IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN
* *
WILLIAM WHITFORD, et al.,
Plaintiffs,
-vs- Case No. 15-CV-421-bbc
GERALD NICHOL, et al.,
Defendants.
* *

DEPOSITION OF KENNETH MAYER, Ph.D.
Monday, November 9, 2015
8:57 a.m.

Reported by: Lisa A. Creeron, RPR

DEPOSITION of KENNETH MAYER, Ph.D., a witness in the above-entitled action, taken at the instance of the defendants, under the provisions of the Federal Rules of Civil Procedure, taken pursuant to notice, before LISA A. CREERON, a Registered Professional Reporter and Notary Public in and for the State of Wisconsin, at the Wisconsin Department of Justice, 17 West Main Street, in the City of Madison, County of Dane, and State of Wisconsin, on the 9th day of November, 2015, commencing at 8:57 a.m.

A P P E A R A N C E S

PAUL STRAUSS, RUTH GREENWOOD and ANNABELLE HARLESS,
CHICAGO LAWYERS' COMMITTEE FOR CIVIL RIGHTS UNDER LAW, INC.,
Attorneys at Law,
100 North La Salle Street, Suite 600,
Chicago, Illinois 60602, appearing on behalf of the plaintiffs;

BRIAN P. KEENAN,
Attorneys at Law,
WISCONSIN DEPARTMENT OF JUSTICE,
17 West Main Street,
Madison, Wisconsin 53703, appearing on behalf of the defendants.

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(Original transcript is filed with Attorney Keenan)

I N D E X

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KENNETH MAYER, Ph.D.,
called as a witness, being first duly sworn in the above cause, testified under oath as follows:

EXAMINATION

BY MR. KEENAN:

Q We met at the hearing on Monday, but I just introduced myself. My name is Brian Keenan. I'm an attorney representing the defendants in this case. We're here for your deposition. Have you been deposed before?

A Yes.

Q Okay. So I suppose you know some of the rules, but I'm just going to go over a few of the ground rules just to refresh your memory. We have a court reporter here, and she's taking down the testimony and so it's important we get a clear transcript. So if you'd please let me finish my question before you say your answer, I'll try to let you say your answer before I start a next question so that we make it easy for her.

You understand that you've sworn to tell the truth?

A Yes.

Q Okay. Now, if at any time during the deposition if

you don't understand my question, just let me know. We want to make sure you understood the question and give a truthful answer. So if you don't understand, just tell me. I'll try to rephrase the question or we can have her repeat it back. Do you understand?

A Yes.

Q Okay. Maybe I could just get your educational background. I know some of it's in your report, but maybe just the schools that you got, the degrees -- the schools you went to, the degrees you obtained and the years.

A My undergraduate degree is from the University of California-San Diego, and that was 1982. My Ph.D. is from Yale University, and I received that in 1988. And there are subsidiary degrees you get along the way, master's and master's of philosophy, which I think the dates were '86 and '87.

Q And the Ph.D. was from where?

A Yale.

Q Yale. And then what was the Ph.D. in?

A Political science.

Q And then you are now a professor at the University of Wisconsin-Madison, correct?

A Correct.

Q Okay. How long have you been a professor there?

A Since 1989.

Q So right after you got your Ph.D. at Yale?

A I spent a year after I received my degree working for the RAND Corporation in Washington, DC.

Q And what's your current title, so to speak, as a professor at Madison?

A Professor of political science and affiliate faculty of LaFollette School of Public Affairs.

Q And what are your research areas?

A Research interests are American politics, the presidency, elections, elections administration, some interest in Australian politics, but mostly American politics.

I teach courses in the undergraduate course, courses in the presidency, a course on campaign finance, various seminars, but all of them are focused on either elections, elections administration, the American presidency, and I taught one course on comparative electoral systems.

Q Do you teach any classes that relate to districting or redistricting like that's at issue in this case?

A Not specifically. I have taught courses that deal with various issues relating to election administration and that plays a role, but no courses specifically on redistricting.

Q You're an expert -- serving as an expert witness for the plaintiffs in this case. Have you served as an expert witness in other cases?

A Yes.

Q And how many other times?

A They are in my report. I think it is six or seven times. I'd have to go back and look to be sure.

Q And how many of those deal with -- have dealt with districting situations as opposed to perhaps campaign finance or something else?

A Well, let me think for a minute. Can I look at my report?

Q Yeah. Actually why don't we mark that as Exhibit 1.

A I just want to make sure I get this correctly.

Q And then you can refer to that.

MR. KEENAN: Here's a copy for Exhibit 1.

MR. STRAUSS: Thank you.

(Exhibit 1 is marked for identification)

Q And just for the record, this is the Exhibit 1 that was provided by your counsel that has the -- I had a copy that didn't have the appendix with some data error -- or an annex, sorry. This one has the annex to it.

A So this covers the last eight years, Baldus vs. Brennan was a redistricting case. Kenosha County vs. City of Kenosha was a redistricting case. I was an expert in 2001, and I think that was Baumgart vs. Wendelberger. Those are the -- as best I can recall, those are the only cases where I have testified as an expert on a redistricting matter.

Q Okay. I'm familiar with the Baldus and the Baumgart case, but what was the Kenosha one about?

A The Kenosha case involved a dispute between the City of Kenosha and the County of Kenosha over the drawing of wards and districts and it -- as I remember, it involved disputes over whether the -- how the city and county resolve discrepancies or disagreements over wards and as they affect county supervisory district lines and city aldermanic lines.

Q Okay. That was going to be my next question. So it involved local election lines, not state assembly lines?

A Correct.

Q Okay. And which party did you represent in that -- or not represent but provide an expert report for?

A I provided an expert report on behalf of the city.

Q Do you know what the end result of that case was?

A The end result of the case -- again I'd have to go

back and look at the record. The end result was that the city was able to reconfigure its wards so that they were in compliance with the -- again I'm operating -- it's been a long time, it's been four years since I've looked at this, that the city was able to reconfigure its wards to address some of the disagreement.

Q Okay. And do you know if there was a judicial decision that allowed that or was it a settlement or agreement or do you know?

A I don't know.

Q Okay. And then it says you have testified as an expert witness at trial or deposition. Which -- did you testify in a deposition, trial or both in that case?

A Baldus was deposition and at trial. NAACP vs. Walker, both deposition and trial. The one case where I testified in deposition but not in trial was McComish vs. Brewer.

Q Okay. So there was a trial in the Kenosha County one?

A There was.

Q In the Baldus vs. Brennan case, on behalf of which party did you submit an expert report -- or parties?

A I'm pretty sure it was on behalf of Baldus because

Brennan was on the GAB.

Q Okay. And what was your understanding of who the plaintiffs were in that case?

A People who were challenging the constitutionality of Act 43.

Q And then in the Baumgart case from the 2000 round of redistricting, on which side did you -- on behalf of which -- sorry, on behalf of which parties did you submit an expert report?

A That case I recall I worked -- one of the parties was the Senate Democratic Caucus I believe was the party that -- I worked for or provided the report for.

Q And what were the issues you offered an opinion on in Baumgart to the extent you can remember?

A In that case my role involved assessing the partisan consequences of the proposed plans submitted by all of the parties.

Q And did you offer an opinion on perhaps which parties under the map that was the best in that case?

A I would have to go back and look at my report, but my recollection is that both the party I was working for and the other party, which I believe was the Assembly Republicans, had submitted multiple maps and I analyzed those maps and provided analysis about the estimated consequences that those maps would have.

But I would have to go back and look at the report to be more specific.

Q And what's your understanding of the district that came into being as a result of the Baumgart case? Did the court accept either of the maps that were drawn by the parties, or did it draw its own map?

A So are we back in 2001?

Q 2001, yeah.

A So my understanding is that the court took the submissions from both parties and produced its own map.

Q Okay. Well, let's switch to this case. When did you first get approached about potentially being an expert in this case?

A I believe it was somewhere around -- it was over the summer. Somewhere around July. I don't remember precisely.

Q July of this -- 2015?

A 2014.

Q 2014. And who did you talk to about it?

A I believe the initial conversations were with Peter Earl and Ruth, Ruth Greenwood.

Q And after that initial contact, when did you officially become involved with the case?

A I would have to look at the agreement letter. I'm

not sure when I actually signed that.

MR. KEENAN: Let's mark that then as No. 2.

(Exhibit 2 is marked for identification)

Q And you mentioned an agreement letter and we put before you Exhibit 2, and is this the agreement letter that you're referring to?

A I believe it is, yes.

Q And it's dated November 5th, 2014. Does that refresh your recollection about the time you were retained about?

A I would say November.

Q And it's your understanding that this letter contains the scope of work that you were asked to do on behalf of the plaintiffs in this case?

A That's correct.

Q And it says that your rate is $300 an hour. That is your rate, correct?

A Correct.

Q Looking at your report, did anyone else assist you in doing the work that went into the production of your report?

A In terms of the report, no.

Q Okay. And when you said in terms of the report, that indicates that perhaps someone else assisted you in

some other ways?
A I had a graduate student whom I've worked with before do some of the data issues, particularly regarding the -- I guess the proper term would be preparing the data for subsequent analysis.
Q Okay. And what type of data is that?
A It was, as I explained in the report, that I obtained data from the LTSB and GAB, primarily ward level election and demographic election returns and demographic data.
Q And what's your understanding of what -- first who was the grad student?
A His name is Brad Jones.
Q What did Mr. Jones do to the data in order to prepare it for the subsequent use by you?
A His responsibilities or his tasks were to do some -- I'll call it cleanup to making sure that the different fields and the data conformed so that we could put them together, and I also instructed him and used him to do some disaggregation. At one of the points we took ward level estimates and disaggregated them down to the block level using voting eligible populations. So it was essentially -- I wouldn't say data analysis, but data processing to put the data in a form that was

suitable for the actual analysis.
Q You used a couple terms there that I just want to get on the record what they are. You mentioned ward level data and block level data. Could you just explain what those are?
A Sure. The data on elections and the redistricting data that the Legislative Technology Services Bureau produced were largely at the ward level or the voting tabulation district level. But I also used census data or the actual redistricting files, the map files that the Legislative Technology Services Bureau produced. And those include block level data, the 250,000 or so blocks, census blocks that are defined by the Census Bureau, and in doing the analysis and preparing the maps, I did that at the block level. So it was necessary to take the ward level results and disaggregate them down to the census block level.
Q Okay. So maybe if I could just also get you to define what disaggregate means when you're talking about the ward level down to the block level.
A Sure. In this case it means assigning values to census blocks based on the percentage of the ward population, the voting eligible population that existed in each census block. And I explained a couple of examples in the report of how I did that.

