that there's been a

11 partisan bias?

12   A   Well, it depends on what you mean by,

13 "Partisan bias," I suppose. Right. It's -- that's I

14 guess, the whole difficult thing. But -- yeah.

15   Q   Now when we talked about your House

16 conclusions, I think we decided -- we agreed that your

17 simulations suggest that 76 districts should lean in

18 favor with the Republican Party?

19   MS. HINKLE: Objection. It's inconsistent with

20   prior testimony.

21   JUDGE WINGATE: Okay. What's your objection,

22   again? I didn't hear you. I don't hear very good.

23   MS. HINKLE: I'm sorry. I think that's

24   inconsistent with Dr. Imai's prior testimony. Of

25   course, he can explain if it is or isn't, but I...

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1   JUDGE WINGATE: Yeah. It's overruled. I think

2   your question was, the 76 districts that are

3   Republican?

4   MS. BECKER: Right.

5   JUDGE WINGATE: And then --

6   MS. BECKER: Which I think we've established

7   that.

8   JUDGE WINGATE: Yeah. I think it's been

9   established, when you were pointing to the one map.

10   So you can ask your question to him, again.

11   MS. BECKER:

12 BY MS. BECKER:

13   Q   Isn't it true that under your simulation

14 analysis, the Republican Party in Kentucky should expect

15 for 76 districts to lean in its favor?

16   A   Oh, I see what you're trying to ask. Okay. So

17 this is average vote share -- of Democratic average vote

18 share. And if you -- are you thinking about the seat

19 share? Like, how many seats the Republicans would win,

20 given any direction?

21   Q   Now, I know that you're not capable of

22 rendering that opinion. So I'm just asking if your

23 simulations suggest that 76 districts lean in favor of

24 the Republican Party?

25   A   Oh, yeah. So the ordered 76 districts,

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1   according to my simulation, you know, on average lean

2   towards Republican, if you used these, you know, average

3   vote share from the past directions that I used.

4   JUDGE WINGATE: Well, the follow-up question to

5   that, is it 76 districts in the new plan? Or are

6   there more that lean Republican? Is that what your

7   follow-up here?

8   MS. BECKER: I'd just like to establish, that

9   using his own simulations and his data, that we all

10   agree that 76 districts lean Republican.

11   JUDGE WINGATE: Well, their question is does

12   81, or 83, or after the plan, is there any way that

13   he can -- that he has a prediction for that? Does

14   that make any sense?

15   MS. BECKER: So I think when you're asking is,

16   is he capable of predicting whether the districts

17   77, 78, 79 or 80 go Republican in an actual

18   election?

19   JUDGE WINGATE: Or lean Republican in this new

20   analysis. Where's the cutoff? Where's the 50/50?

21   I was trying to figure that.

22   THE WITNESS: Right. So that really depends on

23   each election, right? There's just always, you

24   know, swing from one direction to another, based on

25   a variety of factors, including candidate popularity

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1   and other factors. So what I was establishing in

2   the figure 3 is that the 76 district and the enacted

3   plan is much more Republican leaning than the vast

4   majority of simulated 76 districts.

5   JUDGE WINGATE: Okay.

6 BY MS. BECKER:

7   Q   Question about your congressional analysis.

8   A   Okay.

9   Q   So, on page 18, you say, "Under these

10 simulated congressional plans, the Democratic vote share

11 for the district that contains Franklin County is 43.6

12 on average," correct?

13   A   That's correct.

14   Q   And if we're using a strict 50 line, that

15 district is not likely to lean Democratic?

16   A   Again, this is a, you know, measure of

17 partisanship, based on the -- literally, average of past

18 direction vote share. So, you know, I don't want this

19 to interpreted as like a prediction of the future

20 election or anything like that. It's just a measure. In

21 the past elections, 43 percent of voters voted for

22 Democrat on average. But -- yeah. It's less than 50

23 percent of voters, if that's what you're saying --

24   Q   So using your simulation data, we should

25 reasonably expect in the Commonwealth to have a

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1   congressional delegation of five Republicans and one

2   Democrat?

3   A   Again, I'm not expressing any opinion on

4   likely, you know, number of Democrats or Republican

5   seats in the future actions. That's -- I didn't do

6   that. No. It's just --

7   MS. BECKER: Judge, can I have a minute?

8   JUDGE WINGATE: Yeah.

9   MS. BECKER: Judge, we'll pass the witness

10   back.

11   JUDGE WINGATE: Okay. You got any follow-up?

12   MS. HINKLE: It's very brief, Your Honor.

13   JUDGE WINGATE: Okay.

14   REDIRECT EXAMINATION

15 BY MS. HINKLE:

16   Q   Dr. Imai, you were asked some questions about

17 the use of the NCM type of algorithm for purposes of

18 analyzing the Kentucky State House map. Are you

19 confident that that was the right type of algorithm to

20 use for the task, to which you put the algorithm in this

21 instance?

22   A   Yes. Otherwise, I wouldn't put it in my

23 report.

24   Q   And have you used the MCMC type of algorithm

25 in any of your prior expert engagements?

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1   A   Yes. A ton before.

2   Q   And had produced reports on the basis of the

3 MCMC algorithm or expressed opinions in court, based on

4 that type of algorithm?

5   A   Yes.

6   Q   And those opinions, to your knowledge, have

7 been accepted by the courts?

8   A   Yes.

9   MS. HINKLE: Thank, Your Honor. Nothing

10   further.

11   JUDGE WINGATE: Okay. Do you got any follow-

12   up?

13   MS. BECKER: No, Judge.

14   JUDGE WINGATE: Okay. Can we release this

15   witness? You okay to release him? Okay. You can

16   try to make your flight or you can go to Buffalo

17   Trace, and stand in line with everybody else. Thank

18   you, Doctor. I appreciate you being here.

19   THE WITNESS: Thank you very much. Thank you.

20   JUDGE WINGATE: All right. Let's have the

21   lawyers up here to talk about where we're at. And

22   also, Heather, do you want to make these part of

23   your exhibit? Are they in your book?

24   MS. BECKER: Well, they're in the book. Yeah.

25   I just thought it'd be easier for you-all to look at

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1　those.

2　　　　JUDGE WINGATE: Okay. Good enough. Yeah. Good

3　enough.

4　　　　MS. BECKER: Sorry. Did I miss a logistical

5　question?

6　　　　JUDGE WINGATE: Yeah. We're just -- where are

7　we at, as far as witnesses? What do you want to do?

8　　　　MS. HINKLE: I think we would prefer to call

9　another witness today, just to be mindful of the

10　court's time tomorrow as well. We do have a number

11　of witnesses to get through tomorrow.

12　　　　JUDGE WINGATE: Okay. Good enough.

13　　　　MS. BECKER: So, even if we don't finish the

14　witnesses, I think it might be appropriate to get

15　started.

16　　　　JUDGE WINGATE: Okay. Who do you want to do

17　today else?

18　　　　MR. ABATE: We're going to give it (phonetic)

19　to Trey Hieneman --

20　　　　JUDGE WINGATE: Okay.

21　　　　MR. ABATE: -- with the Kentucky Democratic

22　Party.

23　　　　JUDGE WINGATE: Uh-huh. Sounds good. How long

24　do you expect him to be?

25　　　　MR. ABATE: Certainly not as long as Dr. Imai.

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1          JUDGE WINGATE:  Okay.

2          MR. ABATE:  I would imagine we would definitely

3     finish his direct today --

4          JUDGE WINGATE:  Okay.

5          MR. ABATE:  Depending on how long the Court

6     wants to go, but --

7          JUDGE WINGATE:  Yeah.  Okay.  All right. Let's

8     start him then.  Okay.  Thank you-all.

9          MR. ABATE:  Thank you.

10         MS. HINKLE:  We want to take down everything,

11    right?