Q How big is a census block? Are they uniform in size or are they -- do they differ in terms of the number of people in them?
A They vary.
Q Okay. And then I take it that a ward is made up of several different census blocks?
A Usually.
Q Usually, okay. And does that vary from ward to ward, I guess?
A Well, in terms -- vary in terms of what?
Q Like, for example, like a ward could be five census blocks or one or 10, it depends on the ward, or do wards tend to have a certain number of census blocks that are in them?
A The number of census blocks in each ward varies.
Q Okay. And so when you're disaggregating, are you attempting to -- you're taking a larger data set made up of several census blocks and trying to establish the number of votes from the ward totals that are assigned to each different census block? Perhaps that's a bad question.
A Can you -- I mean --
Q Sure.
A -- the methodology of doing this is actually pretty standard. It's common and disciplined, but I want to

make sure that I understand what I mean based on -- match it up.
Q Sure. Well, maybe you could explain what you're doing when you take -- I take from your testimony that you're taking ward level information then and it's a bigger number than trying to break it down into smaller numbers that go into each census block?
A Correct. When you're working with GIS data or geographic data, it's very common to apply or to transfer information at one level to another level. And a common way to do that is that you assign or distribute values at a higher level to a lower level based on the distribution of population.
So in my report, I developed estimates of partisanship, the number of people who I estimate will vote Democratic or Republican, and I broke those down or distributed those ward level totals to the various blocks in that ward based on the proportion of each block or the proportion of a ward that was made up in that block.
Q Okay. And when the data disaggregated from the ward level to the block level, is it a straight population, for example, like one block has 30 percent of the people of this ward, so, therefore, 30 percent of the totals get assigned to that block, or

do you actually go into the demographic data and adjust for different types of populations that vary block to block?

A I did do adjustments -- I made two adjustments. One is that we adjusted for citizenship using data that is data on people who are of voting age but are not eligible to vote because they're not citizens. And I also controlled for institutional -- prison populations which are similarly -- these are typically voting age, but they can't vote in Wisconsin and so it was -- I made a calculation of the voting eligible population in each ward and block.

Q But after you accounted for those two issues, then were the votes assigned from the ward level to the block level based on just the percentage of voters that -- eligible voters that were in that block compared to the whole ward?

A That's correct. And that's very common in both GIS and in political science as a way of doing that.

Q Sure. And I'm just trying to make sure that I understand it correctly.

A Sure.

Q Okay. I've got a couple of documents here.

(Exhibit 3 is marked for identification)

Q And I guess first I should maybe back up a little bit. So you understand that there's a subpoena issued for documents related to this case, correct?

A Yes.

Q You turned over documents that were in your possession to your attorneys who then turned them over to me, do you understand that?

A Correct.

Q And so what was your understanding of the documents that you were supposed to give to your attorneys that they could provide to me?

A My understanding was that I was to turn over documents that reflected the things that I took into account, all of the data sources that I took into account in preparing my report.

Q Okay. And so there weren't any documents that you took into account in your report that you failed to give to your attorneys?

A There were some things in the bibliography, I suppose, the publicly available things that I relied on, but there was nothing that I relied on in making my report that I did not turn over.

Q So getting back to No. 3, I'll just tell you what I did. This is several different documents that were in your production that I put together. These were

the invoices that listed Brad Jones on them.

A Um-hum.

Q And I tried to put them in chronological order. And you mentioned Brad Jones before. So are these the invoices for Mr. Jones' work on this case?

A These look -- these are the invoice that he submitted, so reflecting the work that he did.

Q And then do you know if he's been paid for his work?

A He has.

Q Okay. And who has paid him for the work?

A I believe the same people who paid me.

Q And who is that?

A The Chicago Lawyers' Committee, and I did receive one check or a couple of checks from the national ACLU.

Q And then I also --

MR. KEENAN: We'll mark this as No. 4.

(Exhibit 4 is marked for identification)

Q Exhibit 4 is similar to what I did with Exhibit 3 was I took the invoices that had Kenneth Mayer Consulting, LLC on it and put them in chronological order and just grouped them together here. So if you want to take a look at that, and I'm just going to ask you if these invoices constitute all of the invoices that you've submitted for your work in this case.

A So this looks like -- it looks like there's one error. The invoice I submitted in February was for January, but it says the dates of services were December. So that looks like it's incorrect.

Q Okay. But that's just a typographical error?

A Right.

Q Okay. It says Kenneth Mayer Consulting, LLC. What is that LLC?

A That's a limited liability corporation that I set up in the State of Wisconsin.

Q And is that the -- I guess the business forum for which you do the consulting work on these when you're an expert witness?

A Correct.

Q Looking at Exhibit 4, I noticed that there's one bill for a computer. Why did you submit a bill for what looks to be a computer to the plaintiffs' attorneys?

A The software that I use to -- the GIS software only runs on Windows machines and all of my computers are Macs, so it was necessary to get a machine that could run the program.

Q So if we add up all the total of these invoices, we could get the total amount you've billed to the plaintiffs in this case, correct?

A Through these dates, correct.

Q Yeah. And has all that money been -- have you been paid for all those invoices?
A I don't know.
Q Okay. And you mentioned that some of the checks came from the Chicago Committee and others came from the national ACLU. Do you know what percentage of your invoices were paid by either entity?
A No.
Q What's your understanding of why the national ACLU paid some of the bills?
A I don't know.
Q Perfectly fine answer. I think we can put -- like 2, 3 and 4 we probably won't refer much to again, so you can probably just put somewhere. Exhibit 1 we will refer to, so you might want to keep that handy.
Another thing I didn't say is that since we do have documents and if I put a document in front of you, feel free to read it over and refresh your memory and look at it to the extent you need to to answer a question when it relates to a document.
A Okay, thank you.
Q And also I forgot to mention we can take breaks when you want, so if you're feeling like you have to go to the bathroom or anything like that, just let us know and we can take a break. I will add if there's a

question pending, I'll ask you to answer the question that's pending, but then we can take a break if you need to.
A Okay.
Q Okay. Maybe we could just go to the back of the report, the annex. You mentioned in the report that there were some data errors in Wisconsin election data, and I just wanted to ask you about what -- as I understand it, there were some errors in the ward level data not matching up between the GAB and the LTSB, is that correct?
A Correct.
Q Okay. And so how did you go about resolving any of those data errors?
A The process is that whenever I am provided or begin working with a large data set, it's always important to go through and check the validity of the data. And so in this case we had -- I had -- I'm using the royal we meaning I had the LTSB data which was an individual ward level data on demographics, population, information on the municipality, the jurisdictions in terms of assembly, senate, congressional districts that that ward was in. And it had voting data going back, depending on the file that you used, sometimes it would go back a number of

election cycles.
And so the first thing that I did is took that data file, which had 6,500 or so records, however many populated wards there are in Wisconsin, 6,592, and calculated -- used that data to calculate district level totals for assembly races, which will tell me whether or not those totals are accurate, and I compared them to the GAB, the Government Accountability Board totals and the Blue Book, the State of Wisconsin Blue Book and I took that to be authoritative.
And I found a number of cases where the totals were off, sometimes considerably. The totals were off. There were districts where according to the GAB, a candidate was running unopposed, but there were votes that showed up for both parties in the LTSB data and these were -- I found these to be significant and concluded that it required investigation. I had a conversation with a staffer at the LTSB asking them about this, and I suspected one of the problems and one of the reasons that this happened is that the GAB, the way that elections are administered in Wisconsin is that they are administered at the ward level but smaller municipalities, I think those that have fewer than

35,000 people are actually permitted to combine individual wards into reporting units, and that's done for administrative ease.
And so if you look at the official GAB totals, frequently they'll be City of Madison Ward 96, but in some areas, they'll be the City of Marshfield. It will be Wards 1, 3 and 5 and so they're combined and there is no -- that's how they received the data. And so if you looked at just the GAB, you would get data at the reporting unit level.
The LTSB has data at the ward level, and I was told by LTSB that they did their own allocation process, which is assigning reporting -- in cases where you had reporting units, to assigning those totals to individual wards, and I thought that that is one of the ways that the totals were wrong.
I have a chart in there, I believe it was the City of Mequon that shows what happened and so the City of Mequon, the LTSB data, when you take that data and recombine it into the reporting unit level, all the numbers are off. And so one of the steps that I conducted is to -- I went through in those places where there were errors, I fixed them and I fixed them by either correcting them to the totals in the GAB or I redid the -- I redid the steps that they

performed and reallocated the reporting unit totals to the individual ward levels to get accurate -- an accurate representation of what those totals were.

Q Okay. A lot in that answer, so I'm just going to try to break it down a little bit and just try to figure out what -- so for an assembly race, if we go to the GAB election data that says Candidate A had 17,000 votes and Candidate B had 15,000 votes total throughout the district, you took that number as accurate, correct?

A I took that number as authoritative.

Q Authoritative might be a better word. And then if the GAB's ward level data didn't have an issue of combining certain wards into one reporting unit, would the GAB's ward level data be accurate or authoritative?

A So are you asking whether the GAB's individual ward level data is authoritative?