12         MR. ABATE:  Yes.  I may end up wanting that in

13    Jefferson County --

14         MS. BECKER:  Okay.

15         MR. ABATE:  -- now, perhaps.

16         CLERK:  Hey Casey, when you move that again,

17    will you angle it more this way?  Because it blocks

18    the witness, if Judge asks him questions on the --

19         MS. HINKLE:  Oh, sure.

20         MS. BECKER:  -- board.

21         MS. HINKLE:  Yeah.  If you could just take them

22    down for a minute --

23         MR. ABATE:  You can put them down.

24         MS. HINKLE:  Yeah.

25         MR. ABATE:  Just leave Jefferson County.
```

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1   MS. HINKLE: Feel free to boss us around. When

2   we put it up when -- we're not always mindful of

3   those angles.

4   JUDGE WINGATE: You ready to go?

5   MR. ABATE: Yes, sir. If the Court is ready.

6   Plaintiffs will call Trey Hieneman as witness.

7   JUDGE WINGATE: Okay. Mr. Hieneman, please

8   raise your right hand. Do you swear or affirm the

9   testimony you're about to give in this Court today

10   is the truth and nothing but the truth?

11   THE WITNESS: I do.

12   JUDGE WINGATE: All right. You may be seated.

13   DIRECT EXAMINATION

14   BY MR. ABATE:

15   Q   Thank you. Could you please state your name

16   for the record, please?

17   A   Trey Hieneman.

18   Q   Great. And Mr. Hieneman, what is your current

19   position?

20   A   I am the political director for the Kentucky

21   Democratic Party.

22   Q   How long have you held that job?

23   A   I began that job in March of 2019, so just

24   over three years.

25   Q   Okay. What are your duties as political

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1   director for the KDP?

2   A   I have a number of roles. I maintain

3   relationships with interested groups, and organizations,

4   county parties. I am the campaign strategist in-house

5   for several campaigns. I work closely with our

6   legislative caucuses on issues like recruitment. And

7   then obviously, with any legislative talking points and

8   things like that they may need.

9   Q   Can you describe for the Court, your

10   educational background?

11   A   Sure. I have a bachelor of arts in political

12   science from the University of Kentucky. And a masters

13   of arts in political management from The George

14   Washington University.

15   Q   Okay. Thank you. Can you tell us a little

16   bit about your work history, kind of going backwards?

17   Tell us how you got to your role you're in now?

18   A   Sure. From 2009 to 2013, I was communications

19   director in the Office of the House Majority Caucus

20   Chair. Then from there, I went to work for an outside

21   organization. Then in 2019, returned to the party to

22   work for Governor Beshear's election in 2019.

23   Q   Okay. And you have been since that time --

24   since you left that campaign, you've been employed with

25   the KDP?

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1         A      Correct.

2         Q      And have you been in the same role the whole

3  time?

4         A      Yes.

5         Q      Okay.  Mr. Hieneman, do you have any

6  experience in putting together legislative maps, like

7  the ones we've been looking at here?

8         A      In my experience, during my tenure with the

9  Legislative Research Commission and in the Office of the

10 Majority Caucus Chair, I advised legislators on

11 developing the redistricting maps in the previous cycle.

12        Q      And did you have any involvement in preparing

13 a proposal in this legislative cycle for a redistricting

14 map?

15        A      Yes.  I worked with our legislative leadership

16 and advised them on drafting of House Bill 191.

17        Q      So, House Bill 191 was the Democratic

18 proposal?

19        A      Correct.

20        Q      And was that introduced in the legislature?

21        A      Yes.  It was.

22        Q      But it obviously did not become law?

23        A      Correct.

24        Q      Okay.  Tell us about your role in helping to

25 craft House Bill 191?
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1   A   Sure. I advised the members of the House

2 Democratic Caucus on what they needed to emphasize when

3 drawing a map. Obviously, there are constitutional

4 requirements, federal requirements that they needed to

5 emphasize, and I advised them on those.

6   Q   **Can you tell us what those criteria were that**

7 **you used in drawing the maps or advising the members on**

8 **how to draw maps?**

9   A   Certainly. So the first criteria is the

10 constitutional one person, one vote requirement of being

11 plus or minus 5 percent about the mean for all

12 districts. There's also the section for --

13   Q   **I'm sorry.**

14   A   Oh, yes.

15   Q   **I just want to stop you there. 5 percent of**

16 **population?**

17   A   Of the average population size.

18   Q   **Okay.**

19   A   So, 4,500,000 roughly Kentuckians divided by

20 145,000, and then 5 percent plus or minus about that

21 mean, one way or another. There are also the Kentucky

22 constitutional requirements that I advised them on,

23 obviously, the minimum number of split counties. But

24 then we also emphasized the exact verbiage underneath

25 Section 33 of not pairing more than two counties

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1   together, and no piece of a county to form a district.

2   Q   Okay. And just so I understand, you were

3   looking at the language of Section 33?

4   A   That's correct. Those were the paramount

5   criteria that we used.

6   Q   Okay. We'll get into a little more detail in

7   a second, but let's sort of walk through some of these.

8   On the population variants, did House Bill 191 satisfy

9   the plus or minus 5 percent standard you referred to?

10   A   It did. No district exceeded 5 percent -- or

11   105 percent of the mean, and no district was under 95

12   percent of the mean.

13   Q   Okay. Do you recall how many counties House

14   Bill 191 split?

15   A   House Bill 191 split 23 counties.

16   Q   Okay. And we've heard some testimony that's

17   the minimum is --

18   A   That's correct.

19   Q   Can you explain why that is? Because that's

20   not mathematically the minimum, correct?

21   A   That's correct. The mathematical minimum is

22   actually 21 counties. There are 21 counties that have a

23   population over 105 percent of the mean, so they have to

24   be divided. However, because of geography in the

25   Jackson Purchase region, particularly around Calloway,

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1   Marshall, and Trigg Counties, one of those has to be

2   split. Because there's no county that can be either

3   split beforehand or can be paired with any of those

4   counties to make a district. And the similar -- the

5   same is true in southeastern Kentucky around Bell,

6   Harlan, Perry, Letcher, that region as well. So two

7   additional splits on top of the 21, gets you to 23. And

8   that is the actual practical minimum.

9   Q   So if you added two of those counties

10   together, it still wouldn't be big enough to get within

11   the five percent, is it?

12   A   It would either be too small or too large.

13   Q   Or too large. Okay. Okay. So you had to

14   split 23. So you also talked about -- I believe you

15   said, the total number of times counties were divided --

16   A   Correct.

17   Q   -- was a metric that you looked up; is that

18   correct?

19   A   That's correct. Minimizing that number -- or

20   that piece of a county that then could be added to

21   another time. So minimizing the number of times that a

22   county is actually divided.

23   Q   Okay. And then the other factor you

24   considered, was how many times three or more counties

25   were aggregated together?

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1   A   That's correct.

2   Q   Okay. Have you reviewed House Bill 2, which

3 became the enacted --

4   A   I did. Yes.

5   Q   -- maps? And let's talk a little bit about

6 your analysis of HB 2. I just want to start with the

7 basics. What did you -- what data did you look at to

8 analyze HB 2?

9   A   Sure. So I worked off of the files that were

10 produced by the Legislative Research Commission. So the

11 actual map itself, as well as the Shapefiles that the

12 GIS staff with the Legislative Research Commission

13 produced, to -- to make my analysis.

14   Q   What is a, "Shapefile"?

15   A   So a Shapefile is basically a computer file

16 that's generally used in redistricting, that

17 encapsulates a number of different things, the block

18 level, the polygon shapes that -- that lay out the

19 districts. That you can then import and export into

20 different programs to generate the maps.

21   Q   Okay.

22   A   And generate maps that have already been

23 generated by the same program.

24   Q   And did you look at all the same factors of

25 HB- 2 that we just discussed for 191, things like

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1   population variants, county splits, multi-split

2   counties, and districts with three or more counties?

3   A   Yes. I did.

4   Q   Did you prepare an affidavit in this case,

5   that documents your comparisons?

6   A   Yes. I did.

7   MR. ABATE: Your Honor, I'm not offering this

8   as evidence, but I would like to show the witness

9   the affidavit --

10   JUDGE WINGATE: That's fine.

11   MR. ABATE: -- which is also in the binder we

12   gave you. This is marked number -- well, that was

13   Exhibit 32 of our preliminary injunction motion --

14   that exhibit sticker predated.

15 BY MR. ABATE:

16   Q   Is this a copy of the affidavit that you

17 prepared, Mr. Hieneman?

18   A   Yes. It is.

19   Q   Okay. And if you look down towards the last

20 page, that's your signature?

21   A   Yes. It is.

22   Q   Okay. I want to walk through some of the

23 details of the comparison --

24   MR. MADDOX: Your Honor, I object to the

25   procedure. I don't believe it's proper for a fact

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1   witness to have a cheat sheet in front of him, as

2   he's testifying.

3   JUDGE WINGATE: I've had all kinds of fact

4   witnesses with cheat sheets.

5   MR. MADDOX: All right.

6   JUDGE WINGATE: So I'll allow it. But I'll

7   note your objection for the record.

8   MR. MADDOX: Thank you, Your Honor.

9   MR.ABATE: Your Honor, we'll move forward.

10   BY MR. ABATE:

11   Q   So, Mr. Hieneman, I'd like to look and -- I'd

12   like to look at your comparison of HB 2 and HB 191 on

13   each of these metrics. Let's start with the one that

14   talks about the number of times counties are divided.

15   Can you remind us again, why it is that you counted the

16   total number of times the counties were split?

17   A   So I counted those because by counting those

18   numbers of splits, you can also calculate the number of

19   times that a piece of a county is being used to add onto

20   another district.

21   Q   And how did you actually determine the number

22   of -- you told us you counted the number of counties

23   that were split, and it was 23. But how did you

24   determine the number of total county splits? Excuse me.

25   A   Sure. By analyzing those 23 counties, you can

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1 see each time that that county make -- or has a piece of

2 a district. You know, using McCracken County, for

3 example, in --

4   MR. ABATE: May I approach, Your Honor?

5   JUDGE WINGATE: Yes.

6   A   -- in this -- this -- McCracken County, for

7 example, has parts of --

8   MR. MADDOX: What are you showing him?

9   THE WITNESS: It's this map.

10   MR. ABATE: Your -- sorry.

11   THE WITNESS: I'm sorry, the House Bill 2.

12   MR. MADDOX: Thank you.

13   MR. ABATE: That's the map of House Bill 2 you

14   all provided to the prior witness.

15   A   Using McCracken County, for example, it has

16 parts of four House districts, so you would say that

17 that is split three times.

18 BY MR. ABATE:

19   Q   Okay. And so, you -- I mean, visually, you're

20 looking at the map?

21   A   Correct.

22   Q   Okay. And how many times did you determine

23 that HB 2 has split counties in this method?

24   A   Under my calculation and by reviewing it

25 visually, House Bill 2 split the 23 counties, 80 times.

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1   Q   Did you do the same calculation for 191?

2   A   I did.

3   Q   And how many times did you determine that

4 House Bill 191 split counties?

5   A   House Bill 191 split the same 23 counties, 60

6 times.

7   Q   Okay. And both of those bills complied with

8 the plus or minus 5 percent population?

9   A   That's correct.

10   Q   Okay. So the 80 total splits was not

11 necessary to achieve population equality?

12   A   No. It was not.

13   MR. MADDOX: Objection, Your Honor. I really

14   don't want him to be (Inaudible) on this. That was

15   a leading question, and he needs to ask him

16   questions that the witness can answer.

17   JUDGE WINGATE: Well, I think he can answer

18   that. That's overruled. Okay?

19   MR. ABATE: Understood, your Honor.

20 BY MR. ABATE:

21   Q   I want to look at another metric that you

22 consider -- you've testified that you considered in

23 taking account in drafting 191. And that was the number

24 of times HB 2 took a portion of one county and joined it

25 to a neighboring county to form a district.

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1   A   Correct.

2   Q   **How many times did HB 2 do that?**

3   A   Under my count, that happened 45 times.

4   MR. ABATE: And Your Honor, I guess since the

5   affidavit is not coming in --

6   Q   **-- could you briefly tell us the numbers of**

7   **the districts in which this happened?**

8   A   Sure. It is districts 1, 2, 3, 5, 6, 8, 10,

9   14, 16, 18, 19, 22, 26, 27, 33, 37, 39, 45, 48, 52, 55,

10   56, 61, 63, 69, 71, 73, 78, 80, 82, 83, 85, 86, 87, 88,

11   89, 90, 91, 92, 94, 95, 96, 97, 98, and 100.

12   Q   **Thank you for humoring me with that, Mr.**

13   **Hieneman. I won't make you list them all out, but did**

14   **you count the number of times that HB 191 did the same**

15   **thing, take a portion of one county and joined it to a**

16   **neighboring county?**

17   A   Yes.

18   Q   **And how many times was that?**

19   A   So under my count for House Bill 191, that

20   actually occurred 31 times.

21   Q   **Okay. And then finally, that affidavit that**

22   **you identified talked about the number of times that HB**

23   **2 created districts containing three or more counties.**

24   **How many times did HB 2 do that?**

25   A   House district -- or House Bill 2 did that 31

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1   times.

2   Q   Okay. How many times did House Bill 191 do

3   that?

4   A   House Bill 191 did that 23 times.

5   Q   Okay. Thank you. Mr. Hieneman, did you take

6   a look at specific cities within Kentucky to determine

7   how HB 2 and HB 191 treated them?

8   A   I did.

9   MR. ABATE: Great. Your Honor, I would like to

10   show the witness an exhibit here with certain --

11   MS. HINKLE: 191?

12   MR. ABATE: No. The side-by-sides. Sorry,

13   it'd be the last tab. And for opposing Counsel,

14   this was the last tab in the binder that we handed

15   you this morning and for the Court.

16   JUDGE WINGATE: Okay.

17 BY MR. ABATE:

18   Q   Mr. Hieneman, I'm going to show you what we --

19 what exhibit number are we up to here?

20   MS. HINKLE: 3.

21   Q   3. I'm going to mark this as Plaintiff's

22 Exhibit 3. Mr. Hieneman, have you seen this document

23 before, these images?

24   A   Yes.

25   Q   Can you tell us what they are?

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1   A   These are maps detailing side-by-side the

2 district layout across various cities, across the

3 Commonwealth. Between the 2013 map that was enacted by

4 the General Assembly House Bill 2, and then House Bill

5 191.

6   Q   **Did you create these images?**

7   A   I did create these.

8   Q   **Can you tell us how you did that?**

9   A   Sure. After uploading the Shapefiles into an

10 online program called Dave's Redistricting app, I was

11 able to isolate these individual cities, while

12 overlaying the district maps over top of them.

13   Q   **And were these the same images that you**

14 **provided to Counsel for use with the legal pleadings --**

15   A   Correct.

16   Q   **-- prepared in this case?**

17   MR. ABATE: Your Honor, I'd like to move the

18   admission as Exhibit 3.

19   JUDGE WINGATE: You got any objections?

20   MR. MADDOX: No objection.

21   JUDGE WINGATE: Okay. Comes in.

22   (PLAINTIFF'S EXHIBIT 3 ADMITTED INTO

23   EVIDENCE)

24   MR. ABATE: Thank you.

25 BY MR. ABATE:

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1   Q   Mr. Hieneman, I'd like to kind of walk through

2 some of these districts that you've singled out here.

3 And I'll just start with the first one on the first

4 page. And this is a map of Bowling Green. Can you tell

5 us what the three images on this page show? First

6 describe what they are, and then we'll talk about it.

7   A   Sure. First off, this is the City of Bowling

8 Green overlayed three different times, first with the

9 district layouts for the 2013 map House Bill 2 and then

10 House Bill 191.

11   Q   Okay. In the existing map for -- this is

12 district -- the City of Bowling Green, how is the city

13 divided up for districting under the 2013 map?

14   A   So you can see there, by and large, District

15 20 encompasses downtown Bowling Green. And then

16 outlying districts that come in from other counties --

17 because Warren County is one of those that has to be

18 divided, take out parts of the outskirts of the county -

19 - or of the city, I'm sorry.

20   Q   Now, how does House Bill 2, the enacted map,

21 treat Bowling Green?

22   A   Basically, it cracks the City of Bowling Green

23 right down the middle between District 17 and District

24 20, while leaving District 19 pretty much taking up that

25 -- that same portion.

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1   Q   And does that affect the political leanings of

2 the district?

3   A   It does. Under the calculations that were

4 done through Dave's Redistricting app using a -- a -- I

5 would call it, a composite score of election results,

6 over different cycles. I believe, it's the 2012

7 presidential, the 2016 presidential, the 2016 US Senate,

8 the 2019 gubernatorial and the 2019 attorney general. It

9 aggregates the different partisanships performance of

10 these. And what it showed is that under House Bill 2,

11 District 20 would go from being a Democratic performing

12 district as it is under 2013, to being almost 10 percent

13 more Republican leaning, and moving outside of the City

14 of Bowling Green. Whereas, it was overpopulated

15 following the 2020 Census, so it really needed to

16 condense. But instead of condensing, it was shifted.

17   Q   So you said currently, there was a -- who

18 represents currently the district?

19   A   State Representative Patti Minter.

20   Q   You said there was population growth in

21 Bowling Green?

22   A   Correct.

23   Q   And what is likely to happen to the

24 representation there, under HB 2?

25   A   You will have, with the three districts that -

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1   - that are encompassing, this city, you'll have three

2   Republican representatives.

3   Q   What would -- how would HB 191 have treated

4   Bowling Green?

5   A   It kept District 20 almost wholly, again,

6   within the City of Bowling Green, condensing it, again,

7   because it exceeded the population that's allowable. And

8   keeping it wholly intact within Bowling Green, as it has

9   been for decades.

10   Q   Let's move onto the next page if we could. And

11   I want to ask you about Covington. How does the

12   existing map, under which the current legislature was

13   elected treat the City of Covington?

14   A   So, District 65 encompasses most of downtown

15   Covington. But as you can see, it kind of has an

16   annexed tail that comes down with it. And really House

17   District 65 makes up most of the City of Covington, with

18   District 64 coming in on the bottom.

19   Q   And who currently represents that district --

20   District 65?

21   A   Democratic Representative Buddy Wheatley.

22   Q   What does HB 2 do to the City of Covington?

23   A   As you can see on the map there, it basically

24   splits the City of Covington into three different

25   pieces, and pushes -- what you don't see on this map,

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1   unfortunately, is that it pushes District 65 outside of

2   the City of Covington, and deep into parts of Kenton

3   County that are not a similar community to downtown

4   Covington.

5   Q   And as result of that, what do you expect will

6   happen?

7   A   So a district that -- that is typically about

8   10 percent more Democratic would actually become about

9   10 percent more Republican.

10   Q   So, unlikely to be any Democratic

11 representative --

12   A   Correct.

13   Q   -- representation?

14   A   You would have three Republican

15 representatives for Covington.

16   Q   How would HB 191 have treated Covington?

17   A   As you can see, it still splits the city, but

18 it keeps the downtown portion, particularly there in the

19 concentrated part along the river, wholly within

20 District 65, as it has been for decades.

21   Q   And based on your analysis, do you know what

22 the political leaning of the District 65 would've been

23 under 191?

24   A   I don't right off hand. I believe, we kept it

25 significantly more Democratic, 53 percent.

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1   Q   It more closely resembles the existing

2 district?

3   A   Correct.

4   Q   Can we talk about Erlanger nearby, staying in

5 Northern Kentucky?

6   A   Sure.

7   Q   How has that district historically been --

8 well, how is it, under the current map, treated?

9   A   You can see under the current map, it is

10 divided into three different representative districts,

11 the bulk of it being in District 69, but the tail end

12 there on the south part being in District 63 and 64.

13   Q   How does HB 2 treat the City of Erlanger?

14   A   It actually cracks it even further by pushing

15 63 more into the northern part, and continuing to split

16 it three ways.

17   Q   Is that a significant change?

18   MR. MADDOX: Objection, your Honor. It's

19   purely a matter of speculation and opinion.

20   JUDGE WINGATE: Well, I think he can answer it,

21   if he knows. Or he can say, no, it's not

22   significant, or I think it's significant, or --

23   MR. MADDOX: Maybe we don't need the answer.

24   JUDGE WINGATE: I think it's all right.

25   A   So, the 69th House District has been

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1   represented by former Erlanger city councilman and has -

2   - this basically, is going to push that district less

3   out -- or more out of Erlanger, as it has been pretty

4   much the heart of Erlanger, as you can see in the 2013

5   map.

6   BY MR. ABATE:

7   Q   And how would HB 191 have treated --

8   A   It kept the City of Erlanger almost entirely

9   whole. There's a very small fraction, because precinct

10   lines.

11   Q   What about the City of Florence? How does the

12   current map -- the 2013 map -- sorry, when I say,

13   "Current," I'm referring to the map that the elected the

14   current legislature, as opposed to the one just enacted.

15   A   You can see there again the bulk of it is

16   within one district, but it would -- certain pieces on

17   the outskirts coming in there, to take up the rest of

18   the population. But by and large, it is within one

19   whole district.

20   Q   And how does HB 2 treat the City of Florence?

21   A   It splits it into pretty much two different

22   districts, with a third taking on a third part in the

23   northern part of the district -- or of the city, I'm

24   sorry.

25   Q   And the resulting districts under HB 2, what

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1   did you determine about the --

2   A   They all become -- they all become

3   significantly more Republican performing.

4   Q   Significantly more Republican? Well, what

5   about HB 191, how would that have treated the City of

6   Florence?

7   A   You can see, it basically keeps into two

8   districts only, with the bulk of it being in District

9   85.

10   Q   I would ask you to turn to the next page,

11   which includes maps of Georgetown. How does the 2013

12   map treat Georgetown?

13   A   So the City of Georgetown, by and large, is

14   within the 62nd House District. It is split, as you can

15   see, between the 61st coming in from the north, and then

16   the 78th, which actually comes around and gets a little

17   bit there on the west side.

18   Q   How does HB 2 treat that?

19   A   Well, what you can see here, is that basically

20   House Bill 2 drives a spike right through the City of

21   Georgetown to where it's split. The northern part is

22   actually separated from the southern part by District

23   88.

24   Q   What's the consequence of that decision?

25   A   District 88, which has up to this point been

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1   wholly encased within Fayette County, becomes

2   significantly more Republican performing.

3   Q   And how would HB 191 have treated Georgetown?

4   A   It has the City of Georgetown split into two

5   pieces as well, but trying to maintain that continuity

6   by putting most of it into District 56 and then the

7   outlying portions into District 62.

8   Q   Based on your calculations, how does that

9   compare, in terms of political competitiveness?

10   A   So you would have two --

11   Q   To HB 2, excuse me.

12   A   Yeah. You would have two Republican leaning

13   districts in House Bill 2. I would call House District

14   56 under House Bill 191 competitive, and District 62

15   being Republican.

16   Q   If I could turn your attention to the next

17   page, Mr. Hieneman, which is Hopkinsville. How is

18   (phonetic) Hopkinsville treated under the current 2013

19   maps?

20   A   So, for the most part, it is contained within

21   two districts. There are a couple of small precincts

22   there that are tied into District 4 as it comes in, but

23   for the most part it is contained mostly within 8, and

24   then the rest is in 9.

25   Q   And how did HB 2 address the City of

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1 Hopkinsville?

2   A   So, as you can see, it splits the City of

3 Hopkinsville basically right down the middle. But

4 what's most egregious about this is there are two

5 precincts that are actually numbered, Walnut Street 1

6 and Walnut Street 2. They are the most Democratic

7 performing precincts in Christian County. They're also

8 overwhelmingly African American, and they are divided

9 between House District 8 and House District 9.

10   Q   **How would HB 191 have treated Hopkinsville?**

11   A   House Bill 191 kept the City of Hopkinsville

12 mostly within House District 8, while trying to maximize

13 African American representation in that district, and

14 making it almost 40 percent African American voting age

15 population.

16   Q   **How were the Walnut Street precincts treated**

17 **in --**

18   A   They were both wholly contained within House

19 District 8.

20   Q   **Finally, I'm going to ask you to look at**

21 **Richmond, which is the last page of this exhibit. How**

22 **does the 2013 map treat the City of Richmond?**

23   A   The City of Richmond has been almost wholly

24 contained within the city -- or the 81st House District

25 for generations.

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1   Q   Is that a competitive district?

2   A   It is. Aside from the 2018 -- or the 2020

3 elections, which had some extenuating circumstances, the

4 2018 and the 2016 elections were both decided by less

5 than 1 percent.

6   Q   What does HB 2 do to the City of Richmond?

7   A   So as you can see from House Bill 2 map there,

8 it actually splits the city into three different pieces,

9 particularly with House Districts 91 and 89 taking

10 pieces of the City of Richmond, and then tacking them

11 onto counties outside of Madison County.

12   Q   What is the consequence of that, according to

13 your calculations?

14   A   This would go from probably if not the most

15 competitive district in the state, historically over the

16 past couple of elections, to having three solidly

17 Republican districts.

18   Q   And how would House Bill 191 have treated

19 Richmond?

20   A   House Bill 191 kept the City of Richmond

21 entirely within the 81st House District.

22   Q   Thank you very much. I appreciate you walking

23 me through those very specific examples. I want to

24 switch gears a little bit here, Mr. Hieneman, and talk

25 about a different subject. You mentioned -- well, how

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1   did you -- strike that. Let me start over. When

2   drawing 191, did you consider any factors of race in

3   crafting the map?

4   A   We did.

5   Q   How so?

6   A   So obviously, the constitutional paramounts of

7   plus or minus 5 percent about the mean minimizing the

8   county splits, minimizing the number of splits sort of

9   limiting that number of pieces of a county, and then

10   limiting the number of three or more counties are

11   articulated in Section 33. While we don't have any

12   actual Voting Rights Act districts, we did make every

13   effort to make sure that minority population and

14   minority representation was maintained within this map.

15   Q   And I want to unpack that a little bit. Can

16   you explain for the court what you mean when you say,

17   "We don't have any Voting Rights Act districts"?

18   A   Sure. We don't have -- in Kentucky's State

19   House, there are no districts that are protected under

20   Section 2 of the Voting Rights Act for minority

21   representation.

22   Q   Okay. But you considered these factors when

23   drawing 191?

24   A   That's correct.

25   Q   Did you compare the results of the districts

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1   drawn under 191 to House Bill 2 --

2   A   Yes.

3   Q   -- on these metrics? And can we walk through

4   the different kinds of metrics you looked at? What

5   kinds of districts did you consider with racial --

6   A   Sure. There were four. The first being a

7   consideration of majority, minority populations. So,

8   that --

9   Q   What does that mean?

10   A   So that is 50 percent -- or above 50 percent

11 of the voting age population being non-White.

12   Q   Okay. So that doesn't -- could that be

13 multiple races combining?

14   A   Correct.

15   Q   Okay. What other -- you said there were four.

16   A   There were.

17   Q   Can you name the second kind?

18   A   So -- yeah. The others -- so subsets of that,

19 the first is a plurality Black district, because those

20 are districts where the Black voting age population is

21 the plurality of the voting age population. It may not

22 necessarily constitute a majority. In fact, it didn't

23 in any of these -- these districts, but it does

24 constitute a plurality. The third are what are called,

25 "Coalition districts." That is where two minority

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1   groups combine to exceed 50 percent of the voting age

2   population. And then the last one are what are called,

3   "Influence districts," and that is where a -- a minority

4   population in almost every instance -- actually, in

5   every instance, it's the Black voting age population

6   exceeds 20 percent, giving them an opportunity to

7   influence the election of a representative of their

8   choice.

9   Q   How did House Bill 2 and House Bill 191

10   compare, in terms of majority minority districts?

11   A   Both maps contained six majority minority

12   districts.

13   Q   Okay. How did House Bill 2 and House Bill 191

14   compare, in terms of plurality Black districts?

15   A   So if I recall, I believe, that House Bill 2,

16   contained five plurality Black districts, whereas House

17   Bill 191 contained four plurality Black districts.

18   JUDGE WINGATE: How many? I'm sorry.

19   MR. MADDOX: Sorry. The door was shut. Yeah.

20   Q   Can you repeat that last answer, sir?

21   A   Sure. House Bill 2, as I recall, contained

22   five plurality Black districts, and House Bill 191 had

23   four plurality Black districts.

24   JUDGE WINGATE: Okay.

25   Q   How about -- how did the two maps compare, in

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1   terms of coalition districts?

2   A   So, House Bill 2, as I'm recalling, had no

3   coalition districts, that is no two combined minority

4   groups formed a coalition to exceed 50 percent voting

5   age population. Under House Bill 191, District 77 was a

6   coalition between Hispanic and Black population

7   exceeding 50 percent voting age population.

8   Q   And on the final metric, which you talked

9   about influence districts, how did the two maps compare?

10   A   So, again, as I recall, I believe House Bill 2

11   contained three influence districts, whereas House Bill

12   191 contained five influence districts.

13   Q   Okay. Thank you very much for those facts. I

14   appreciate it. So I'm going to shift gears again, and

15   I'm going to ask you a little bit about the impacts of

16   House Bill 2 on the Kentucky Democratic Party, based on

17   your work in the party and your role. First of all,

18   were you in involved in candidate recruitment for the

19   2022 election cycle?

20   A   Yes.

21   Q   Tell us about your involvement in that

22   process, please?

23   A   Sure. I worked closely with the legislative

24   leadership and their anointed member of their caucus who

25   heads up recruitment to find leads, vet leads, make

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1   contact with individuals to gauge interest, connect them

2   to the legislators to gauge their level of interest in

3   running for state representative.

4   Q   **Did the passage of HB 2 impact candidate**

5   **recruitment efforts for the party for the 2022**

6   **elections?**

7   A   Absolutely.

8   Q   **How so?**

9   A   Coupling the uncertainty of what the map, you

10   know, rolling out on a state holiday right at the end of

11   the year, and the uncertainty that created, the biggest

12   hurdle that it created was several districts where

13   candidates had been recruited, and then were drawn out

14   of their districts, to where now we have no candidate.

15   Q   **Can you name some specific examples?**

16   A   Sure. You know, House District 24 -- or House

17   District 21, I should say. He's now running in 24. John

18   Pennington was our recruited candidate in House District

19   21. He was drawn out into now District 24. District 81,

20   Martina Jackson was our recruited candidate. She was

21   drawn out in the cracking of the City of Richmond into

22   District 91. District 36, Derek Penwell was our

23   recruited candidate in that district, and he was drawn

24   out to where we have no candidate District 36. In

25   District 29, Suzanne Kugler was our recruited candidate.

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1   She was drawn out and now we have no candidate in

2   District 29.

3   Q   Do you know how many candidates overall are

4   running for office, in the State House, as Democrats?

5   A   So, I believe of contested races, that number

6   is 56 -- 57, actually.

7   Q   How does that compare to past cycles?

8   A   It's down almost 25 percent from 2020.   I

9   believe, we had 77 contested races in 2020 to now we

10   have 57 potentially contested races in 2022.

11   Q   How does HB 2 affect candidate recruitment?

12   A   By changing the lines.   Even within split

13   counties, it draws potential recruits out, who -- who

14   were qualified candidates that we had identified, and

15   potentially persuaded to run.   You know, it -- by

16   changing significantly the performance of those

17   districts, it dissuades candidates from wanting to -- to

18   run in a district, where the results are predetermined.

19   Q   So, is it harder to recruit candidates in a

20   more polarized manner?

21   A   Yes.   Yes.

22   Q   How did HB 2 treat Democratic incumbent

23   legislators?   Or let me ask more specifically, did it

24   pair any existing sets of incumbent legislators?

25   A   Democratic legislators were paired in

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1   Jefferson County. There were two sets in the 41st

2   District. State Representatives Mary Lou Marzian and

3   Josie Raymond were paired together, creating a brand new

4   -- with no incumbent still within Jefferson County. And

5   similarly, Representative McKenzie Cantrell and

6   Representative Lisa Willner were paired together. Again,

7   leaving an open district in Jefferson County, beside the

8   district where they drew the those lines.

9   Q   **What does it mean when a new district is open?**

10   A   There's no incumbent that can seek reelection

11   there. So it means, that you have to significantly work

12   to hold a district like that because incumbency provides

13   a lot of leverage in -- in an election.

14   Q   **And what does it mean when two incumbents are**

15   **paired against one another?**

16   A   It basically means -- yeah -- that either they

17   run against each other, or one steps aside. And that

18   happened in both of these instances.

19   Q   **Can you explain that, what has happened?**

20   A   Sure. Representative Mary Lou Marzian, after

21   being in the legislature for, you know, decades, has

22   decided to step down and not seek reelection. And then

23   Representative Cantrell having only served, I believe,

24   three terms, is now running for Court of Appeals because

25   she didn't want to be in a race against a fellow

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1 Democratic incumbent.

2   Q   Did HB 2 pair any Republicans against one

3 another?

4   A   It did, but those --

5   Q   I was going to say, are those equivalent to

6 the way they pair Democrats?

7   A   They're not. Those parents come because of

8 population losses, specifically Representative Lynn

9 Bechler is paired into the 12th District now, and that

10 comes because Hopkins County, having previously been

11 split under the 2013 map, has to come back whole. And

12 so by doing that, there's no incumbent within Hopkins

13 County. So, Crittenden County, which cannot be split

14 and where he is -- currently resides has to be paired

15 into another district. Similarly, population losses in

16 eastern Kentucky -- in southeastern Kentucky in

17 particular, meant pairing incumbent Representatives

18 Bobby MCCool and Norma McCormick. And that district --

19 Norma McCormick's district, District 93, was relocated

20 to Fayette County in House Bill 2.

21   Q   As a result of these changes, are there areas

22 of the state where it'll be harder to recruit candidates

23 than in previous years?

24   A   It is. Again, because of changing of district

25 lines, and the way that some of these cities in

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1   particular have been changed, you know, we have areas of

2   the state where having a voice is becoming significantly

3   harder.

4   Q   Such as?

5   A   You know, we currently have no Democratic

6   representative candidates in the Jackson Purchase

7   region, and there's six districts there.

8   Q   Okay. What does it mean for the Kentucky

9   Democratic Party, if you have no candidates or no

10   elected leaders in a particular region?

11   A   Yeah. You have no one to carry your message

12   and carry your banner, even though the party represents

13   over a million Kentuckians across Kentucky.

14   Q   What other impacts do you foresee for the

15   party, if there are regions of the state with no elected

16   representatives?

17   A   It makes it harder to convince donors to

18   support those candidates that do decide to run in those

19   regions, because they feel that those are lost causes,

20   and they don't feel that they are able to allocate their

21   resources as effectively. And so, it means a lot more

22   sweat equity, and hard work to A, convince those

23   candidates to run, and B for those candidates to

24   actually make a competitive stand.

25   Q   Will it affect your volunteer base in any way?

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1   A   Definitely. By having the -- or not having

2 the ability to compete and -- you know, by taking a

3 district in Warren County that has traditionally been 6

4 or 7 percent more democratic than Republican and turning

5 it plus-10 Republican, that diminishes volunteer

6 enthusiasm, and the ability to generate support for

7 local candidates.

8   Q   **Why are local volunteers important to the**

9 **party?**

10   A   They are the grassroots. They are the people

11 who help do the day-to-day operations of a campaign, you

12 know, knocking on doors, stuffing envelopes, making

13 phone calls, sending text messages.

14   Q   **Will these -- you mentioned, like, a**

15 **fundraising, lack of local volunteers. Will that affect**

16 **the party's ability to run statewide races?**

17   A   It could. You know, we -- we saw in years

18 past that, you know, not having resources can diminish

19 the ability of down ticket candidates to compete in a

20 statewide election.

21   Q   **So, HB 191 would've given the Republicans a**

22 **super majority?**

23   A   Correct.

24   Q   **So why -- help us understand why the**

25 **difference between HB 2 and HB 191 matters to the party?**

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1   A   Well, the first is the Constitution matters.

2 The exact verbiage in Section 33 matters. And by

3 excessively exceeding it, these districts are created

4 outside of --

5   MR. MADDOX: Objection, Your Honor. This calls

6   for a legal conclusion. He's not a lawyer.

7   JUDGE WINGATE: I think he can answer. But I

8   can read Section 33. I've read it backwards and

9   forwards a 1,000 times.

10 BY MR. ABATE:

11   Q   In addition to any legal reasons, why else

12 does the difference between 191 and HB 2 matter to the

13 party, from an operational perspective?

14   A   Yeah. It -- you know, by -- there are shifts

15 that are occurring in this state. And by being able to

16 dilute the -- the Democratic votes in certain areas, it

17 makes it so that the next election is guaranteed. But

18 you're also guaranteeing elections to come, as opposed

19 to trying to make those competitive in the future. This

20 isn't -- House Bill 191, isn't about 2022. It's about

21 2030, and 2040, and beyond.

22   Q   Are there a different number of competitive

23 districts?

24   A   There are. Based on the analysis that was

25 produced by the Dave's Redistricting app, I believe,

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1   that the number actually is cut in half between House

2   Bill 2 and House Bill 191. It goes from 17 in House

3   Bill 191 to, I believe, nine in House Bill 2. And by

4   competitive, I define that as within 10 percent one way

5   or another. So 55 to 45, one way or another.

6   Q   **And why does it matter if there are fewer**

7   **competitive races across the state?**

8   A   It basically allows the most extreme

9   legislation to come out. There's no bipartisanship.

10 There's no compromise. It's we -- we have the votes,

11 we're going to do it our way, and our majority is safe

12 no matter what.

13   Q   **You mentioned earlier that HB 2 was released**

14 **on a holiday, I think. Did you or did the KDP have any**

15 **advanced knowledge of what the maps in HB 2 would be?**

16   A   No. No.

17   Q   **When did you first see HB 2?**

18   A   I saw House Bill 2 for the first time as a

19 screenshot on a Twitter account, on a map that was

20 placed on a wall.

21   Q   **Can you unpack that a little bit; when was**

22 **that?**

23   A   On December 30th, when the House majority

24 leadership unveiled House Bill 2 as their proposed plan.

25 They held a press conference and I believe, members of

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1   the media were there, and they shared that on social

2   media. And that was the first time that I actually saw

3   the proposal from there. I requested the Shapefiles

4   after it had been filed, to begin an analysis of it.

5   Q   Do you recall when you received the

6   Shapefiles?

7   A   That would've been first day of session, so --

8   what, January 3rd, 4th, somewhere around there.

9   Q   And do you remember when the bill was passed?

10   A   I believe session started on the 4th, so it

11 would've been the 8th, 9th. I can't -- it was the

12 Saturday of that week, I believe.

13   Q   Was that a sufficient amount of time to

14 analyze HB 2?

15   A   Not from a public perspective. I mean, you

16 know, the -- the bill was put up on the first day,

17 immediately moved through committee that week, and then

18 out of the chamber within the first couple of days.

19   Q   Did the timing of that announcement, impact

20 your ability to recruit candidates in new districts?

21   A   Yes. I mean, although, the filing deadline

22 was postponed, there was still a lot of uncertainty over

23 when -- when this bill would be enacted. Or, you know,

24 there was a bill filed that was enacted on, to continue

25 to move the primary -- to move the filing deadline. That

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1   created a lot of uncertainty as well.

2   MR. ABATE: Give me one second to confer with

3   co-Counsel here, if I may.

4   THE WITNESS: Sure.

5   MR. ABATE: Your Honor, I don't have any more

6   direct questions. I guess, my one question would be

7   a procedural one, which is I had asked Mr. Hieneman

8   to look at this map. I don't know if we ever

9   introduced these as exhibits. Did you move that as

10   an exhibit with Dr. Imai?

11   MS. BECKER: Not the big ones, but the small

12   maps are in our binder.

13   MR. ABATE: Okay.

14   JUDGE WINGATE: Small maps are in there, too.

15   MR. ABATE: Okay. Great. Well, then I think

16   we can skip introducing the big map as a separate

17   exhibit. And for now, I will pass the witness.

18   JUDGE WINGATE: Why don't we take a little

19   break? How long do you think your cross will be?

20   MR. MADDOX: I could have an hour, Your Honor.

21   JUDGE WINGATE: I'd like to finish this guy.

22   MR. ABATE: I would, too.

23   JUDGE WINGATE: I'd like to finish him, so he -

24   - you know. Let's go ahead and take a ten-minute

25   break and then we'll go to about 5:30 today. Okay?

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1   All right. Thank you all.

2   (OFF THE RECORD)

3   JUDGE WINGATE: There you go. Take your seat

4   again. You're still under oath.

5   MR. ABATE: Your Honor?

6   JUDGE WINGATE: Yes.

7   MR. ABATE: While he's sitting down, I have one

8   housekeeping item. We refer to the map for HB 191,

9   which is a tab in the binder that we gave you this

10   morning, but it was not introduced as an exhibit

11   yet. So we would just like to move to introduce that

12   as Plaintiff's Exhibit 4.

13   JUDGE WINGATE: Okay. That'll be HB 191. Okay.

14   We've got it in. If there's any objection --

15   there's no objection.

16   MR. MADDOX: No objection.

17   (PLAINTIFF'S EXHIBIT 4 ADMITTED INTO

18   EVIDENCE)

19   JUDGE WINGATE: Okay. You may begin.

20   CROSS EXAMINATION

21   BY MR. MADDOX:

22   Q   Good afternoon, Mr. Hieneman. My name is

23   Victor Maddox. We've never met before, have we?

24   A   No.

25   Q   So I represent the Commonwealth, along with

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1   Ms. Becker and I'd like to ask you some questions about

2   your testimony today. First of all, you were involved

3   in the preparation of HB 1 in the 2012 regular session,

4   right? The law that was passed and signed by Governor

5   Beshear, but ruled unconstitutional by the Supreme

6   Court, right?

7   A   I offered advice and opinion to legislators

8   who introduced and voted on the bill. Yes.

9   Q   Right. You said that you, in your job for the

10   House at that time, you were -- part of your

11   responsibilities was working with the Shapefiles and --

12   A   At that time, no.

13   Q   No?

14   A   No.

15   Q   Okay. What was your involvement?

16   A   Again, I did work with the Maptitude software,

17   and helped legislators craft what districts that they

18   wanted.

19   Q   Okay. And the legislatures, at that time,

20   there was what -- a 59 Democrat majority in the House?

21   A   58, 59, I believe.

22   Q   And as I remember, the Republicans in the

23   Senate had the majority. And so the way HB 1 in 2012

24   came together, the respective Houses agreed to pass each

25   other's maps, right?

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1   A   I believe, that's correct.

2   Q   Okay. Now you said a moment ago that one of

3   the reasons HB 191 matters is because the Constitution

4   matters, right?

5   A   Yes.

6   Q   I want to show you a close up of a portion of

7   the map, that was enacted into law by the Kentucky

8   General Assembly with Speaker Stumbo and Governor

9   Beshear, both members of the Kentucky Democratic Party,

10   right?

11   A   Yes.

12   Q   Okay. And what you see here is a close up of

13   what I called in the 2012 case, Fischer Four, "The

14   Pulaski strip." You're familiar with that, aren't you,

15   sir?

16   A   No. But I see what you're referencing. Yes.

17   Q   Okay. So District 80 on the right is

18   Rockcastle County, and it connects with this narrow

19   strip through Pulaski County -- that's sort of the

20   taupe-y color, to Casey County; you see that?

21   A   Yes.

22   Q   And do you see there where the Lincoln County,

23   Rockcastle County, Pulaski County lines sort of come

24   together?

25   A   Yes.

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1   Q   That's like a little spec of land, where the

2 District 85 connecting Rockcastle County and Casey

3 County, actually connects Pulaski to Rockcastle; isn't

4 that right?

5   A   Judging by the picture. Yes.

6   Q   Okay. Do you --

7   A   I've never visited there

8   Q   Right. But the Constitution in Section 33

9 requires counties to be contiguous, doesn't it?

10   A   Yes.

11   Q   Okay. Now, as a political operative, you're a

12 director of a party, and you've worked with

13 redistricting maps, and you're familiar with the

14 Constitution, I believe, even though you're not a

15 lawyer. Does that strike you as respecting the

16 Constitution's continuity requirement?

17   A   I would say they're contiguous. I would say

18 it's also more than two counties paired together.

19   Q   So you think that's unconstitutional?

20   A   Yes.

21   Q   Even though the Democrat Party in 2012 thought

22 it was perfectly fine, right?

23   A   Yes.

24   Q   Okay. When did the Democrat Party decide that

25 it was unconstitutional to connect more than two

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1 counties?

2   A   Well, I have -- I'm not, nor have I ever been,

3 a member of the Kentucky General Assembly. I didn't get

4 to vote on this bill. I got to talk to members about

5 what they wanted, and then help them figure out what

6 they wanted to do on the software. I didn't get to

7 actually draw the map for the individuals. I didn't get

8 to make the strategic decisions.

9   Q   And I appreciate that. But my question was,

10 when did the Democrat Party of Kentucky decide that it

11 was unconstitutional to join more than two counties in

12 creating a map? Because it clearly wasn't their view in

13 2012, right?

14   A   I would say that the members of the General

15 Assembly decided on this map.

16   Q   Okay. So the Kentucky Democrat Party didn't

17 have a view on whether it was --

18   A   I don't think they took an official position

19 on redistricting at that time. Members of the party may

20 have.

21   Q   Okay. So my question again is, when did the

22 Kentucky Democrat Party decide that it was

23 unconstitutional to join more than two counties?

24   A   I don't think the party has ever taken that

25 official position.

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1   Q   That's their position in this lawsuit, isn't

2 it?

3   A   It is the position that Section 33 requires

4 that, and that House Bill 191 requires that, and the --

5 our challenge is that House Bill 2 did not do that.

6   MR. MADDOX: Okay. Now, Your Honor, I would

7   like to offer the map I've just shown as

8   Commonwealth Exhibit Number 8, I believe.

9   JUDGE WINGATE: Yes. It's number 8.

10   MR. MADDOX: And offer it into evidence.

11   JUDGE WINGATE: You got any objection? Anybody

12   going to object?

13   MR. ABATE: No.

14   JUDGE WINGATE: Okay. It comes in.

15   (COMMONWEALTH'S EXHIBIT 8 ADMITTED INTO

16   EVIDENCE)

17 BY MR. MADDOX:

18   Q   So you talked about there being 23 county

19 splits that are required, right?

20   A   Yes.

21   Q   And into the current population numbers, that

22 23 counties have to be split. Now you remember -- I

23 believe, you would remember that in 2012, that number

24 was 24 counties, right?

25   A   I believe, that's correct. Hopkins and

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1   Henderson were required to be divided, and Shelby was

2   not. So, yes.

3   Q   Right. So do you remember that on

4   January 12, 2012, Speaker Stumbo in the floor of the

5   House said the following, when told that it would be

6   unconstitutional to divide 28 counties, because that's

7   what HB 1 in 2012 did, right? It divided 28 counties,

8   right?

9   A   I honestly don't remember, but I'll take your

10 word for it.

11   Q   Okay. I think the record will show that.

12 Mr. Stumbo said, when told that the law required and the

13 Constitution required that the minimum number of

14 counties be split and that was 24. He said --

15   MR. MADDOX: -- and this is available, Your

16   Honor, at the KET website. We can introduce that

17   for the record, or you can take judicial notice of

18   it.

19 BY MR. MADDOX:

20   Q   At 81 minutes -- I believe it's at the 81.13

21 mark on the tape, he says, "I would submit to you, that

22 the word possible means what you can get past, and what

23 you can get done in light of all the circumstances." And

24 a few seconds later, he said, "My interpretation of that

25 is, possible means what you can pass in light of the

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1 spirit of the document. What you can pass that makes

2 sense in the modern world. What you can pass through

3 this body and the Senate and get signed into law." So,

4 Speaker Stumbo, at least, high ranking Republican -- or

5 Democrat who was involved in passing HB 1 in 2012

6 essentially said, that the minimum number of counties

7 that needed to be divided, Section 33 notwithstanding,

8 was a political proposition, right?

9   A   I don't --

10   Q   The minimum number of counties that you can

11 get passed --

12   A   If that was his opinion, then that was his

13 opinion.

14   Q   And that's what the majority Democrat Party

15 did in the House, right? They passed that law.

16   A   They passed it. Yes.

17   Q   Okay. I asked you earlier --

18   JUDGE WINGATE: Vic, regarding that tape,

19 sometimes you just put it on a disc, and put a

20 exhibit sticker on it, and we'll enter it in the

21 next couple days.

22   MR. MADDOX: Yeah. Your Honor, what I might

23 also do is, I read from that -- that was in the

24 brief that Representative Fischer filed in the

25 Supreme Court in the 2012 case -- the Fischer court

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1   case.

2   JUDGE WINGATE: Okay. Well, then that would be

3   good enough.

4   MR. MADDOX: I can offer that as an exhibit

5   here. I only have one copy, but I don't mind

6   introducing that into the record.

7   JUDGE WINGATE: Yeah. That's --

8   MR. MADDOX: We do have copies. I'm sorry.

9   JUDGE WINGATE: We got copies of it, don't we?

10   MR. MADDOX: We have extra copies here.

11   JUDGE WINGATE: Okay. Yeah. I would

12   appreciate that.

13   MR. MADDOX: I would offer that as Exhibit 9.

14   JUDGE WINGATE: Hey, I'm doing this for the

15   Supreme Court. I'm making a record, you-all. You

16   all understand that don't you?

17   MR. MADDOX: So, I would offer that as

18   Commonwealth Exhibit Number 9.

19   JUDGE WINGATE: It'd be 9.

20   MR. MADDOX: Your Honor, the brief filed by

21   Representative Fischer in Legislative Research

22   Commission v. Joseph M. Fischer Supreme, Court case

23   number 2012-SC-0091.

24   JUDGE WINGATE: Okay. Do you-all got any

25   opposition to that?

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1   MR. ABATE: We have no objections.

2   JUDGE WINGATE: Okay.

3   (COMMONWEALTH'S EXHIBIT 9 ADMITTED INTO

4   EVIDENCE)

5   MR. MADDOX: Your Honor, I read from page 12,

6   quoting Speaker Stumbo.

7 BY MR. MADDOX:

8   Q   The other thing that I would offer and ask

9 Mr. Hieneman, since we have an Exhibit 9 in the record

10 now, is are you aware that in the spec of land there in

11 Pulaski County that connected it to Rockcastle, there

12 were five voters?

13   A   No.

14   MR. MADDOX: Okay. Your Honor, I would submit

15   that Exhibit Number 9 will demonstrate that, on page

16   15 as well.

17   JUDGE WINGATE: Okay. Thank you.

18 BY MR. MADDOX:

19   Q   Now, I was going to ask you, Mr. Hieneman, if

20 you're familiar with the case that the Supreme Court did

21 in the Jensen matter?

22   A   I'm familiar with the name of the case.

23   Q   Okay. Well, the Democrat Party is asking this

24 Court to rule as a matter of law, that you can't split a

25 county more than twice, and you can't -- or you have to

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1 split the minimum number of counties multiple times, and

2 you can only join two counties to form a district; is

3 that right?

4   A   As well as the plus and minus 5 percent about

5 the mean, and the (Inaudible) number of split counties.

6   Q   Right. So, in the Fischer Four case, the

7 Supreme Court sort of addressed the question of how many

8 counties had to be divided. And it rejected the LRC's

9 position that they could divide 28 counties or as many

10 as were politically possible. But in footnote 17, they

11 said this, and I wondered if you and the Democrat Party

12 were aware of it because it's part of --

13   MR. ABATE: Your Honor, I'd like to object. It

14   seems like Mr. Maddox is trying to re-argue the case

15   from the preliminary injunction, and he already

16   objected to Mr. Hieneman --

17   JUDGE WINGATE: Well, I think he can ask him

18   these questions. And if he doesn't know, he doesn't

19   know.

20   MR. ABATE: All right.

21   MR. MADDOX: Thank you, Your Honor.

22 BY MR. MADDOX:

23   Q   I'm asking you, Mr. Hieneman, because you're

24 representing the Kentucky Democrat Party, if the party

25 was aware of this statement by our Supreme Court, in

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1   support of the argument that more counties than the

2   minimum should be divided, that the legislature should

3   have more discretion. The Court said, "The LRC notes

4   that by dividing more counties than the mathematical

5   minimum, larger portions of more populous counties would

6   remain intact. We decline to address the LRC's

7   assertion because this is essentially the same argument

8   made and rejected in Jensen. The appellant there asked

9   the Court to require division of the minimum number of

10 counties, only after each county large enough had

11 obtained a district. The Court rejected this argument,

12 upholding a requirement articulated in Fischer Two, to

13 divide the fewest counties mathematically possible."

14 Were you aware of that statement?

15   A   No.

16   Q   So essentially, LRC there was suggesting the

17 Supreme Court that the rule they wanted would allow

18 fewer counties to be multiply split, right? That you

19 wouldn't have to have so many smaller fragments. You

20 could keep larger portions of counties together, when

21 forming districts, right?

22   A   Sure.

23   Q   And the Supreme court said they wouldn't even

24 consider that, (Inaudible) Jensen rejected it, right?

25   A   I'm not an attorney. I haven't read the

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1   Jensen case.

2   Q   Okay. Let me go now to some of your other

3   testimony. Before I do that, as one of your

4   responsibilities, you said that you are responsible for

5   candidate recruitment for the Kentucky Democrat Party,

6   right?

7   A   I work with the legislative leadership to

8   recruit candidates -- to help them recruit candidates.

9   Q   Okay. So you work on recruitment, but you're

10   not in charge of recruitment; is that it?

11   A   No.

12   Q   I'm sorry. "No," means I'm wrong right or

13   wrong?

14   A   No. I am not in charge of the recruitment of

15   state legislative candidates.

16   Q   Thank you. But you are involved?

17   A   Yes.

18   Q   Okay. So, do you know generally, if the

19   Democrat Party's approach toward candidate recruitment

20   is to meet with people one on one in the communities and

21   in question, and go to the churches, or the unions, or

22   the schools, or wherever it might be where potential

23   candidates could be located, and try to actively

24   identify such candidates?

25   A   However the legislative leaders choose to

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1   recruit their candidates is their prerogative.

2   Q   Okay. Are you aware of any program by the

3   Kentucky Democrat Party, whereby you engaged a

4   California consultant to send text messages to random

5   people asking them if they wanted to run for the

6   Kentucky House?

7   A   The program was not random. But, yes. I am

8   familiar with the program.

9   Q   Can you explain it for the Court?

10   A   It's a -- a camp -- or it's a program from a

11   company that texts to registered Democrats with -- to

12   cell phone numbers that have been appended to the voter

13   file, that the Kentucky Democratic Party purchases. And

14   texts those folks to engage them and ask their level of

15   interest. There are errors that occur because cell

16   phone numbers are not as easy to pair as landlines and

17   addresses.

18   Q   So you get phone numbers, and you have a

19   California company send text messages, and then if

20   whoever receives that text message expresses interest,

21   the company follows up and somehow tries to entice this

22   person at the other end of the phone to become a

23   candidate; is that it?

24   A   They share their information with us. They

25   offer to communicate with them, and then pass that

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1   information to us. And then the legislative leaders and

2   the county party leadership can make follow-ups on that.

3   Q   How long has that program been in place; do

4   you know?

5   A   Couple months. it started at the end of last

6   year.

7   Q   So you never tested it in a previous election

8   cycle?

9   A   No.

10   Q   And have you had any success with it in this

11   one?

12   A   Yes.

13   Q   Okay. So how many people have you recruited

14   that way?

15   A   I honestly don't know.

16   Q   But it's been a successful program?

17   A   We have identified successful recruits from

18   that program.

19   Q   Okay. And that's not withstanding HB 2,

20   correct?

21   A   Most of those came from counties that were not

22   divided yet.

23   Q   Okay. So is it your concern that --

24   A   They also came from local -- or they are also

25   running for local and county offices as well.

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1   Q   I see. Is it is the Kentucky Democrat Party's

2 position, that it's the counties that have been divided

3 that makes it more difficult for the party to recruit

4 candidates? Is that your basic position?

5   A   Not necessarily. It's the realignment of

6 counties with different counties to make districts that

7 also compose problems.

8   Q   Okay. Do you agree that the candidate

9 recruitment in an off-year election like this, between

10 presidential elections, is more difficult for the party

11 that holds the White House?

12   A   Electorally?

13   Q   Recruitment of candidates and election of

14 those candidates to office?

15   A   Electorally, yes. I don't have evidence of

16 recruitment, one way or another.

17   Q   Well, if it's more difficult to win office,

18 does it make sense that it would be more difficult to

19 get people to change what they're doing and become a

20 candidate, if the likelihood of them winning is less?

21   A   I don't know.

22   MR. ABATE: Objection to form.

23   JUDGE WINGATE: You got to explain all these

24   objection to forms.

25   MR. ABATE: He --

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1   JUDGE WINGATE: I've been doing it for 22

2   years. I had a Chicago lawyer say it every single

3   time there was a question asked, so...

4   MR. ABATE: Well, thankfully, Your Honor, we're

5   not doing that.

6   JUDGE WINGATE: Okay.

7   MR. ABATE: Mr. Maddox just said it's more

8   difficult to win elections in State House in an

9   off-year, and there's no evidence of that in the

10   record.

11   JUDGE WINGATE: The -- I think he was asking

12   him if he knows there was any evidence of that.

13   MR. MADDOX: I was.

14   JUDGE WINGATE: So you can ask him again if he

15   knows there's any -- yeah.

16 BY MR. MADDOX:

17   Q   Do you know, sir?

18   A   What's the question? I'm sorry. I --

19   Q   Do you know if it's more difficult for

20 candidates to win office in off-year elections, when the

21 party in the White House -- in an off-year election,

22 when that party holds the White House?

23   A   For State House, I don't know.

24   Q   Okay. Do you agree, though, that in election

25 years that are presidential election years, the quality

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1   of the candidate and the appeal of the candidate at the

2   top of the ticket matters right on down the line, both

3   federal and state offices, would you agree with that?

4   A   That the quality of candidate matters in a

5   particular race?

6   Q   Yes, sir.

7   A   Yes.

8   Q   And that, if the presidential candidate is

9   unappealing in a state like Kentucky, that it makes it

10   more difficult for candidates of that same party to do

11   well, doesn't it?

12   A   It can.

13   Q   Okay. So now, in 2016, Hillary Clinton was

14   the Democrat's candidate in Kentucky, right?

15   A   Correct.

16   Q   And she basically called just about everybody

17   in eastern Kentucky a deplorable, didn't she?

18   MR. ABATE: Objection.

19   A   I disagree.

20   Q   She called --

21   A   I'm a native to eastern Kentucky, and I didn't

22   consider myself deplorable.

23   Q   Well, no. Because you weren't a Trump

24   supporter, right? She called the Trump supporters a

25   basket of deplorables, didn't she?

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1   A   But your question implies that there are only

2   Trump supporters in eastern Kentucky, and that's not

3   true.

4   Q   **No. I said, about half.**

5   A   No. You said, the population of eastern

6   Kentucky.

7   Q   **I think the record's going to show that I said**

8   **she called about half --**

9   A   Did she call them deplorable? Yes.

10   Q   **Okay. And she said they were racist, didn't**

11   **she?**

12   A   That I don't know.

13   Q   **She said they were xenophobic, they were**

14   **homophobic, they were Islamophobic. And it's really**

15   **hard to call somebody something worse than a racist in**

16   **21st Century America, isn't it?**

17   A   I don't know.

18   Q   **Okay. So does that seem like an appealing way**

19   **for a candidate to sort of help Democrats win election**

20   **in Kentucky in 2016?**

21   A   By calling them deplorable?

22   Q   **Yes.**

23   A   No. It doesn't help.

24   Q   **Okay. What happened to the Democrat Party in**

25   **the House races in 2016?**

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1   A   They lost the majority.

2   Q   They lost 17 seats, didn't they?

3   A   Correct.

4   Q   So they didn't just lose the majority. They

5 went from 53 in the majority to, I think, 36 in the

6 minority?

7   A   Correct.

8   Q   So they went from a majority to being a super

9 minority, right?

10   A   Correct.

11   Q   And that was the first time in -- what, 95

12 years the Democrat Party had not controlled the State

13 House?

14   A   I believe, that's correct.

15   Q   Okay. Now, in 2018, I think it was kind of a

16 wash, right?

17   A   I believe Democrats gained a couple seats.

18 But, yeah.

19   Q   Okay. A couple of special elections involved,

20 weren't there?

21   A   No. There were -- there were a couple of

22 Republican held seats that -- I think it went from 36 by

23 the start of the 2019 General Assembly, it was like 39.

24   Q   And that's an interesting point, right?

25 Because 2018 was an off year, and the Democrat -- the

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1 Republicans held the White House, right? And the

2 Republican Party lost a couple of seats in that off-year

3 election, right?

4   A   Yes.

5   Q   Okay. So it suggests that I was right, when I

6 said earlier that it's more difficult for can --

7   A   One election doesn't create a trend.

8   Q   Right. So the third election in the last

9 three cycles, what happened?

10   A   Democrats lost seat in the State House.

11   Q   Lost how many?

12   A   They lost seats.

13   Q   They lost 11 seats, didn't they?

14   A   I believe, that's correct.

15   Q   So, they went to 75/25 in the minority, right?

16   A   I believe, that's correct.

17   Q   Okay. So now we've got three elections in a

18 row. And if you draw a line from the 2016 to the 2018

19 to the 2020, does that demonstrate a trend?

20   A   I -- what's the trend?

21   Q   Well, the trend is, the Democrat Party lost

22 over 52 percent of its House memberships, in that

23 three-year period, right?

24   A   In two elections.

25   Q   Three elections.