Q Yes.

A I took the GAB data as authoritative.

Q And at the ward level as well?

A Correct.

Q Okay. Now, some of the GAB data might be -- I think you said where there are several wards combined into one reporting unit, is that correct?

A Correct.

Q Okay. So I think you used the City of Marshfield example of like 1, 3 and 5? Or it's 1, 3 and 5 are combined into one reporting --

A Actually it might be better to use the Mequon because we actually have --

Q Okay, yeah. Maybe. Where is that?

A That's in the --

Q Page 3 of the annex. So we see there's three columns here on this page. One says GAB reports, one says LTSB data and one says difference. So the GAB reports, for example, it has Ward 1, there's only one ward there and a list of Romney and Obama votes and vote totals. Did you take that line, Ward 1 in Mequon, as authoritative?

A Yes.

Q Okay. But then the LTSB data, that had some different numbers there, and I take it when you looked at that data and compared it to GAB data, you noticed a discrepancy and thought that the LTSB data for Ward 1 needed to be corrected, so to speak?

A Well, there are two parts to that. I think it's more accurate to say that I looked at -- compared the LTSB data, ward level data to the GAB, so the LTSB was different and it required investigation as to why.

Q Okay. But just looking at these two, if I pulled up these two spreadsheets, so to speak, that had both of the ward units reporting here and GAB as Ward 1 and then LTSB as Ward 1, if I wanted to know which one had the authoritative vote totals, that would be the GAB?

A Right. As I understand it, the LTSB data has no official status. It is simply the data that is presented and I think that it's -- I am not aware of anything that suggests that that has any official status as opposed to something that they release. It's the GAB which I took to be authoritative.

Q Okay. And then I guess we go to GAB like, for example, the GAB reports, there's reporting Units 3 and 4 together, Wards 3 and 4 are together and if I understand your testimony correctly, in a situation like that, that may cause some errors in the LTSB data because there's one reporting unit for multiple wards?

A Well, I'm not prepared to say that the second part of that is true.

Q Okay.

A But the -- correct to say that in the GAB data, Wards 3 and 4 produce results at the reporting unit level, and those numbers are off as well in the LTSB

data.

Q Okay. And then so when you did any sort of calculation in Mequon here, there's Wards 3 and 4 report together, what did you do to disaggregate, so to speak, Ward 3 from Ward 4 based on the data in the GAB report?

A Well, the disaggregation was the second step in this because the first step was to try to determine why these individual ward or reporting unit totals are off in the LTSB data. My experience tells me that this is an allocation issue because if you look at the totals, the last row, the total number of votes cast for Romney and Obama were all accurate. They match up perfectly.

It's just the internal distribution of those votes in the LTSB data is incorrect, and that is why I concluded that this was a problem or there was an error in how the LTSB allocated those votes, and I don't know why that happened. I don't know why the LTSB when it had individual wards just didn't plug the GAB totals in there, I don't know why.

But it's clear this was an erroneous allocation of votes in this case at the reporting unit level, and if the reporting unit level is wrong, it's not going to get better when you further disaggregate

into wards.
Q Sure.
A And so I was able to identify every case where there was what I considered to be a material discrepancy. There were some where it was a single vote or a small handful of votes that was too small to have any effect on subsequent analysis. And as I explained in the report, I went through and corrected those and there were -- this was only one of the errors.
There were other instances that I describe in here where a ward was simply assigned to the incorrect district in the LTSB data and I was able to identify and fix those.
Q Okay. But if I want to just look at the -- what were the results in a particular election by reporting unit, I can just go to the GAB spreadsheet that lists each reporting unit and that would be the authoritative source of the vote totals?
A That's correct.
Q Okay. I think that's enough on the data errors. If we just go get a little more general, what's your understanding of what partisan symmetry is?
A I understand partisan symmetry to mean that the political parties, the two major parties are treated equally in terms of their ability to translate the

votes that they receive into seats.
Q And when you say the votes they receive, what do you mean by that?
A The votes that they receive in a particular -- typically partisan symmetry is used in the context of legislative races where you have a set of elections and you --
Q So it will be the votes cast for all the candidates in a particular party?
A Generally. There are some exceptions to that, as I'm sure we'll get into.
Q And what's -- and maybe we can just get into it now. What's your opinion about the appropriate way to measure a party's share of the vote in a legislative -- a series of legislative elections, for example, like the 2012 election for Wisconsin Assembly?
A In the political science literature in the context of redistricting, the general -- what is in my view the generally accepted way of measuring that is looking at some measure of the underlying partisanship of a district. Frequently this is a function of the actual votes that are cast, but there are instances where that will not give you an accurate measure of the underlying partisanship, particularly when there

are uncontested races.
But there were also issues where incumbency can affect the vote and so the -- a common, I don't know if I would say it was the most common, but a common method of estimating the vote or partisanship in a district is you construct a measure of the partisanship of that district. And sometimes you can use the actual votes. In many cases you can't.
And that gives you an estimate of what the underlying partisanship of a district would be ideally. In some cases you would need to do that independent of the actual candidates who are running.
Q For legislative elections, would it be appropriate to look at that party's candidate for, for example, presidency in the state during the same election to determine the statewide vote share for that party?
MR. STRAUSS: Object to the form of the question. Appropriate for what purpose?
MR. KEENAN: Well, for determining the statewide vote share that we're using in determining partisanship symmetry.
A So can you restate?
Q Yeah.
A I'm kind of losing track here.

Q Sure. At some instances I see reference to the fact that President Obama won a certain percentage of the vote in Wisconsin in 2012. Other times there's a reference to the amount of votes perhaps adjusted that the Democratic candidates won in the 2012 assembly elections. Which one would be the appropriate one to use for measuring partisan symmetry of the assembly elections?
A It depends. My references to the presidential vote is -- the statewide presidential vote is a marker of an indication. It is a measure of statewide partisanship. But that is not the measure I used in constructing my analysis of the underlying partisanship of all of Act 43 and also the demonstration plan that I drew.
Q And when you calculated the Democrat statewide vote share in the 2012 assembly elections, was it higher or lower than the share of the vote that President Obama received in Wisconsin in 2012?
A So if I calculated referring to my measure of partisanship?
Q Yes. The way you -- you said you didn't look at the presidential vote as -- you did something else, you looked at your measure.
A Right.

Q And did your measure come up with a number that was higher or lower than President Obama's vote total in Wisconsin in 2012?
A Well, now we're starting to get apples and oranges. We're talking about percentages or numbers.
Q Well, we can do either or both.
A I don't recall sitting here. I would have to look at the data to be able to tell you whether -- I would have to look at the report. I don't remember what those numbers are or even if I did that calculation.
Q Okay. And then another question would be when calculating the statewide vote share of the Republicans and the Democrats, how do you account for votes that are cast for third parties or even just scattering votes for random candidates?
A So in doing the calculation, the accepted practice and the discipline is that you count the major parties. And the scattering will typically be a minuscule proportion, but it's the two-party vote that is the quantity of interest.
Q Okay. So just so I understand that, the two-party vote would be, for example, I'm just giving you some numbers, if there's 100 statewide votes and one party got 50 votes and one party got 48 votes and another like random people got two votes, you disregard those

two votes and now the vote total is 50 to 48, is that correct?
A Well, for the purposes of doing an analysis of a plan that you would look at the 50 and the 48.
Q And so then the percentage ends up being a little bit off where it's now the party that got 50 percent actually got a little more than 50 percent because it's --
A Well, I dispute the term off because that suggests that there is a true measure that this departs from.
Q Fair enough.
A The political scientists and people who study redistricting would say that the best measure of the partisanship in that scenario would be 50 divided by 98, which would be a small majority. We could do the math.
Q Yeah. That's just what I'm trying to get at.
A It would be 50 percent. It would be probably 51 percent.
Q So when you look at a GAB statewide election total, President Obama or Scott Walker or someone might have a total, but that's not quite exactly right because someone -- it's not the exact percentage of the two-party vote because there's some scattering of some less than one percent of votes that are out

there?
A There will be -- there are votes that are not counted in those percentages. They are almost always a trivial and immaterial number.
Q Okay. What is a wasted vote?
A So a wasted vote in the context of the efficiency gap is a vote that is cast by either the losing party in an election or for the party with -- that wins, the number in excess of what was necessary to win the seat.
Q Now, the losing party makes sense, that's pretty easy. You just take their vote total, right, and that counts -- all those are wasted votes, is that correct?
A Yes.
Q Okay. Now, for the winner, I just want to figure out how we just get to the exact number there. How do you determine the number of wasted votes for the winning candidate's party?
A So I recall it is the essentially one-half of the margin of victory in terms of number of votes.
Q Okay. So that would take the winning candidate's number, whatever it is, subtract the losing candidate's number and left with something and then I divide that by two and I got -- and that's the wasted

votes for the winning candidate?
A Say that again. I want to make sure --
Q Sure. Yeah. I may not have explained it very well. So I would take the vote total for the winning candidate and then subtract from that the vote total for the losing candidate and I'm left with the difference -- the margin of victory, correct?
A Correct.
Q And I would take the margin of victory and divide that by two and I have the wasted vote number for the winning party?
A Correct.
Q Okay. And if I just to make sure that that number is a two-party vote measure, it also kind of disregards any sort of stray votes that are cast for candidates outside of that two-party race?
A So it's correct that that quantity is calculated using the -- well, it will always be the Democratic and Republican candidate and -- but it counts only those votes.
Q What's your understanding of where the -- well, first maybe you mentioned that as part of the efficiency gap, we're talking about the wasted vote. What is the efficiency gap?
A It's a measure of the -- it is a measure of the total

number of wasted votes divided by the total number of votes cast and it gives you a measure of the relative number of wasted votes for the two parties.
Q What's your understanding of where this version of the efficiency gap first came into being in the political science world?
A Well, that's an ambiguous question because the method and quantity was explained in a University of Chicago Law Review article. I don't know exactly the publication date. It may have been October 2014 or something like that, but I can't tell you the history and evolution of the concept.
Q So did that article from you think maybe October of 2014 but may be off a little bit, did that article provide the basis for how you went about calculating the wasted votes in Wisconsin in 2012?
A So my method of calculating the wasted vote relied on the methods and formulas outlined in that article.
Q Okay. And then were there any other -- whether they're law reviews or political science articles or I don't want to limit it, but any other articles or maybe something else that you relied on in developing your method for calculating the wasted votes in Wisconsin?
A Well, in terms of the actual calculation of the

wasted votes or the method -- so in terms of the -- once I had my district level measures, my method of calculating the wasted votes, I did not rely on any other sources.
Q Okay. Yeah. I'm aiming more at the theoretical concept that you were using, where that came from. And so that came from this article in the Chicago Law Review?
A Yes.
Q Okay. How does this efficiency gap method of calculating partisan symmetry differ from other methods of calculating partisan symmetry?
A That you'd have to ask the author of the article. I'm really not in a position to answer that.
Q All right. Are you familiar with the term partisan bias as a measure of political or partisan symmetry?
A Well, the partisan bias is not really synonymous of partisan symmetry. It reflects something different.
Q Enlighten me, I guess. What does it reflect that's different?
A So the quickest definition of partisan bias would be in a 50-50 election what percentage of seats does the majority party have and so if the -- so if there was a 50-50 election and one -- in that election, one party had 55 percent of the seats, would you

calculate the partisan bias at five percent, and there are sort of roughly analogous methods of looking at it at different levels, but that's -- as I understand it, that's the most common way of measuring the partisan bias.
Q Have you ever performed a partisan bias calculation on Wisconsin or any other state's election?
MR. STRAUSS: Object to the form. In what year?
MR. KEENAN: Any year.
A It's possible that I may have done something similar in the Baumgart case. I don't remember.
Q Do you consider yourself an expert in calculating the partisan bias in this 50-50 election scenario?
A Well, can you define -- I mean I know how to do it.
Q Okay.
A And I'm familiar with the literature of how that's done.
Q All right. Well, I just didn't want to start asking you questions about something you had no idea what it was. So how does one go about determining how many seats a party would win in a 50-50 election?
A So normally the method would be to construct an underlying measure of election outcomes and then typically you would perturb -- you would apply

frequently what would be a uniform swing and you would assume that the percentage of the vote that the one party gets goes up or down by a fixed amount around the state and you would adjust that to see what happens at 50, look at the numbers of seats and that's what you would use as the partisan bias, and there are lots of refinements in terms of how you calculate the winners, but that's -- my recollection is that that's the most common method of doing it.
Q So someone has to create a model that determines underlying partisanship of each and every district in the state?
A Well, you wouldn't necessarily need to -- you can do it just looking at the actual votes, but it ultimately relies on some measure of election outcomes at the district level that you can perturb or examine what happened under some alternative scenarios.
Q And then so, for example, in a 48-52 election, this many seats, and then eventually you get to 50-50 and then you have to see how many seats each party gets?
A Well, it's more complicated than that. In a 48 to 52 statewide election, the district level votes would be distributed, and so you would see what happens in the district where you perturb the percentage.

Q Okay. I guess to be clear, the method you used in this case isn't a measure of partisan bias in the 50-50 election?
A That's correct.
Q Why don't you explain the -- how you went about determining the underlying partisanship of each district in the Wisconsin Assembly? And feel free to refer to your report to the extent you need to do that.
A What I did in the report was construct the regression model that uses as the dependent variable the actual assembly vote in contested districts. And the independent variables, I'm going to refer to my report here just to make sure I get this correct.
Q Sure. And just identify, please, the page where you're at and we can follow along.
A Okay. So I'm on Page 10 and 11. So it explains -- it is a model that uses as a dependent variable the assembly vote in a particular ward. This is ward level analysis.
Q Maybe I could just stop you. In terms of the assembly vote just so -- I know they're small numbers, but is this the two-party vote or the total vote?
A I did a separate model for Democrats and Republicans

in each district. So this is the actual number of votes received by in the first case the Democratic candidate and then I ran the model again for the Republican candidate.
Q For just the D's and R's, so if there was some candidate that gets 15 and I look at the results, I need to add the Republican and the Democratic actual votes to get the total votes in your model?
A Well, the way that you would use this to get a district level measure is that you would look at the Democratic and Republican totals.
Q All right. Continue, sorry.
A Then the dependent variables again for each ward are the demographics, the total voting eligible population and these are numbers, not percentages. The total Black voting eligible population, the Hispanic voting eligible population.
And on the next page, the Democratic and Republican presidential vote, again these are all absolute totals. A dummy variable, if there is a Democratic incumbent or a Republican incumbent and that's one, if it's a Democratic or Republican incumbent, zero otherwise. And then the last term of the county, that's what's called a fixed effect, there's a dummy variable for each county reflecting

some possible geographic effects.
And I did this again for the underlying data with the actual vote totals in contested assembly districts in 2012.
Q Okay. One thing is just with political scientists, you guys like to use these equations, and I'm not sure exactly how to say the letters and numbers and things that are there. So when it says y and then like little i, I guess, how would I just like refer to that?
A That's Y i or Y, sub i.
Q Y, sub i, okay.
A But that's just sort of a symbolic representation sort of explaining the regression and just sort of as -- expresses the fact that this is a linear model.
Q And then the sub i is meant to refer to -- that's for one district?
A For each ward.
Q Each ward, okay, that's a ward. And then there's A, do we just call that, or alpha?
A Alpha.
Q And then is the next one beta?
A Beta.
Q Sub i or sub 1?
A Yeah.

Q Okay. And then there's the really fancy one at the end?
A Right. That's basically it reflects the fact there are 72 counties in Wisconsin. So rather than write out all 72 counties, it's a way that for each county, it's a 1 if it's in that county, a 0 if it's not and then I believe I excluded Dunn County because when you have a dummy variable that's exhaustive, you need to exclude at least one variable because otherwise you have a constant that makes it difficult to -- or makes it impossible to generate the estimates.
Q We've been going for like an hour. I don't know if you're fine still going or if you want a break.
A I could take a break.
MR. KEENAN: Okay. Let's take a break.
(Short recess is taken)
Q Mr. Mayer, before the break, we had just started to get into the model on Pages 10 and 11, so we can just go back there and I'd like to just go into each of the different pieces of the model and we can just talk about them individually. So I think we already talked about the assembly vote part of it. The total voting age population, why don't you explain that element of the formula?

A The census produces numbers for each block which the LTSB aggregates into wards, and one of the variables is the number of people 18 or over who are eligible to vote. I did two corrections. One is that I adjusted for estimates of noncitizenship rates using separate estimates that the census produces. I believe I used county level estimates of basically the percentage of adults for noncitizens and did that correction and also removed institutionalized felon populations using state and federal prisons.
Q Okay. So I think we talked about that earlier in the deposition.
A Okay. And so that gives me an estimate of the number of people who are eligible to vote in each ward, which is a better figure to use than the total number of people because there may be numbers of people who for whatever reason are not eligible to vote. Generally these numbers are going to be small enough that they are not likely to make a material effect on the outcome.
Q So just so I understand the county level issue with the noncitizenships, for like a ward that's in Dane County here, you just took the Dane County average for noncitizens and applied that to each ward in Dane County?

A Well, there are separate estimates for each ethnic and demographic group. So there's noncitizenship for Whites, African-Americans, Hispanics, Asians and so I applied the noncitizenship rates to each of those demographic groups.
Q So as they appear in Dane County, so if there's five percent Hispanics, then you needed to -- I'm sorry. Probably I think that's a bad question.
So you looked at the underlying demographic data of each county or did you look at the demographic data of each ward?
A Well, I applied the county level noncitizenship estimate to the wards and they don't differ that much from the municipality level estimates. One of the reasons I used the county estimates is because you have a slightly larger geographic jurisdiction. Those estimates are going to be more accurate because there are more people. But I strongly suspect that it would not change if I had applied the city level figures in any case. Those would have been -- there was a larger chance that those estimates were inaccurate or would be more likely to be a larger margin of error using the larger base population.
Q Sure. And I guess maybe I'm trying to figure out that's the percentage of noncitizenship used. What

did you apply that to?
A So I applied the voting age to the voting age population. Just to give a hypothetical example that in most parts of the state, the noncitizenship rate among White voting age, White non-Hispanic voting age, the noncitizenship rate is on the order of 1 to 1.2 percent and so would reduce the ward level populations by that much. They tend to be very small with the exception of Hispanics where you have a larger noncitizenship rate.
Q But you looked at each individual ward's demographic data to determine like how many Hispanics are in this ward and then applied the noncitizenship factor to that ward individually?
A Correct.
Q All right. I probably asked that poorly to get that simple answer, so I apologize.
Why don't we just -- I think you probably can address Black and Hispanic voting age population together. Like what do those elements mean?
A Those are again taken from census. The number of people identified in census as Black and Hispanic and again with the same adjustment made for voting eligible population.
Q Okay. And then why did you break out Black voting

age population, Hispanic voting age population separately from total voting age population?
A Well, the reason I did that was because the propensity to vote the partisanship of different demographic groups varies. Blacks are more likely to be democrats. Hispanics are slightly more likely to be democrats or vote Democratic is the proper way to phrase that. And so it was -- I considered it necessary to include a measure of that as a way of trying to estimate the number of people who vote for one party or the other.
Q When you eventually did the -- run the numbers for an individual ward, what -- I'm trying to think of the way to ask this. But, for example, like when you put in the Black voting age population, what percentage of that are you assigning to like the Democratic column, or is that --
A That's purely a function of what the data showed. I wasn't doing any prior assignment.
Q Okay.
A It was you run the regression, you will get a coefficient that tells you each additional Black voting age person will add a certain number -- in this case a fraction of votes for Democrats or Republicans, so it's not an assumption that I made.