```
 1      A      Well, but there's a blip up in '18.

 2      Q      Right.  And so when you draw a line through

 3   three points, and there's a blip up, but then the third

 4   point is below where the first point is, that line is

 5   down, right?

 6      A      Sure.

 7      Q      Okay.  And so all of that happened to the

 8   Democrat Party in Kentucky, without any regard to any

 9   sort of mapmaking process, right?

10      A      Sure.

11      Q      HB 2 didn't have a thing in the world to do

12   with it, did it?

13      A      No.

14      Q      Okay.  Now, you complained about the timing of

15   HB 2 in your testimony, right?

16      A      Yes.

17      Q      You said it was released on a holiday.  Now,

18   December 30th is not --

19      A      It's a state holiday.

20      Q      Very important difference, right?  You didn't

21   --

22      A      And I said, that's a state holiday.

23      Q      Okay.  S, for the most part of people in the

24   state, it's not a holiday at all, is it?

25      A      No.
```

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1   Q   Okay. Were you working on the 30th?

2   A   I was.

3   Q   Okay. So it wasn't a holiday for you either?

4   A   No.

5   Q   Okay. Now, you understand, right, that the

6 General Assembly couldn't do any redistricting law for -

7 - that led to HB 2, right, until the United States

8 Census Bureau released the census data, right?

9   A   Correct.

10   Q   And typically, that happens early in the year.

11 So the census is in the aughts (phonetic), the '10s, the

12 '20s, and typically it's early in the spring, right?

13 That data comes out by April, I think, right?

14   A   Correct.

15   Q   But last year was a COVID year, right?

16   A   Yes.

17   Q   So, when did the data come out?

18   A   I don't honestly remember the date that it

19 came out.

20   Q   Wasn't it in September?

21   A   I -- again, I don't remember.

22   Q   Okay. So the General Assembly had between the

23 date that data came out -- let's call it September 1st,

24 just to be general. And the end of the year to do a

25 bill, right?

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1   A   Bills can be filed, I believe, until the

2   middle of March.

3   Q   Right. But they couldn't do a redistricting

4   bill until they knew what the population density was,

5   right? So, they only had that four-month window,

6   correct?

7   A   But again, they could have filed a bill

8   significantly later, and shown it to the public.

9   Q   Significantly later than what?

10   Q   Then the first day of session, when they

11   introduced the bill.

12   Q   Okay. So they could have filed it sooner, but

13   they only had a four-month window to actually come up

14   with a bill, and get it vetted internally, and do

15   whatever else they wanted to do, and then get it

16   introduced, right?

17   A   Sure.

18   Q   Are you suggesting to the court that the

19   Democrat Party when -- or the Democrats, when they

20   controlled the House, and in that 95-year period

21   beforehand, that they got their bills introduced much

22   sooner?

23   A   No. No.

24   Q   Okay. So, what happened with HB 2 is what's

25   happened traditionally in Kentucky, when redistricting

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1 bills are introduced, right?

2   A   I'll defer to you on that. I've only been

3 involved in one working for the LRC.

4   Q   Okay. So here's another question. Your --

5 the -- your party's position, the Democrat Party and the

6 plaintiff in this case position is, that the legislature

7 damaged the party because it held the bill, and didn't

8 introduce it until the first day of the session, right?

9   A   I would say that that damaged the public.

10   Q   But the public isn't a plaintiff here today.

11 The party is, right?

12   A   And our complaint is about the

13 constitutionality of the bill.

14   Q   Right. But you were complaining to Judge

15 Wingate about the timing of its release and

16 introduction. And you seem to say -- be saying that,

17 that timing made it more difficult for the Democrat

18 Party to recruit candidates?

19   A   It did.

20   Q   Right?

21   A   Yes.

22   Q   Okay. So now, Andy Beshear is a Democrat,

23 isn't he?

24   A   Yes.

25   Q   And he's the only man in the state who has the

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1   power to call a special session to deal with

2   redistricting, right?

3   A   Yes.

4   Q   So if the Democrat Party -- did the Democrat

5   Party ask Governor Beshear to call a special session, so

6   that redistricting could be done before the regular

7   session, and the Democrats would then be better able to

8   recruit candidates?

9   A   No.

10   Q   Why didn't it call -- why didn't it ask the

11   governor to do that?

12   A   I don't know.

13   Q   Okay. Fair enough. Are you familiar with the

14   concept of political geography?

15   A   As -- I need a little bit more information on

16   that.

17   Q   Well, people tend to be partisans one way or

18   the other. They vote for one party or another. They're

19   registered as Democrats, or Republicans, or

20   Independents. They live in cities, or they live in

21   rural areas, or suburbs, that sort of thing. Are you

22   familiar with how that affects sort of electoral

23   success, and success recruiting candidates?

24   A   Somewhat.

25   Q   Okay. Are you familiar with the proposition,

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1   that I think is commonly accepted in political science,

2   that Democrats tend to concentrate in urban areas of

3   larger cities, and Republicans tend to locate in

4   suburban areas or in rural areas in small towns?

5   A   I'm not aware of that as a political science

6   concept. No.

7   Q   Okay. So, you haven't ever looked into the

8   concept of political geography and the -- sort of the

9   disadvantage in the redistricting process that the

10   Democrats often face, simply because they are

11   concentrated in urban districts?

12   A   No. I haven't looked at that.

13   Q   Okay. Do you have any information you can

14   share with the Court, on the extent to which the

15   migration within Kentucky in the last decade has tended

16   to further concentrate Democrats in urban areas and

17   disperse Republicans in other areas?

18   A   I don't know about moving Democrats and

19   Republicans, but I am aware of demographic changes and

20   population movement, regardless of partisanship.

21   Q   All right. Do you agree that where people

22   choose to live is an important factor in the partisan

23   makeup of House districts across Kentucky?

24   A   I'm sorry. Repeat that.

25   Q   Yeah. I asked you if you agree that the --

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1   where people choose to live is an important factor in

2   the partisan makeup of House districts across Kentucky?

3   A   No.

4   Q   So let me ask you about the House District 40,

5   for instance. Are you familiar with House District 40?

6   A   Yes.

7   Q   Where is that?

8   A   Shively, roughly. It's in Jefferson County.

9   Q   Yeah. I think it's more like Shawnee Park,

10   right? And you know where Shawnee Park is, don't you?

11   A   I'm not overly familiar with too many of the

12   smaller cities within Jefferson County.

13   Q   Okay. Well, let's see if we can take a quick

14   look at it. So -- I think you're right, Mr. Hieneman.

15   It is Shively. So I apologize. You've got a set of

16   maps there in front of you in that notebook.

17   MR. MADDOX: And Your Honor, this is the

18   stipulated notebook that we called Exhibit 1, I

19   believe.

20   Q   If you look at tab number one, which is a map

21   of -- this is HB 2, I believe; is that right? HB2. You

22   see that?

23   A   Yes.

24   Q   So if you look at exhibit -- or at the

25   Jefferson County detail up in the top left corner of

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1   that, you'll see that District 43 is there in the --

2   that bend in the Ohio River, right on the northwest

3   corner of Jefferson County, right?

4   A   Yes.

5   Q   Okay. So do you know what the black

6   population of that district is?

7   A   The population or the voting age population?

8   Q   Voting age population.

9   A   I'm not aware. I know that it is a

10   plurality-black district.

11   Q   So 35 to 45 percent?

12   A   I would say over 45 percent.

13   Q   45 percent black voting age population. And

14   that suggests, to a reasonable objective observer, that

15   the Democrat vote percent in that district is going to

16   be extremely high, doesn't it?

17   A   Yes.

18   Q   Okay. And if you look at that -- the

19   geography of that district, you really can't go west and

20   gain any population that might sort of change that,

21   right? Because there's a river there, and then there's

22   Indiana.

23   A   Correct.

24   Q   And you can't go north because there's a river

25   there, and then there's Indiana, right?

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1   A   Correct.

2   Q   And if you go south, you're in the 42nd

3 District. 42nd District is just like the 43rd District,

4 right?

5   A   Yes.

6   Q   About 45 percent black, very high Democrat

7 population, a partisan split. So you can't go to that

8 district and get anybody who might sort of reduce the

9 partisan makeup of that district, to make it less

10 Democrat, right?

11   A   Correct.

12   Q   So those two districts, and there's others

13 just like it, 40, 44 are no different. Those are

14 basically districts where -- because Democrats chose to

15 live in the urban center. And the geography of the

16 state, with the river, and the boundaries, and the like,

17 and the relationship of one Democrat district to

18 another, means it's very, very difficult for a map maker

19 to make that district one that's going to be less than

20 highly Democrat, right?

21   A   Yes.

22   Q   Okay. And so to the extent that Kentucky has

23 a given statewide vote percentage for Democrats, a

24 partisan split, and to the extent that a big number of

25 those people are concentrated in just a few districts,

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1 that suggests that the rest of the state is going to be

2 a whole lot more Republican, doesn't it?

3   A   Yes.

4   Q   And that's not because of HB 2 or the

5 mapmakers. That's because of the political geography of

6 Kentucky; isn't that right, sir?

7   A   With due respect to those, it's also because

8 of redlining.

9   Q   Okay. So redlining is a -- you're talking

10 about a practice whereby somehow people were forced to

11 live in these areas, right?

12   A   It -- it's a historical practice of -- yeah,

13 limiting the expansion of minority communities.

14   Q   Okay. And that -- you're saying that took

15 place in the west end of Jefferson County, right?

16   A   I'm saying that has historically happened. Not

17 necessarily -- I don't know because I'm a historian and

18 I'm definitely not a Jefferson County native resident,

19 but that has typically been what has concentrated some

20 communities.

21   Q   You don't believe the Republican Party has

22 been in --

23   A   No.

24   Q   -- control of Jefferson County --

25   A   No.

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1   Q   -- in the last 50 years, do you?

2   A   No.

3   Q   So you're not suggesting that redlining has

4 got anything to do with the makeup of HB 2, do you?

5   A   No.

6   Q   Okay. You know, that's another interesting

7 point. You know, when I was a kid, I lived in the west

8 end of Louisville. I think I lived in what would now be

9 the 40th District. It was right off of Algonquin

10 Parkway. You know where that is?

11   A   No.

12   Q   Okay. Well, it's in the west end. And it was

13 a long time, I confess, but my parents moved us to a

14 different part of the state. When I came back to

15 Kentucky after law school, I lived in the 34th District.

16 And that's Mary Lou Marzian's district, right?

17   A   She was elected in that, but -- no. She

18 wouldn't -- she doesn't live in there, under House Bill

19 2.

20   Q   The 34th House district right now is Mary Lou

21 Marzian's district, isn't it?

22   A   She was elected to that under the 2020 -- in

23 2020.

24   Q   And she's been there for 30 years, right?

25   A   Roughly, yes.

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1   Q   Well, about 20 of those years, she represented

2   me. And you know, she never once voted the way I wanted

3   her to. Not once. And so, you know what I did, I got

4   sick of it. And so, I moved to another district, right?

5   I moved to a district that Jerry Miller represents, in

6   the 36th District. And Jerry Miller is in a district

7   that's so Republican, that at least one year in the last

8   three cycles, he didn't even have an opponent.

9   MR. ABATE: Your Honor, is this testimony or is

10   this a question for the witness?

11   MR. MADDOX: So, it's leading to a question.

12   JUDGE WINGATE: I think he could answer his

13   questions.

14   MR. MADDOX: It's leading to a question.

15   MR. ABATE: I never heard the question.

16   MR. MADDOX: Thank you for encouraging me to

17   move on, though, Michael.

18   BY MR. MADDOX:

19   Q   So the question is, sir: People have a choice

20   about where they want to live, don't they?

21   A   Some do. Some don't have the economic means

22   to move.

23   Q   Okay. And you're suggesting that some of the

24   people in the 40th, and the 42nd, and those districts

25   don't have a choice about where to move? And that's --

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1   A   I'm not saying about them in particular. The

2   same can be said in eastern Kentucky as well.

3   Q   Okay. But certainly, people in the 34th

4   District do, right? That's a well-off district, isn't

5   it?

6   A   Again, they're -- it's socioeconomics I'm not

7   familiar with.

8   Q   Have you ever been to the Highlands, the

9   Cherokee Triangle area?

10   A   Is that where that is? I don't know.

11   Q   Okay. So people can make decisions about

12   where they want to move to, right? And that affects the

13   political geography. People can self-segregate into

14   more partisan for their purposes or less partisan for

15   their purposes -- districts, right?

16   A   Sure.

17   Q   Okay. And when that happens, over a period of

18   years or decades, the legislature is compelled to deal

19   with the people they have in the counties they find

20   them, right? And they have to draw lines, and sometimes

21   those lines lead to an electoral disadvantage for one

22   party or another; isn't that right?

23   A   It can. Yes.

24   Q   Okay. So while I've got you, up here on the

25   big map --

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1   MR. MADDOX: -- and this is tab 11, Your Honor,

2   in Exhibit 1.

3   Q   We have a copy of HB -- I think this is the

4   2013 map, right? So, this is the existing -- the

5   districts that were recently repealed, and where Mary

6   Lou Marzian was actually elected in, right? And you can

7   see 34th District is right here. That looks like a

8   reasonably compact district, doesn't it?

9   A   Yes.

10   Q   Okay. And do you know if the shape of that

11   district has basically changed at all, in the last 30

12   years?

13   A   I don't know.

14   Q   Okay. But over here on 43, and 41, and 42,

15   those districts looks like bacon strips running east to

16   west, don't they?

17   A   They are long. Yes.

18   Q   Those are not compact districts, are they?

19   A   I don't know the compact scores from --

20   Q   Right.

21   A   -- from a statisticians --

22   Q   But using the eyeball test, you can tell me,

23   can't you, that those districts are long and narrow

24   compared to the same districts in HB 2?

25   A   41 is completely relocated. So, yes. And

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1 then 40 -- I would say 43 and 42 are more compact. Yes.

2   Q   Okay. And do you know what the partisan

3 makeup of these districts is, in their current

4 configuration?

5   A   I -- not right off hand.

6   Q   Okay. Is it important for mapmakers to try to

7 make districts more compact?

8   A   If at all possible.

9   Q   Okay. And it's certainly possible in western

10 Jefferson County, because we have a map in front of you

11 with more compact districts, don't we?

12   A   They are compact.

13   Q   Okay. Let's move on. So your job, with

14 respect to HB 1, was basically to extract some data --

15 with respect to this case, excuse me, was to extract

16 data about HB 191 and HB 2, and then sort of present

17 that so that the plaintiffs could incorporate that into

18 their complaint, right?

19   A   Yes.

20   Q   And you did that with the Dave's Redistricting

21 website, basically, right?

22   A   Correct.

23   Q   Okay. When you went to Dave's Redistricting

24 website, did you notice that it tells you a lot of

25 information about the various districts and the metrics

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1   of the plan itself; did you notice that?

2   A   Some. Yes.

3   Q   Okay.

4   A   I'm not familiar with -- and I don't -- I'm

5   not a statistician, so I don't know a lot of those

6   details.

7   MR. MADDOX: Yeah. I want show you -- can you

8   give the witness --

9   MR. MAGERA: Absolutely.

10   BY MR. MADDOX:

11   Q   I want to -- Mr. Magera is going to hand you a

12   printout of a page that deals with HB 191. And this

13   comes from the Dave's Redistricting website. You

14   recognize this as coming from Dave's, don't you?

15   A   Yes.

16   MR. MADDOX: Okay. Your Honor, I would offer

17   this as Commonwealth's Exhibit 10.

18   JUDGE WINGATE: Okay. Is there any objection?

19   MR. ABATE: I've never seen this before.

20   MR. MADDOX: Well, let me go through it and --

21   JUDGE WINGATE: Well, how about this? Why

22   don't you ask him about?

23   MR. MADDOX: I'll go through it.

24   JUDGE WINGATE: And then, at the end of it, you

25   can --

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1   MR. MADDOX: And then we'll offer it.

2   JUDGE WINGATE: Okay.

3   BY MR. MADDOX:

4   Q   So, what I've marked as the Commonwealth's

5   Exhibit 10 for identification, is a printout of a

6   screenshot from Dave's Redistricting. You can see there

7   it says "HB 191" in the middle, right? Sort of --

8   A   Yes.

9   Q   -- top. And over to the left-hand side, it

10 says, "Kentucky 46,018." It has a number of things you

11 can do. And then over on the right-hand side, it has,

12 "District details 47," and it has a lot of different

13 information about voting age, and population, and

14 partisan issues, right; you see that?

15   A   Yes.

16   Q   So you've seen these kinds of pages before in

17 your work, right?

18   A   Yes.

19   Q   Okay. And this relates to District 47 in

20 particular. You can see where it says on the bottom

21 there on the -- under, "Composite 2012, 2019 Democrat,

22 35," I think that's 0.7 or 0.9 percent. And,

23 "Republican, 60.9 percent"; you see that?

24   A   Yes.

25   Q   So it looks like Dave's has said, if we look

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1   at some elections over the last eight or nine -- seven

2   years, this district tends to vote 35 to 40 percent --

3   35 to 36 percent Democrat and about 64 percent

4   Republican, right?

5   A   Correct.

6   Q   Okay. Now, if you go -- look to the next

7   page, do you see where it says, "Efficiency gap," there?

8   On the left-hand side, under, "Metrics," extreme right -

9   - extreme left?

10   MR. ABATE: I only have one page.

11   JUDGE WINGATE: Yeah. I've only got one.

12   MR. MADDOX: Yeah. Sorry, Your Honor. Mine

13   are combined. Mr. Magera's going to hand out --

14   JUDGE WINGATE: Got you.

15   MR. MADDOX: -- the second page. Alex, are you

16   handing out just one or the other two?

17   MR. MAGERA: Just one.

18   MR. MADDOX: Okay. We'll do it page by page.

19   And Your Honor, I would offer this as -- for

20   identification as -- well, can I just make it all

21   one exhibit? Is that --

22   JUDGE WINGATE: Yeah. That's what I was going

23   to say. I'm going to staple mine. How's that?

24   MR. MADDOX: That's what we'll do. It's going

25   to be a three-page exhibit.

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1   JUDGE WINGATE: Is it going to be a three-

2 page?

3   MR. MADDOX: Three page.

4   JUDGE WINGATE: Okay.

5 BY MR. MADDOX:

6   Q   So, Mr. Hieneman, you can see there on the

7 second page of Exhibit 10 for identification, the

8 efficiency gap number. Do you see that?

9   A   Yes.

10   Q   Okay. And it says, "Efficiency gap, 9.26." Do

11 you know what that means?

12   A   I don't. I mean, other than the description

13 that's written there. I'm not a statistician, I don't -

14 - I'm not familiar with it.

15   Q   Okay. So we've seen in the record, in

16 connection with earlier filings, that the efficiency gap

17 number -- that number would suggest that the map is a

18 pro-Republican map; do you agree? And if that's the

19 case -- let me ask you to assume that for a moment. Can

20 you tell me why the Democrat Party sponsored a map that

21 became HB 191, that has a pro-Republican leaning and an

22 efficiency gap of 9.26?

23   A   Again, I don't know what efficiency gap

24 percent means. What I advised the members of the

25 Democratic Caucus of the General Assembly was to draft a

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1   map, that complied with the written text of Section 33.

2   Q   How many seats do you think would be elected

3   by Republic -- be elected for Republicans under HB 191?

4   A   In '22 or in 2030?

5   Q   In the coming election?

6   A   It's -- I believe the estimates from this

7   website, was 76, something like that. I do -- I

8   honestly don't remember right off hand.

9   Q   So Dave's Redistricting, sort of an objective

10 website, one that -- the Republican -- the Democrat

11 Party, excuse me, used to help it put together its own

12 map 191, says that map's going to result in 76

13 Republicans, right?

14   A   After the 2022 election, and again, not

15 assuming candidate quality or anything like that. Just

16 based off statistical estimation.

17   Q   If you and the Democrat Party were able to

18 draft a map that would've resulted in more Democrats

19 being elected, would you have tried to do that?

20   A   What I advised the members of the legislative

21 cauc -- of the Democratic Legislative Caucus to do was

22 draft the map that was compliant with the written text

23 of Section 33.

24   Q   Okay. And when you say, "The written text,"

25 did you include the authoritative interpretation of that

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1   written text, that the Supreme Court has handed down?

2   A   I'm not an attorney and did not have

3   interpretation of that. I could simply read the text of

4   the mandates in it.

5   Q   But the Constitution is a legal document,

6   right?

7   A   Yes.

8   Q   And so to interpret it, if you -- you have to

9   rely on either some training or some authoritative

10 source, don't you?

11   A   The authoritative source was the written words

12 of Section 33.

13   Q   Okay. So you formed your own layperson's

14 opinion about the meaning of Section 33 when you advised

15 the Democrat Party on how to construct HB 191; is that

16 your testimony?

17   A   I advise members of the General Assembly to do

18 so.

19   Q   Even better. Okay. Did anybody in the

20 General Assembly ask you if there was a legal opinion

21 supporting that?

22   A   No.

23   Q   Who did you talk to specifically, in the

24 General Assembly?

25   A   The legislative leadership.

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1 Q And that was who?

2 A Representative Jenkins -- Joni Jenkins,

3 Representative Derrick Graham, Representative Angie

4 Hatton.

5 Q And not one of them asked you if your

6 layperson's interpretation was supported by a legal

7 opinion, from anybody with any legal training?

8 A They did not ask me that.

9   MR. MADDOX: Third page. Your Honor, I would

10 like to now turn to the third page of what I've

11 called Commonwealth's 10 for identification.

12   JUDGE WINGATE: Again, I'm making this one

13 exhibit, if that's all right?

14   MR. MADDOX: Yes. Thank you, Your Honor.

15 BY MR. MADDOX:

16 Q And so, Mr. Hieneman, the -- this document -

17   MR. MADDOX: Where's the precinct's one? With

18 the -- Okay. All right.

19 Q So the last line in this document, sir,

20 addresses the splitting of precincts. Do you see that?

21 A Yes.

22 Q Okay. And it says, to achieve almost exact

23 district population, 99 precincts may also have to be

24 split in -- but 24 are split. Do you understand that is

25 what HB 191 does?

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1   A   Yes.

2   Q   Okay. Do you know how many precincts HB 2

3 splits?

4   A   No.

5   Q   Have you ever done anything to inform yourself

6 or the Democratic Party about whether HB 2 splits even

7 one precinct?

8   A   I have not.

9   Q   Do you think the legislature was entitled to

10 adopt a rule that says, we're not going to split any

11 precincts, when we redistrict the state?

12   A   Are they entitled to that? If that is their

13 mapmaking principle, that's -- they're certainly

14 entitled to that.

15   Q   Do you understand that there are good reasons

16 why you don't want to split precincts, when you're

17 creating legislative districts? For one, it saves the

18 county clerks a whole lot of time and money. Would you

19 agree with that?

20   A   I've not worked in the clerk's office. I

21 don't know.

22   Q   Okay. In any event, HB 191 splits at least 24

23 precincts, right?

24   A   According to this. Yes.

25   Q   And you don't have any reason to doubt it,

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1 right?

2   A   No.

3   Q   Okay. So when you go to Dave's Redistricting

4 -- and that's what you did, right?

5   A   Yes.

6   MR. MADDOX: Your Honor, I would like to offer

7   Exhibit 10, at this point -- 11 -- 10 for

8   identification

9 --

10   JUDGE WINGATE: It's 10. Do you-all have any

11   objections?

12   MR. MADDOX: -- I mean, into evidence.

13   MR. ABATE: No.

14   JUDGE WINGATE: Okay. Go ahead then.

15   (COMMONWEALTH'S EXHIBIT 10 ADMITTED INTO

16   EVIDENCE)

17 BY MR. MADDOX:

18   Q   All right. So when you go to Dave's

19 Redistricting, Mr. Hieneman, it allows you to upload the

20 maps and the files that go into creating the maps that

21 are HB 2 and HB 191, right?

22   A   Correct.

23   Q   And you -- so you went to the LRC website, and

24 you can go to the link, and it says, "Here are the

25 Shapefiles files, right? And you got those Shapefiles,