It's driven by the results.
Q Sure. I didn't mean to like imply that, but you gave me the way to ask it to you, I think. How did you develop that coefficient that then goes into the formula?
A That's simply a function of the regression commands done in this data where you have the data and you tell it I want to use this as a dependent variable and here are my independent variables and it performs the calculations and it gives you the results and you show them -- give some of the results and the annex gives the full set of coefficients.
Q Okay. So if we just turn to the annex to --
A It would be Page 5.
Q Page 5, okay. So it says Black voting age population, coefficients negative .03, is that what you're referring to?
A Correct.
Q So for someone that doesn't have as much of a background in stats, what does that mean?
A So the way that you would interpret this result or that results, the coefficient is minus .03 which suggests that each -- and this is all linear -- the unit of analysis is the person.
So each additional -- as the Black population

goes up, the Republican number -- number of Republican votes will tend to go down. You also need to look at the estimate of precision, which is the standard error, and that simply gives you a way of assessing how precise this estimate is and in particular use that further statistical test to see if the coefficient is different from zero. And the P-value, which is the last, that gives you the probability that the number is significantly different from zero.
The bottom line is that the Black voting age, this coefficient is not significant. And the reason it's not significant is that the bulk of that effect is going to be picked up through the Republican and Democratic presidential votes, that if I know how many Republicans vote, if people voted for Republicans, having the additional information of how many people in the ward were African-American doesn't give me much more information, which is a little different than for the Democratic vote. So that's why I ran different models.
Basically through -- in this table, the coefficients, the rows that are bolded, those are what would be defined as statistically significant coefficients.

Q Okay. So the ones that are not bolded, Black voting eligible population, Hispanic voting eligible population and Democratic presidential votes, are not significant?
A Correct.
Q Statistically significant?
A Correct.
Q And then maybe I can just get you to define what these columns are. You mentioned them, but the robust standard error, the t-statistic and P-value.
A So the standard error, again it's the calculation of the precision of the coefficient estimate that the coefficients will be drawn -- it will be a distribution and basically if you think of it as a curve, as the standard error goes down, that curve gets narrow and so you can have more confidence that that number is precisely where it is.
It's robust because there's an adjustment to be made when the -- each of the wards is clustered into a particular district and we know that you have one candidate running in a series of wards and so it's an adjustment that is made to the standard error to account for that. The t-statistic is simply the coefficients divided by the standard error, and generally the t-statistic is greater than plus or

minus -- it's greater than 1.96 or smaller than minus 1.96. That gives you a measure of the statistical significance. And the P-value is just an expression of the significance of the estimate.
Q Okay. I think you may have just done this, but it slipped out of my head. The P-value, what's the cutoff for showing what's significant or not significant?
A So the typical standard is using -- it's called a 95 percent confidence interval and that in a data set of this size, that cutoff will be 1.96.
So you can see just an example, the Republican presidential votes is .95, which means that each additional Republican presidential vote gives you .95 votes for the candidate. The standard error is .01. The t-statistic is 110, which is -- that means that the probability that that number is actually zero is zero.
Q Okay. Maybe you could explain why the Democratic Assembly incumbent and Republican Assembly incumbent are also significant.
A Generally when there's an incumbent in a race, that incumbent will do better. There's long literature in political science explaining why this is true. Better name recognition, better candidates, they tend

to have more experience, more money. And so other things being equal, an incumbent will do better in a district than a non-incumbent of the same party would do.

Q Looking at the numbers, could you just explain what those numbers signify in terms of their significance?

A So generally a -- so we're looking at the number of votes that the Assembly Republican candidate would get. And the fact that the Democratic Assembly incumbent coefficient is negative, it's small, but it's negative, is that other things being equal in a race where the Democratic Assembly incumbent, the number of the votes for the Republican will go down.

Q Okay.

A And the reverse for the Republican incumbent, that in the case where you have a Republican incumbent, that will go up. And I need to make one correction. The Democrat -- the incumbency coefficients are weighted by the population of the ward.

Q Explain what that means.

A So if I just used -- typically you would just use a dummy variable. It's one in a ward where there's a Democratic incumbent and zero when there's not, but because the wards are unequal size and some of them they have populations ranging from a few hundred to a

few thousand, that would bias the results because you would expect more votes for the Democratic candidate when you have a Democratic incumbent in a ward of 3,000 people as opposed to a ward of 100 people or 300 people.

And so this is -- you would have to multiply this number by the population of the ward to get the number of additional votes that the candidate would receive.

Q When you're calculating the raw like actual total numbers, but is the percentage effect the same? You know, like a 100-vote ward might get two more votes or something, but then you'd upscale that to 1,000 and it gets a load of 20 more votes or something? Or is there a difference added to that?

A Well, the coefficient is that the -- let me think here for a minute. The independent effect of incumbency would be -- as a theoretical quantity would be constant across wards, although the effects would not. So basically for each additional person, you would expect an effect based on incumbency and that effect -- that effect on that individual person or that individual level effect would be the same in a ward of 100 people as opposed to a ward of 3,000 people even though the total number of votes that the

Republican or Democrat would get would be different in those two.

Q Okay. So if I'm looking at just a district-wide vote total that isn't broken down into each individual ward, is there a way to take your number and just kind of like convert that into like a total percentage of the vote that's a bump due to incumbency, you know, like five percent, two percent, one percent just to kind of get an idea as to like the magnitude of that effect?

A I'm just trying to work out in my head whether you could do that. The way that this model expresses that is that you would get an increment in each ward based on the coefficient and the size of the ward, and I think it's possible that you could simply apply that to the district-wide total. But that's -- I would not be comfortable doing that.

The way that I would want to do that is to do the analysis and actually look at the incremental number of votes you get on a district by district basis. You might be able to get a first approximation of what that might look like, but it's -- there are reasons why you would want to interpret that with caution.

But the general rule holds is that -- the other

issue here is that that coefficient exists after you have taken into account the Republican and presidential -- Republican and Democratic presidential vote. So you wouldn't be able to look at that number and say, ah, there were 50,000 votes or 40,000 votes cast in the assembly race, .02, that means that the Republican advantage was 800 votes.

You would have to look at that and say that would be after you take into account all of the other variables. So this is the independent effect of incumbency once you've controlled for the other variables. So in that sense, you wouldn't be able to take this coefficient and just apply it to a district to come up with an estimate of the total effect of incumbency.

Q So the effect of the incumbency, will it be different, for example, a ward that has 55 percent that voted for the Republican presidential candidate versus another ward that has 40 percent that voted for the Republican candidate? You know, how does the effect of this Republican Assembly incumbent differ there?

A This is a linear estimate and so that assumes that the effects would be the same at different levels of Republican support or Democratic support.

Q Okay.
A But again the number -- that that would be after you take into account the Republican and Democratic presidential votes, so you would not see the same presidential number of votes for Republicans and Democrats in the 55 percent Republican district as opposed to 55 percent Democratic district. So you need to keep that in mind that this is controlling for all of these factors, including population and counties and all of these things.
Q I think I understand it. So we've been talking about the Democratic and Republican incumbents. I think we've gone over those. And then the county, what exactly is the county effect?
A Well, there are different areas of the county that may have particular political dispositions that these don't capture and it was -- struck me as prudent to put this in. You can see most of the effects are actually not significant, and even the effects on which you would think of the most Republican and most Democratic districts, like the effect in Washington County, Waukesha County, Ozaukee County, Dane County, Milwaukee County, those are all not significant, but it gives me a little more analytical leverage to include those.

Q And what page?
A We're looking at the coefficients on Page 6 and 7.
Q It's the same that these ones that are bolded are the ones that have a significant -- statistically significant effect?
A Correct.
Q So then you mentioned Dane and Milwaukee and Washington. And those are not bolded, that's the way you reference it?
A Right. That means once you take into account all these other variables, being in Dane County does not have an independent effect on the Republican presidential vote.
Q So just going back to Page 10 and 11 -- 11, I guess, in this -- should I call it an equation?
A Sure. Or model.
Q Model. Which elements take the actual votes cast in -- for the assembly candidates in that district -- as maybe I should say you applied this model to several different -- to Act 43 actual elections and then to your demonstration plan. I'm kind of focusing on the Act 43 since there's no actual elections under your demonstration plan.
When looking at Act 43, which elements of this model take into account the actual votes cast for the

particular candidates in an assembly district?
A I would say they all do because the actual vote is the dependent variable. So these all reflect the estimate of the effect these variables have on the actual vote. So in that sense, they are all related to what actually occurred in the -- in contested districts.
Q But in terms of actually like plugging in the numbers of Candidate A in District 1 got 12,000 votes and Candidate B in District 1 got 15,000 votes, where do those numbers go into the equation?
A They go in on the left-hand side.
Q The assembly vote?
A Right.
Q Where you add up total votes Republican and total votes for Democrats?
A Well, again we'd need to be precise here that the dependent variable is the ward level totals. So I'm not adding anything up there. And that the model estimates the effect of all of these independent variables on the actual vote. So in that sense, they are all connected and they all are a function -- all of the estimates are a function of the actual vote.
Q Let's go to something else quick. Page 40, there's like Figures 10, 11 and 12. I'll just ask you some

questions on those, but you can look at them to familiarize yourself.
A Okay.
Q So we'll just start at Figure 10 and it says actual 2012 Republican Assembly vote in Act 43 districts. What did the numbers in Figure 10 represent?
A This is a histogram that shows the distribution of the actual results. And the way that you would look at -- so the X axis here is the Republican vote percentage in 2012 going from zero to 100 and what this shows is that the left-hand bar, the one with the 23, that is 23 districts in which there was no Republican running, so that Republican vote percentage shows up as zero.
You look at the right-hand side where there's the bar with the 4, that shows that there were four districts where there was a Republican on the ballot but no Democrat. And so the rest of these figures show that, for example, there was one -- this is just the Republican votes.
If you looked at the Democratic vote, it would be the mirror image of this. There was one district in which the Republican got between 25 and 30 percent of the vote, nine where the Republican got between 40 and 45 percent. The bold vertical line is 50

percent, so everything to the right the Republican won, everything to the left, the Republican lost. And this shows you that there were a large number of Republicans who won with between 50 and 60 or basically between 50 and 65 percent of the vote.