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1 and then you went to Dave's, and you uploaded the LRC

2 files to the Dave's website, right?

3   A   I was given the files from LRC staff.

4   Q   Okay. Even better. But all you had to do

5 then was take the LRC shape files, and put them into

6 Dave's, right? And then when you did that, what did

7 Dave's ask you and what did it do for you?

8   A   I uploaded the map, and I guess, ran analysis.

9   Q   Okay. And you don't have any training in

10 statistics, or quantitative analysis, or computational

11 science?

12   A   No.

13   Q   And you don't have any training in election

14 history or political science in the country or in

15 Kentucky, right?

16   A   I have a degree in political science.

17   Q   Oh, you do?

18   A   Yes.

19   Q   Okay. Is that the one you got at George

20 Washington?

21   A   No. I have a master's in political management

22 from George Washington.

23   Q   Okay. So, you have an undergraduate degree in

24 political science. You got that when?

25   A   2004.

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1   Q   Do you consider yourself an expert in

2 redistricting techniques?

3   A   No.

4   Q   Do you consider yourself an expert in computer

5 programming?

6   A   No.

7   Q   Okay. So after you uploaded the maps, you

8 asked Dave's to analyze it for you, and that's what it

9 did?

10   A   It generates those automatically.

11   Q   Okay. And then -- and that's where you got

12 the files, the maps for the different cities we looked

13 at earlier?

14   A   Yes. You can isolate by city.

15   Q   And it gave us -- it would've given you if

16 you'd asked for it and wanted to keep it all the data

17 that we called Exhibit 11, right?

18   A   Yes.

19   Q   Okay. 10, I'm sorry. Heather's keeping me

20 honest. And if I wanted to take those shame shape

21 files, or if Judge Wingate wanted to take those files,

22 he could do the same thing you did to generate --

23   JUDGE WINGATE: Probably not. I can barely run

24   that computer.

25   MR. MADDOX: Well, I'm not far behind you,

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1   Judge.

2   BY MR. MADDOX:

3   Q   But anybody generally can do this, right? The

4   whole point is, it's set up so that anybody can do it,

5   right?

6   A   Yes.

7   Q   Okay. Now you'll notice on page 2 of Exhibit

8   10, at the very bottom, it says, "Use plan score to

9   further assess the degree to which a map is

10 gerrymandered." Do you see that?

11   A   Yes.

12   Q   And then it has a little tab you can click on,

13 and that'll take you to plan score, right?

14   A   I believe, I --

15   Q   You didn't do that?

16   A   No.

17   Q   Okay. So you don't know what the plan score

18 data for HB 191 is, right?

19   A   I don't.

20   Q   Okay. Mr. Hieneman, I want to ask you about

21 some of the districts you talked about in your testimony

22 earlier. So, the first one was Bowling Green, right?

23 That's the first map on Plaintiff's Exhibit Number 3,

24 right?

25   A   Yes.

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1   Q   Do you see the purple area under, "2013 Map,"

2   the purple area that has a 17 in it?

3   A   Yes.

4   Q   That is part of District 17 from the map that

5   was enacted in 2013, right?

6   A   Yes.

7   Q   So if you look at tab 11 -- tab 10 in our

8   Exhibit number 1 for the Commonwealth, that's another

9   map of the 2013 plan. Do you see District 17 there is

10   mostly Butler County. Do you see that?

11   A   Geographically, yes.

12   Q   Yes. And it actually kind of looks like a

13   jellyfish, doesn't it, with like the tentacles, the

14   tendrils hanging down below sort of the base of the

15   jellyfish. And that purple -- that blue section on tab

16   10, but the purple section in your map that goes down

17   all the way from the northwestern Warren County border

18   and encircles District 20. Isn't that how you would

19   describe that?

20   A   I wouldn't say it encircles, but it comes

21   underneath. Yes.

22   Q   It comes underneath, and it comes back up on

23   the eastern side, right? So it comes down on the west,

24   goes all the way across the south, comes back up halfway

25   on the east, right?

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1   A   Yes.

2   Q   Okay. Does that look like a gerrymander

3 district to you?

4   A   I don't know the details that come with that,

5 in terms of the racial or voting population to know one

6 way or another.

7   Q   But you're complaining in the party -- the

8 Democrat Party is complaining about gerrymandering in

9 this case, right?

10   A   As it relates to -- yes, the manipulation of

11 district lines to favorite one party over another.

12   Q   Okay. So, when HB 1 in the 2012 map created

13 the Pulaski strip and the Pulaski spec to join Casey and

14 Rockcastle, was there a partisan advantage to doing

15 that?

16   A   I don't know.

17   Q   Okay. Is it your -- let me ask you to take

18 another look at Plaintiff's Exhibit 3. Your view is

19 that this changed -- from what HB 2 does from the 2013

20 map, changed the district number 20 from a district that

21 was Democrat to one that's likely to be Republican,

22 right?

23   A   Yes.

24   Q   Okay. And you said there was population

25 growth in Bowling Green. Do you have any figures for

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1   the Court, on how the population of the city of Bowling

2   Green grew?

3   A   I -- I don't have those.

4   Q   Okay. So, as you sit here today, even though

5   you told the Judge that the population in Bowling Green

6   grew, and that's part of the reason why the district had

7   changed, you don't know what the numbers are, right?

8   A   The population of District 20 exceeded the

9   maximum population of the district.

10   Q   In fact, every district in Warren County is

11   more than the ideal population in the current map,

12   right?

13   A   That's the only district wholly contained

14   within Warren County. I don't recall from the other

15   districts where they are.

16   Q   Okay.

17   A   I believe, 17 is definitely over the others. I

18   can't say one or another.

19   Q   Okay. Do you know what the compactness scores

20   are for HB 2's District 20 versus the 2013 map?

21   A   I do not.

22   Q   Okay. Do you -- when you look at tab 10 in

23   Exhibit 1, do you see where part of District 19 in 2013

24   was in Edmonson and Warren, but then District 23 in

25   Barren County took a little part of Warren County. Do

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1 you see that?

2   A   Yes.

3   Q   Now in the current map, HB 2, there's no

4 Barren County population in Warren County -- in the

5 District 19, right?

6   A   Correct.

7   Q   It's because Barren County population grew as

8 well, right?

9   A   I believe so. Yes.

10   Q   Right. And so the map makers were faced with

11 a choice of how to change the districts in that

12 geographical part of the state, where both Warren and

13 Barren County had grown in population, right?

14   A   Yes.

15   Q   Okay. Now looking again at HB -- the 2013

16 map, can you tell me how many districts are in Warren

17 County? It looks like there's 19.

18   A   Five, I believe; is that correct? Five

19   Q   Well, let's count them. We got 19.

20   A   17, 19, 20, 16, and 23, 22. Did I say 22?

21   Q   You said 23, but you meant 22?

22   A   Well, no. 23 is in there as well. So, 16,

23 17, 19 20, 22, and 23. So, six.

24   Q   So, there were six different districts in that

25 one county, that the Democrat Party thought was just

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1 fine, right?

2   A   The members of the General Assembly thought

3 that.

4   Q   Okay. Now how many districts are in Warren

5 County, under HB 2?

6   A   Four.

7   Q   So, that seems like a big improvement, doesn't

8 it?

9   A   Yes.

10   Q   Okay. Let me ask you about Erlanger --

11 Erlanger. So in the first map on your exhibit -- this

12 is the second page of Plaintiff's Exhibit 3, the

13 democratic map in 2013 split Erlanger into three

14 different districts, right?

15   A   Correct.

16   Q   The HB 2 in the current bill splits Erlanger

17 into three different districts, right?

18   A   Correct.

19   Q   And when did the Democrats decide that

20 Earlenger really should be just one district? Because

21 that's what HB 191 does, right?

22   A   It preserves the boundaries of the City of

23 Erlanger in the district.

24   Q   But that wasn't important just nine years ago,

25 right?

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1 A You'll have to ask the members of the General

2 Assembly from 2012.

3 Q **Whom you advised, correct?**

4 A Yes.

5 Q **Did you advise them, that it was important to**

6 **keep Erlanger as a single district?**

7 A That was not what I -- one of the places I

8 advised on.

9 Q **So you didn't deal with that part of the**

10 **state?**

11 A No.

12 Q **Who did?**

13 A I honestly -- I don't remember.

14 Q **Okay. Let's look at Florence. It's the next**

15 **page of Plaintiff's Exhibit 3. There's, in 2013, one,**

16 **two, three, four districts in Florence, right? That's**

17 **generally a Republican area, right?**

18 A Yes.

19 Q **And it looks like the Democrats were trying to**

20 **crack Florence in 2013; wouldn't you say?**

21 A Again, you'd have to ask the members of the

22 General Assembly.

23 Q **Well, they divided in into four different**

24 **counties or four different districts, right? Now it's**

25 **only in three, right, HB 2?**

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1   A   Yes.

2   Q   Okay. Do you know you -- I think your cheat

3 sheet told us what the partisan makeup was; can you

4 remember?

5   A   Yeah. There were three Republican districts

6 under House Bill 2.

7   Q   Okay. And is there -- let's see. So HB 2

8 creates three Republican districts, 62 percent, 60

9 percent, and 63 percent. Your bill would keep it intact

10 60 percent. So where's the partisan disadvantage to the

11 Democrat Party, by Erlanger being either three districts

12 or one district, with 60 percent or more Republicans?

13   A   Looking at this isolated, I don't think can

14 give it a whole perspective.

15   Q   Well, you isolated it on Plaintiff's Exhibit

16 3, not me, sir.

17   A   And that's true. But that is to demonstrate

18 what happened to the city, not necessarily what happened

19 at large.

20   Q   Okay. But as you sit here today, you can't

21 tell the Judge what the partisan disadvantage is, right?

22   A   No.

23   Q   Okay. Let's look at the next page.

24 Georgetown, 2013 Democratic Party in charge.

25 Georgetown's one, two, three districts, right?

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1   A   Yes.

2   Q   Okay. HB 2, two districts. So that's an

3 improvement, right?

4   A   Yes. Okay.

5   Q   Current map, HB 2 improvement over existing

6 map, sponsored by the Democrat Party nine years ago. And

7 you said that it puts a spike through the middle of

8 Georgetown, I believe, right?

9   A   Dividing the city. Yes.

10   Q   Okay. And if we look at your cheat sheet, it

11 says, Georgetown has been divided into two

12 unrepresentative (phonetic) majority Republican

13 districts, 52 percent and 58 percent. Whereas in

14 contrast, HB 1 keeps it intact in a competitive

15 district, right? So HB 191 you say, has 53 percent and

16 that's competitive, right? But HB 2 creates two

17 different districts, one of which only has 52 percent,

18 right? So you've got to concede that's even more

19 competitive, don't you?

20   A   Yes.

21   Q   Where's the partisan disadvantage for the

22 Democrat Party?

23   A   Again, it's not only one isolated incident.

24 It's the map at large.

25   Q   Right. And you understand that when you do a

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1 map at large, you've got to start somewhere, and you've

2 got to move across the state. And the geography makes

3 it very difficult sometimes to keep things just the way

4 you might like them, right?

5   A   Yes.

6   Q   Okay. Let me ask you about the -- I think

7 it's the last page. No. It's the next page on the

8 Plaintiffs 3, and that's Hopkinsville. 2013 map, the

9 city had four districts, right?

10   A   I believe, it's three.

11   Q   I'm sorry, three districts. Excuse me.

12 District 4, District 8, District 9. HB 2, it only has

13 two districts, right?

14   A   Correct.

15   Q   So that's an improvement, right?

16   A   Correct.

17   Q   Okay. Now HB 191 has two districts, right?

18   A   Yes.

19   Q   And your only real concern about Hopkinsville

20 is that it split two Black precincts. It moved one

21 Black precinct into one district, and the other into

22 another district, right?

23   A   It did dilute the Black population -- or

24 voting age population, relative to House Bill 191.

25   Q   Now were -- how would you characterize the

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1   Black population district in the existing bill -- 2013

2   bill? Was that a majority minority? Was that a

3   plurality? Was that a coalition or an influence?

4   A   I don't recall.

5   Q   Okay. So after HB 2, did it change from one

6   of those categories to another, or can't you say?

7   A   I can't say that it changed one way or

8   another, because I don't know what District 8 or 9

9   looked like before that.

10   Q   Yeah. That reminds me. You testified that

11   When you did HB 191, you explicitly considered race in

12   deciding where districts should be, right?

13   A   Not necessarily. It was not paramount. It

14   was a secondary factor, in an effort to help maximize

15   those racial districts. The primary factors were from

16   Section 33.

17   Q   So here's the thing. When you consider race,

18   you either consider race or you don't, did you consider

19   race in 191?

20   A   In certain areas, where it was able to draw

21   one of these districts. Yes.

22   Q   And is that because the Democrat Party had

23   made an analysis and reached a conclusion, that that was

24   required under Supreme Court precedent that race be

25   specifically considered in these districts?

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1   A   No.

2   Q   In fact, you understand don't you -- and the

3   parties certainly should doesn't it, that it is illegal

4   to consider race, unless the Voting Rights Act requires

5   it, right?

6   A   No.

7   Q   You don't know that?

8   A   No.

9   Q   Let me finally take you to the last page of

10   Plaintiff's Exhibit 3, and that's Richmond. So there

11   was one district in the previous map that's three now.

12   And now, it's one in HB 191. So going by my standard,

13   HB 2 makes Richmond a little worse, right? Worse than

14   three districts -- one district to three districts,

15   right?

16   A   Correct.

17   Q   Okay. And the partisan disadvantage there is

18   -- sorry, I got to get a cheat sheet -- is, again, the

19   difference between more Republican districts. In fact

20   in one case heavily Republican 72 percent. And then a

21   competitive district, right? Again, not one that at 51

22   percent, the Democrat Party would count on winning, but

23   at least it would be competitive, right?

24   A   Yes.

25   MR. MADDOX: Okay. Your honor, I know we're

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1   running out of time, and I'm trying to be as

2   conscious as I can. I think I'm getting close to

3   done.

4   JUDGE WINGATE: Okay.

5 BY MR. MADDOX:

6   Q   You talked about fundraising -- well, a few

7 other things. Let me -- before I go to fundraising, let

8 me ask you about the congressional map real quick.

9   MR. MADDOX: Where do we have that? Is that in

10   our tabs? In our stipulations?

11   Q   If you would look to table of contents -- SB

12 3. So, tabs 11 and 12, I think. Yes. So tab 11,

13 Mr. Hieneman, is SB 3, that's the congressional map.

14 And tab 13 is the congressional map from 2012, again,

15 signed in the law by Democrat governor and passed by a

16 Democrat House, right?

17   A   Correct.

18   Q   Okay. So One of the principle concerns that

19 the Democrat Party has announced in this complaint which

20 it's filed, is that Franklin County under SB 3 is not

21 kept in the district that's centered on the Bluegrass,

22 right?

23   A   Yes.

24   Q   And it's not kept in the central Kentucky

25 region where it naturally belongs, right?

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1   A   Yes.

2   Q   So, take a look at tab 13, in Exhibit 1. And

3 that'll show you the congressional map from the 2013 --

4 2012 bill, I'm sorry -- that was passed, as I said, with

5 a lot of Democrat support. You see how part of

6 Jessamine County that goes right up to the Fayette

7 County line, is in the 2nd District with Owensboro?

8   A   Yes.

9   Q   So, Which is more central to the Bluegrass and

10 the central Kentucky, and Lexington region, northwestern

11 Franklin County or Jessamine County on the Fayette

12 County line?

13   A   I can't say that one is valued over the other.

14   Q   Jessamine County is at least as central to the

15 Bluegrass and central Kentucky, as Franklin County;

16 wouldn't you say?

17   A   Sure.

18   Q   Okay. Did the Democrat Party have any concern

19 at all for Jessamine County being carved up in two -- I

20 mean, first of all, it was a split County. And then

21 second of all, it was moved into a district that sort of

22 centered on Bowling Green and Owensboro. Was there any

23 objection to that?

24   A   Not at the time it was passed.

25   Q   Okay. Was there an objection that developed

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1   later?

2   A   Not that I'm aware of.

3   Q   Okay. This reminds me. I'm sorry. I want to

4   go back to one other district map. And I want to take

5   you to -- so it's the 2013 map, but in Exhibit 1, tab

6   number 4, we have a blow up of -- wait a minute. What

7   is this?

8   JUDGE WINGATE: Where are you at?

9   MR. MADDOX: I'm trying to understand what my -

10   - tab 4 is HB 2. So do we have the 2013 there for

11   these? We don't, do we?

12   MS. BECKER: No. We don't (Inaudible)

13   MR. MADDOX: Okay. All right. Well, I'm just

14   going to have to use -- I'm sorry, Judge. We can

15   put that aside.

16   JUDGE WINGATE: It's all right.

17   BY MR. MADDOX:

18   Q   I want to ask you about the large map. So,

19   this is the District 44 and 28 split. Do you see that?

20   A   Yes.

21   JUDGE WINGATE: Which one are you on?

22   MR. MADDOX: And Judge, this is -- this is --

23   JUDGE WINGATE: 2013 or the --

24   MR. MADDOX: Yes, sir -- Your Honor, 2013. And

25   so, if you go back to tab 10, the insert at the top

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1   for Jefferson County.

2   JUDGE WINGATE: Yes.

3   MR. MADDOX: You'll see that.

4 BY MR. MADDOX:

5   Q   And Mr. Hieneman, do you see where District 44

6 and District 28 come down into that narrow section of

7 Jefferson County, that terminates at the Hardin County

8 line? And so, there's like a tri-county area, Bullitt

9 County, Jefferson County, and Hardin County?

10   A   Yes.

11   Q   Are you familiar with the geography in that

12 part of the Jefferson County?

13   A   I'm not.

14   Q   Do you know what Dixie Highway is?

15   A   I have heard the name. Yes.

16   Q   Okay. So, looking at the geography, I'm not a

17 cartographer, but it looks like the split between the

18 Ohio River and the Bullitt County line is maybe a mile

19 or two, maybe less. And my understanding is -- and we

20 can try to firm this up for Your Honor later, is that

21 Dixie Highway runs right down the middle of that. And

22 that the district line runs right down the middle of

23 Dixie Highway. Do you have any information on that?

24   A   I didn't work on Jefferson County in 2012. And

25 I'm not familiar with the geography.

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1   Q   Okay. If that were the case and this little

2 tail of Jefferson County consists of communities called

3 Valley Station, and Kosmosdale, and that sort of thing.

4 Do you understand those to be communities of interest?

5   A   I assume they're cities in Jefferson County.

6   Q   Right.

7   A   I'm not familiar with them but I understand if

8 you say they're cities. Like I said, I'm not familiar.

9   Q   Do you know of any good reason why District 44

10 under the 2013 map, ran from the Hardin County line all

11 the way up to Shively, if it wasn't to provide a

12 partisan advantage to the Democrat Party?

13   A   I have no idea. Again, I didn't work in Jeff

14 -- Jefferson County in 2012.

15   Q   Okay. So let me just ask you about funding

16 and I think we'll be done. You've complained about the

17 impact that HB 2 either has had, or might have on the

18 Democrat Party's funding, right?

19   A   Could. Yes.

20   Q   Could have, is that what you're saying?

21   A   I believe, that's what I said. Yeah.

22   Q   Okay. So your testimony to the court is that

23 it might damage your fundraising efforts, right?

24   A   It makes it harder for us to compete, and that

25 could jeopardize fundraising.

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1   Q   Okay. It's a fact, isn't it, that throughout

2   2021, the Democrat Party out-raised the Republican Party

3   in Kentucky; isn't that right?

4   A   Correct (phonetic).

5   Q   By a substantial amount, right?

6   A   Correct.

7   Q   Do you have the numbers?

8   A   I don't.

9   Q   Okay.

10   A   I don't work in fundraising.

11   Q   Okay.

12   A   And finance.

13   Q   So, even though the party had a super minority

14   in the House had lost 52 percent of its members in the

15   House in just three election cycles, the party still

16   substantially out-raised the Republican Party in

17   Kentucky, right?

18   A   In 2021. Yes.

19   Q   Okay. Now you don't know what's going to

20   happen in 2022 because there haven't been any

21   fundraising reports. There's been no, like donation

22   records and stuff made public, right?

23   A   Not that I'm aware of.

24   Q   Okay. I mean, we're just at the end of the

25   first quarter, last week, right?

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1   A   And I don't work in fundraising and finance.

2   Q   Okay. Finally, let me ask you, you were

3 complaining about candidates who were drawn out of their

4 districts. They had announced that they were going to

5 run in the district, and they then learned that they

6 didn't live in the district they planned to run in,

7 right?

8   A   Yes.

9   Q   And I think you listed three or four of those

10 districts, right? Are you aware that Kentucky revised

11 statutes provide a mechanism for the party to nominate a

12 replacement candidate, in those circumstances where a

13 candidate who is unopposed in the primary drops out? I

14 think this is the way it works. And the Secretary of

15 State will correct me if I'm wrong. But basically, if a

16 vacancy occurs, this is KRS 18105, sub 3. "If a vacancy

17 occurs in the nomination of an unopposed candidate, or a

18 nomination made by the primary or the certification of

19 candidates for the regular election made under 118215

20 because of, among other things withdrawal, then" --

21 let's see. "The governing authority of the party may

22 provide for filling the vacancy. But only after the

23 certification is made that the statute's been

24 satisfied." So has the Democrat Party filled those

25 vacancies or tried to?

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1   A   I've only learned of that in the past week.

2   Q   Oh, okay. So when you filed the lawsuit, you

3   didn't know about that?

4   A   No.

5   Q   Okay. Where did you learn of that?

6   A   After the Secretary of State's Office provided

7   us with a nomination form.

8   Q   Shouldn't a political director know that sort

9   of thing?

10   A   I'm not an attorney. I don't interpret

11   revised statute.

12   Q   But you interpret Constitution?

13   A   Not an interpretation, just a strict reading.

14   MR. MADDOX: Okay. Thank you, Mr. Hieneman. No

15   other questions, Your Honor.

16   JUDGE WINGATE: Do you have any follow-up?

17   MR. ABATE: Give us one second to confer.

18   JUDGE WINGATE: Okay.

19   MR. ABATE: It won't be much, if we do.

20   JUDGE WINGATE: Ray (phonetic), you should have

21   asked him when he was talking about moving to the

22   Highlands, and maybe he was a rich lawyer, and made

23   a little bit of money. What are you thinking?

24   THE WITNESS: I had to get out, Judge.

25   JUDGE WINGATE: Everybody wants to live in the

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1 Highlands of Louisville. But every time I drive

2 down through there, I'm like, there's more cars

3 parked on the street than any place in America, I

4 think.

5   MR. MADDOX: So, judge, I'll tell you my lot

6 was 60 feet wide by 120 feet deep.

7   JUDGE WINGATE: Okay. Yeah.

8   MR. MADDOX: Tells you all you need to know,

9 right?

10   JUDGE WINGATE: Did you have off-street

11 parking?

12   MR. MADDOX: I did have a garage. Thank you.

13   JUDGE WINGATE: Okay. There you go.

14   MR. MADDOX: But like most Highland garages, it

15 was falling down.

16   JUDGE WINGATE: It was falling down. My best

17 friend and my best man in my wedding lived on

18 Crescent Avenue.

19   MR. MADDOX: Yeah.

20   JUDGE WINGATE: And they used to live on

21 Bailey.

22   MR. MADDOX: Yep.

23   JUDGE WINGATE: And when -- you know, I really

24 didn't know how to take the LSAT. And I went up

25 here and took this UofL professor of political

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1   science professor tour and stayed with them and we

2   would go out and drink. I'll probably go off

3   record.

4   (OFF THE RECORD)

5   JUDGE WINGATE: Do you have any questions?

6   MR. ABATE: Your Honor, we're not going to ask

7   any redirect at this time. There a few issues we'll

8   probably deal with Professor Caughey.

9   JUDGE WINGATE: Okay. And if you need to -- if

10 you need to recall him, you know, he's going to be

11 hanging, you're going to be hanging around, right?

12 Well, good enough. All right. Let's talk about

13 tomorrow morning. We can go off the record about

14 this.

15   (TRIAL ADJOURNED AT 5:54 P.M.)

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 9  no way interested financially, directly or indirectly,

10  in this action.

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$

$50 137:7

0

0.00001 86:16

0.001 86:9,13, 16,20

0.1 74:21,23,25 75:8,9 76:1 85:23 86:1,4,10 148:10

0.2 146:10

0.5 76:17,23 77:8

0.7 232:22

0.9 232:22

0.95 77:6

0.97 77:6

03 98:14

1

1 5:6 10:21 11:4,10 46:5, 14,17 48:1 75:6 80:20 81:21 83:15,19,20,23 85:1,12 88:13, 22 89:20 97:18 99:15,18,21 100:7,12,14 111:21 128:3,8 133:9,10,11 142:3 143:12, 19 144:4 168:8 179:5 180:5 196:3,23 201:7 202:5 222:18 229:2 230:14 243:8 244:12 245:23 250:14 255:2 256:5

1,000 18:3 21:9 44:7,20 51:13 191:9

1.05 77:6

1.1 77:6

10 47:22 105:18,19 130:25 142:18, 22 168:8 172:12 174:8,9 192:4 231:17 232:5 234:7 237:11 239:7, 10,15 241:19 242:8 243:7,16 245:22 256:25

10,000 43:22 44:4,13,16 48:14,18 51:7, 8,16 52:19 58:16,19 70:19 72:12 78:3,4 82:5 87:19,24 95:19,24 96:2,4

100 27:21 28:13 41:17 55:7 56:2,3 61:8 93:3 168:11

100,000 140:18 141:7

105 161:11,23

10s 217:11

11 54:3 101:17 105:15,17,18, 19 115:24 215:13 229:1 239:7 241:17 243:7 254:12

118215 260:19

12 61:19 126:23 201:4 204:5 254:12

120 262:6

12th 188:9

13 46:25 50:18 63:20 101:17 121:4,5 128:23 134:22 135:7 144:3,4,8 254:14 255:2

14 136:12 168:9

145,000 160:20

15 46:23 67:16 91:12 111:24 137:14 204:16

16 104:23 168:9 246:20,22

17 46:25 83:3 171:23 192:2 205:10 214:2 243:2,4,9 245:17 246:20, 23

18 9:3,4 46:19, 20 88:15 111:24 152:9 168:9 216:1

18105 260:16

19 168:9 171:24 245:23 246:5, 17,19,20,23

191 159:16,17, 25 161:8,14,15 163:25 165:12 167:1,4,5,23 168:14,19 169:2,4,7,11 170:5 171:10 173:3 174:16, 23 176:7 177:5 178:3,14 179:10,11 180:18,20 181:2,23 182:1 183:9,13,17,22 184:5,12 190:21,25 191:12,20 192:2,3 195:8, 13 197:3 200:4 230:16 231:12 232:7 234:21 235:3,12 236:15 237:25 238:22 239:21 242:18 247:21 250:15 251:17, 24 252:11,19 253:12

1:30 91:13

1st 217:23

2

2 12:23 36:2,6 47:21 98:9 99:15,22 100:10,11,16, 18 128:3,10 133:9 163:2,6, 8,25 165:12 166:11,13,23, 25 167:24 168:2,8,23,24, 25 169:7 170:4 171:9,20 172:10,24 173:22 175:13 176:20,25 177:18,20 178:11,13,25 179:6 180:6,7 181:20 182:1 183:9,13,15,21 184:2,10,16 185:4 186:11, 22 188:2,20 190:25 191:12 192:2,3,13,15, 17,18,24 193:14 200:5 209:19 216:11, 15 217:7 218:24 222:21 225:4 226:4,19 229:24 230:16 238:2,6 239:21 242:7 244:19 246:3 247:5,16 248:25 249:6,7 250:2,5,16 251:12 252:5 253:13 256:10 258:17

2's 245:20

2,000 21:10 75:4

2.6 57:7

20 123:15 171:15,24 172:11 173:5 183:6 227:1 243:18 244:20

245:8,20 246:20,23

20,000 135:24

200 21:8

2002 13:11

2003 13:12

2004 240:25

2009 158:18

2012 123:13 172:6 196:3,23 197:13 198:21 199:13 200:23 201:4,7 202:5, 25 232:21 244:12 248:2 254:14 255:4 257:24 258:14

2012-SC-0091 203:23

2013 121:20 158:18 170:3 171:9,13 172:12 176:4, 12 177:11 178:18 179:22 188:11 229:4 243:1,5,9 244:19 245:20, 23 246:15 247:13 248:15, 20 249:24 251:8 252:1 255:3 256:5,10, 23,24 258:10

2016 36:18 38:2,4 53:22 72:15 73:6,8,15 112:4 172:7 180:4 212:13 213:20,25 215:18

2017 16:15 17:21

2018 14:25 15:1 180:2,4 214:15,25 215:18

2019 17:21 36:18 38:2,6

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53:24 73:12,15
112:4 140:12
157:23 158:21,
22 172:8
214:23 232:21

2020 24:13
124:22 125:7,9
126:24 127:20
128:23 129:8
130:4,5,12,23
172:15 180:2
186:8,9 215:19
226:22,23

2021 123:16
130:3,25 259:2,
18

2022 184:19
185:5 186:10
191:20 235:14
259:20

2030 191:21
235:4

2040 191:21

20s 217:12

21 48:11 161:22
162:7 185:17,
19

21st 213:16

22 49:2 105:8,
15,17 168:9
211:1 235:4
246:20,21,23

23 45:6,8,10,15,
21 126:4
161:15 162:7,
14 165:23,25
166:25 167:5
169:4 200:18,
22 245:24
246:20,21,22,
23

24 48:8 185:16,
17,19 200:24
201:14 237:24
238:22

25 31:19 186:8

26 31:19 168:9

27 168:9

28 201:6,7
205:9 256:19
257:6

29 67:2 185:25
186:2

2nd 255:7

___

3

___

3 12:23 54:1
55:2 59:15
99:15,22
100:16,19
128:3,12 134:5
142:11 148:7
152:2 168:8
169:20,21,22
170:18,22
242:23 244:18
247:12 248:15
249:16 251:8
253:10 254:12,
13,20 260:16

30 17:4 48:11
64:8 134:6
226:24 229:11

30,000 30:17

30th 192:23
216:18 217:1

31 48:6 168:20,
25

32 164:13

33 64:20 65:5,
20 66:13,14,19
107:24 121:3,6,
12,13 122:1,7,
17 139:4,15
160:25 161:3
168:9 181:11
191:2,8 198:8
200:3 202:7
235:1,23
236:12,14
252:16

34 64:8

34th 226:15,20
228:3 229:7

35 88:24 223:11
232:22 233:2,3

36 122:5 139:14
185:22,24
214:5,22 233:3

36th 227:6

37 168:9

39 168:9 214:23

3rd 193:8

___

4

___

4 17:7 62:15
63:19 99:23
100:17,20
101:3,4 126:22
128:3,14
178:22 195:12,
17 251:12
256:6,10

4,500,000
160:19

40 55:21 64:8
179:14 222:4,5
224:13 230:1
233:2

40th 226:9
227:24

41 64:8 229:14,
25

41st 187:1

42 64:7 229:14
230:1

42nd 224:2,3
227:24

43 64:7 94:20
95:4,8,10
152:21 223:1
229:14 230:1

43.6 95:10,13
152:11

43rd 224:3

44 64:8 98:16
224:13 256:19
257:5 258:9

45 68:5,11 69:2,
5,7 121:4
168:3,9 192:5
223:11,12,13

224:6

46,018 232:10

47 232:12,19

47.5 57:4

48 57:19 64:14,
15 65:5,20,21,
25 66:5,7,12
121:3,6,9,19,21
139:4,6 168:9

49 94:3

4A 135:7

4th 193:8,10

___

5

___

5 41:19,20
67:16,20 127:7
128:3,16
160:11,15,20
161:9,10 167:8
168:8 181:7
205:4

5,000 58:18
140:15 141:6

50 56:23,24
57:5,11,15,17,
18 58:18 59:6,7
60:16 71:16
93:22 94:15
116:1,5,15
152:14,22
182:10 183:1
184:4,7 226:1

50/50 56:5
116:19 151:20

51 117:10
118:15 253:21

52 117:10
118:18 168:9
215:22 250:13,
17 259:14

53 117:10
174:25 214:5
250:15

55 168:9 192:5

56 168:10
178:6,14 186:6

57 186:6,10

58 139:15
196:21 250:13

59 196:20,21

5:30 194:25

5:54 263:15

___

6

___

6 83:2 129:11,
15 168:8 190:3

60 55:22 167:5
249:8,10,12
262:6

60.9 232:23

61 168:10

61st 177:15

62 178:7,14
249:8

62nd 177:14

63 168:10
175:12,15
249:9

64 173:18
175:12 233:3

65 173:14,17,20
174:1,20,22

69 168:10
175:11

69th 175:25

___

7

___

7 88:15,18,19
89:8 104:22
131:9,14 190:4

700 75:6 85:23
86:4,18 148:12,
20

71 168:10

72 253:20

72,000 44:5,15

73 56:18 58:24
168:10

73rd 56:13

74 93:13

75/25 215:15

76 92:13,24 93:2,10,25 94:3,12,13 118:7 149:17 150:2,15,23,25 151:5,10 152:2, 4 235:7,12

76th 93:21

77 67:25 118:16 151:17 184:5 186:9

77th 57:1

78 59:1 93:13 118:16 151:17 168:10

78th 177:16

79 57:23 59:2 151:17

79th 57:8

8

8 168:8 178:23 179:9,12,19 200:8,9,15 251:12 252:8

80 49:8 59:2 151:17 166:25 167:10 168:10 197:17

800 75:6 85:24 86:5,18 148:12, 18,20

80th 57:9

81 151:12 185:19 201:20

81.13 201:20

81st 179:24 180:21

82 168:10

83 151:12 168:10

84 56:19 58:24

85 168:10 177:9 198:2

86 168:10

87 168:10

88 68:4,5,10,20, 25 121:3 122:23 168:10 177:23,25

89 168:11 180:9

8th 193:11

9

9 17:7 46:6 48:24 111:20 178:24 179:9 203:13,18,19 204:3,9,15 251:12 252:8

9.26 234:10,22

90 101:18 168:11

91 168:11 180:9 185:22

92 168:11

93 82:7 188:19

94 168:11

95 161:11 168:11 214:11

95-year 218:20

96 168:11

97 168:11

98 168:11

99 83:16 89:10 237:23

9th 193:11

@

@RD 100:21

A

ABATE 3:9 54:7 91:14,17 119:24 155:18, 21,25 156:2,5, 9,12,15,23,25 157:5,14 164:7, 11,15 165:10 166:4,10,13,18 167:19,20 168:4 169:9,12, 17 170:17,24, 25 176:6 191:10 194:2,5, 13,15,22 195:5, 7 200:13 204:1 205:13,20 210:22,25 211:4,7 212:18 227:9,15 231:19 233:10 239:13 261:17, 19 263:6

ability 75:21 190:2,6,16,19 193:20

absolute 75:11

Absolutely 185:7 231:9

abstract 131:19

academia 125:2

academic 9:23 10:25 13:3 15:24 16:13 17:15 18:3 22:25 23:2 24:21 29:22 37:9,22 38:14 58:4 62:11,16 71:3 72:18,24 75:25 76:24 82:25 111:6 112:25 132:18 135:19

academics 30:19 40:18 41:23

accept 122:12

accepted 62:16 154:7 221:1

accomplish 107:2

account 114:5 115:16 167:23 192:19

accounting 49:4 146:15

accounts 30:17

accuracy 133:19

accurate 10:23 35:19 78:6

accurately 39:3 131:25 133:24 135:12, 24 137:25

achieve 26:9 167:11 237:22

achieved 69:12

acknowledged 141:23

ACLU 129:23

Act 43:17,18 181:12,17,20 253:4

actions 153:5

active 39:11

actively 15:21 207:23

activities 16:7

actual 38:22 93:15 101:9 105:1 151:17 162:8 163:11 181:12

actuality 132:12

add 49:6 53:3 80:7 165:19

added 162:9, 20

adding 122:24

addition 16:22 87:17 191:11

additional 49:8,10 51:25 69:11,20 89:22 104:19 111:18 137:22 162:7

address 16:11 132:7 178:25 206:6

addressed 135:20 205:7

addresses 208:17 237:20

adjacent 25:13,15

adjoin 121:2

ADJOURNED 263:15

adjusting 145:2

admissible 4:11

admission 170:18

admit 127:25 128:3 129:10 131:8

admitted 11:10 36:6 128:8,10, 12,14,16 129:14,15 131:14 170:22 195:17 200:15 204:3 239:15

adopt 35:22 148:3 238:10

advanced 192:15

advantage 23:13 24:12,20 53:2 146:7,11 244:14 258:12

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advice 196:7

advise 15:22 236:17 248:5

advised 159:10,16 160:1,5,22 234:24 235:20 236:14 248:3,8

advising 160:7

affect 80:1 83:25 172:1 186:11 189:25 190:15

affects 84:6 220:22 228:12

affidavit 164:4, 9,16 168:5,21

affiliation 34:12

affirm 7:9 157:8

African 179:8, 13,14

afternoon 92:10 195:22

age 12:18 179:14 182:11, 20,21 183:1,5 184:5,7 223:7, 8,13 232:13 251:24

aggregate 37:23 55:19

aggregated 162:25

aggregates 172:9

agree 50:11 104:14,16 110:22 113:12 139:5 141:5 148:16,23 151:10 210:8 211:24 212:3 221:21,25 234:18 238:19

agreed 149:16

196:24

agreement 40:19,23 135:10

agrees 24:1

agricultural 38:8

ahead 6:7 128:3 194:24 239:14

airport 91:21

Alex 4:24 10:11 99:23 233:15

Algonquin 226:9

algorithm 18:23 19:8,13, 16,25 20:1,17 21:15,17,23,24 22:2,8,10 23:11,13 24:12, 25 26:12 27:25 28:3,8 29:12 30:5 39:6,18, 21,24,25 40:4, 12,16,20 41:10, 16 42:15,16 43:1,20 49:23 52:6 53:2,7,11 70:1 74:6,9,16, 18 75:10 76:5, 6,10,20 77:2,5, 10,18,22,24 79:13,21,23 80:8 86:23 87:6,10 90:4,9 97:19,21,22,24 98:21 99:4 106:13,14,22, 25 107:5,17 108:7,8,9,11, 15,16,17,20,23 109:1,4,15,18, 21,24 110:6,9, 12,15 124:22 125:1 126:24 127:2 128:20 130:3,11,16 132:6,12,25 135:2,3,6,15,23 136:14,17 137:20,23

138:5,7,9,13,24 139:1,19 144:6, 8 147:5,9 153:17,19,20, 24 154:3,4

algorithm's 97:23 106:19

Algorithm-assisted 31:3

algorithms 16:10 18:12,13, 14 20:18 21:17 22:22 23:1,7 24:23 25:9 27:14 28:5 29:7 41:8,13 78:17 87:16 96:1,24 104:7,9 124:21 132:8,19 133:2, 6,14,17,20 134:10,13,17 136:8 138:22 147:3

allocate 189:20

allowable 173:7

allowed 148:14

alternate 24:16 42:21

alternative 19:10 20:21 70:19 146:12 147:18

alters 28:25

America 40:24 140:21 213:16 262:3

American 21:9,12 51:12 179:8,13,14

Americans 51:15

amount 193:13 259:5

Amy 125:21,25 126:10

analyses 41:7

analysis 18:9, 15,18,21 26:14 27:11 28:6,14 32:2,4,5,22 35:5 36:12,17 40:1,9 41:3,11 42:18 43:4,6,15 44:23 45:15 46:6,8 47:1,21, 24 49:22 50:10 53:15 54:1 61:7,13 62:9,10 63:8,18 67:12, 15,20 70:21 73:9,25 74:7 75:17,24 80:15 81:13,15 82:6 83:1 86:4,20 88:10,14 95:19, 23,25 97:15,20 98:3,5,6,10 102:19 103:15, 23 104:3,13 111:16 112:2, 18 117:5,7,11, 13 124:7 138:6, 25 141:11 142:22 146:22 150:14 151:20 152:7 163:6,13 174:21 191:24 193:4 240:8,10 252:23

analyst 129:23

analysts 19:7

analytic 129:23

Analytics 12:24

analyze 18:10 35:10 37:24 43:22 70:22 74:2 88:5 163:8 193:14 241:8

analyzed 76:24

analyzing 21:13 28:4 42:24 87:12 153:18 165:25

Andy 114:25 115:17 219:22

Angie 237:3

angle 156:17

angles 157:3

annexed 173:16

announced 254:19 260:4

announcement 193:19

anointed 184:24

anymore 120:2

apologize 222:15

app 170:10 172:4 191:25

appeal 212:1

appealing 213:18

Appeals 187:24

appearing 130:7

appears 66:13

appellant 206:8

appended 208:12

appendix 105:9 142:17

apples 24:2,3 82:13

applicable 138:17

application 12:10 21:16 131:21,23

applications 21:14 136:9 138:18

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applied 45:3
137:24

appointed
102:15

appointment
15:7

approach 10:3
23:11 28:12
35:16 74:10
166:4 207:19

approached
124:19

approved
130:1

April 217:13

area 14:13
16:7,10 63:15,
16 64:4,10,15
65:21 66:2,6,14
68:8,19,25
104:7 123:8
139:16,22
140:3,7 228:9
243:1,2 248:17
257:8

areas 16:1,2
66:9 68:2,9
123:5 132:3
188:21 189:1
191:16 220:21
221:2,4,16,17
225:11 252:20

argue 3:20

argument
206:1,7,11

art 135:6
137:20

article 62:18
126:22,23
127:1,11,13
128:20,22,24
129:1,3,18
131:2 134:2,23
135:4,16,19
136:25 144:23
145:5

articles 16:23
17:2 29:9 134:1

articulated
181:11 206:12

arts 11:18
158:11,13

Asia 18:5

asks 156:18

aspect 51:19
79:21

aspects
145:24

Assembly
107:8 170:4
197:8 199:3,15
214:23 217:6,
22 234:25
236:17,20,24
247:2 248:2,22

asserted 50:16
70:20

assertion
50:20 206:7

asserts 52:2

assess 242:9

assessed
50:17

assign 19:17
105:4

assistance
115:11

assistant
13:16 14:16,17

associate
13:17 14:18
102:11

assume 15:24
39:18 101:6
113:6 149:10
234:19 258:5

assuming
101:8 113:1
235:15

assumption
113:8

Astronomical
21:1

attached
122:17

attacked
140:25

attempt 105:5

attempting
90:4

attention 5:20
178:16

attorney 38:7
172:8 206:25
236:2 261:10

attractive
87:16

audience 7:20

auditor 38:8

aughts 217:11

August 130:25

author 135:17

authored
35:21 128:20

authoritative
235:25 236:9,
11

authority
260:21

automatically
241:10

Avenue 262:18

average 41:22
42:3 46:23,24
48:8,10 49:10
55:13,23 59:2
65:15,18 67:24
73:1,2 75:4
84:22,23,24
85:3,6 87:2
93:21,25 94:1,
3,11,14,17,19,
25 95:13
111:19,23
114:15 115:19
116:5,9 123:4
142:19,25
143:5,8,18
150:17 151:1,2
152:12,17,22

160:17

averaging
114:9 116:24

avoid 107:9

avoidance
105:13

avoiding 49:23

awards 12:23

aware 30:19
32:16,17,19
49:12 81:1
121:23,25
139:24 140:3
142:8 144:21
147:25 148:2,6
204:10 205:12,
25 206:14
208:2 221:5,19
223:9 256:2
259:23 260:10

axis 56:22

―――――

B

―――――

bachelor
158:11

back 6:2
115:23 123:11
127:24 135:5
139:3 140:9
148:21 153:10
188:11 226:14
243:22,24
256:4,25

backbone
102:2

background
9:23 158:10

backwards
158:16 191:8

bacon 229:15

bad 80:14
126:19 144:16

Bailey 262:21

balance
146:25

banner 189:12

bar 92:17
118:13

barely 241:23

Barren 245:25
246:4,7,13

bars 48:2 83:10

base 65:3
189:25 243:14

based 18:4,5
19:11 28:2
29:14 38:22
40:1 41:7,23
46:9 53:21
55:12 56:20
57:1 64:5 65:14
73:14 75:2,15,
20 96:22
106:23 118:6
124:6 146:17
151:24 152:17
154:3 174:21
178:8 184:16
191:24 235:16

basic 149:9
210:4

basically
11:20 15:15
17:15,18 18:3
19:12,21 20:12
22:12 24:12
25:4 31:9 35:10
41:16 43:21
44:6 46:9 48:9
51:22 52:11
56:1 58:6,17
63:14 65:1
66:21 67:8
70:13 71:18
72:17 79:4 85:7
86:16 87:8
88:12,24 89:5
106:14 163:15
171:22 173:23
176:2 177:7,19
179:3 187:16
192:8 212:16
224:14 229:11
230:14,21
260:15

basics 163:7

basis 154:2

basket 60:9,10 212:25

beat 121:18

Bechler 188:9

Becker 33:1 92:9,10,17,20, 23 95:7,15 97:9,10 99:16, 21 100:1,4,10, 15,18,23 101:1 103:9,16 114:24 119:12, 25 120:5,13,16, 19,22,24 121:11,17 122:13,15,19, 22 125:15 126:6,14,18,20 127:6,10,25 128:18 129:10, 17 131:8,16 134:7 137:12 141:3,4 149:6,7 150:4,6,11,12 151:8,15 152:6 153:7,9 154:13, 24 155:4,13 156:14,20 194:11 196:1 256:12

beep 126:3

began 157:23

begin 5:18 193:4 195:19

beginning 16:18 99:19 121:4

behavior 113:11

Bell 162:5

belong 25:1 65:19,22 66:2, 7,15 67:2 68:20,23 69:3, 16 89:3

belonged 123:6,9

belonging 66:24

belongs 254:25

belt 101:19

bend 223:2

Benjamin 129:20

Beshear 196:5 197:9 219:22 220:5

Beshear's 114:25 115:17 158:22

Bevin 114:18 115:2,14 140:10,24

bias 21:19 22:21 23:16,18, 19 40:2 42:19, 24 43:15 53:15 61:13 62:12 70:2 71:2,5 72:1,25 79:17 80:1,3,10,13 88:6 90:8 149:2,11,13

biased 22:2 23:23 24:4 42:23 43:4

big 25:2 57:7 58:4 86:1,12 119:21 162:10 194:11,16 224:24 228:25 247:7

bigger 86:25

biggest 23:12 185:11

bill 111:18 119:9 142:11 148:7 159:16, 17,25 161:8,14, 15 163:2 166:11,13,25 167:4,5 168:19, 25 169:2,4 170:4 171:9,10, 20 172:10

belonging
177:20 178:13, 14 179:11 180:7,18,20 182:1 183:9,13, 15,17,21,22 184:2,5,10,11, 16 188:20 191:20 192:2,3, 18,24 193:9,16, 23,24 196:8 199:4 200:4,5 217:25 218:4,7, 11,14 219:7,13 226:18 247:16 249:6,9 251:24 252:1,2 255:4

bills 167:7 218:1,21 219:1

binder 4:7 5:22,24 10:15, 17 99:18,24 100:1,12 164:11 169:14 194:12 195:9

binders 5:20, 23 6:6 81:2

bipartisanship 192:9

bit 9:22 19:14 53:25 65:6 77:6,7 105:8 119:12 158:16 163:5 177:17 180:24 181:15 184:15 192:21 220:15 261:23

black 64:12 182:19,20 183:5,14,16,17, 22,23 184:6 223:5,13 224:6 251:20,21,23 252:1

blank 25:22 26:4 74:11,13

blip 216:1,3

block 37:19 75:22 120:14 163:17

blocking 9:4

blocks 86:6 156:17

blow 256:6

blue 65:21 69:13,14 243:15

Bluegrass 254:21 255:9, 15

board 85:6 108:4 156:20

Bobby 188:18

body 202:3

book 10:14 16:14 154:23, 24

books 16:12

border 64:17 66:23 243:17

borders 66:7

boss 157:1

bottom 56:10 95:16 173:18 232:20 242:8

boundaries 38:17,18,23 39:2 42:2 64:12 78:24 84:8,9 109:25 110:3,4 224:16 247:22

boundary 64:11,13 78:19, 21 79:5 133:21

bounded 146:3

Bowling 50:18 51:20 52:7 171:4,7,12,15, 21,22 172:14, 21 173:4,6,8 242:22 244:25 245:1,5 255:22

box 8:14,16 58:17,18 92:17 117:19 118:13

boxes 55:25

brand 187:3

break 5:15 91:18 141:1 194:19,25

breaking 90:11

breaks 116:1

bridge 115:8

briefly 168:6

bring 5:20 41:7 79:17

brings 15:15

Buddy 173:21

Buffalo 91:23 154:16

build 14:7

building 14:10 74:13

builds 138:12

built 144:5

bulk 175:11 176:15 177:8

bulleted 104:23

Bullitt 257:8,18

bunking 110:10

Bureau 36:15 217:8

burn-in 26:24 27:9,10 43:24 44:6,19

Butler 243:10

C

---

calculate 72:5 93:15 112:2 165:18

calculated 70:17 72:3 92:13

calculation

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115:1,18
166:24 167:1

calculations
172:3 178:8
180:13

California
208:4,19

call 3:10,12 7:4
12:11 16:3
19:22 25:12,16
45:5,9 96:20
118:1 125:20
135:5 148:25
155:8 157:6
172:5 178:13
213:9,15
217:23 220:1,5,
10

called 17:11
25:1,3,10 26:24
27:9,10 29:13
31:2 36:22 37:4
43:23 44:9
45:18 58:5,12,
19,20 62:15
68:19 70:18
82:21 115:4
140:3 170:10
182:24 183:2
197:13 212:16,
20,24 213:8
222:18 237:11
241:17 258:2

calling 213:21

Calloway
161:25

calls 190:13
191:5

camera 9:5
120:14,17

cameras 9:9
92:21

camp 208:10

campaign
72:23 114:19
158:4,24
190:11

campaigns
158:5

cancel 73:3

candidate
113:16,17,19,
23 115:21
151:25 184:18
185:4,14,18,20,
23,24,25 186:1,
11 207:5,19
208:23 210:8,
20 212:1,4,8,14
213:19 235:15
260:12,13,17

candidates
71:14 72:21
110:7 114:13
185:13 186:3,
14,17,19
188:22 189:6,9,
18,23 190:7,19
193:20 207:8,
15,23,24 208:1
210:4,13,14
211:20 212:10
219:18 220:8,
23 260:3,19

Cantrell 187:5,
23

capable
106:13 150:21
151:16

capture 71:9
135:12 145:24

care 76:10

career 16:13

careful 79:3,8
94:7

carefully
104:17

Carlo 23:3
25:2,3,9,10,11,
21 26:11,16
27:4,14,15
28:10,24 40:15
74:8 108:13
133:2

carry 189:11,
12

cars 262:2

cartographer
257:17

carved 49:24
69:18 255:19

case 5:17 16:4,
9 18:11,16
24:13 27:19,22
28:3,6 33:5,10,
13 34:9,10,20,
24 35:3,8,20,25
36:11 41:4,5,6
43:7,14 44:4,5
49:13 51:7 58:7
64:22 73:20
93:5 96:17
106:10 108:3
119:21 124:2,5,
8,9,20 136:23
138:9,21 148:4
164:4 170:16
197:13 202:25
203:1,22
204:20,22
205:6,14 207:1
219:6 230:15
234:19 244:9
253:20 258:1

cases 28:23
30:25 31:17,21,
24 32:3,15,18
33:21,24 34:23
41:6 43:9 68:22
71:3,21 78:19

Casey 4:12,15,
17,18 57:22
128:5 156:16
197:20 198:2
244:13

cast 71:15

categories
252:6

cauc 235:21

caucus 158:19
159:10 160:2
184:24 234:25
235:21

caucuses
158:6

Caughey
263:8

causal 16:3

caused 49:24
85:17 97:22
98:1 99:3

cell 208:12,15

census 18:25
24:14 36:15
37:11,16,18,23
75:15,22 86:6
172:15 217:8,
11

center 69:12,
15 80:21
224:15

centered
254:21 255:22

centers 27:23
49:25 52:9

central 254:24
255:9,10,14,15

Century
213:16

certification
260:18,23

chain 25:10
26:11,16 27:4,
15 40:15 44:8
108:12 133:2

chains 44:8

Chair 158:20
159:10

challenge
32:17 200:5

challenging
135:20 136:6

chamber
193:18

chance 49:19
71:13 91:5

change 24:9,
10 52:8 77:5
84:4,8,10,11
104:20 113:2,
13,15 117:11,
12,13,18,19,20
118:4,5,14,21
121:23 175:17

210:19 223:20
246:11 252:5

changed
117:14 189:1
229:11 244:19,
20 245:7 252:7

changing 26:3
58:23 85:13
186:12,16
188:24

characteristic
21:18,20

**characteristic
s** 18:22 20:20
23:4,5 53:9
75:18 109:14
113:23

characterize
21:6 40:23
251:25

characterizing
115:25

charge 33:10
207:10,14
249:24

charging 33:9

chart 92:24
111:20

chase 121:18

cheat 165:1,4
249:2 250:10
253:18

check 120:17

Cherokee
228:9

Chicago 211:2

Cho 134:9

choice 11:20
19:7 40:18 75:2
76:22 78:3
82:10 85:22
86:1,5,23,25
87:8 88:3 183:8
227:19,25
246:11

choices 39:7

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choose 12:15
38:10 72:14
73:19 76:17,21
77:1 87:23
104:14 106:3,
10 207:25
221:22 222:1

choosing
86:18 87:10

chose 28:11
72:15 86:8,14,
19,20 105:24
107:6 114:4,17
224:14

chosen 70:9
104:17

Christian
179:7

churches
109:2,16
207:21

circles 24:21

circumstance
s 34:18 41:2
180:3 201:23
260:12

citation 13:2,5

cite 134:1,2

cited 126:22

cites 86:9

cities 50:18
51:24 52:1,6,15
53:1 169:6
170:2,11
188:25 220:20
221:3 222:12
241:12 258:5,8

citing 135:4

city 51:9 52:17,
18,20 69:13,15
171:7,12,19,22
172:13 173:1,6,
13,17,22,24
174:2,17
175:13 176:1,8,
11,20,23 177:5,
13,20 178:4,25
179:2,11,22,23,

24 180:6,8,10,
20 185:21
241:14 245:1
247:22 249:18
250:9 251:9

claim 3:25
43:11

claimed 49:23

clarify 56:9

Clarivate
12:24

classes 13:19

clear 52:3
114:5

CLERK 9:6
92:22 100:8,12
120:9,11
125:13,17,19
126:2,17,19
156:16

clerk's 238:20

clerks 238:18

click 242:12

Clinton 212:13

close 57:15
58:6,8 59:6
61:24 66:4
71:22 91:9,10
116:19 141:9
197:6,12 254:2

closely 104:4
158:5 175:1
184:23

closer 54:13,
22 59:7 60:16
66:1 117:10

closest 56:5,
19 57:10,18
61:20

co-counsel
194:3

coalition
182:25 184:1,3,
4,6 252:3

code 30:4,5,9
52:11 86:15

97:6,11,12,14,
22,25 98:1,6,
10,12,23 99:2,
3,10,13,22,23
101:4,11,18
102:1 103:2

coincide 110:3

collaborators
29:17 127:14,
16

colleague
144:14

collecting
36:25

color 65:5
69:14 119:14,
15,16,20,22
120:1 197:20

colored 64:4

coloring 65:14

colors 69:14

combine 12:20
64:21 68:13
73:22 183:1

combined
65:2 66:11,17
68:25 69:10
184:3 233:13

combines
11:19 14:8
64:16 69:6

combining
63:14 66:21
67:9 68:8 89:20
114:7 145:2
182:13

comfortable
32:12 35:4
124:6,7 146:16

comment
59:21

commercial
30:8

Commission
159:9 163:10,
12 203:22

commissioner
38:9

committee
193:17

commonly
62:20 145:18
221:1

Commonwealt
h 92:11 115:11
127:7 152:25
170:3 195:25
200:8 203:18
243:8

commonwealt
h's 128:8,10,
12,14,16
129:11,15
131:9,14
200:15 204:3
231:17 232:4
237:11 239:15

communicate
208:25

communicatio
ns 103:8
158:18

communities
108:21 207:20
225:13,20
258:2,4

community
139:16,18,21
174:3

compact 19:5
20:10,11 41:22
76:7,11 77:7
81:19 83:11,12,
15,18 84:13,14
85:5,9,10,13,18
139:6 143:19,
21 147:21
229:8,18,19
230:1,7,11,12

compactness
20:8,13 41:24
76:4,13,17,22
78:25 79:6,9
81:16,21,22
82:16,20,22,23
83:1,7,8,10,21,

22,25 84:4,5,6,
7,22,24 85:3,14
89:16 111:7
139:8 142:10,
14,19 143:2,6,
8,11,13,17,24
144:25 145:19,
24 146:7,22,23
147:2,7,14,19
245:19

company
208:11,19,21

compare
22:15 23:19
24:7 42:20 58:9
65:9 68:17 72:8
81:20 82:2
93:11 178:9
181:25 183:10,
14,25 184:9
186:7

compared
23:18,22 47:8
48:21 52:21
59:8,20 72:4
82:16 89:4
141:6,8 229:24

comparing
24:2,3,5,11,17
72:10 82:13,14
146:9,12

comparison
22:17 23:24
42:2,6 59:4
60:7 62:6 66:25
89:7 135:5,23
143:23 146:14,
17 164:23
165:12

comparisons
135:18 164:5

compelled
228:18

compensation
33:12

compete
190:2,19
258:24

competitive
56:5,19 57:15

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competitiveness 178:9

complained 216:14 258:16

complaining 219:14 244:7,8 260:3

complaint 219:12 230:18 254:19

completely 82:14 229:25

complex 27:24 28:18 133:18

compliant 235:22

complicated 28:15 55:3

complied 167:7 235:1

comply 81:25 82:3

compose 210:7

composite 172:5 232:21

compound 106:6

comprised 42:5

comprising 142:3

compromise 192:10

computational 16:9,10 32:21

125:4,9 127:18 240:10

computationally 21:3 144:2

compute 23:16 72:15 73:16

computer 12:17 15:16 139:10 163:15 241:4,24

computing 46:10

con 107:18

concede 250:18

concentrate 221:2,16

concentrated 174:19 221:11 224:25 225:19

concentration 12:7,15

concept 220:14 221:6,8

concern 87:12 209:23 251:19 255:18

concerns 132:7 254:18

conclude 83:20 111:17

concluded 90:18

conclusion 59:22 79:7 80:1,10 149:2 191:6 252:23

conclusions 59:14 78:6 87:25 88:1,4 89:18 103:20 104:20 149:16

condense 172:16

condensing 172:16 173:6

conducted 18:16 86:20

conducting 86:4

confer 90:25 194:2 261:17

conference 192:25

confess 226:13

confident 153:19

configuration 230:4

confused 86:15

congress 80:7 97:12 99:22 100:19

congressional 27:22 28:9,20 35:11 38:20,21 74:2,3,7,16,20 75:13 76:5 77:11 78:2 79:13 80:16 81:11,14 88:6 89:17 94:19,22 95:2,23,25 97:13,15 119:25 141:11, 17 146:22 147:25 152:7, 10 153:1 254:8, 13,14 255:3

connect 185:1 198:25

connected 204:11

connecting 198:2

connection 234:16

connects 197:18 198:3

conscious 254:2

consequence 177:24 180:12

consideration 79:25 182:7

considered 57:20 58:4 79:19 111:7 138:22 162:24 167:22 181:22 252:11,25

considers 110:19,21

consistent 19:11 20:22 22:14 24:16 42:21

consists 258:2

constant 146:14

constitute 182:22,24

Constitution 191:1 197:3 198:8,14 201:13 236:5 261:12

Constitution's 198:16

constitutional 112:7 113:7 114:12 160:3, 10,22 181:6

constitutionality 219:13

constraint 20:1 52:12,22, 24 53:3 70:1,5 98:23 105:2,4, 12,13,14,20,24 106:10,16 107:1,9,13,22 108:6,10,12 136:15,18,19, 22,23,24 137:4, 5 147:1,4,6,11, 19,23 148:10

constraints 19:15,16,20,22, 23 20:4,5,12,

15,25 22:14 28:18 51:18,23, 25 52:5 65:12 98:19 104:24 105:6 106:12, 21 131:25 133:16,24 137:2 138:10, 15

construct 236:15

constructed 89:20

consult 114:14

consultant 208:4

contact 185:1

contained 95:19 178:20, 23 179:18,24 183:11,16,17, 21 184:11,12 245:13

contemplate 114:18

contents 254:11

contested 186:5,9,10

context 78:18 132:18,20 136:10

contiguous 41:17 198:9,17

continue 11:21 92:3 126:4,13 128:19 193:24

continuing 175:15

continuity 19:25 65:12 110:13 178:5 198:16

continuous 19:4 20:2 74:19

continuum 20:8

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contrast
135:11 250:14

contrived
136:3

control 225:24

controlled
214:12 218:20

conversations
124:14

Convex 145:12

convince
189:17,22

coordinate
14:11

copier 119:17,
20

copiers 119:16

copies 119:14,
15,23 203:8,9,
10

copy 10:8
35:19 63:21
127:5 130:13
164:16 203:5
229:3

core 110:16

corner 222:25
223:3

correct 6:23
10:1 11:23
13:10 33:6,11
45:17 47:23
48:23 61:22
67:14 76:15
81:12 83:4
95:21 96:18,19
101:4,23 102:6,
12 104:18
123:17,20
127:19 128:20,
25 129:7,9,25
130:2,24 131:1,
5,7 132:10,16
135:2 141:15
145:25 148:5
152:12,13
159:1,19,23
161:4,18,20,21

162:16,18,19
163:1 166:21
167:9 168:1
170:15 172:22
174:12 175:3
181:24 182:14
190:23 197:1
200:25 209:20
212:15 214:3,7,
10,14 215:14,
16 217:9,14
218:6 223:23
224:1,11
230:22 233:5
239:22 246:6,
18 247:15,18
248:3 251:14,
16 253:16
254:17 259:4,6
260:15

correctly
134:20 135:25

correlate
116:25

correlated
117:2

correspond
130:8

corresponds
109:13

corridors
109:22

councilman
176:1

counsel 5:3
103:4,15,19,23
104:1 107:20,
24 123:21
124:1 142:4
169:13 170:14

count 47:16,
18,19 49:5
111:14 168:3,
14,19 246:19
253:22

counted 47:10
165:15,17,22

counter 3:25

counties 41:25

42:5,6,8,13
45:5,6,8,9,12,
16,19,21,22
46:2,4,9,10,19,
21,23,24,25
47:3,7,12,14,
18,20 48:5,7,18
49:7,24 61:1
64:23 65:3
77:15 89:21
109:12 111:18
137:1,3 141:16,
23 160:23,25
161:13,15,22
162:1,4,9,15,24
164:2 165:14,
16,22,25
166:23,25
167:4,5 168:23
171:16 180:11
181:10 186:13
198:9,18 199:1,
11,23 200:22,
24 201:6,7,14
202:6,10 205:1,
2,5,8,9 206:1,4,
5,10,13,18,20
209:21 210:2,6
228:19 248:24

counting 46:1,
2,9 165:17

countries
31:13

country 23:8
240:14

counts 13:2
30:13,15
111:10

county 28:16
42:2,10,11
45:4,23,24,25
46:11,14 47:15,
16 48:21 49:5,
11 51:18 63:9,
18 64:3,11,17,
18 66:18,22
67:13,15,20
68:6,10,14,15,
25 69:7,20
77:10,19 80:16,
19,22 81:23
82:9,12 83:9,14
88:12,21 89:3,

5,22,25 94:18
95:1,13 98:24
105:11,12
109:19 110:3,4
121:1,22 122:2,
8,16,19,24,25
140:1,5 141:1,
13,20,24,25
142:6 152:11
156:13,25
158:4 161:1
162:2,20,22
164:1 165:19,
24 166:1,2,6,15
167:24,25
168:15,16
171:17,18
174:3 178:1
179:7 180:11
181:8,9 187:1,
4,7 188:10,13,
20 190:3
197:18,19,20,
22,23 198:2,3
200:18 204:11,
25 206:10