I counted 51 Republicans won with between 50 and 65 percent of the vote. So this shows the distribution of the actual results.

Q And the percentage of vote, is this like we'd been talking about before, the two-party vote, or is this just like the top line number?

A I believe this is the percentage of the two-party vote.

Q So someone might have got 47. -- or 49.8 percent, but they would actually be counted as above 50 percent because once you look at if they won the seat, they would have gotten more than 50 percent of the two-party vote? And it's like a hypothetical of a guy -- you know, a close race where there's 48 to 49.6 and then there's scattering.

A It is possible that if someone got 49.9 percent of the vote and the Democrat got 48 percent and there's someone else with that extra, it's possible that that could move someone over 50 percent, but I don't recall that there were any -- certainly not many

examples of that.

Q And then going to Figure 11, it says Republican vote forecast in Act 43 districts-Gaddie measure. What does this represent?

A This is estimates that the expert that was hired in the 2012 redistricting case, he did an analysis for the -- I guess we'll call them the defendants. I don't know if that's the right term -- where he derived his own estimate of what the results would -- like what the partisanship would be and the projected Republican vote in the Act 43 districts and laid along the same axis. So you can visually compare them.

Q And then going to Figure 12, it says Act 43 baseline partisan measure. What does that recommend?

A This is the numbers that came out of the regression model. It gave me estimates of the number of votes that were cast, and from that, I extracted the incumbency advantage. So the baseline partisanship is an estimate of what the vote would be in an Act 43 district that was contested with no incumbent.

Q And this reminded me of something I forgot to ask on your model. What elections went into looking at the baseline for you to determine the baseline partisanship of the districts? Did you just look at

the 2012 election results, or did you look at past elections as well?

A I used the 2012 election results.

Q And so if we look at Figure 12, that's your calculation of the baseline partisan measure based on the 2012 election results?

A Correct.

Q I was going to get to Table 9, which is on Page 52 -- no, sorry. Table 8. Table 8 on Page -- how you calculated the efficiency gap for Act 43.

A We're on Page 50?

Q 50, yeah, sorry. I misspoke. Why don't you just generally explain what your -- what the calculations you did on Table 8.

A So this reflects my -- the results of the model which I used to produce estimates of the votes that -- the underlying partisanship of the votes. It's basically the model applied to Act 43 districts extracting the incumbency advantage.

The reason I did that is I wanted to have a uniform basis of comparison with my demonstration plan, the results produced by Professor Gaddie, and compared it to the underlying partisanship of the Act 43 districts. So the predicted Democratic and Republican votes are the model estimates of what the

votes would have been and if the race was contested and when there was no incumbent running.

So this is a way of correcting for the -- how to deal with uncontested races because we know in an uncontested race that even if there's no Republican on the ballot and the Republican gets zero votes, that doesn't mean there are no Republicans in the district. So it's necessary to correct for that. And so this is the -- each district from 1 to 99 has a predicted Democratic and Republican vote total which is produced by the model.

It predicts the winning party, which is simply which candidate gets the most votes, and then it goes through and calculates the efficiency gap for each district, the lost -- the votes for the losing candidate are lost, the surplus votes or the votes in excess of what is necessary. So the efficiency gap has two categories of wasted votes. There are lost votes and there are surplus votes, that the lost votes are the votes cast for the losing candidate. The surplus votes is one-half of the margin of victory for the winning candidate.

You would add up the surplus and wasted votes or the lost and surplus votes for Democrats and Republicans and you can -- and then you basically add

those up across all districts and the difference between the wasted Democratic and wasted Republican votes gives you a net wasted votes which when divided by the total number of votes cast gives you the efficiency gap.

Q I'm going to mark a document.

(Exhibit 5 is marked for identification)

Q And I've put before you Exhibit 5. What this is is there was a document that your counsel provided called -- it was a spreadsheet called Efficiency Gap Calculations, and there were several tabs in that Excel spreadsheet, and then this was the one that was labeled Act 43 Direct. So it had a lot of columns, so I printed out on legal size paper here, but I think it matches up with the calculations done on Table 8 in terms of the -- you can check that over to make sure I gave you the right document.

A So this looks like the spreadsheet I used to generate this table.

Q Okay. So I was just going to ask you some questions on the spreadsheet and the columns and just what they are. So obviously district is the district and then there's Pop, what does that mean?

A That I believe is the population of the district, total population.

Q And then there's a column that says Dev, do you know what that --

A That's deviation, which is the difference between the population and the ideal population, which I believe is 57,444. Yeah, that's what it is.

Q Okay. And then percent?

A The percent deviation.

Q And then there's dhat_open. Do you know what that --

A So typically when you're dealing with an estimate, you use -- if you were to write it down, it would be a D with a caret over it, so dhat, rhat. So that was how I identified that it was a predicted value, and then open reflects the fact that it assumes -- it's an estimate after the incumbency advantage has been extracted. So it assumes that the seats are open.

Q So that -- you see that 16.235 is what's listed on the Table 8 as predicted Democratic votes?

A Correct.

Q And so that column is what your model predicts would be the Democratic votes in the Assembly District 1?

A Correct.

Q The Dem percent, what does that mean?

A That's the percentage of the Democratic vote of the two-party vote. Basically you add up the Democratic and Republican vote and you divide the Democratic

vote -- or you divide each party's side by that total and that gives you the percentage of the two-party vote.

Q And it says rhat_open. I think I know what that means, but you can explain it.

A That's the estimate of the number of votes that a Republican candidate would receive in a contested race with no incumbent.

Q And then I would think Republican percentage, that's the baseline --

A That's the Republican share of the two-party vote.

Q Okay. And then D Lost?

A So that's -- I think those just matched the lost Democratic, lost Republican, surplus Democratic, surplus Republican, the total of the Democratic and Republican wasted votes.

Q All right. And then Rep Win, it says 1, I take it that means the Republican would win that district?

A Correct.

Q How is the R surplus determined? I was trying to figure that out by just adding and subtracting these numbers, but I wasn't quite sure how it worked out.

A It should be that if you subtract the Republican vote from the Democratic vote in District 1, for example, that gives you 383 -- 393, I believe that's right.

So that gives you 393, the margin of victory, you divide that by two, which gives you 196.5, which I rounded.

Q Okay. To 197, all right. And so for every one of these districts, we can just do that same calculation and we'll get that R wasted or the D wasted if they're the winner?

A Correct.

Q Okay. Now, so if we look at the District 1, you can look at either the spreadsheet or the table, this is a pretty close election, correct, in that there's 197 surplus votes?

A That's a close election.

Q Okay. Then how would you characterize the seat as like a toss-up seat or a swing seat, or is there a name that you characterize kind of a 50-50 seat like this?

A It would be accurately characterized as a toss-up seat.

Q Okay. Now, I take it if the surplus Republican votes, it's only 197, if this election goes a little bit differently in real life rather than in the model and the Democratic candidate wins narrowly, then these numbers flip in the sense that the Republican is going to have 16,000-some wasted votes and the

Democrat is going to have a narrow number of surplus votes?
A Correct.
Q Okay.
(Exhibit 6 is marked for identification)
Q I put before you Exhibit 6, which is a printout from the Government Accountability Board website, and this is the 2012 fall general election final vote totals from the GAB website. So if you could flip to -- I printed out the entire thing because I just figured we should have the entire document, but the assembly districts start --
MS. GREENWOOD: Page 8.
Q 8, okay. So if we look at Assembly District 1, on the official results, the actual results were Gary Bies, I think the Republican won with 16,993 votes at 52.27 percent and then Patrick Veeser I believe is a Democrat. He lost at 48.65 percent. So I guess what I'm trying to say is the actual election results, the 69.83 is not the number that you have here for the Republican votes in Assembly District 1?
A That's correct.
Q And then also the 16,124 is different from your predicted Democratic votes?
A That's correct. Again this table is based on

estimates of what the vote would be.
Q Okay. So why did you use estimates instead of the actual vote totals?
A Because in extracting the incumbent advantage, I concluded that it was best to use a consistent methodology rather than picking and choosing and applying one method in this district, one method in that district.
And again this is consistent with what Professor Gaddie did, and I wanted to make sure that I had a consistent methodology that I applied to Act 43 and the demonstration plan because in the demonstration plan, we -- that's based on a hypothetical set of results in a different plan and wanted to make sure that I was applying a consistent methodology and consistent judgment in making comparisons across the two plans.
Q And but Act 43 elections did take place with actual incumbents running, correct?
A That's true.
Q So when you look at the actual vote totals cast in the assembly districts, they reflect whatever measure of incumbent advantage any incumbent had?
A That's true.
Q Now, in your predicted Republican vote total, 16,628,

is that created just by looking at 16,993 and subtracting out an incumbent advantage?
A No.
Q So it is 16,628 is produced by that model we went through earlier that had the number of different variables --
A Correct.
Q -- on Page 10 and 11?
A Correct.
Q We don't need to go through them all again.
A But again after extracting the incumbent advantage. I actually don't know sitting here whether Gary Bies was the incumbent in District 1.
Q Yeah, perhaps he wasn't. Now, subtracting out the incumbent advantage, that ends up reducing the wasted votes for any incumbent who won, is that correct?
A It would -- extracting the incumbent advantage would reduce the number of votes for the incumbent, so it would have the effect of reducing the number of surplus votes.
Q And then this is like -- am I correct in saying that this is a zero sum gain with respect to the Democratic and Republican votes in the sense that by reducing the Republican incumbent vote, you would increase the Democratic losing vote?