209:2,25 222:8,
12,25 223:3
225:15,18,24
230:10 238:18
243:10,17
245:10,14,25
246:4,7,13,17,
25 247:5
254:20 255:6,7,
11,12,14,15,19,
20 257:1,7,9,
12,18,24 258:2,
5,10,14

couple 5:11,20
26:16 87:2 91:2
102:18 121:7
178:21 180:16
193:18 202:21
209:5 214:17,
19,21 215:2

Coupling
185:9

court 4:6,25
5:1 6:25 7:10
9:12 19:18
22:25 23:6
30:22 32:14
41:9 54:4 71:3

80:25 154:3
156:5 157:5,9
158:9 169:15
181:16 187:24
196:6 202:25
203:15,22
204:20,24
205:7,25 206:3,
9,11,17,23
208:9 218:18
221:14 236:1
245:1 252:24
258:22

court's 155:10

courtroom
6:16 8:18

courts 23:8
111:1 154:7

covers 139:17

COVID 217:15

Covington
173:11,13,15,
17,22,24 174:2,
4,15,16

crack 71:18
248:20

cracking
71:10,17
185:21

cracks 171:22
175:14

craft 159:25
196:17

crafting 181:3

create 21:24
25:23,24,25
26:1 63:16
67:10 69:10,20
79:20 84:15,21
85:4,5 90:4
170:6,7 215:7

created 27:9
43:8 68:4 70:14
96:5 168:23
185:11,12
191:3 194:1
244:12

creates 25:22

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68:15 74:18 85:1 249:8 250:16

creating 26:5 66:23 147:9 187:3 199:12 238:17 239:20

Crescent 262:18

criteria 19:1,3, 7,11,15 20:22 41:10,21 45:3 53:13 74:15 76:4 77:9,17, 18,21,23 79:22, 23 80:7 82:1 90:3 104:14,19, 24 105:3,4 110:23,25 111:5,8,11,15 141:19 148:25 160:6,9 161:5

criterion 42:17 107:19

criticism 70:7

criticisms 134:10

critique 50:13, 22 70:3,4 85:21,22

critiques 49:22 50:9

Crittenden 188:13

cross 3:25 64:23 91:19 92:8 194:19 195:20

crosscheck 145:9

crosses 64:17 139:25

crossing 66:22 68:14

current 8:8 157:18 173:12 175:8,9 176:12, 13,14 178:18

200:21 230:3 245:11 246:3 247:16 250:5

curriculum 16:21

curves 145:22

custom 98:23 105:14

cut 121:22 192:1

cutoff 151:20

CV 10:5,21,23 11:7 12:22 14:1 15:10 16:25 17:1,7 31:2 33:22 103:24 123:11 126:22

CVA 31:19

cycle 159:11, 13 184:19 209:8

cycles 172:6 186:7 215:9 227:8 259:15

D

D1 56:16

D100 56:17

D76 117:13,16, 22 118:1

D77 117:22 118:1

D79 57:24 58:3 117:14,16

D80 58:3

damage 258:23

damaged 219:7,9

dare 6:21

darker 69:14

data 12:21 14:5,13 18:25 19:1,6,12

24:13,14,17 36:11,14,16,19, 20,23,25 37:10, 11,12,15,17,18, 20,21,23,24 38:12 40:2,7 55:24 59:14 73:8 75:3,20, 22,25 86:3 87:14,15 98:18 103:2,20,21 129:23 151:9 152:24 163:7 217:8,13,17,23 230:14,16 241:16 242:18

data-wise 76:3

dataset 87:11

Dataverse 36:24

date 130:7 217:18,23

Dave's 170:10 172:4 191:25 230:20,23 231:13,14 232:6,25 235:9 239:3,18 240:1, 2,6,7 241:8

day 193:7,16 218:10 219:8

day-to-day 190:11

days 193:18 202:21

deadline 193:21,25

deal 220:1 228:18 248:9 263:8

deals 231:12

debate 146:6

decade 221:15

decades 27:5 173:9 174:20 187:21 228:18

December 192:23 216:18

decide 28:2 189:18 198:24 199:10,22 247:19

decided 140:14,18 149:16 180:4 187:22 199:15

deciding 252:12

decision 177:24

decisions 199:8 228:11

decline 34:10, 22 124:17 206:6

declined 34:20,22 123:22,23 124:3,10

deep 174:2 262:6

defendant's 49:17

defendants 49:13

defer 219:2

define 192:4

definition 101:25

degree 11:22, 25 12:2,4 13:8, 14 20:6,13 240:16,23 242:9

delegation 153:1

demarcation 116:2

Democrat 152:22 153:2 196:20 198:21, 24 199:10,16, 22 202:5,14 204:23 205:11, 24 207:5,19

208:3 210:1 213:24 214:12, 25 215:21 216:8 218:19 219:5,17,22 220:4 223:15 224:6,10,17,20 232:21 233:3 234:20 235:10, 17 236:15 244:8,21 246:25 249:11 250:6,22 252:22 253:22 254:15,16,19 255:5,18 258:12,18 259:2 260:24

Democrat's 212:14

democratic 33:19,21,23,24 34:23 55:5,6,7, 15,21 56:14,15, 16,17,18,22,24 57:2,3,10 63:14 64:5,8,9 65:7, 18 66:15,21,24 67:9 68:3,8,12, 16 69:9,12,16, 18,19 73:18 80:5,8 88:11, 23,25 89:4,11 90:1,5 94:2,19 95:7,8,14 115:17 117:17 150:17 152:10, 15 155:21 157:21 159:17 160:2 172:11 173:21 174:8, 10,25 179:6 184:16 186:22, 25 188:1 189:5, 9 190:4 191:16 197:9 208:13 234:25 235:21 238:6 247:13 249:24

Democratic- 59:9 65:23

Democratic-leading 89:22

Democratic-lean 115:25

Democratic-leaning 57:11, 13 58:8 59:2,5, 19 68:1,21,23

Democrats 50:17 66:3 71:24 116:5,6 118:11 123:7 124:1 153:4 186:4 188:6 208:11 213:19 214:17 215:10 218:19 220:7, 19 221:2,10,16, 18 224:14,23 235:18 247:19 248:19

demographic 221:19

demonstrate 204:15 215:19 249:17

density 135:8 218:4

department 8:9,10 15:4,5,6

depend 33:13

dependency 44:21

dependent 44:10 60:25 89:15 133:3

depending 27:24 41:4 43:6 146:20 156:5

depends 41:1 43:3 78:18 98:17 138:8 139:8 149:12 151:22

depicted 55:2

deplorable 212:17,22 213:9,21

deplorables 212:25

Derek 185:22

Derrick 237:3

describe 14:3 20:16 31:7 34:18 41:9 46:15 50:25 63:11 70:25 77:13 83:5 86:22 88:8,17 158:9 171:6 243:19

describes 85:16

describing 105:6

description 234:12

design 143:10

designed 6:16, 17,24 22:3 26:5 27:15,17 44:19 75:17,18 76:7, 11 136:14,17

detail 28:1 36:10 97:5 161:6 222:25

detailing 170:1

details 105:10 164:23 231:6 232:12 244:4

determine 165:21,24 166:22 167:3 169:6 177:1

develop 16:10 29:9

developed 18:13 29:17 130:9 135:16 255:25

developing 23:3 29:5 79:13 90:3 159:11

deviates 118:20

deviation 41:19,20 74:21,

23 76:1 85:23 86:9 88:2 148:1,15

diagnostics 106:14,23 108:14

dichotomy 20:9 147:8

differ 71:24

difference 48:12 52:23 61:12 70:15 75:14 85:24 87:21 106:7 111:25 118:12 140:18 190:25 191:12 216:20 253:19

difficult 133:19,22 146:9 149:14 210:3,10,17,18 211:8,19 212:10 215:6 219:17 224:18 251:3

dilute 191:16 251:23

dimension 21:20

diminish 190:18

diminishes 190:5

dire 6:21

direct 7:24 92:5 102:19 104:1 156:3 157:13 194:6

direction 150:20 151:24 152:18

directions 151:3

directly 109:9, 15 110:21 132:25

director 14:11 157:20 158:1, 19 198:12 261:8

disadvantage 221:9 228:21 249:10,21 250:21 253:17

disagree 212:19

disc 202:19

discard 26:24

discarded 44:7

discarding 27:8

disciplines 14:8

disclose 103:3,5,11

disclosed 49:13,17 50:3,5

discontinuous 20:3

discourage 106:25

discouraged 44:6

discretion 206:3

discussed 163:25

discussion 140:9

disliked 115:14

dismiss 3:20

disperse 221:17

dispute 78:20, 22 80:23

disputes 33:18 34:1

dissuades 186:17

distorted 44:20

distribution 51:5 72:6 87:22 93:8 132:1,13 133:15 134:17 135:9,11,12,24 136:6

distributions 134:12

district 20:2,9, 10 25:23,24,25 27:21 28:9,20 29:1 38:17,23 39:1,10,23 47:17,18 53:20, 21 55:6,7,20,21 56:9,13,17,18, 20 57:1,9,18, 20,23 60:3 62:2,5 64:12, 14,15,19,23 65:4,18,22,25 66:3,7,8,10,13, 14,16,19,23 67:1,4,11,25 68:1,4,5,16,20, 21,24 69:2,5,8, 11,16 71:12 74:14 75:16 78:11,12,19 79:2,4,5,6,9,11 80:20,23 81:16, 21,22 82:17 83:2,8,14,15, 17,18,19,20,23, 25 84:5,6,8,9, 10,13,14 85:1, 4,5,8,12 88:13, 22 89:1,3,6,12, 19,23,25 93:9, 21 94:15,18 95:1,12 100:12 118:7,16 121:19,21 122:1,5,7,9,23 123:6 138:12 139:5,6,14,15, 25 142:1,2,3 143:3,12,19,20 144:3,4 152:2, 11,15 161:1,10, 11 162:4 165:20 166:2

167:25 168:25 170:2,12 171:9, 12,14,23,24 172:2,11,12,18 173:5,14,17,18, 19,20 174:1,7, 20,22 175:2,7, 11,12,25 176:2, 16,19,23 177:8, 14,22,25 178:6, 7,13,14,22 179:9,12,13,19, 24 180:1,15,21 182:19 184:5 185:16,17,18, 19,22,23,24,25 186:2,18 187:2, 7,8,9,12 188:9, 15,18,19,24 190:3 197:17 198:2 205:2 206:11 222:4,5 223:1,6,10,15, 19 224:3,8,9, 17,19 226:9,15, 16,20,21 227:4, 5,6 228:4 229:7,8,11 232:12,19 233:2 237:23 243:4,9,18 244:3,11,20 245:6,8,9,10, 13,20,23,24 246:5 247:20, 23 248:6 249:12 250:15 251:12,21,22 252:1,8 253:11, 14,21 254:21 255:7,21 256:4, 19 257:5,6,22 258:9 260:5,6

districting 29:1 39:17 171:13

districts 19:3, 4,5 20:24 25:13,14 26:1, 5,22 27:21,22 28:7,13,18,21, 22 38:16 39:4 41:17,21,25 42:4,5,9,11 43:8,13 45:25

46:1,11,12,13, 20,21 47:3,8, 11,16,19 48:5, 7,9,15,16,17 49:6,25 55:5,7 56:3,5,11 57:11,13,14,16 58:7,8 59:1,5, 10,12,18,19 60:3,6,10,13,15 61:9,11,20,23, 24 62:1 63:17 64:7,10,21,22, 25 65:6 66:25 67:3 68:3 69:3, 21 71:13,14,21 74:19,20 75:11 76:7,8,9,11 78:21,23 79:10 81:1 82:15 84:1,7,11,16, 18,24 85:10 88:11,20 92:14, 25 93:11,13,16 94:11,14 109:17 110:16 116:19 118:4,8 121:1,3,7 123:9 131:24 133:22 138:11 139:4 141:17 142:11 143:1,14,17 147:9,21 149:17 150:2, 15,23,25 151:5, 10,16 152:4 160:12 163:19 164:2 166:16 168:7,8,23 171:2,16 172:25 175:10 176:22,25 177:8 178:13, 21 180:9,17 181:12,17,19, 25 182:5,20,23, 25 183:3,10,12, 14,16,17,22,23 184:1,3,9,11,12 185:12,14 186:17 189:7 191:3,23 193:20 196:17 206:21 210:6 221:11,23 222:2 224:12,

14,25 227:24 228:15 229:5, 15,18,23,24 230:3,7,11,25 238:17 242:21 245:15 246:11, 16,24 247:4,14, 17 248:16,24 249:5,8,11,25 250:2,13,17 251:9,11,13,17 252:12,15,21, 25 253:14,19 260:4,10

divide 71:20 201:6 205:9 206:13

divided 160:19 161:24 162:15, 22 165:14 171:13,18 175:10 179:8 201:1,7 202:7 205:8 206:2 209:22 210:2 248:23 250:11

dividing 206:4 250:9

division 206:9

Dixie 257:14, 21,23

Doctor 92:2,10 154:18

document 35:18 97:19 98:2,9,13 101:3 130:18,19 133:12 169:22 202:1 236:5 237:16,19

documents 100:5 164:5

domestic 137:7

dominant 24:22

don't' 119:16

donation 259:21

donors 189:17

door 183:19

doors 190:12

dots 56:1,3,21, 25 57:6 117:16, 19 118:13,18

dotted 56:6 117:15,20 118:15,17,19

double 110:10

doubt 238:25

download 30:10,13,15 37:10 101:14

downloaded 30:18

downtown 171:15 173:14 174:3,18

draft 130:5,12, 23,25 234:25 235:18,22

drafting 159:16 167:23

draw 20:24 59:14 87:24,25 102:16 160:8 199:7 215:18 216:2 228:20 252:20

drawer 76:16

drawers 76:19

drawing 107:8 160:3,7 181:2, 23

drawn 121:20 182:1 185:13, 19,21,23 186:1 260:3

draws 186:13

drew 12:14 88:4 187:8

drink 263:2

drive 262:1

drives 177:20

drops 260:13

due 34:12 225:7

duplicate 29:24

duplicated 52:13

duties 157:25

E

Earlenger 247:20

earlier 43:23 116:13 123:21 139:13 148:11 192:13 202:17 215:6 234:16 241:13 242:22

early 3:4 127:20 217:10, 12

easier 154:25

east 229:15 243:25

eastern 188:16 212:17,21 213:2,5 228:2 243:23

easy 208:16

economic 227:21

economics 12:19

edge 142:1

Edmonson 245:24

educational 14:12 158:10

effective 28:24 137:20,21,24

effectively 189:21

effects 16:4,5

effectuate 29:12

efficiency 70:18,20 71:1, 17 72:3,5,7,8, 15 73:11,14,16 78:4 107:4,17 108:8 233:7 234:8,10,16,22, 23

efficient 29:4

efficiently 108:7,15 131:25 132:25 135:21

effort 36:25 181:13 252:14

efforts 14:12 185:5 258:23

eggs 60:9

egregious 179:4

elect 90:5

elected 17:25 71:14 173:13 176:13 189:10, 15 226:17,22 229:6 235:2,3, 19

election 17:24 36:22 37:2,5,7, 12,20,21 38:1, 5,12,20,21 39:7,22 40:7 56:20 71:21 72:14,16,19,20 73:5,6,12,20,24 75:23 112:19 114:15 116:11, 24 117:1,2 118:9,22,24 140:14 141:5 151:18,23 152:20 158:22 172:5 183:7 184:19 187:13 190:20 191:17 209:7 210:9,13 211:21,24,25 213:19 215:3,7,

8 235:5,14 240:13 259:15 260:19

elections 36:17,19,20 38:6,10,11,15, 19 39:1,16,20 53:21,22,23 55:13,23 64:6 72:17 73:15,22 108:4 113:21 116:9,14,20 118:10,11 140:17 141:7,8, 9 152:21 180:3, 4,16 185:6 191:18 210:10 211:8,20 214:19 215:17, 24,25 233:1

electoral 220:22 228:21

Electorally 210:12,15

emphasize 160:2,5

emphasized 160:24

empirical 35:2 51:24

employed 158:24

empty 5:24

enact 22:5 35:11 75:13,19

enacted 18:22 21:20,25 22:9, 15,16,18 23:17 26:20,21 40:5 41:22 42:3,6, 19,20,25 45:8 46:18,19,20 47:8 48:6,10, 16,21 49:7 53:16 56:1,25 57:2 59:3,6,9 61:1,23 62:6,12 64:6,13 65:24 66:4,19 67:23, 24 68:19,24

69:2,5,17 70:21 72:4,9,10 73:10,13,17,21 74:2,3 76:20 77:16 79:1,17 80:3 81:10,14, 21 82:11,17 83:7,16,19 84:23,25 88:13, 21,23 89:4,5, 12,15,16 111:24 118:20 142:20 143:4,9 148:6 149:1,9 152:2 163:3 170:3 171:20 176:14 193:23, 24 197:7 243:5

enacting 111:3

encapsulates 163:17

encased 178:1

encircles 243:18,20

encompasses 171:15 173:14

encompassin g 173:1

encouraging 80:11 227:16

end 3:23 31:18 91:9 111:16 156:12 175:11 185:10 208:22 209:5 217:24 225:15 226:8, 12 231:24 259:24

energy 133:16

enforce 136:15,18

engage 208:14

engaged 33:21 34:7,21 208:3

engagement 34:11,15,22 74:5

engagements

153:25

engineering 13:23 14:9

enlarged 54:4

ensemble 92:12 94:9,11 95:2,19 96:8 98:13 110:19 111:19 134:15 149:9

ensure 80:8

ensures 19:23

enter 202:20

enthusiasm 190:6

entice 208:21

entire 88:1 138:16 142:24

entitled 103:9 238:9,12,14

enumerate 21:1 25:6 136:4

envelopes 190:12

environs 68:6

equal 19:4 41:20 45:11 148:7

equality 75:11 85:17 147:1 167:11

Equally 112:6

equity 189:22

equivalent 188:5

Eric 144:11

Erlanger 175:4,13 176:1, 3,4,8 247:10, 11,13,16,23 248:6 249:11

errors 208:15

essentially 66:12 202:6

206:7,16

establish 151:8

established 27:3,5 150:6,9

establishes 43:12

establishing 152:1

estimates 135:8 235:6

estimation 235:16

Europe 18:5

evaluate 18:14,21 21:18 22:2,8,9,23 23:23 24:22 29:7 32:23 35:11 36:10 40:5,13 42:19 50:22 53:18 74:6 75:18 79:16 80:2,12 81:16 90:7 118:23

evaluated 23:10 40:11

evaluating 23:14 31:11 62:11 74:16 77:11 78:2,16

evaluation 21:22 51:5 61:8 74:1

event 238:22

events 72:22

eventually 13:17

everyone's 4:7

evidence 11:11 35:1,2 36:7 51:25 59:16 128:9,11, 13,15,17 129:16 131:15

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164:8 170:23 195:18 200:10, 16 204:4 210:15 211:9, 12 239:12,16

exact 45:10 52:14 65:14 73:17 92:16 136:5 146:13 160:24 191:2 237:22

exam 92:5

examination 7:24 90:18 91:19 92:8 153:14 157:13 195:20

examples 136:4 180:23 185:15

exceed 147:7 183:1 184:4

exceeded 122:9 161:10 173:7 245:8

exceeding 184:7 191:3

exceeds 183:6

exception 14:7

excessively 50:20 191:3

excluded 32:14

excuse 17:11 22:8 165:24 178:11 230:15 235:11 251:11

exercise 39:13 72:18

exercises 135:19

exhibit 5:6 10:21 11:4,10 36:2,6 97:18 98:9 99:15 127:7 128:1,8, 10,12,14,16 129:11,15

131:9,14 154:23 164:13, 14 169:10,19, 22 170:18,22 179:21 194:10, 17 195:10,12, 17 200:8,15 202:20 203:4, 13,18 204:3,9, 15 222:18,24 229:2 231:17 232:5 233:21, 25 234:7 237:13 239:7, 15 241:17 242:7,23 243:8 244:18 245:23 247:11,12 248:15 249:15 253:10 255:2 256:5

exhibits 194:9

exist 34:24 39:2

existed 13:7

existing 26:11 132:2,3,19 133:2,6,17,21 134:10 171:11 173:12 175:1 186:24 229:4 250:5 252:1

expanded 115:10

expansion 225:13

expect 3:24 93:15 150:14 152:25 155:24 174:5

experience 11:1 28:2 31:15 159:6,8

expert 9:24 30:25 31:16 32:14,17,21 33:5 34:11,15 35:20 36:2 46:5 49:14 62:24 63:19 74:5 76:25 81:20

102:7 112:20 123:14 124:8 134:9 153:25 241:1,4

expertise 18:15 28:2 32:8,11 102:11

experts 49:17 70:16 144:13

explain 12:25 15:12 18:17 19:18 45:19 55:4 71:6 93:6 149:25 161:19 181:16 187:19 208:9 210:23

explained 9:19 40:17 86:2

explaining 50:9

explains 54:6

explanation 138:23

explicit 134:14

explicitly 252:11

explore 132:25

export 163:19

express 111:10,14

expressed 154:3

expresses 208:20

expressing 153:3

extent 103:7 106:13,22 109:6,12,13 110:2 117:1 221:14 224:22, 24

extenuating 180:3

extra 203:10

extract 230:14, 15

extreme 77:1 192:8 233:8,9

extremely 72:21 223:16

eyeball 139:9, 11 229:22

F

face 7:19,20 221:10

faced 246:10

fact 39:13 48:14 57:18 58:25 65:7 73:5,9 75:2,23 83:16 84:15,20 117:13,14,16, 17,18 118:20, 21 164:25 165:3 182:22 245:10 253:2, 19 259:1

factor 118:4 162:23 221:22 222:1 252:14

factors 22:21 72:21 73:2 79:19 109:9 151:25 152:1 163:24 181:2, 22 252:15

facts 100:13,14 184:13

fail 135:11

failed 135:2

fair 50:14 145:18 220:13

falling 262:15, 16

falls 93:22 143:5

familiar 17:11 97:11 102:13 127:11 129:1 130:18 139:16,

21 144:22 197:14 198:13 204:20,22 208:8 220:13, 22,25 222:5,11 228:7 231:4 234:14 257:11, 25 258:7,8

family 25:2,9

fare 62:5

fast 9:6

faster 97:4

father 46:3

favor 92:14,25 149:18 150:15, 23

favorable 146:4

favoring 22:19 59:17 73:10,14, 18

favorite 244:11

favors 22:17

Fayette 63:9 67:13,15,20 121:1 122:19 178:1 188:20 255:6,11

features 146:15

fed 41:10 52:5 70:1

federal 112:4 160:4 212:3

federalism 40:24

fee 33:9,10

feed 19:15 42:16 43:1 74:15 77:9

feel 32:11 35:2, 4 124:6,7,12 146:16 157:1 189:19,20

feet 262:6

fellow 187:25

felt 34:23
107:1,3

fewer 28:22
42:1,4,7,8 47:7
48:9 49:10
71:13 77:15
192:6 206:18

fewest 206:13

field 40:20
134:9 144:13

fields 12:8

Fifield 129:20

figure 46:5,14,
15,17 47:4,21
48:1,24 53:4
54:1 55:2,4
59:15,16 62:15
63:19 67:16,20
83:2,6 88:15,
18,19 89:8
111:21 135:7
142:18,22
143:16 144:3,4,
8 151:21 152:2
199:5

figures 67:22
70:14 87:20
88:20 244:25

file 101:7 142:7
163:15 208:13

filed 3:19 4:25
142:8 193:4,24
202:24 203:20
218:1,7,12
254:20 261:2

files 101:13,15,
17,24 102:3
163:9 239:20,
25 240:2,3,5
241:12,21

filing 193:21,25

filings 234:16

filled 260:24

filling 260:22

final 44:13
137:13 184:8

finally 168:21
179:20 253:9
260:2

finance 259:12
260:1

find 108:11
184:25 228:19

fine 6:4 8:16
137:6 164:10
198:22 247:1

finish 155:13
156:3 194:21,
23

fire 139:24

firm 257:20

Fischer 197:13
202:24,25
203:21,22
205:6 206:12

flashing
126:19

flat 57:6 116:1

flattened 57:7

flew 9:18

flight 154:16

flipping 133:21

floor 201:4

Florence
176:11,20
177:6 248:14,
16,20

Florida 37:1

focus 16:5
55:25 56:4 68:4
76:10 88:20
121:3,6 141:20,
23 142:6

focused 43:15
80:15 142:5

focusing 15:16
56:18 61:10

folks 208:14

follow 147:10
149:5

follow- 154:11

follow-up
151:4,7 153:11
261:16

follow-ups
209:2

footnote
205:10

forced 147:10
225:10

forecasting
39:12 112:19

foresee 189:14

forgot 48:2

form 102:23
112:21 149:4
161:1 167:25
205:2 210:22
261:7

formed 184:4
236:13

forming
206:21

forms 210:24

forward 165:9

forwards
191:9

found 107:16

four-month
218:5,13

fraction 176:9

fragments
206:19

Franklin 80:16,
19,22 81:23
82:9,12 83:8,14
88:12,20 89:2,
5,24 94:18
95:1,13 140:25
141:13,20,24,
25 142:6
152:11 254:20
255:11,15

free 29:23 30:3,
10 157:1

freeze 78:11,22
79:4

freezing 79:1,
4,8

frequency
48:4

friend 262:17

front 81:2
165:1 222:16
230:10

frozen 79:11

full 13:18 14:19
15:3 37:5 82:5
134:11

function 99:4
133:17

funding
258:15,18

fundraising
190:15 254:6,7
258:23,25
259:10,21
260:1

funny 55:25

future 39:7
116:25 117:2
152:19 153:5
191:19

G

gain 223:20

gained 122:5
214:17

gap 57:7 58:22
70:18,20 71:1,
17 72:3,5,7,8,
15 73:11,15,16
233:7 234:8,10,
16,22,23

garage 262:12

garages
262:14

gauge 185:1,2

gave 146:25
147:2 164:12

195:9 241:15

gears 180:24
184:14

general 12:9
18:18 32:2 38:7
39:5 40:23
44:12 73:3
84:12,19 87:24,
25 104:7 106:9,
23 107:8
115:20 116:23
132:5 136:1,11
141:9 170:4
172:8 197:8
199:3,14
214:23 217:6,
22,24 234:25
236:17,20,24
247:2 248:1,22

generalize
138:20

generally 18:9
63:11 69:16
76:6 78:9
163:16 207:18
242:3 248:17

generate 19:8
22:3 24:16
38:16 41:17
42:23 43:20
44:3,4 47:5,6
53:7 75:19
76:7,11,20
78:1,8,23
79:23,25 83:13,
17 87:5,19
96:10 97:19
98:12,21
101:16 147:5
163:20,22
190:6 241:22

generated
29:3 43:21 44:5
70:13 95:22,24
134:15 148:24
163:23

generates
87:7 241:10

generating
78:10

generations

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179:25

gentleman 129:19

geographical 146:15 246:12

Geographically 243:11

geography 41:1 161:24 220:14 221:8 223:19 224:15 225:5 228:13 251:2 257:11, 16,25

George 158:13 240:19,22

Georgetown 177:11,12,13, 21 178:3,4 249:24 250:8, 11

Georgetown's 249:25

gerrymander 244:2

gerrymandered 242:10

gerrymandering 41:5,6 43:5 58:6,13 59:17 60:11 62:15 80:12 123:18 244:8

GIS 163:12

give 4:24 7:10 81:5 90:10,24 91:12 119:22 125:17 137:7 139:9 147:20 155:18 157:9 194:2 231:8 249:14 261:17

giving 5:1 89:24 183:6

glad 119:14

go-to 37:8

goal 21:22 26:9

41:3 90:7

goals 18:20 41:3

gold 144:24

good 8:1,2 12:16 19:19 20:7 22:24 34:25 40:22 54:10 55:11 62:8 72:9,13 75:1 87:8 90:11 92:7,10 112:16, 21 114:10 120:22 135:9 149:22 155:2, 12,23 195:22 203:3 238:15 258:9 263:12

governing 260:21

government 8:10 15:4 16:6

governor 38:7 158:22 196:4 197:8 220:5,11 254:15

graduate 11:25 13:21 15:22 16:18 31:9

Graham 237:3

granular 37:16,18

graph 56:10

Graphical 125:5,9 127:18

grassroots 190:10

gray 48:2 64:11 83:10 88:24

great 5:8 6:12 38:4 97:5 144:18 157:18 169:9 194:15

greater 47:3

Green 50:19 51:20 52:7

171:4,8,12,15, 21,22 172:14, 21 173:4,6,8 242:22 244:25 245:2,5 255:22

grew 245:2,6 246:7

group 31:9,14 68:3 137:7

groups 158:3 183:1 184:4

grown 246:13

growth 139:14 172:20 244:25

guarantee 25:5 26:17 87:15

guaranteed 191:17

guaranteeing 191:18

guarantees 25:4 77:3

gubernatorial 114:5 140:12 172:8

guess 93:25 99:16 106:5 119:13 149:14 168:4 194:6 240:8

guessing 118:6

guided 147:13

guy 32:6 194:21

H

half 146:23,24 192:1 213:4,8

halfway 243:24

hand 7:9 127:5 130:13 157:8 174:24 230:5 231:11 233:13

235:8

handed 169:14 236:1

handily 114:13

handing 99:23 233:16

handles 138:10

hanging 243:14 263:11

happen 51:14 65:11 72:23 116:11 125:18 126:3 172:23 174:6 259:20

happened 35:6,7 48:6 124:14 168:3,7 187:18,19 213:24 215:9 216:7 218:24, 25 225:16 249:18

hard 8:13 19:16,22,25 133:19 136:15, 18,19,22,24 137:2 147:4 189:22 213:15

harder 186:19 188:22 189:3, 17 258:24

Hardin 257:7,9 258:10

Harlan 162:6

Harvard 8:11 9:20 11:25 13:9 14:23,25 15:2, 5,7,14 17:10 31:9 36:23 144:14

Harvard's 15:10

hate 6:17 40:22

Hatton 237:4

HB 163:6,8 165:12 166:23

167:24 168:2, 14,22,24 169:7 172:24 173:3, 22 174:16 175:13 176:7, 20,25 177:5,18 178:3,11,25 179:10 180:6 185:4 186:11, 22 188:2 190:21,25 191:12 192:13, 15,17 193:14 195:8,13 196:3, 23 197:3 201:7 202:5 209:19 216:11,15 217:7 218:24 222:21 225:4 226:4 229:3,24 230:14,16 231:12 232:7 234:21 235:3 236:15 237:25 238:2,6,22 239:21 242:18 244:12,19 245:20 246:3, 15 247:5,16,21 248:25 249:7 250:2,5,14,15, 16 251:12,17 252:5,11 253:12,13 256:10 258:17

HB- 163:25

HB2 222:21

head 142:13

heads 184:25

hear 149:22

heard 130:10 144:9,10 148:11 161:16 227:15 257:15

hearing 4:3 8:13

heart 176:4

Heather 92:10 99:14 154:22

Heather's

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241:19

heavily 66:9
253:20

heavy 68:7

held 38:19
157:22 192:25
214:22 215:1
219:7

helped 196:17

helpful 4:8

helping 159:24

helps 69:20

Henderson
201:1

Hey 156:16
203:14

Hieneman
155:19 157:6,7,
17,18 159:5
164:17 165:11
168:13 169:5,
18,22 171:1
178:17 180:24
194:7 195:22
204:9,19
205:16,23
222:14 234:6
237:16 239:19
242:20 254:13
257:5 261:14

high 13:5
115:17 146:10
202:4 223:16
224:6

higher 56:14
89:11 118:3

Highland
262:14

Highlands
228:8 261:22
262:1

highlighted
116:14

highly 85:1,4
89:21 133:18
135:9 143:12
224:20

highly-cited
12:24

Highway
257:14,21,23

Hillary 212:13

HINKEL 63:21

Hinkle 4:13,15,
17,20 5:11,16,
19,23 6:4,8,12,
15 7:2,4,7,18,
23,25 8:17,24
9:2,7,15,17
10:2,5,8,12,15,
17,20 11:3,12
32:20 33:3
35:16 36:1,8
50:7,15 54:8,
11,12,20,24,25
57:25 58:2
60:23 61:16
62:13 63:4,24
64:1,2 67:17
69:23 80:24
81:4,9 90:10,
13,15,24 91:4,
10 92:4,19
103:6 122:11,
21 128:6
129:13 131:12
137:11 149:4,
19,23 153:12,
15 154:9 155:8
156:10,19,21,
24 157:1
169:11,20

Hispanic
184:6

histogram
83:9 88:24
142:20

histograms
48:3

historian
225:17

historical 6:24
79:12 225:12

historically
175:7 180:15
225:16

history 15:7
113:2 158:16
240:14

hold 15:3 67:17
119:1 125:14
187:12

holding 146:13

holds 210:11
211:22

holiday 185:10
192:14 216:17,
19,22,24 217:3

homophobic
213:14

honest 241:20

honestly 201:9
209:15 217:18
235:8 248:13

honor 3:9,13
4:15,21 5:19
6:18 7:2,18
8:12 10:2,8
11:8 13:6,7
32:20 35:16
36:4 50:1,7
54:20 62:22
81:5 90:15,17
91:14 128:6
129:13 153:12
154:9 164:7,24
165:8,9 166:4
167:13,19
168:4 169:9
170:17 175:18
191:5 194:5,20
195:5 200:6
201:16 202:22
203:20 204:5,
14 205:13,21
211:4 222:17
227:9 229:1
231:16 233:12,
19 237:9,14
239:6 253:25
256:24 257:20
261:15 263:6

honors 12:22

hopes 54:4

Hopkins
188:10,12

200:25

Hopkinsville
50:19 51:21,22
52:7 178:17,18
179:1,3,10,11
251:8,19

hosted 36:23

hour 91:12
194:20

House 27:21
28:7,12,13
35:11 38:21
40:11,13,14,21
41:5,10,18,19
42:1,4 43:20
44:24 45:7
47:2,11 53:16
56:2,11 61:14
70:19 92:14,25
94:22 95:19
98:3,5 99:22
100:20 104:13
111:18 119:2
138:6,25 139:1
149:15 153:18
158:19 159:16,
17,25 160:1
161:8,13,15
163:2 166:11,
13,16,25 167:4,
5 168:19,25
169:2,4 170:4
171:9,10,20
172:10 173:16
175:25 177:14,
20 178:13,14
179:9,11,12,18,
24 180:7,9,18,
20,21 181:19
182:1 183:9,13,
15,16,21,22
184:2,5,10,11,
16 185:16,18
186:4 188:20
191:20 192:1,2,
3,18,23,24
196:10,20
200:4,5 201:5
202:15 208:6
210:11 211:8,
21,22,23
213:25 214:13
215:1,10,22
218:20 221:23

222:2,4,5
226:18,20
249:6 251:24
254:16 259:14,
15

Housed 30:16

housekeeping
3:15 99:17
195:8

Houses 196:24

How's 6:3
233:23

huge 125:2

Hull 145:12

humanities
14:9

humoring
168:12

hundreds
102:3

hurdle 185:12

I

idea 46:8 71:8
80:14 85:2
140:23 258:13

ideal 85:24
122:9 245:11

identification
10:22 97:18
98:8 232:5
233:20 234:7
237:11 239:8

identified
168:22 186:14
209:17

identify 116:17
207:24

ignore 55:8

illegal 253:3

images 169:23
170:6,13 171:5

imagine 45:23
84:16 156:2

Imai 7:5,15 8:1, 5,6 9:6,10,18 10:22 11:13 18:7 31:15 32:21 33:4 35:18 36:9 49:12 50:5,13 54:5,13 55:1 56:8 59:21 60:24 67:19 69:22 91:20 103:13 153:16 155:25 194:10

Imai's 10:5,21 36:2 90:18 149:24

immediately 193:17

impact 13:5 27:1,6 44:19 51:18,23 52:1, 25 53:4,13 79:1,6,9 86:22 87:9 88:3 89:15 113:17 185:4 193:19 258:17

impacted 70:1 139:15

impacting 107:4

impacts 184:15 189:14

implication 70:6

implies 137:19 213:1

import 163:19

important 20:19 29:25 51:1,16 70:7 77:4,21 79:20 80:22 87:22 104:15 116:16 118:12 190:8 216:20 221:22 222:1 230:6 247:24 248:5

importantly 42:13

impose 20:14 27:24 28:23

imposed 70:5 104:25 133:24

imposing 51:17

impossible 20:25 21:1,3 25:6

improperly 121:2

improve 132:19 133:5

improvement 30:1,7 247:7 250:3,5 251:15

in-house 158:4

inaccurate 76:23

inappropriate 50:6

Inaudible 3:9 43:15 62:19 93:8 107:24 111:25 117:19 118:2 125:4 142:21 144:21 167:14 205:5 206:24 256:12

incident 250:23

include 18:24 47:11 76:4 107:19 132:21 143:16 235:25

included 4:6 81:1 114:25 115:17

includes 5:3 123:18 177:11

including 31:22 151:25

inconsistent 149:19,24

incorporate 109:9 131:24 133:16 230:17

incorrect 26:15 50:10 51:2

increase 108:9

incumbency 187:12

incumbent 186:22,24 187:4,10 188:1, 12,17

incumbents 110:7 187:14

independent 29:3 107:25

Independents 220:20

Indiana 223:22,25

individual 170:11

individuals 185:1 199:7

infer 51:14

inference 16:3

influence 72:23 183:3,7 184:9,11,12 252:3

inform 238:5

information 40:5 42:14 43:2 80:14 90:9 208:24 209:1 220:15 221:13 230:25 232:13 257:23

informed 47:1

initial 26:24 27:1,6,8 44:6, 20 50:8 52:21

injunction 164:13 205:15

innovated 30:21

innovation 23:10

input 19:6,12 79:24 90:9 104:14

inputs 18:19, 24 39:14 41:14, 15

insert 122:20 256:25

inspection 117:25

install 99:11 101:12,14

instance 153:21 183:4,5 222:5

instances 187:18

institute 15:11, 13,14,18,19,20

instruct 108:17,20,23 109:1,4,18,21, 24 110:6,9,12, 15

instructed 77:22

instruction 142:4

instructor 13:16 14:17

intact 173:8 206:6 249:9 250:14

intend 3:20

intensive 144:2

interdisciplinary 14:10 15:14

interest 12:14, 20,21 16:8 108:21 139:16, 18,21 185:1,2 208:15,20 258:4

interested 12:17,18 13:24 16:18 19:2

25:20 26:7 31:10 51:12,19 158:3

interesting 214:24 226:6

internally 218:14

international 17:14 18:6

interpret 99:7, 8 236:8 261:10, 12

interpretation 107:23 201:24 235:25 236:3 237:6 261:13

interpreted 152:19

interpreting 146:19

interrupt 8:12 56:8

intertwined 140:7

interview 51:14

interviewing 21:8

intricately 140:7

introduce 11:3 36:1 80:24 130:3 195:11 201:16 219:8

introduced 124:22 125:1 126:24 159:20 194:9 195:10 196:8 218:11, 16,21 219:1

introducing 194:16 203:6

introduction 219:16

introductory 16:17

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invade 103:7

Inverse 145:12

invested 14:5

investigate
70:3 85:21

investigating
72:24

involve 31:24

involved
184:18 196:2
202:5 207:16
214:19 219:3

involvement
159:12 184:21
196:15

Islamophobic