A Well, not necessarily.
Q Why not?
A Because again working from the model estimates that if you reduce the number of Republican votes for the incumbent, that doesn't increase the number of votes that the Democrat gets.
Q Well, I thought that your model, though, used the total votes for Assembly District 1 would be the total two-party votes cast.
A Correct. But if I did that and extracted the incumbency advantage and basically moved from -- I'd have to double check this, but if I extracted the incumbency advantage, you only do that for the incumbent. You don't -- extracting the incumbency advantage reduces the number of votes that the incumbent would get. I would have to go back and look at the results, but --
Q But your model assumes -- or maybe I'm wrong. In Assembly District 1, for example, there's 16,993 votes for the winner and 16,124 votes for the loser. Is your total turnout model, so to speak, like total number of votes that are going to be cast in Assembly District 1 adding up 16,993 and 16,124?
A No.
Q Okay. What does the total turnout model mean?

A Well, the total turnout is the predicted number of votes that would be cast and it's going to be different than the actual total. It's going to be very close. I think in this one I was off by 350 votes, which that's pretty good. But so let's go back a step here. If we look at the regression results on -- I'm on Page 21.

So these are the substantive variables. So if you look at the effects of incumbency for the Democratic and Republican Assembly incumbent that you can see that those -- the coefficients are -- the coefficient for Democratic Assembly incumbent is positive for Democrats, .028, negative for Republican votes, minus .021.

Now, those numbers are different. They're not the mirror image of each other. They show that the number of votes that the Democratic Assembly candidate gets is higher when the Democrat is a Republican, they get more Democratic votes and fewer Republican votes. In extracting that advantage, you use this -- the results of the model to generate the results, but you set both of these equations, both of these coefficients to zero.

So that means that you are -- you are, in fact, when you subtract the incumbency advantage, it has

the effect in a race with a Democratic incumbent, that reduces the number of votes that the Democratic candidate gets. It increases the number of votes that the Republican candidate gets, but those numbers are not equal. It's not like you take 100 votes.

It depends on what the coefficients are, and so it would affect both totals, but it's not you're taking marbles from one jar and transferring them to the other. It depends on what the underlying data show.

Q That makes sense.

A Okay.

Q But there would be some sort of, so to speak, like reduction for the incumbent and bump for the non-incumbent candidate, but we can't say that they're equivalently sized?

A Correct.

Q Do you have an opinion as to whether your baseline partisanship numbers for all of these districts would hold also for the 2014 election?

A I think that they would be similar. I don't know how they would line up exactly. The reason I have some confidence that they would be similar is that my -- if you look at my estimates using 2012 data to generate the estimate of underlying partisanship,

that's based on the 2012 election and measures of underlying partisanship.

When Professor Gaddie did his underlying partisanship estimate in 2011, he did them -- he did not have the 2012 election results. He had previous election results, 2010, 2008, 2003. And he did it in a different way. It is analogous in terms of what he's trying to measure, but his methods were slightly different than mine. If you look at -- so you look at Page 30, which is Professor Gaddie's baseline partisan metric plotted against mine. You can see that there are some differences, but they are very strongly related in that the correlation, the R squared between these two measures are .96, which is almost perfect.

And my conclusion looking at this is that we are measuring the same thing in that the fundamentals of the districts do not change even when the actual votes that might be cast in an election do change. So it is likely that the -- well, these numbers would be different if you used 2014, but that's a separate problem. You could not -- you couldn't take this model and simply say we're going to plug in the 2014 numbers and get what the -- see what the results are.

But my conclusion is that this model is an

accurate measure of the underlying partisanship of the districts that were created in Act 43.

Q So do you think the partisan gerrymandering should be based on underlying partisanship of the district or based on the votes that were actually cast in the legislative elections?

A It's hard to give a clear answer to that because it depends on what you're measuring. Now, looking at the actual results gives you one indication of what happened. But as I explained here and is well-known in the discipline that there are other things that you need to look at, in particular, trying to deal with the question of uncontested districts.

Q What's the margin of error for determining the baseline partisanship of the district?

A So my -- with the Act 43, I would have to go back and look at the standard error of the regression, but it's probably on the order of plus or minus one and a half percentage points. I'd have to look specifically, but these are very precise estimates. It's not a large margin of error.

Q Although for determining the efficiency gap for districts that are somewhere between 48 and 52 percent, that 1.5 percent margin of error could flip a district from one to the other, can't they?

A Possibly. But the margin of error is not a uniform thing that anything that's within the margin of error means that you don't know what the answer is. That the farther away you are, the less likely it is that the actual number is -- that as you move away from the point estimate, the likelihood that the number being that far away goes down considerably.

So in a 49 percent -- in a 51-49 percent district, the margin of error suggests that there is some likelihood that the actual number is different, and it is not impossible that that actually might be 51-49, but that's not equally likely. You can't say that, oh, the margin of error is 1.5 and the -- my estimate is a victory margin of 1.5 percent, so it's a coin flip. That's not how you calculate the probabilities.

Q Sure. But a district like that wouldn't be a guaranteed win for the party that had districted it to be 51-49 percent Republican, is that correct?

A That's correct. That would be a competitive district.

Q Now, you calculate the percentage of the districts out to like 49.402 percent.

A Um-hum.

Q Do you think that it is possible to get the

partisanship down to like hundredths and thousandths of a percentage?

A Well, that's the results of the number, and as you will see, I rounded that to I think one or two significant digits. I'm not sure what the actual figures are. Now, that's not suggesting that I think you should measure that out to the 100,000th. That's a function of the way that Excel calculates the numbers and you look at that. So you clearly would have to round that.

MR. KEENAN: Off the record.

(Discussion off the record)

(Exhibit 7 is marked for identification)

Q Can you read it okay, Mr. Mayer?

A Yes.

Q All right. Because I think I can get an electronic copy up here if we need to blow it up, and I think the numbers are also somewhere else too here.

MR. KEENAN: I will also mark this right away as Exhibit 8.

(Exhibit 8 is marked for identification)

Q So my first question is going to be do you know what Exhibit 7 is? That's the color copy.

A Yes.

Q What is that?

A This is a chart, a table that was produced by Professor Gaddie which analyzed the projected partisanship of the districts in the map of -- the Act 43 districts.

Q Okay. And I'll explain what Exhibit 8, what I did is the same thing I did with Exhibit 5 is I printed out the tab of your spreadsheet that was titled Gaddie Metric that was at the top there on the wasted votes or maybe it was called Efficiency Gap spreadsheet and if I compare, I was just comparing -- if you look at Exhibit 7, the third column is the new and it has a list of percentages, like the first one is 51.22, and then if you look at the Gaddie Metric spreadsheet, there's a rep percentage column and that has .5122 and if I go down, it looks like it's matching up.

A Correct.

Q But let me know if you disagree. So maybe I could just have you explain what you did in the Gaddie metric wasted vote calculation.

A So if I recall, and I would have to look at the math, so what Professor Gaddie produced was a map of percentages, sort of his estimate of the underlying partisanship of the district. In order to generate an efficiency gap calculation that is consistent with what I did in the rest of my report, I needed a

method of converting those percentages to actual votes.

And so what I believe I did, and I would have to go back and double check, but I believe what I did is looked at the total number of votes for the Democratic and Republican candidates that my model generated. So that gives me a total. So we would add up the Republican and Democratic votes in District 1, that gives me the total number of votes, and then I applied the percentages in this chart to that number to give me a distribution of the number of votes. And I think that's what I did.

And then I used the predicted Democratic and Republican votes to replicate an efficiency gap calculation that I could then compare with my metric.

Q Okay. So if I understand correctly, the Republican percentage column is just taken straight from Professor Gaddie's numbers in Exhibit 7?

A I believe that's true.

Q Now, the corresponding Democratic percentage, is that -- would that just be 100 percent minus whatever the Republican percentage is?

A That's correct.

Q So this again is a straight two-party vote

calculation?
A Right, which again is consistent with how the problem was handled in the literature.
Q And then in terms of the predicted number -- the total number of votes, obviously you needed to apply the 51.22 percent to a total vote number to get to the Republican vote total. How did you come up with like the total number of votes in this district?
A As I mentioned, I believe what I did is -- we can actually check this if you would like. I believe that the total number of Democratic and Republican votes is the same in this model. Or in here, I think I took that in the total that I generated in my model to come up with an estimate of the total number of votes, and we can check that if you'd like.
Q Okay. I can look at that, too, over the lunch break. Now, Professor Gaddie himself, though, to your understanding did not make projections of the expected turnout in the 2012 elections when he did this chart in Exhibit 7?
A I don't believe he did, but I don't know for sure.
Q Okay. And then how is -- you've gone into this a little bit before, but what's your understanding as to how Professor Gaddie arrived at his Republican percentage there?

A So my understanding as he described it is that he looked at past electoral performance in certain elections, and I don't recall precisely which ones that he looked at, and he concluded that that was an effective way to come up with an accurate estimate of the partisanship. So my understanding is that is how he generated these numbers.
Q Okay. And then where did your understanding of how he did this come from?
A From his deposition in which he described his methods and the different files that he produced that I was able to examine.
Q And that's the deposition from the Baldus litigation?
A See, the problem is that the Baldus vs. Brennan -- there's so many B's in these cases.
Q Baumgart, yeah.
A To be precise.
Q Okay. So here's your report. And in your report, the Gaddie metric calculation is at Table 9, I believe, which is on Page 52. And just to confirm, so the way that the wasted votes were calculated was the same way that we went over with respect to the Act 43 calculations?
A Yes.
Q All the losing candidate votes count as wasted and

then the surplus votes is the differential divided by two?
A Correct.
Q Now, it's not your testimony that Dr. Gaddie himself went ahead and performed any sort of calculation like this?
A Not that I'm aware of.
Q Okay. Basically what you did is you took his underlying baseline partisanship numbers and plugged them into -- I guess you didn't plug them into your model, but you applied them to the total votes produced by your model?
A Correct. I'm glad you rephrased that -- that was very nicely done.