213:14

isolate 53:11
170:11 241:14

isolated
249:13,15
250:23

issues 158:6
232:14 263:7

item 195:8

iterations
135:25

J

Jackson
161:25 185:20
189:6

January 193:8
201:4

Jeff 258:13

Jefferson
63:9,18 64:3,24
67:5,22 69:9
121:1,7 156:13,
25 187:1,4,7
222:8,12,25
223:3 225:15,
18,24 230:10
257:1,7,9,12,24
258:2,5,14

jellyfish
243:13,15

Jenkins 237:2

Jensen 108:3
204:21 206:8,
24 207:1

jeopardize
258:25

Jerry 227:5,6

Jessamine
68:14 69:7
255:6,11,14,19

Jill 137:6

job 123:22
124:3 157:22,
23 196:9
230:13

jobs 123:23
124:10

John 185:17

join 199:11,23
205:2 244:13

joined 167:24
168:15

joint 4:1 5:5
15:7

Joni 237:2

Joseph 203:22

Josie 187:3

journal 17:5
62:19 125:4,8
127:17 129:5
131:2

journals 13:3
17:3

judge 3:2,10,
14,17,22 4:4,
14,16,18,22
5:5,9,13,17,22
6:2,5,10,13,16,
19,23 7:3,6,8,
13,16,21 8:15,
19,22 9:1,3,8,
11,13 10:4,7,10
11:6,9 32:25
33:1,2 35:17

36:3,5 50:11
54:9,16,23
55:9,14 57:22
58:1 60:19
61:18 62:8,24
63:3,22 81:3,8
90:11,14,16,20
91:1,7,11,15,22
92:1,6 95:5
99:14,17,20,24
100:3,6,9,11,
14,16,22,24
103:9,10
114:21 119:13,
18,19 120:1,3,
6,10,12,15
121:9,12,18
122:1 125:12,
16,18,23 126:3,
6,8,12,16
127:6,8 128:2,7
129:12,14
131:10,13
134:6 137:6,10
140:24,25
149:21 150:1,5,
8 151:4,11,19
152:5 153:7,8,
9,11,13 154:11,
13,14,20 155:2,
6,12,16,20,23
156:1,4,7,18
157:4,7,12
164:10 165:3,6
166:5 167:17
169:16 170:19,
21 175:20,24
183:18,24
191:7 194:14,
18,21,23 195:3,
6,13,19 200:9,
11,14 202:18
203:2,7,9,11,
14,19,24 204:2,
17 205:17
210:23 211:1,6,
11,14 219:14
227:12 231:18,
21,24 232:2
233:11,14,22
234:1,4 237:12
239:10,14
241:21,23
242:1 245:5
249:21 254:4
256:8,14,16,21,

22,23 257:2
261:16,18,20,
24,25 262:5,7,
10,13,16,20,23
263:5,9

Judging 198:5

judgment 3:24

judicial 201:17

judiciary
119:16

jump 58:3,4,25

jury 6:20 8:14,
16

K

KDP 158:1,25
192:14

keeping 173:8
241:19

Kenton 174:2

Kentuckians
160:19 189:13

Kentucky
23:25 24:15
38:2 40:11 43:2
44:24 61:8 75:7
80:5,9 90:6
107:8 108:1
112:4,18 115:8
116:22 117:3,4
136:23 150:14
153:18 155:21
157:20 158:12
160:21 162:5
169:6 175:5
184:16 188:16
189:8,13 197:7,
9 199:3,10,16,
22 205:24
207:5 208:3,6,
13 210:1 212:9,
14,17,21 213:2,
6,20 216:8
218:25 221:15,
23 222:2
224:22 225:6
226:15 228:2
232:10 240:15
254:24 255:10,

15 259:3,17
260:10

Kentucky's
36:11 74:2
79:12 85:9 88:6
92:14,25
181:18

KET 201:16

kid 226:7

kids 115:2

kill 115:2

kind 158:16
171:1 173:15
182:17 214:15
243:12

kinds 165:3
182:4,5 232:16

knew 218:4

knocking
190:12

knowledge
32:13 37:6
38:13 154:6
192:15

Kosmosdale
258:3

Kosuke 7:4,15
8:5 9:10

KRS 260:16

Kugler 185:25

L

L-E-X 9:4

labeled 133:10

lack 83:21
190:15

lag 125:2

land 198:1
204:10

landlines
208:16

language
29:15 96:22

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161:3

languages
29:16

large 28:17
63:20 68:9,13,
25 69:6 86:2
115:13 123:1
131:23 138:11
162:12,13
171:14 176:18
177:13 206:10
249:19 250:24
251:1 256:18

larger 27:20
83:11 206:5,20
221:3

laughed
119:22

law 21:25 108:1
144:14 148:16
159:22 196:4
197:7 201:12
202:3,15
204:24 217:6
226:15 254:15

lawsuit 200:1
261:2

lawyer 6:22
34:5 108:2
148:19 191:6
198:15 211:2
261:22

lawyers
123:25 154:21

lay 163:18

layout 170:2

layouts 171:9

layperson's
236:13 237:6

lead 31:14
62:25 84:10,17
228:21

leaders 189:10
207:25 209:1

leadership
159:15 184:24
192:24 207:7
209:2 236:25

leading 62:23
94:12 167:15
227:11,14

leads 66:23
184:25

lean 39:10,17
69:19 92:14,25
149:17 150:15,
23 151:1,6,10,
19 152:15

leaning 56:23,
24 58:7 59:10
65:23 66:20
68:11 93:13
152:3 172:13
174:22 178:12
234:21

leanings 172:1

leans 93:24

learn 261:5

learned 260:5
261:1

learning 14:3
15:16 16:19
17:17

leave 91:24
121:16 156:25

leaving 134:14
171:24 187:7

led 83:19 217:7

left 64:4 67:23
135:12 141:3
158:24 222:25
233:9

left-hand
232:9 233:8

legal 19:2
131:24 170:14
191:6,11 236:5,
20 237:6,7

legislation
192:9

legislative
32:23 112:12,
16,17 116:6
158:6,7 159:6,
9,13,15 163:10,

12 184:23
203:21 207:7,
15,25 209:1
235:20,21
236:25 238:17

legislators
159:10 185:2
186:23,24,25
196:7,17

legislature
159:20 173:12
176:14 187:21
206:2 219:6
228:18 238:9

legislatures
196:19

lengthy 142:2

Letcher 162:6

level 13:21
36:25 37:13,19,
24 38:13 55:18,
19,20 65:15
75:22 84:5,22,
25 85:13
105:12,14
107:5,9,13
143:3,11
163:18 185:2
208:14

levels 105:4
108:7

leverage
187:13

Lexington
67:13 255:10

liberal 11:18

libraries
101:18

lieutenant
38:7

life 96:12

light 201:23,25

lights 8:23
125:24

likelihood
210:20

limiting 181:9,
10 225:13

Lincoln 197:22

lines 58:19
64:11,13 69:13
75:5 98:22
136:13 146:3
176:10 186:12
187:8 188:25
197:23 228:20,
21 244:11

link 239:24

Lisa 187:6

list 141:3
168:13

listed 16:25
17:1,6 31:18,21
33:22 99:25
111:9 260:9

listen 5:13 94:2

lists 12:22

literally 20:18
152:17

literature
22:25 44:12,18
58:4,13 62:16
71:3 72:18,24
75:25 82:25
108:13 111:6
112:25

litigation 31:16
33:20 123:14,
19 124:18

live 8:6,7 65:8
68:9,12,14,17,
18,22 69:2,17
110:7 123:7
220:20 221:22
222:1 224:15
225:11 226:18
227:20 260:6
261:25 262:20

lived 226:7,8,
15 262:17

lobbed 50:10

local 61:13
63:6 190:7,8,15
209:24,25

localities
63:12

locate 97:18
98:9 221:3

located 43:13
99:1 140:5
142:9 207:23

location 62:3
109:19

lock 78:12

logistical
155:4

long 22:22
91:19 155:23,
25 156:5
157:22 194:19
209:3 226:13
229:17,23

looked 46:3
48:20 52:6
53:19 63:8,12
86:15 88:10
96:12 116:10
142:16 162:17
182:4 221:7,12
241:12 252:9

lose 71:21
214:4

losses 188:8,
15

lost 189:19
214:1,2 215:2,
10,11,12,13,21
259:14

lot 5:25 84:17
146:1 187:13
189:21 193:22
194:1 225:2
230:24 231:5
232:12 238:18
255:5 262:5

lots 38:16
46:13 87:7,18
98:22

Lou 187:2,20
226:16,20
229:6

loud 125:20

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Louisville 226:8 262:1

love 6:18

low 87:4 146:10

lower 56:15 148:14

LRC 4:9 206:3, 16 219:3 239:23 240:1,3, 5

LRC's 205:8 206:6

LSAT 262:24

lunch 90:12,21 91:5,8,12

Lynn 188:8

M

machine 14:2 15:16 16:19 17:17

Maddox 3:13, 15,18,23 4:5, 21,24 5:8 6:18 8:12 10:11,13 11:8 36:4 50:1 60:12,17,21 62:22 63:1,23, 25 90:17,22 114:23 119:17 121:16 164:24 165:5,8 166:8, 12 167:13 170:20 175:18, 23 183:19 191:5 194:20 195:16,21,23 200:6,10,17 201:15,19 202:22 203:4,8, 10,13,17,20 204:5,7,14,18 205:14,21,22 211:7,13,16 222:17 227:11, 14,16,18 229:1 231:7,10,16,20, 23 232:1,3

233:12,15,18, 24 234:3,5 237:9,14,15,17 239:6,12,17 241:25 242:2 253:25 254:5,9 256:9,13,17,22, 24 257:3,4 261:14 262:5,8, 12,14,19,22

made 30:7 40:17,19 41:21 42:1,3,7 43:16 58:7,8 59:10,13 60:4,6 74:18 77:14 85:8 96:1 122:24 134:13 138:3 143:8 206:8 219:17 252:23 259:22 260:18,19,23 261:22

Madison 180:11

Magera 231:9, 11 233:17

Magera's 233:13

main 16:1,2 17:15 21:16,22

maintain 158:2 178:5

maintained 181:14

maintaining 107:17 110:13

major 11:18 16:21 24:11,19 109:22 112:23

majoring 13:22

majority 43:8, 12 118:2 146:21 148:23 149:8 152:4 158:19 159:10 182:7,22 183:10,11 190:22 192:11, 23 196:20,23

202:14 214:1,4, 5,8 250:12 252:2

make 27:6 29:22 34:24 35:4 39:8 44:9 45:2 52:3 61:12 77:6 82:10,12 84:13,14,17 85:12 87:16 89:22 95:18 99:17 106:15 108:14 113:8 121:2,22 125:7 130:10 133:20 136:10 144:9 151:14 154:16, 22 162:4 163:13 166:1 168:13 181:12, 13 184:25 189:24 191:19 199:8 209:2 210:6,18 224:9, 19 228:11 230:7 233:20

maker 224:18

makers 22:6 30:2 246:10

makes 66:8 84:21 99:4 111:18 173:17 189:17 191:17 202:1 210:3 212:9 251:2 253:13 258:24

makeup 221:23 222:2 224:9 226:4 230:3 249:3

making 59:18 89:5 120:2 125:20 133:19 179:14 190:12 203:15 237:12

man 219:25 262:17

managed 145:1

management 158:13 240:21

mandates 236:4

manipulation 244:10

manner 186:20

map 21:2,25 22:3,4,5,7 25:11 26:3,12, 13 28:12,13 40:13,14 43:20 52:16 61:14 64:3 65:14 74:2,3,6,17 76:5,16,19 77:11 78:2,16 80:16,25 81:11, 14 84:15,17 85:9,14 88:6 90:4 121:20,23 123:2 139:5,6,7 141:19,22 142:15 143:21 150:9 153:18 159:14 160:3 163:11 166:9, 13,20 170:3 171:4,9,11,13, 20 173:12,23, 25 175:8,9 176:5,12,13 177:12 179:22 180:7 181:3,14 185:9 188:11 192:19 194:8, 16 195:8 197:7 199:7,12,15 200:7 222:20 224:18 228:25 229:4 230:10 234:17,18,20 235:1,12,18,22 240:8 242:9,23 243:1,4,9,16 244:12,20 245:11,20 246:3,10,16 247:11,13 250:5,6,24 251:1,8 253:11 254:8,13,14 255:3 256:4,5, 18 258:10

map's 235:12

mapmakers 225:5 230:6

mapmaking 216:9 238:13

maps 20:19,20 25:17 47:5 50:17 51:3 52:20 53:5,6,8, 9 64:4 70:18,19 79:13,18,19,20 80:4 81:1 85:18 95:20 96:4,10 131:23 143:22 159:6,11 160:7, 8 163:5,20,22 170:1,12 177:11 178:19 183:11,25 184:9 192:15 194:12,14 196:25 198:13 222:16 239:20 241:7,12

Maptitude 196:16

March 157:23 218:2

margin 71:22

marginal 60:13,14

mark 97:17 98:8 101:2 169:21 201:21

marked 10:21 164:12 232:4

Markov 25:10 26:10,16 27:4, 15 40:15 108:12 133:2

Marshall 162:1

Martina 185:20

Mary 187:2,20 226:16,20 229:5

Maryland 124:17,20

Marzian 187:2, 20 229:6

Marzian's 226:16,21

Massachusetts 8:7 9:19 23:21 24:1

master's 12:4 240:21

masters 158:12

material 51:23 52:8,25 70:15 87:21 88:3

materials 4:8 5:4

mathematical 23:5 25:4 26:17 87:15 105:2 161:21 206:4

mathematically 20:10 161:20 206:13

mathematics 11:19 12:17,20

Matt 114:18 115:1,14 140:9, 24

matter 9:25 12:1 32:7 99:16 117:15 126:14 175:19 191:12 192:6,12 204:21,24

matters 31:16, 18 190:25 191:1,2 197:3,4 212:2,4

maximize 179:12 252:14

maximum 74:23 148:13, 14 245:9

MCCOOL 188:18

Mccormick 188:18

Mccormick's 188:19

Mccracken 166:2,6,15

Mcghee 144:11

Mckenzie 187:5

MCMC 26:2,10 28:8,12 29:10 40:20 44:12,18 96:23 124:22 126:24 127:2 132:8,11 133:2, 14 134:10,17 135:1,3,6,11, 15,23 136:14 137:20 138:5,9, 13,24 139:1 153:24 154:3

meaning 236:14

means 12:25 30:3 65:6,22 66:3 71:10 83:12 187:11, 16 189:21 201:22,25 207:12 224:18 227:21 234:11, 24

meant 145:6 188:17 246:21

measure 20:8 39:3,16,22 40:6 41:24 71:1,2,4, 25 72:1 73:15 76:18 78:25 82:20,21,23,24 85:19 113:9 114:10 115:20 116:11,18,19 139:8 142:10, 14 143:1,2,24 144:5,7,19 146:13 147:8, 14 152:16,20

measured 55:19 73:11 145:19

measurement 146:14

measurements 145:23

measures 3:16 22:10 41:23 72:2 143:3,13 144:25 145:2, 11 146:7,18

measuring 39:9 83:22

mechanism 260:11

media 193:1,2

median 58:21 93:22 118:16

meet 207:20

member 15:20 17:19,20 184:24 199:3

members 18:1,2 160:1,7 192:25 197:9 199:4,14,19 234:24 235:20 236:17 247:2 248:1,21 259:14

memberships 215:22

memorize 94:21 101:7 145:4

mention 48:2 121:7 141:2

mentioned 22:7 28:14 34:21 38:1 43:23 45:3 53:22 62:14 141:18 180:25 190:14 192:13

mentions 141:13

mere 148:17

merge 25:12, 15,16 28:8,18, 25 40:16 136:14

merging 26:22

message 189:11 208:20

messages 190:13 208:4, 19

met 195:23

method 24:22 26:10,11 130:8 135:21 143:25 145:14,18,21 146:4,8,11,17 148:24 166:23

methodologies 30:21

methodology 12:12 17:12,14 31:3

methods 12:12 23:3 25:2,3 29:6,9,23 31:11 39:15 131:23 132:2,3 145:10

metric 23:18, 19 82:23 144:20 145:7 162:17 167:21 184:8

metrics 23:16, 19 144:24 165:13 182:3,4 230:25 233:8

Michael 3:8 128:4 227:17

microphone 8:20,22 9:7 54:18

microphone's 8:18

middle 57:19 171:23 179:3 218:2 232:7 250:7 257:21, 22

midway 134:8

migration 221:15

mile 257:18

Miller 227:5,6

million 21:9 189:13

mind 203:5

mindful 155:9 157:2

mine 233:12,23

minimize 41:24 42:12 106:11

minimized 45:4

minimizing 162:19,21 181:7,8

minimum 45:12 160:23 161:17,20,21 162:8 201:13 202:6,10 205:1 206:2,5,9

minorities 43:11

minority 43:8, 13 181:13,14, 20 182:7,25 183:3,10,11 184:3 214:6,9 215:15 225:13 252:2 259:13

mint 120:2

Minter 172:19

minus 41:19 74:21,23,25 75:6,8,9 148:10 160:11,20 161:9 167:8 181:7 205:4

minute 90:10, 25 153:7 156:22 256:6

minutes 201:20

mistake 30:6

mix 133:18

134:18

model 39:12

models 39:13

modern 202:2

moment 197:2
234:19

money 238:18
261:23

monitor 7:22

Monte 23:3
25:2,3,8,10,21
26:11,16 27:4,
14,15 28:10,24
40:15 74:8
108:12,13
133:2

months 209:5

Morgan 10:12
120:5,6

morning 8:1,2
169:15 195:10
263:13

motion 3:19
164:13

motivated
78:3

mountains
110:1 146:2

mouthful 31:4

move 8:16 11:3
36:1 54:22 63:5
74:1 87:5 112:1
129:10 131:8
156:16 165:9
170:17 173:10
193:25 194:9
195:11 227:17,
22,25 228:12
230:13 251:2

moved 8:14
15:1 193:17
226:13 227:4,5
251:20 255:21

movement
221:20

moves 117:15

118:15,17

moving 172:13
221:18 261:21

MR.ABATE
165:9

multi- 46:6

multi-split
45:19 52:5,22
69:25 105:13
107:22 136:19,
22 137:4 164:1

multi-splits
49:23 61:1
107:1,9

multi-spread
70:5

multimodal
135:9

multiple 13:4
60:10,19,20,21
106:14,21
114:7 116:9
128:21 145:2
182:13 205:1

multiply
206:18

N

---

named 13:3

names 3:11
144:10

narrow 197:18
229:23 257:6

native 212:21
225:18

natural 109:25

naturally
254:25

NCM 153:17

nearby 175:4

necessarily
33:24 62:1 84:3
85:9 93:5,18
109:10 123:8
130:8 182:22

210:5 225:17
249:18 252:13

needed 28:23
81:7 119:5,8
160:2,4 172:15
202:7

neighborhood
109:16

neighborhood
s 109:5,11,13

neighboring
79:10 167:25
168:16

neutral 148:25

news 120:19

Newton 8:7
9:18

nice 41:12

Nicholas
144:10

Nick 144:14

noise 125:20

nominate
260:11

nomination
260:17,18
261:7

non-compact
84:16,18 85:1,4
143:12

non-
government
16:6

non-white
182:11

Norma 188:18,
19

normal 70:20

north 177:15
223:24

northern 115:8
175:5,15
176:23 177:21

northwest
223:2

northwestern
243:17 255:10

notable 80:19

note 77:19
165:7

notebook 5:2
222:16,18

noted 69:24
122:1

notes 206:3

notice 57:5
64:14 129:18
201:17 230:24
231:1 242:7

noticed 114:11

notwithstandi
ng 202:7

number 21:1
26:25 28:17,21
31:22 41:24
42:12 45:4,12,
22 46:9,10
47:3,7,10,19
48:5,21 49:6
52:9 56:13,15,
16 68:9,13 69:6
74:19 77:15
86:9,12,14
92:16 93:15
95:22 101:3,4
106:11,17
125:11 126:22
128:23 136:25
137:3 138:11
153:4 155:10
158:2 160:23
162:15,19,21
163:17 164:12
165:14,16,18,
21,22,24
167:23 168:14,
22 169:19
181:8,9,10
186:5 191:22
192:1 200:8,9,
23 201:13
202:6,10
203:18,23
204:15 205:1,5
206:9 222:20
224:24 232:10

234:8,17
242:23 243:8
244:20 256:6

numbered
99:18 134:5
179:5

numbers
56:10,12 94:21
106:9 146:19
165:18 168:6
200:21 208:12,
16,18 245:7
259:7

O

---

oath 92:2 195:4

object 8:13
103:6 164:24
200:12 205:13

objected
205:16

objection 4:13
11:6,8 33:1
36:3,4 62:22
129:12 131:11
149:4,19,21
165:7 167:13
170:20 175:18
191:5 195:14,
15,16 200:11
210:22,24
212:18 231:18
255:23,25

objections
128:4 170:19
204:1 239:11

objective
223:14 235:9

objectively
148:17

observation
89:8

observations
60:25 70:2
89:16

observe 63:13
148:1

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observed 52:8 63:12

observer 223:14

obtain 21:4,7 25:6,7,17 26:6 27:7 44:13

obtained 22:13 36:15 37:16 206:11

obtaining 29:4

occupation 8:8

occur 208:15

occurred 168:20

occurring 191:15

occurs 260:16, 17

off-street 262:10

off-year 210:9 211:9,20,21 215:2

offer 32:20 34:23 200:7,10 203:4,13,17 204:8 208:25 231:16 232:1 233:19 239:6

offered 123:13 196:7

offering 164:7

offers 146:11

office 112:7 113:7 158:19 159:9 186:4 210:14,17 211:20 238:20 261:6

offices 114:12 209:25 212:3

official 199:18, 25

offset 143:19

Ohio 23:21 223:2 257:18

older 57:9 93:9

Oldham 64:16, 24 66:6,11,18 121:10,13,14, 22 122:2

one-to-one 112:8,10

online 170:10

open 5:1 30:3, 10 134:14 187:7,9

openings 3:6

operational 191:13

operations 35:12 190:11

operative 198:11

opinion 21:12 22:1 47:2 51:12 59:22 60:24 67:6 89:14,24 111:10 112:20, 22 120:25 150:22 153:3 175:19 196:7 202:12,13 236:14,20 237:7

opinions 32:14 33:13 35:14,22, 25 49:14 50:8 61:3,4,6 70:23 102:24 103:3 111:14 154:3,6

opponent 227:8

opportunity 49:16 183:6

opposed 76:17 138:13 176:14 191:18

opposing 71:11,19

169:13

opposition 203:25

oral 4:2

orange 82:13

order 51:4 57:2 80:12 81:25 87:25 94:12 116:17

ordered 11:9 33:2 55:5 93:21 94:13 95:7 118:7 150:25

organization 13:1,2 17:11,14 18:6 31:6 158:21

organizational 16:7

organizations 158:3

organize 15:21

organized 5:25 10:18

original 44:15

other's 196:25

out-raised 259:2,16

outcome 104:15

outlier 26:14 48:16,17 73:10, 13,17 82:4 83:20 114:5 117:14,22,23 118:2 141:6

outliers 59:24, 25

outlying 171:16 178:7

output 20:17, 19 52:18 87:20 88:2

outskirts 171:18 176:17

overheating 125:20

opposition overlayed 171:8

overlaying 170:12

overly 222:11

overpopulated 172:14

override 119:6

overruled 50:12 150:1 167:18

overwhelming ly 179:8

Owensboro 50:19 51:20 52:7 255:7,22

P

P.M. 263:15

pack 30:5 71:10

package 29:13,19 30:12, 24 31:1 97:2, 21,24 98:1 99:1,2,3,6,11 101:5,9,13

packages 102:11,14

packing 69:12 71:9,10

packs 69:18

pages 12:23 17:6 31:19 98:16 101:18 232:16

paid 33:7

pair 186:24 188:2,6 208:16

paired 162:3 186:25 187:3,6, 15 188:9,14 198:18

pairing 160:25 188:17

panel 135:7

paper 6:1 125:3,5 130:14 131:6,18 132:7 138:3,19 144:21

papers 13:5 30:23 128:21 129:24 130:6

paragraph 104:23 105:15, 17 133:8 134:11 135:6 136:13,16

parallel 44:8

parameter 76:13,21,22

paramount 161:4 252:13

paramounts 181:6

parentheticall y 134:2

parents 188:7 226:13

Park 222:9,10

parked 262:3

parking 262:11

Parkway 226:10

part 15:17 28:14 29:22 42:11 47:11 64:16,23,24 65:25 66:5,6,10 67:4 71:17 74:5 76:24,25 77:4, 18,21,23 80:19, 22 89:6 97:2 98:22,23 99:2 111:17 122:16 141:19 142:4 144:8 154:22 174:19 175:12, 15 176:22,23 177:21,22

178:20,23
196:10 205:12
216:23 226:14
243:4 245:6,23,
25 246:12
248:9 255:5
257:12

participate
15:21

parties 4:11
158:4 253:3

partisan 21:19
39:10,17 42:16,
24 43:15 53:15
59:17 60:11
61:13 62:11
70:2,6 71:2
72:1,25 75:24
77:17 79:16
80:2,11,13 88:6
89:15 90:8
112:2,23
123:18 149:2,
11,13 221:22
222:2 224:7,9,
24 228:14
230:2 232:14
244:14 249:3,
10,21 250:21
253:17 258:12

partisans
220:17

partisanship
21:19 38:24
39:3,10,16,23,
25 40:4,7
42:14,22,24
62:6 73:4
112:24 115:21
146:24 152:17
221:20

partisanships
172:9

partnership
113:9 114:10
116:18

parts 42:19
43:9 53:20 62:4
71:5 97:2
166:7,16
171:18 174:2

party 22:17,19
33:19,20,24
34:6,12 40:3
59:17 71:11,19,
20 73:11,14,18
93:1,14 115:14
149:18 150:14,
24 155:22
157:21 158:21
184:16,17
185:5 189:9,12,
15 190:9,25
191:13 197:9
198:12,21,24
199:10,16,19,
22,24 202:14
204:23 205:11,
24 207:5 208:3,
13 209:2 210:3,
10 211:21,22
212:10 213:24
214:12 215:2,
21 216:8
218:19 219:5,7,
11,18 220:4,5,
18 225:21
228:22 234:20
235:11,17
236:15 238:6
244:7,8,11
246:25 249:11,
24 250:6,22
252:22 253:22
254:19 255:18
258:12 259:2,
13,15,16
260:11,21,24

party's 190:16
207:19 210:1
219:5 258:18

pass 119:8
153:9 194:17
196:24 201:25
202:1,2 208:25

passage 185:4

passed 193:9
196:4 202:11,
15,16 254:15
255:4,24

passing 202:5

past 18:13
23:16 39:15,19
40:7 55:13,23

56:20 64:6
116:24 117:1
151:3 152:17,
21 180:16
186:7 190:18
201:22 261:1

pattern 57:5
58:5,10,11,15,
16 60:3,7,11
63:13 65:1
66:13,20 67:6,8
69:9 73:3

patterns
55:16,17 67:1
113:2

Patti 172:19

peer 17:3,5

peer-review
131:4

peer-reviewed
129:24

Peewee
139:25 140:4

Pennington
185:18

Penwell
185:22

people 13:4
15:15 21:9,10
25:21 74:24
75:7,16 85:24
86:5,17,18,21
87:2,3 137:6
148:12 190:10
207:20 208:5
209:13 210:19
216:23 220:17
221:21 222:1
224:25 225:10
227:19,24
228:3,11,13,19

percent 41:19,
20 55:21,22
56:23,24 57:4,
5,12,15,17,18,
19 58:18 59:6,7
60:16 71:16
74:21,23,25
75:6,8,9 76:1
82:7 83:16

85:23 86:2,4,
10,17,21 88:24
89:10 93:22
94:15,20 95:4,
8,11,13 116:6,
16 117:10
118:15,18
148:11 152:21,
23 160:11,15,
20 161:9,10,11,
12,23 162:11
167:8 172:12
174:8,9,25
179:14 180:5
181:7 182:10
183:1,6 184:4,7
186:8 190:4
192:4 205:4
215:22 223:11,
12,13,15 224:6
232:22,23
233:2,3 234:24
249:8,9,10,12
250:13,15,17
253:20,22
259:14

percentage
43:14 57:8
224:23

perfect 9:11

perfectly
198:22

perform 136:8

performance
133:5 172:9
186:16

performing
106:20,23
172:11 177:3
178:2 179:7

period 215:23
218:20 228:17

Perry 162:6

person 51:14
75:14,21,22
76:2 86:21
148:1,7,17,19
160:10 208:22

perspective
191:13 193:15

249:14

persuaded
186:15

pertinent
113:24

Phd 12:5 13:8

Phillip 141:1

phone 190:13
208:12,16,18,
22

phonetic 16:7
17:5 23:4 29:14
32:12 41:5
42:10 47:6 48:3
53:10,21 56:2,
3,6 58:10,24
65:13 68:6 86:7
87:3 92:18
93:10,16,17
97:22 98:20
109:11 112:25
117:17 118:3,
13 135:20
136:19 141:1
142:24 147:8
155:18 178:18
217:11 250:12
259:4 261:20

pick 25:12,14
54:17 75:19

picked 52:15
86:12 106:2,6,7

picking 8:18
113:25

picture 198:5

piece 161:1
162:20 165:19
166:1

pieces 173:25
176:16 178:5
180:8,10 181:9

pinched 86:8

pink 65:6

place 142:4
209:3 225:15
262:3

places 65:1

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248:7

plaintiff 219:6, 10

plaintiff's 5:3 10:13 11:10 36:6 107:20 169:21 170:22 195:12,17 242:23 244:18 247:12 248:15 249:15 253:10

plaintiffs 7:4 9:25 33:5 142:7 157:6 230:17 251:8

plan 18:22 19:10,24 20:1, 2,3 21:21 22:9, 13,15,16,18,20 23:17,22 24:4, 8,19 25:8 26:20,21 27:1,6 29:1,2 35:11,12 38:18,25 39:11, 12 40:5,6,21 41:22 42:1,3,4, 7,19,20,25 44:10,20,22,24 45:7,8,10,11 46:18,19,20 47:2,9 48:6,10, 17,21 49:8,10 51:6 53:16 55:5 56:2,25 57:2 58:15,18,21,22 59:3,7,8,9,13 60:1,4,7 61:1, 23 62:6,7,12 64:6,7,13 65:15,19,24,25 66:5,16,19,25 67:3,23,24 68:17,18,19,24 69:2,4,5,15,17 70:10,21 71:5 72:4,6,7,8,9,10, 11,12,25 73:10, 13,17,21 74:22 75:13,19 76:20 77:16 79:1,17, 24,25 80:3 81:21,23 82:3, 8,11,18 83:7, 16,19 84:23,25

87:24 88:13,21, 23 89:1,2,4,5, 12,15,17 90:8 91:20 93:13,16 94:3 98:21 102:16 107:8 108:11 111:3, 23,24 118:20, 21 121:15 123:5,10 138:16 141:17 142:20,23 143:4,6,9 148:6 149:1 151:5,12 152:3 192:24 231:1 242:8,13, 17 243:9

plan-wide 143:2

plane 91:24

planned 260:6

plans 18:14 19:9,10 20:21 22:14,23 23:9, 14,20,22 24:5, 16,22 25:5,7, 19,20 26:7,18, 25 27:2,7,8 28:20 29:7 31:12 36:10 38:23 39:4,17 40:10 41:15 42:8,21,23 43:19,22 44:7, 13 45:6 46:23 48:8,14,19,22 50:22 51:4,6, 16,19 52:13,14, 15 58:16 59:20 61:2,25 62:2 65:10 70:8,9 72:5,13 77:14 78:1,10 79:23 81:22 82:6 83:13,17 87:6, 19,23 89:7,11 95:11,24 101:16 109:14 133:1 134:16 137:2 142:19, 21 146:12 147:5,17,18,25 148:13,24 149:8,10

152:10

plants 48:4

play 15:22

pleadings 170:14

plurality 182:19,21,24 183:14,16,17, 22,23 252:3

plurality-black 223:10

plus-10 190:5

point 10:22 14:22 26:12,13 30:6 54:15,16 57:4,8 76:21 78:9 90:11 93:11 94:4 106:19 114:7 121:11 142:12 143:7,15 148:9 177:25 214:24 216:4 226:7 239:7 242:4

pointed 146:19

pointing 150:9

pointless 78:9

points 92:12 104:24 133:23 135:1 158:7 216:3

polarized 186:20

policy 13:23 16:5 22:6 30:2 129:6

political 12:3, 5,11,12 13:22 15:5 17:12,13, 17 34:12 40:25 157:20,25 158:11,13 172:1 174:22 178:9 198:11 202:8 220:14 221:1,5,8 225:5 228:13 240:14, 16,21,24 261:8

262:25

politically 205:10

politics 12:19

Polsby-popper 82:21 83:10 142:25 143:25 144:5 145:8,17,21 146:4,10,18

polygon 163:18

pop 87:14

popular 29:15 72:22

popularity 151:25

population 19:1,4 21:11 24:9 25:19 26:7 27:23 36:12 37:15,23 40:1,2 41:18,20 65:12 74:21 75:5,15 81:25 85:17,19, 23,25 86:9 87:4,11,13 88:2 111:7 115:8 122:6,9,10 139:14 147:1,3, 6,11,18,22 148:8 160:16, 17 161:8,23 164:1 167:8,11 172:20 173:7 176:18 179:15 181:13 182:11, 20,21 183:2,4,5 184:5,6,7 188:8,15 200:21 213:5 218:4 221:20 223:6,7,8,13,20 224:7 232:13 237:23 244:5, 24 245:1,5,8,9, 11 246:4,7,13 251:23,24 252:1

populations 115:13 182:7

populous 206:5

portion 117:17 122:6,25 123:1 134:12 167:24 168:15 171:25 174:18 197:6

portions 178:7 206:5,20

position 14:14, 15 15:2,3,4,8 157:19 199:18, 25 200:1,3 205:9 210:2,4 219:5,6

positive 85:25

possibility 134:14

possibly 116:12

postponed 193:22

potential 87:9 186:13 207:22

potentially 186:10,15

power 220:1

powerful 87:16

practicable 148:17

practical 162:8

practice 27:3, 5,18 39:5 44:2, 18 114:16 133:17 225:10, 12

pray 125:21

pre-code 99:1

pre-mark 5:11

pre-marked 5:14,15

precedent 252:24

precinct 37:13, 24 38:12 55:18,

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19 65:15,16,19 86:6,19 121:24 176:9 238:7 251:21

precinct's 237:17

precinct-level 75:3,20,25 86:3 87:14 112:24 113:9,22

precincts 37:21 64:21 65:2 86:25 87:1,5 121:2 133:21 178:21 179:5,7,16 237:20,23 238:2,11,16,23 251:20

predated 164:14

predetermined 186:18

predict 39:7

predicting 118:6 151:16

prediction 113:11 116:10 151:13 152:19

predictions 112:21

predictors 112:16

prefer 7:18 25:21 155:8

preferences 113:12

preliminary 164:13 205:15

premier 13:1 17:15

premised 146:22

prep 98:22

preparation 196:3

prepare 164:4

prepared 4:1 10:23 164:17 170:16

preparing 159:12

prepping 98:18

prerogative 208:1

present 36:25 136:15 230:16

presented 18:10

presenting 35:4 136:16

presents 46:14

preserves 247:22

president 17:21,23,25

presidential 38:5 72:16 73:6 112:11,15 113:6 172:7 210:10 211:25 212:8

press 16:15 192:25

pretty 91:8 171:24 176:3, 21

prevailing 132:8

prevent 110:10

previous 24:7, 19 38:18,23 39:22 47:15 70:6 79:17,19, 20,24 80:3 88:19 141:19 159:11 188:23 209:7 253:11

previously 188:10

primarily 145:8

primary 193:25 252:15 260:13,18

prime 56:6 117:17

primes 106:17 118:2

Princeton 13:15 14:6,15, 20 16:14

Princeton's 14:2

principle 29:22 106:9 238:13 254:18

print 101:6 130:7

printed 4:7 101:8 102:2

printer 120:1

printout 231:12 232:5

prior 23:10 31:15 36:17 50:3 98:20 118:3 123:13, 15 149:20,24 153:25 166:14

prison 140:4

pro-republican 234:18,21

problematic 23:25 24:8

problems 12:11,19,21 13:24 15:17 16:11 135:20 137:25 210:7

procedural 194:7

procedure 50:2 164:25

proceeding

3:23 124:8

PROCEEDINGS 3:1

process 101:11 131:3,4 184:22 216:9 221:9

produce 35:13 85:18 149:1

produced 13:4 154:2 163:10, 13 191:25

productively 145:1

products 103:8

professionals 30:20

professor 8:9 9:20 13:17,18 14:17,18,19,22 15:4 102:22 127:11 139:5 262:25 263:1,8

program 14:2, 7,10,11 97:1,3 99:4 163:23 170:10 208:2,7, 8,10 209:3,16, 18

programming 29:15,16 96:21 101:13 241:5

programs 14:6 16:6,20 102:1 163:20

prohibitively 134:18

project 31:3,7, 8

promoted 13:18 14:18

prop 93:17,18

proper 164:25

properness 146:6

properties 87:9

proposal 159:13,18 193:3

proposals 31:25 32:24 133:20

proposed 18:22 137:23 192:24

proposition 202:8 220:25

protected 181:19

prove 124:4 133:20 134:4

provide 20:12 103:19 258:11 260:11,22

provided 5:2 166:14 170:14 261:6

providing 124:8

public 13:22 16:5 115:11 129:6 193:15 218:8 219:9,10 259:22

publication 124:24,25 125:10 130:1,7

publications 17:5 104:2,6

publicly 37:9

published 16:12,14 17:3 29:8 62:17 127:17,20,23 129:5 131:2

Pulaski 197:14,19,23 198:3 204:11 244:13

Purchase 161:25 189:6

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purchases 208:13

purely 175:19

purple 243:1,2, 15,16

purpose 26:8 42:18 43:3 145:3

purposes 36:17 76:5 77:10 78:2 153:17 228:14, 15

push 176:2

pushes 173:25 174:1

pushing 77:2 107:3 175:14

put 5:21 6:5 19:21,25 60:9 100:25 153:20, 22 156:23 157:2 193:16 202:19 235:11 240:5 256:15

puts 250:7

putting 159:6 178:6

puzzling 86:11

Q

qualifications 9:23 32:18

qualified 186:14

quality 111:7 113:16,19 211:25 212:4 235:15

quantifying 49:3

quantitative 15:11,13 16:16 240:10

quarter 259:25

question 12:16 19:20 22:24 38:4 40:22 50:1 55:12 61:19 65:10 75:1 93:25 94:1,24 98:11 103:7,12 105:23 130:10 134:24 137:13 139:20 149:5 150:2,10 151:4, 11 152:7 155:5 167:15 194:6 199:9,21 205:7 207:21 211:3, 18 213:1 219:4 227:10,11,14, 15,19

questions 12:11 18:10 90:19,21 91:3,5 92:4,6 102:18 106:5 153:16 156:18 167:16 194:6 196:1 205:18 227:13 261:15 263:5

quick 3:15 222:13 254:8

quickly 103:24 139:3

quoting 204:6

R

race 43:2,4 73:7 108:18 112:5,11 113:6, 7 114:5,8 115:22 140:12 181:2 187:25 212:5 252:11, 17,18,19,24 253:4

races 38:2 73:1,2,8 112:3, 5,7,12,13,15, 16,17,21 113:1, 7,20,25 114:4, 8,9,17 116:6,7 182:13 186:5,9, 10 190:16

192:7 213:25

racial 41:6 42:14 43:5 77:23 182:5 244:5 252:15

racist 213:10, 15

raise 7:8 157:8

ran 97:14 114:18 140:20 240:8 258:10

random 25:7 53:7 208:4,7

randomly 25:12,14,24

range 58:20 59:25 60:2 70:21 73:1,21 77:7 143:5

ranges 46:25 48:11

ranking 202:4

ratio 21:20

Ray 261:20

Raymond 187:3

re-argue 205:14

reach 33:13 41:14

reached 4:2 34:4 41:22 111:6 252:23

reaction 76:18

read 22:21 108:3 131:22 132:23 133:24 134:12,19,23, 25 135:25 137:25 144:19 191:8 202:23 204:5 206:25 236:3

reading 121:10 261:13

reads 135:22

ready 7:1 101:11 157:4,5

real 74:24 96:12 137:24 251:19 254:8

realignment 210:5

realistic 76:22 131:24

reason 21:10 29:24 38:13 44:15 79:18 93:6 107:7 116:4,21 138:9 238:25 245:6 258:9

reasonable 111:2 223:14

reasons 191:11 197:3 238:15

rebuttal 69:24 70:9,16 72:3 76:12 85:15

recall 92:16 161:13 183:15, 21 184:10 193:5 245:14 252:4 263:10

recalling 184:2

receive 5:25 33:12

received 12:4 13:6,8,13 14:20 96:14 102:25 103:21 193:5

receives 208:20

recently 124:2 229:5

recognition 12:23

recognize 231:14

recommend 78:15

record 3:21 8:4 91:25 92:1 107:15 120:20, 22 126:11 157:16 165:7 195:2 201:11, 17 203:6,15 204:9 211:10 234:15 263:3,4, 13

record's 213:7

recording 125:22

records 259:22

recreate 102:5

recreated 87:19

recruit 186:19 188:22 193:20 207:8 208:1 210:3 219:18 220:8

recruited 14:24 185:13, 18,20,23,25 209:13

recruiting 220:23

recruitment 158:6 184:18, 25 185:5 186:11 207:5,9, 10,14,19 210:9, 13,16

recruits 186:13 209:17

red 46:18 56:1, 21 57:6 83:7 117:16 118:13, 18 125:15 126:15,17,18 142:19 143:18

redirect 153:14 263:7

Redis 29:14,19 30:12 96:18,22 97:24,25 98:1 101:7

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redistrict
238:11

redistricters
111:2

redistricting
16:11 18:8,10,
14 19:9,10
21:17 22:23
23:9,14 24:22
27:18,19 29:7
30:20 31:3,12,
24 32:23 33:20
38:25 40:10
61:12 102:16
104:9 110:23,
25 111:5,8,11,
15 124:2,18
133:1 137:24
138:14,16
148:25 159:11,
13 163:16
170:10 172:4
191:25 198:13
199:19 217:6
218:3,25 220:2,
6 221:9 230:20,
23 231:13
232:6 235:9
239:3,19 241:2

redlining
225:8,9 226:3

reduce 42:12
44:19,21 47:5
106:12,18,21
224:8

reduced 86:8

reduces 69:19

reducing
107:18

reelection
187:10,22

refer 62:20
134:8 195:8

reference 10:6
14:1 15:10
43:16 56:9 81:6
135:10

references
45:18

referencing
197:16

referred 161:9

referring 125:6
176:13

reflect 10:25
46:6

reflected
35:23 54:1
59:15 63:19
83:2 88:15

reflects 35:14
47:25 61:7

regard 70:23
85:21 88:14
89:14 216:8

region 161:25
162:6 189:7,10
254:25 255:10

regions
189:15,19

registered
33:15 208:11
220:19

registration
55:10,15

regular 196:3
220:6 260:19

rejected 205:8
206:8,11,24

relate 104:2,4

related 61:5
82:24 84:12,19
89:19

relates 232:19
244:10

relating 77:9

relationship
224:17

relationships
158:3

relative 20:14
40:6 48:3 59:13
118:12 133:5
147:8 251:24

relaxed 85:16

release
154:14,15
219:15

released
192:13 216:17
217:8

relevant 5:3
16:8 118:16
133:1

reliable 135:2

relocated
188:19 229:25

rely 72:19
73:24 114:8
236:9

relying 73:4

remain 206:6

remainder
78:13

remains 57:14

remember 3:3
70:12 118:22
119:4,7,11
124:11,15
137:8 193:9
196:22 200:22,
23 201:3,9
217:18,21
235:8 248:13
249:4

remind 165:15

reminds
252:10 256:3

remove 53:3

removed 52:4,
12,25 115:10

rendering
133:22 150:22

Reock 82:23
144:1,7 145:8

repealed 229:5

repeat 25:16
72:17 183:20
221:24

replacement
260:12

report 27:11
32:14 35:13,20,
21,23 36:2
45:18 46:5
47:22 48:24
49:18,22 50:4
51:2 54:1,3
63:19 67:16
70:9,17 72:3
76:12 83:2
85:15,25 86:7,
20 87:20 88:15
95:17 102:22,
23 103:1
104:11,22
105:9 111:20
115:24 121:4
141:13 142:17
153:23

REPORTER
9:12

reports 49:20
69:24 96:14
154:2 259:21

repository
30:16

represent
92:11 195:25

representation
110:13 172:24
174:13 179:13
181:14,21

representative
19:9 20:21
21:4,11 22:13
25:8,19 26:6,18
56:11 80:6,9
90:1 134:19
172:19 173:21
174:11 175:10
183:7 185:3
187:5,6,20,23
188:8 189:6
202:24 203:21
237:2,3

representative
ness 23:4 25:5

representative
s 40:12 80:6

90:5 173:2
174:15 187:2
188:17 189:16

represented
49:25 90:1
176:1 227:1

representing
34:5 124:1
205:24

represents
172:18 173:19
189:12 227:5

reproduce
29:25

Republic
235:3

Republican
33:19 34:1,5,6
55:22 56:23
57:20 59:3,17
63:15 64:10
65:3,4 66:8,9,
17 67:4,10
68:7,9,13 69:6,
10 73:10,14,18
80:6 89:22
92:25 93:1,24
94:12 95:5
114:12 115:14
118:8 121:2
122:24 123:1
149:18 150:3,
14,24 151:2,6,
10,17,19 152:3
153:4 172:13
173:2 174:9,14
177:3,4 178:2,
12,15 180:17
190:4,5 202:4
214:22 215:2
225:2,21 227:7
232:23 233:4
235:10 244:21
248:17 249:5,8
250:12 253:19,
20 259:2,16

Republican-
58:6 66:20
68:10

Republican-
leading 89:21

Republican-lean 116:1

Republican-leaning 57:16 59:12,18 63:16 64:19 65:8 66:1,5,12,24 67:11 68:15 69:1,8,11,21 89:6

Republicans 63:15 66:4 71:24 92:14 118:11,25 123:7 150:19 153:1 188:2 190:21 196:22 215:1 220:19 221:3,17,19 235:3,13 249:12

requested 193:3

requesting 34:12

require 39:14 45:4 75:10,22 206:9

required 200:19 201:1, 12,13 252:24

requirement 82:4 148:3 160:10 198:16 206:12

requirements 160:4,22

requires 24:15 108:1 138:15 148:16 198:9 200:3,4 253:4

rerun 87:6

research 15:24 16:1,2 31:13 76:25 104:8 132:18, 22 145:1 159:9 163:10,12 203:21

researcher 12:24

researchers 23:2,15 29:24 30:24 36:24 37:9,22 38:14 62:11,18

resembles 175:1

reserve 91:4

resident 225:18

resides 188:14

resources 189:21 190:18

respect 26:10 37:15 44:24 70:2 89:16 146:2 225:7 230:14,15

respecting 198:15

respective 196:24

respond 50:7

response 3:19 134:11

responsibilities 196:11 207:4

responsible 207:4

rest 78:22 176:17 178:24 225:1

restrictions 28:15

result 65:4 73:25 174:5 188:21 235:12

resulted 235:18

resulting 25:18 26:18 27:1,2,7 39:23 135:8 176:25

results 29:25 38:2 39:7,22 40:3 56:20 73:9,13,17 75:23 80:1 87:13 103:14, 15 113:22 114:15 116:25 118:22,24 135:2 136:16, 17 137:22 172:5 181:25 186:18

retained 9:24 33:4 35:8 49:13 123:24

retention 110:16

return 86:19 91:12,20

returned 158:21

returns 38:21, 22 113:25

review 17:5 49:16 131:3

reviewed 17:3 102:22,23 103:1 163:2

reviewing 166:24

revised 260:10 261:11

rich 261:22

Richmond 179:21,22,23 180:6,10,19,20 185:21 253:10, 13

right-hand 232:11

Rights 43:17, 18 181:12,17, 20 253:4

river 146:3 174:19 223:2, 21,24 224:16 257:18

rivers 109:25 146:1

ROBINSON 137:9

Rockcastle 197:18,23 198:2,3 204:11 244:14

role 15:19 22:5 29:5 158:17 159:2,24 184:17

roles 15:23 158:2

rolling 185:10

roughly 101:17,18 160:19 222:8 226:25

row 215:18

rule 204:24 206:17 238:10

ruled 196:5

rules 24:8,14, 15,17,18 27:24 28:22 40:25 42:22 146:15

run 29:12 36:24 87:17 99:12 100:18,19 101:23 107:12, 14 137:21 186:15,18 187:17 189:18, 23 190:16 208:5 241:23 260:5,6

running 108:7, 15 185:3,17 186:4 187:24 209:25 229:15 254:1

runs 257:21,22

rural 63:16 64:9,18,22 65:3 66:2,22 67:10 69:10 220:21 221:4

S

safe 57:17,20 59:3 192:11

safer 58:7 59:13,18 60:4 121:3

sample 21:5,7, 9,11,13 25:7 26:5,6 29:4 51:13 131:25 132:12,18 133:15 134:13, 18,19 135:10, 13,23 137:21

samples 132:24 133:3 135:11

sampling 20:23 28:19 131:23

satisfied 20:6 260:24

satisfy 19:24 106:18 108:12 147:6,18 161:8

Saturday 193:12

saves 238:17

SB 254:11,13, 20

scalability 133:19

scale 131:23

scholar 144:18

scholars 17:16 18:3 144:23

school 144:15 226:15

schools 108:24 109:16 207:22

Schwartzberg 145:14

science 12:4, 6,10,13,17

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13:22 14:5,13
15:5,11,14,16,
17 16:9,16,20
17:17 32:22
36:23 37:3,5
158:12 221:1,5
240:11,14,16,
24 263:1

sciences
11:20 14:8

scientific 30:1

scope 50:4,8

score 82:22
83:10 142:19
172:5 242:8,13,
17

scores 229:19
245:19

scoring 98:20

Scott 68:7,10,
25 122:24,25

screenshot
192:19 232:6

Sean 49:17

seat 149:1,9
150:18 195:3
215:10

seated 6:9
157:12

seats 59:4
109:19 118:25
121:2 150:19
153:5 214:2,17,
22 215:2,12,13
235:2

secondary
252:14

seconds
201:24

secretary 4:9
38:8 140:20
260:14 261:6

section 107:23
137:17 160:12,
25 161:3
181:11,20
191:2,8 198:8

200:3 202:7
235:1,23
236:12,14
243:15,16
252:16 257:6

seek 80:24
187:10,22

select 147:20

selected 114:3
132:1 144:24

selecting
113:1,20

self-segregate
228:13

senate 38:5
73:7 112:11,15
113:6 142:11
148:6 172:7
196:23 202:3

send 208:4,19

sending
190:13

sense 18:18
45:11 48:16
66:8 72:10
84:11 99:5
117:5 151:14
202:2 210:18

sentence
132:23 135:22
136:10 137:16

separate 61:2,
4,5 89:17,18
135:1 194:16

separated
177:22

separately
29:3

September
217:20,23

Sequential
25:21 27:14
28:10,24 74:8
108:13

sequentially
28:25

serve 26:8

served 17:21
31:17 32:10
187:23

services 33:7,
10 34:13

serving 31:16

session 193:7,
10 196:3
218:10 219:8
220:1,5,7

set 18:24 19:1,
2,6,9 20:4,22,
25 21:5,6 22:20
24:14 26:25
40:25 41:2,15,
18,23 44:14
50:21 67:21
70:14,19 79:22
82:3,5 86:13,16
87:3 97:25
101:13 105:11,
12 106:1
108:14 111:4
134:16 136:7
147:16,18
222:15 242:4

sets 37:25 53:9
96:2 101:10
186:24 187:1

setting 28:4
98:19

settled 107:15

setup 119:12
136:7

shaded 122:25

shame 241:20

shape 81:24
83:21 229:10
240:5 241:20

Shapefile
163:14,15

Shapefiles
163:11 170:9
193:3,6 196:11
239:25

shapes 163:18

share 55:5,12,
13,22,23 56:22
57:2,3 58:24
64:5 69:19
88:11,23,25
89:11 92:13
94:2,14,17,20,
25 95:8,9,14
112:3 115:1,18
116:5,9 118:3,6
149:1,9 150:17,
18,19 151:3
152:10,18
208:24 221:14

shared 102:24
103:14 193:1

sharp 145:22

Shawnee
222:9,10

SHDMS 98:15

shed 122:10

sheet 165:1
249:3 250:10
253:18

sheets 165:4

Shelby 64:25
66:18 122:8,16
140:5 201:1

shift 58:23
184:14

shifted 172:16

shifts 191:14

Shively 222:8,
15 258:11

short 124:14

shorter 91:18

show 47:24
59:11,12 73:20
103:14 117:7
164:8 169:10,
18 171:5 197:6
201:11 213:7
231:7 255:3

showed 44:24
67:22 143:10
172:10

showing 49:3
123:4,7,8 166:8

shown 47:21
54:6 67:15,20
83:9 89:8 200:7
218:8

shows 46:16
47:4 49:9 51:25
57:12 58:17
59:4,9,16 64:3
67:7,8 73:9
83:5,6 84:20
85:2,12 88:18,
25 135:7

shut 183:19

sic 75:6 123:13

sick 227:4

side 33:19,20,
21,23 34:1,6,7,
22,23 80:20
123:24 177:17
232:9,11 233:8
243:23

side-by-side
170:1

side-by-sides
169:12

signature
58:5,12 62:15
164:20

signed 196:4
202:3 254:15

significance
105:20

significant
48:13 52:23
89:9 175:17,22

significantly
174:25 177:3,4
178:2 186:16
187:11 189:2
218:8,9

similar 21:8
26:21 32:3 48:1
51:10 67:12
143:9 162:4
174:3

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similarly 5:19 68:11 69:1 187:5 188:15

simply 221:10 236:3

simulate 78:12 98:14,15 117:18 147:17

simulated 19:24 20:3,23 22:13,18,19 25:18 27:2 28:19 29:2 39:4,11 40:6 42:8 43:19,22 44:6,10,13 45:6,10,11 46:22 48:4,8, 14,18,22 49:10 50:21 51:4 52:13,14 58:10, 15,16,18,21,22 59:8,13,20 60:1,4,7 61:2, 25 62:7 65:10, 15,19,24 66:16, 25 67:3 68:17, 18 69:4,15 70:8,10,19 72:5,6,7,11,12 73:21 74:22 77:14 78:1,10 81:22,23 82:3, 6,8,17 83:13,17 84:23 88:1 89:1,2,7 93:12, 16 94:3,14 95:11,24 98:21 101:16 109:14 111:23 117:17 118:21 123:5, 10 137:2 142:20,21 143:9 147:5,17 152:4,10

simulates 20:1

simulation 18:12,18,21,23 19:13 20:17,18 21:15,17,23,24 22:1,22 23:1,7, 10,13 24:12 31:11 32:4,5,6,

22 35:12 36:12 38:15 41:12,16 42:15 51:4 52:21 53:2 59:11 67:24 75:17 77:21,22 78:16 79:21 81:19 84:20,21 85:2,11,17 94:19 97:13,15 98:13,20 101:11 104:7,9 111:16 118:22 139:19 143:5 146:8,11,17 148:24 150:13 151:1 152:24

simulations 44:14 96:7,11 104:25 110:18 147:10 149:17 150:23 151:9

simulator 42:1,4

single 19:23 21:2 51:3 72:19,20 93:10 107:15 110:18 211:2 248:6

singled 171:2

sir 157:5 183:20 197:15 211:17 212:6 225:6 227:19 237:19 249:16 256:24

sit 7:19 245:4 249:20

sitting 195:7

situation 27:24 28:12 34:19

size 63:20 86:19 87:1 160:17

skip 194:16

slate 74:11,13

slightly 65:21, 23 91:18

slow 134:18

small 28:21 86:6 106:17 162:12 176:9 178:21 194:11, 14 221:4

smaller 83:12 148:19 206:19 222:12

smallest 37:20

SMC 25:21 26:4 29:1,10 74:8 96:23 130:3,11,12 132:25 135:10 137:1,19 138:11,12,14 144:6

smoothly 58:23

snake-looking 76:9

snakes 84:17

social 11:19 12:10,19 13:24 14:8 15:11,13, 17 16:9,11,16, 19 193:1

societal 12:21

society 17:10, 12,13,15,19,20, 22,24 18:1,2

socioeconomics 228:6

sociology 12:19

soft 20:4,12 137:5

software 29:12,13,17,19 30:9,12,16,18 87:7 96:18 101:5 196:16 199:6

solid 64:12

solidly 180:16

something's 125:13

sooner 218:12, 22

sort 6:20 8:20 21:21 23:14 26:22 28:15,22, 25 33:19 37:8 40:22 41:23 44:11 55:8 57:6 58:11 64:15,17 67:21 68:2,5 80:11 98:22 124:14 138:17 161:7 181:8 197:19,23 205:7 213:19 216:9 220:21, 22 221:8 223:20 224:8 230:16 232:7 235:9 243:14 255:21 258:3 261:8

Sounds 155:23

source 30:3,9, 10 37:3,7,8 236:10,11

south 175:12 224:2 243:24

southeastern 162:5 188:16

southern 177:22

space 133:1, 19,23

speak 8:20 9:6

Speaker 197:8 201:4 202:4 204:6

spec 198:1 204:10 244:13

special 214:19 220:1,5

specialize 18:12

specific 51:6 61:19,23 106:9

117:7 124:23 132:6,12 133:15 136:9 138:19 143:3 145:3 169:6 180:23 185:15

specifically 104:8 114:3 115:21 136:14 139:4 186:23 188:8 236:23 252:25

speculation 175:19

spike 177:20 250:7

spills 64:17 68:6

spirit 202:1

spits 29:1

split 25:12,14, 15,16 28:8,19, 25 40:16 41:25 42:2 45:5,6,9, 13,16,21,22,23, 24,25 46:2,4,12 47:14 50:19 51:9,18,24 52:15,20 82:9 105:11 136:14 137:4 160:23 161:14,15 162:2,3,14 165:16,23 166:17,23,25 167:4,5 175:15 177:14,21 178:4 186:12 188:11,13 200:22 201:14 204:24 205:1,5 206:18 224:7, 24 237:24 238:10,16 247:13 251:20 255:20 256:19 257:17

splits 28:16 45:4 46:7,13 47:2 48:21 49:8,11 50:18 52:9,17 53:1

77:10 107:18
111:18 162:7
164:1 165:18,
24 167:10
173:24 174:17
176:21 179:2
180:8 181:8
200:19 238:3,6,
22 247:16

splitting 46:21
237:20

sponsored
234:20 250:6

spot 58:17

spread 77:16,
20 82:11 137:1
148:12

spreading
26:23

spreads
106:11

spring 217:12

staff 163:12
240:3

stand 6:6
138:2 154:17
189:24

standard
33:10 44:12,18
62:10 82:22
85:16 112:24
114:16 144:24
145:9 161:9
253:12

staple 233:23

Staples 120:1

start 11:13
18:8,19 25:11
26:2,3,4 74:12,
13 101:11,19
107:4 116:7
138:13 156:8
163:6 165:13
171:3 181:1
214:23 251:1

started 13:15
14:16 23:2
148:21 155:15

193:10 209:5

starting 26:2,
12,13,19

starts 25:22
26:11 74:10
100:20

state 8:3 22:4
24:5,7 25:22
26:4 27:20
38:8,21 39:2
40:11,25 41:10
43:9 49:7 56:11
62:4 68:1 78:23
80:21 108:3
109:22 112:12,
16 114:4,12
133:23 135:5
137:20 138:6,9,
24 139:1
140:20 146:1,
20 153:18
157:15 172:19
180:15 181:18
185:3,10 186:4
187:2 188:22
189:2,15
191:15 192:7
207:15 211:8,
23 212:3,9
214:12 215:10
216:19,22,24
219:25 224:16
225:1 226:14
238:11 246:12
248:10 251:2
260:15

State's 4:10
261:6

stated 70:17

statement 4:1
132:5 133:3,4
136:1,11
138:20 144:22
205:25 206:14

statements
131:17 134:3
138:2,17

states 18:4
24:6,18 27:20,
23 31:12 33:16
75:12,13 76:24
116:24 217:7

statewide
36:19 38:6,11,
14 39:1 53:23
73:7 112:3,4,
12,13 113:21
116:5 190:16,
20 224:23

station 139:25
258:3

statistical
12:12 29:16
39:14 59:24
70:15 78:4
89:13 96:21
105:22 235:16

statistically
48:12 52:23
89:9

statistician
60:8 139:11
231:5 234:13

statisticians
229:21

statistics 8:10
12:3,4,5,9,10
13:20 14:2
15:6,15 16:19
17:16 125:5,9
127:18 129:6
240:10

status 37:7

statute 261:11

statute's
260:23

statutes
260:11

stayed 263:1

staying 175:4

step 81:13,15
112:1 125:25
187:22

**Stephanopoul
os** 144:11

Stephen 49:18

steps 187:17

sticker 164:14
202:20

stipulate
114:23

stipulated
4:10 100:4,12,
14 114:21
222:18

stipulation 4:2
5:6

stipulations
4:19 254:10

stop 126:9
160:15

stopped
126:21

straight 146:3

straighter
67:18

strategic
199:8

strategist
158:4

strategy 67:9

street 179:5,6,
16 262:3

strength 59:21

strengths
108:10

strict 148:1
152:14 261:13

strike 181:1
198:15

strip 197:14,19
244:13

strips 229:15

strong 35:3
64:18 65:2
106:16

stronghold
71:18

struggle 132:2
133:18

stuck 108:9

students
13:22,23 15:22

16:17,18 31:10

studies 11:14,
15,21 15:15

study 11:17,24
12:3,8 16:11
17:16,17 30:20
137:22

studying 16:4,
19 23:1 138:8

stuff 5:14,15
98:25 259:22

stuffing 190:12

Stumbo 197:8
201:4,12 202:4
204:6

subject 12:1
32:7 180:25

subjects
11:17,19 13:25

submit 201:21
204:14

subsequently
12:5

subset 82:7

subsets
182:18

substantial
259:5

substantially
137:23 259:16

substantive
12:21

suburban
221:4

suburbs
220:21

success
209:10 220:23

successful
131:21,22
209:16,17

suffers 132:15

sufficient 78:5
193:13

suggest 137:22 149:17 150:23 234:17

suggested 77:8

suggesting 206:16 218:18 226:3 227:23

suggestion 69:25

suggests 52:24 85:15 116:15 215:5 223:14 225:1

suit 142:7,8

suited 40:21

summarizes 134:25

summary 120:25

Sunday 103:18

super 190:22 214:8 259:13

support 35:3 113:17 189:18 190:6 206:1 255:5

supported 149:3 237:6

supporter 212:24

supporters 71:11,19,20 212:24 213:2

supporting 236:21

suppose 149:13

Supreme 196:5 202:25 203:15,22 204:20 205:7, 25 206:17,23 236:1 252:24

surrounding 64:4 68:5 69:20

79:5,6 84:9

survey 20:23 21:13 51:10

surveys 21:8

Suzanne 185:25

swear 7:9 157:8

sweat 189:22

swing 118:14 151:24

swings 118:9

switch 141:10 180:24

switched 141:16,23

system 125:14

systematic 53:4

systematically 118:20 134:15

T

tab 169:13,14 195:9 222:20 229:1 242:12 243:7,15 245:22 254:12, 14 255:2 256:5, 10,25

table 254:11

tabs 254:10,12

tacking 180:10

tail 135:12,13 173:16 175:11 258:2

takes 64:15 68:5,11 130:6

taking 94:17 115:19 167:23 171:24 176:22 180:9 190:2

talk 19:14 63:6 91:7,15 95:17

104:10 124:21 125:25 126:10 131:17 139:4, 13 141:10 147:22 154:21 163:5 171:6 175:4 180:24 199:4 236:23 263:12

talked 110:19 139:13 140:13 149:15 162:14 168:22 184:8 200:18 242:21 254:6

talking 95:5 105:7 117:3 124:23 126:21, 23 132:3 136:24 144:25 145:11 158:7 225:9 261:21

talks 165:14

Tam 134:9

tape 201:21 202:18

target 85:24 132:1,13 133:15 135:8, 24

targeting 13:21

task 153:20

taupe-y 197:20

teach 13:19,20, 25

teachers 115:2,4

teaching 13:15 16:21

Team 36:23 37:3,5

technique 43:23 44:9,11, 12

techniques 26:9 108:14 241:2

telling 9:4 11:13

tells 48:3 62:4 106:15 230:24 262:8

ten 14:4 23:1 105:12,14

ten-minute 194:24

tend 57:16 59:2 65:22 66:2,7,15 116:19,25 220:17 221:2,3

tended 221:15

tendencies 53:10

tendency 51:17 64:19 116:23

tender 4:5

tendering 4:25

tendrils 243:14

tentacles 243:13

tenure 14:15, 16,20 159:8

tenured 14:18, 19 15:3,8

term 45:20 62:14,16,17

terminates 257:7

terminology 45:1

terms 41:13 43:5 58:23 62:5 74:24 83:20 137:21 178:9 183:10,14 184:1 187:24 244:5

terrible 114:18

test 9:7 22:11 139:9,12 229:22

tested 209:7

testified 167:22 252:10

testify 18:8 50:3

testifying 165:2

testimony 7:9 10:6 62:14 92:12 102:20 123:14 149:20, 24 157:9 161:16 196:2 207:3 216:15 227:9 236:16 242:21 258:22

text 190:13 208:4,19,20 235:1,22,24 236:1,3

textbook 16:16,17,22

texts 208:11,14

thankfully 211:4

that'll 195:13 242:13 255:3

theoretical 77:3 87:9

theory 27:17 133:14

thin 44:16

thing 24:6,11 27:18 51:1 56:9 57:4 64:13 72:9,13 106:20 149:14 168:15 204:8 216:11 220:21 241:22 252:17 258:3 261:9

things 5:11,25 10:18 24:9 27:16 29:21 47:5 54:15 110:19 111:1,6, 8 136:7 140:13 146:16 158:8

163:17,25
232:10 251:3
254:7 260:20

thinking 47:14,
17 150:18
261:23

thinning 44:9,
21

thought 3:5,6
76:16 90:22
154:25 198:21
246:25 247:2

thousand 87:2

threatened
115:7

three- 234:1

three-page
233:25

three-year
215:23

threshold
87:11,14 117:9
147:7

thugs 115:5

ticket 190:19
212:2

tied 178:22

tight 87:10,13

time 3:2 6:22
8:13 25:23 29:2
34:6 74:14
91:24 111:2
122:8 130:7
132:8 137:21
138:12 141:7
155:10 158:23
159:3 162:21
166:1 192:18
193:2,13
196:10,12,19
199:19 211:3
214:11 226:13
238:18 254:1
255:24 262:1
263:7

times 25:17
30:17 52:17,18
137:19 162:15,

21,24 165:14,
16,19 166:17,
22,25 167:3,6,
24 168:2,3,14,
18,20,22,24
169:1,2,4 171:8
191:9 205:1

timing 193:19
216:14 219:15,
17

today 3:20
7:10 18:7 30:22
45:1 89:24
102:19,24
104:3,5 155:9,
17 156:3 157:9
194:25 196:2
219:10 245:4
249:20

Tokyo 11:16

told 41:16
106:1 107:20
108:16 111:1
119:15 141:20,
21 165:22
201:5,12 245:5
249:3

tolerance
87:3,4

toll 115:8

tomorrow
155:10,11
263:13

ton 154:1

tonight 91:21

top 142:13
162:7 170:12
212:2 222:25
232:9 256:25

topic 128:22

topics 12:14
141:10

total 41:17
43:21 45:22
48:20 74:19
136:25 162:15
165:16,24
167:10

tour 91:23
263:1

towns 221:4

Trace 91:23
154:17

track 13:2
14:15,16 30:11,
13,15

tradeoff 84:4,
12,19

traditional
23:13,15
110:23,24
111:5,8,10,15

traditionally
190:3 218:25

training 10:25
236:9 237:7
240:9,13

transition
133:22

transparency
30:1 79:21

transparent
41:13

transportation
109:22

travels 80:20

traverse
133:18

treasurer 38:8

treat 171:21
173:13 175:13
176:20 177:12,
18 179:22
186:22

treated 169:7
173:3 174:16
175:8 176:7
177:5 178:3,18
179:10,16
180:18

trend 215:7,19,
20,21

Trende 49:17
70:12,17 72:2

73:19 77:8

Trende's
70:22 76:12
102:23 103:22

Trey 155:19
157:6,17

tri-county
257:8

trial 6:20
263:15

Triangle 228:9

Trigg 162:1

trouble 54:21

true 92:13
116:22 133:3,4
134:16 136:6
143:20 150:13
162:5 213:3
249:17

Trump 212:23,
24 213:2

truth 7:11
136:5 157:10

turn 3:2 105:8
133:7 134:5,22
137:1,13
177:10 178:16
237:10

turned 34:11,
15

turning 190:4

turnout 113:17

Twitter 192:19

type 18:9,15
19:21 27:3
28:17 29:9,11
32:2 39:14
40:8,12,20 43:7
58:5 74:6
116:24 138:15
153:17,19,24
154:4

types 19:20
24:23,25 25:9
27:13 28:5 29:6
138:10,22

typical 58:20
59:25 60:1
103:11

typically 26:18
38:14 40:8
43:10 66:9 77:5
79:16 174:7
217:10,12
225:19

U

Uh-huh 9:21
13:12 93:4
97:16 98:7
105:25 127:8
137:18 155:23

Uh-uh 119:19

**un-
compactness**
143:19

unable 138:14

unappealing
212:9

uncertainty
185:9,11
193:22 194:1

**unconstitution
al** 196:5 198:19,
25 199:11,23
201:6

**undergraduat
e** 11:14,15
13:21 16:17
31:10 240:23

underlies 30:5

underlying
103:20

underneath
160:24 243:21,
22

understand
21:12 60:18
90:22 92:11
95:18 105:23
122:5,8 161:2
190:24 203:16
217:5 237:24

238:15 250:25 253:2 256:9 258:4,7

understanding 23:6 94:1 98:11 100:16 107:25 257:19

understands 45:2

understood 52:4 62:20 167:19

uniform 118:14

unions 207:21

unique 40:25

unit 37:20

United 18:4 31:12 33:16 217:7

universe 96:4

universities 14:5 16:21 37:1

University 8:11 11:16 13:16 14:23 16:15 37:1 158:12,14

unlike 28:24 30:8

unnecessarily 47:2

unnecessary 71:16

unopposed 260:13,17

unpack 181:15 192:21

unrepresentative 250:12

unusual 58:14 65:11 78:24

unveiled 102:19 192:24

UofI 262:25

up-to-date 10:23

upholding 206:12

upload 239:19

uploaded 240:1,8 241:7

uploading 170:9

upper 135:7

urban 49:24,25 52:9 63:14 64:15,20,21 65:2 66:12,14, 21 67:9 68:2 69:9 221:2,11, 16 224:15

V

vacancies 260:25

vacancy 260:16,22

valid 134:16

validation 135:19

Valley 139:25 140:4 258:3

valued 255:13

values 77:1 107:14,16 135:13

variants 161:8 164:1

variety 11:19 14:8,12 15:22 23:8 151:25

vast 118:2 146:21 148:23 149:8 152:3

verbiage 160:24 191:2

versa 84:15

versus 55:22 84:5 116:1

147:1 245:20

VEST 36:22 37:4

vet 184:25

veto 119:6

vetted 218:14

Vic 62:25 202:18

vice 84:14

Victor 195:23

video 49:9

view 48:13 53:20 199:12, 17 244:18

violence 137:7

visited 198:7

visual 117:25

visually 166:19,25

voice 189:2

Voir 6:21

volunteer 189:25 190:5

volunteers 190:8,15

Voss 49:18 50:12,13,16,23 51:2 52:11 53:14 70:12 85:22 103:22

Voss' 49:22 85:15,21 102:22

vote 33:16 39:19 55:5,12, 13,22,23 56:22 57:2,3 58:23 69:19 88:11,25 89:11 92:13 94:2,14,17,19, 25 95:8,9 112:3 114:25 115:17 116:5,9 118:3,6 150:17 151:3 152:10,18

160:10 199:4 220:18 223:15 224:23 233:2

voted 152:21 196:8 227:2

voter 64:5 65:3 95:14 113:12 208:12

voters 21:9,12 39:8,18 43:2 51:12,13 63:14, 15 64:16 65:7, 22,24 66:2,10, 11,12,15,17,21, 24 67:2,9,10 68:8,10,12,13, 16,18,22 69:1, 2,6,7,9,10,12, 15,18 71:11 123:1 152:21, 23 204:12

votes 71:15,16, 23,24 88:23 95:6 113:5,6 119:5,8 140:15, 18 141:6,7 191:16 192:10

voting 36:22 37:2,4 39:7 43:17,18 55:15, 17 113:2,10,11 179:14 181:12, 17,20 182:11, 20,21 183:1,5 184:4,7 223:7, 8,13 232:13 244:5 251:24 253:4

VRA 43:11,16

W

wait 126:8,9,10 256:6

walk 55:1 67:19 161:7 164:22 171:1 182:3

walked 102:8

walking

180:22

wall 192:20

Walnut 179:5, 6,16

wanted 3:21 5:19 14:7 29:21 33:15 55:8,24 57:4 68:4 82:12 106:25 142:7 196:18 199:5,6 206:17 208:5 218:15 227:2 241:16,20,21

wanting 156:12 186:17

warning 87:7

warnings 87:18

warranted 137:22

Warren 171:17 190:3 243:17 245:10,14,24, 25 246:4,12,16 247:4

wash 214:16

Washington 158:14 240:20, 22

wasted 71:15, 16,23,24

watching 7:22

ways 26:16,23 45:24 136:5 145:20 175:16

weaknesses 132:16

web 30:14

website 4:9,10 201:16 230:21, 24 231:13 235:7,10 239:23 240:2

websites 5:4

wedding 262:17

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week 3:24
193:12,17
259:25 261:1

weekend
102:25

weight 19:17
112:5,8 146:25
147:1,20

weights 20:13
145:2

well-
established
110:23

well-known
140:25

well-off 228:4

well-respected
144:13

Wendy 134:9

west 80:20
177:17 223:19
225:15 226:7,
12 229:16
243:23

western 230:9

Wheatley
173:21

whiskers
58:20

white 66:3 69:4
122:25 123:5
210:11 211:21,
22 215:1

wholly 173:5,8
174:19 178:1
179:18,23
245:13

wide 72:25
262:6

widely 16:20
37:6

Willner 187:6

win 150:19
210:17 211:8,
20 213:19

winding 146:2

window 218:5,
13

Wingate 3:2,
10,14,17,22
4:4,14,16,18,22
5:5,9,13,17,22
6:2,5,10,13,16,
19 7:3,6,8,13,
16,21 8:15,19,
22 9:1,3,8,11,
13 10:4,7,10
11:6,9 32:25
33:2 35:17
36:3,5 50:11
54:9,16,23
55:9,14 57:22
58:1 60:19
61:18 62:8,24
63:3,22 81:3,8
90:11,14,16,20
91:1,7,11,15,22
92:1,6 95:5
99:14,20,24
100:3,6,9,11,
14,16,22,24
103:10 114:21
119:13,19
120:3,6,10,12,
15 121:9,12
125:12,16,18,
23 126:3,8,12,
16 127:8 128:2,
7 129:12,14
131:10,13
134:6 137:6,10
140:24 149:21
150:1,5,8
151:4,11,19
152:5 153:8,11,
13 154:11,14,
20 155:2,6,12,
16,20,23 156:1,
4,7 157:4,7,12
164:10 165:3,6
166:5 167:17
169:16 170:19,
21 175:20,24
183:18,24
191:7 194:14,
18,21,23 195:3,
6,13,19 200:9,
11,14 202:18
203:2,7,9,11,
14,19,24 204:2,

17 205:17
210:23 211:1,6,
11,14 219:15
227:12 231:18,
21,24 232:2
233:11,14,22
234:1,4 237:12
239:10,14
241:21,23
254:4 256:8,16,
21,23 257:2
261:16,18,20,
25 262:7,10,13,
16,20,23 263:5,
9

winner 140:22

winning 116:7
210:20 253:22

withdrawal
260:20

withstanding
209:19

witness's 5:24

witnesses 3:7
155:7,11,14
165:4

women's
140:4

won 114:13,14
140:22 141:5,7

wondered
205:11

wondering
91:17

word 60:18
201:10,22

words 22:10
34:25 40:19
78:12 84:3
236:11

work 33:25
63:24 77:1
96:17 102:5
103:8 104:3
124:17 128:19
144:19 158:5,
16,20,22
184:17 187:11
189:22 196:16

207:7,9 232:17
257:24 258:13
259:10 260:1

worked 159:15
163:9 184:23
198:12 238:20

working 75:2,
20 127:2
130:14 131:6,
18 138:3
196:11 217:1
219:3

works 5:18
18:19 260:14

workshops
15:21

world 137:24
138:21 202:2
216:11

worried
120:19,20

worry 26:19

worse 213:15
253:13

would've
174:22 190:21
193:7,11
235:18 241:15

write 127:13
130:21 132:24
134:11 136:13

written 4:1,19
16:23 35:13
97:1,3 128:21
234:13 235:1,
22,24 236:1,11

wrong 125:13
207:12,13
260:15

wrote 87:7
98:10 127:1,2
128:23 129:3,
18 132:7 145:4

X

xenophobic
213:13

Y

y- 56:21

Yean 51:1

year 123:15
125:10 127:21,
24 185:11
209:6 214:25
217:10,15,24
227:7

years 13:6 14:5
23:1,7 29:18
125:8 126:4
157:24 188:23
190:17 211:2,
25 214:12
226:1,24 227:1
228:18 229:12
233:2 247:24
250:6

yellow 126:19

yesterday
3:18

yield 78:5
133:3 134:19
135:2

York 23:21
124:1,2

you-all 5:7
6:14 8:15 91:7
114:21 119:14
154:25 156:8
203:15,24
239:10

young 12:18

youngster 3:3

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