MR. KEENAN: Actually I think I'm at a good stopping point to go to lunch and then come back.

(Lunch recess is taken)
(11:18 p.m. to 12:19 p.m.)

Q We're back on the record after lunch. Let's just go back to some of the stuff we were talking about before lunch. One was uncontested seats and we had talked a little bit about how those were handled. I just wanted to look at first maybe just generally explain for any of the Act 43 calculations that you

did how your model predicted the votes in an uncontested race.
A So the model itself utilized data from contested districts. I think there were 72 contested districts. And all of the independent variables, the incumbency, the presidential votes, demographics, the county fixed effects, those are all exogenous to the characteristics of any particular district.

And so I was able to use the relationships that the model produced in the 72 contested districts to create evidence of the uncontested districts because we still have a presidential vote, we still have the ballots cast for both the Republican and Democratic presidential candidates. We have the demographics. So I essentially developed a model using the contested districts and then applied the results of that model using the values of the independent variables in uncontested districts to generate the vote, the estimated vote totals for the uncontested districts.
Q Okay. So in terms of the total number of votes that would be cast in an uncontested race, how is that determined?
A It was a function of the number of votes cast in the presidential, so the turnout is related to that, but

again the nature of that relationship was a function of the relationship that you observed in contested districts.

Q Okay. And so the number of total votes that you see -- that your model predicts between both of the parties' candidates, is that going to be greater than the total number of votes that the candidate received undefeated?

A So can we find --

Q Sure. I was thinking maybe we could look at your exhibit, Table 8, Page 50. And if you want to for reference go to Exhibit 6, I think District 8 is the first uncontested one. And then 9 and 10 I think are uncontested. And if I look at the votes for District 8, you know, Jocasta Zamarripa received 78-69 votes.

MR. STRAUSS: I'm sorry, I missed it. Where are you?

MR. KEENAN: Sure. It's Page 10 of Exhibit 6. So it's Assembly District 8.

MR. STRAUSS: Okay, thanks. Yes.

Q So there is 78-69 votes for the uncontested Democratic candidate and then I see that -- looks like there's about 9,000 estimated votes for your Act 43 calculation.

A Okay.

Q So maybe just explain like what -- how you end up with 9,000 votes here when there was 7,800-some cast.

A I don't see 9,000 votes. Where are we?

Q If I look at No. 8, I see predicted Democratic vote, 73-42, predicted Republican vote, 1,738.

A I see. So again the no incumbent baseline is the estimated partisanship of a contested race with no incumbent, and then in this District 8 is -- I believe Zamarripa was the incumbent. The reason that -- so basically the fact that there was no Republican on the ballot in District 8 doesn't mean that there were no Republicans in the district.

If you looked at the presidential vote, you would see that Romney did get some votes in that district and so the no incumbent baseline is an estimate of what the votes would have been had that race been contested and had there been no incumbent.

And so a couple of things are going on here. One is that turnout will go up in a contested race as opposed to in an uncontested race because those 1,700 people who would have voted Republican under my model, they have no Republican to vote for. And so the most common thing for them to do is simply to abstain, and that's one of the reasons why you see

almost invariably lower turnout, sometimes much lower turnout in an uncontested race rather than a contested race.

So that explains the reason why my model estimates that there would be 9,000 votes cast in a contested race with no incumbent as opposed to the result which was an uncontested race with an incumbent.

Q Okay. And then when we go to the Gaddie calculation, did you take, for example, the total number of votes, you know, the 7,342 and 1,738 equals -- there's a certain amount of total turnout in that. Did you then just apply Gaddie's percentages to that number?

A I believe I did. I'd have to sit down and do the calculations. My recollection is that's the way that I calculated the total number of votes is using the estimates generated by my model and as for the totals in applying them to Professor Gaddie's calculations.

Q Did your calculations for the efficiency gap for Act 43 have any instances where the model predicted a winner from the wrong party?

A There were I believe two instances where the model picked the wrong winner and I explained -- there's a table and it shows -- I think those two races, it was, you know, the winner got between 50 and 51

percent, 52 percent. They were both very close.

Q So how was that handled? Did the wasted vote calculation proceed on the basis that your model was correct, or did it flip that, so to speak, to show who actually won the race?

A When my model -- I used the results from my model. I didn't go back and manually correct the errors. The results are what they are.

Q Did you do an efficiency gap calculation for the 2014 legislative elections?

A I did not.

Q Is there any reason why you did not?

A A couple of reasons. One is that I concluded that the presidential year was the -- was going to give you the most accurate estimate of the underlying partisanship. And that's what's typically done for trying to assess a redistricting plan.

I had Professor Gaddie's estimates that he produced of what he anticipated what the results would be. And doing -- repeating the results for 2014 was actually a very involved process. It's not sitting down and saying, oh, I'm going to just change this number and punch a button. It would take quite a bit of work to do that.

But I did 2012 because in my view that the first

election after redistricting is going to give you the -- an accurate estimate of the effects of that redistricting plan.
Q Now, coming at the next redistricting in 2020, the first election is going to be a nonpresidential year, correct?
A Correct.
Q So if a court has to do this next time around, should it wait until a presidential year? Should it look at the 2022 year?
A Well, so in 2022 would be a nonpresidential year, so I would -- I mean it's hard to know precisely, but in that election, I would probably -- I don't know for sure but would be interested in what would happen in the first election after redistricting.
Q Now, the turnout -- the total turnout number is a lot different between the presidential year and a nonpresidential year, correct?
A That's correct.
Q Okay. Please explain how it differs.
A Well, it's well-known the empirical pattern is significant, that there are more people who vote in the presidential year than in a midterm election because without a president on the ballot, interest in the campaign is less and so there's no question

that the number of people who vote in a midterm election year is going to be lower than the number who vote in the presidential election year.
Q Is the difference in turnout going to drive a difference in efficiency gap calculations?
A Probably.
Q And do you know how much?
A Judging -- I have to go back and look at Professor Jackman's report that the efficiency gap was lower in 2014 than it was in 2012.
Q That leads me to one question which is you're familiar with Professor Jackman's report, correct?
A I've read it, yes.
Q And he calculates the efficiency gap in a different way from you, correct?
A In some ways, yes. The underlying concepts are similar, but the precise methodologies were different.
Q Okay. So explain to your understanding what his methodology was.
A So my understanding of his method is that he used what is in terms of the formula for the efficiency gap an equivalent mechanism of calculating it, which is a formula which looks at the percentage of vote and the percentage of seats, and that's how he

generated that, whereas I went through on a district by district basis looking at the actual number of votes.
Q Can you explain for me how those two different calculations yield basically the same end result?
A Because the reason they yield the same or very similar results is that they're both measuring the same thing, that the seat share and vote share calculation is the equivalent of what you would get if you did the district by district calculations with equal turnout. And my method was to look at district by district and actually counting the votes, and I did that for two reasons.

One is that I had the data available to do it. The second is that in the second step of my analysis, I was going to estimate what the partisan effect would be under an alternative district configuration. And if I was just looking at the percentage, there was no way to know what would happen if you have a district that's 47 percent-53 percent, if you changed the boundaries so the district is different, there's no way just looking at the percentages -- there's no way to calculate or estimate what the vote would be in the alternative district. For that you needed a measure of actual votes.

But that measure is not necessary if all you were interested in doing is calculating the efficiency gap, and that is why his estimate and my estimate are very close.
Q So you mentioned assuming equal turnout, I think was the phrase?
A Correct.
Q Could you just explain what that means?
A Well, so one way of doing the efficiency gap is that you just look at the percentages in each district without looking at the votes, and by looking just at the percentages, you are making an assumption that turnout is going to be equal in every district, and that way, that is mathematically identical to doing it as he did, which is using the seats and votes.

In looking at the actual votes or, more properly, the estimated votes, I'm able to take advantage of the fact that in this case, I can derive estimates of the numbers of votes that are cast in each district, and it gives me a method of calculating the efficiency gap that I can compare to an alternative district configuration such as my demonstration plan.
Q So if I'm understanding, equal turnout means it's assuming District 1 has the same number of voters as

District 2 and District 3 and District 4, all the way down the line?
A Correct.
Q Okay. And so then if you know that District 1 is 53 to 47 percent, you know that 47 percent of the vote is wasted on one side and 30 is on the other and then you can come up with a --
A Correct.
Q Okay.
A But having said that, the fact that our numbers are so close means that the fact that he did just looking at the percentages and I did it at the turnout, the fact that those numbers are so close means that they're both estimating the same underlying phenomenon.
Q Does he adjust for the incumbency effect?
A I don't believe so.
Q And the --
A Which is another reason why my efficiency gap calculation for Act 43 is going to be a little bit different because I've already extracted the incumbency advantage.
Q Do you know if Professor Jackman's total statewide vote share, is it actual -- is it the average share in each district, or is it the average of the total

statewide vote? Or is it the same?
A Well, these are questions you probably should direct to him because --
Q Yeah.
A -- I don't know that I'm in a position to get into the weeds about his specific methodologies.
Q Okay, that's fine. Now, out of every 10-year period, there's going to be either two or three elections that take place in a presidential election cycle and two or three that take place in a nonpresidential cycle depending on the decade. Do you think your efficiency gap model accounts for how there might be differences between the presidential election year and the nonpresidential election year?
A Well, the model that I developed was an estimate of the efficiency gap in 2012. And in that sense, you would expect to see similar results in presidential years and similar but somewhat different results in off year elections, and I think here I would defer to Professor Jackman in his estimates of how enduring efficiency gaps are over time.
Q Let's move on. Your report a few times refers to the fact that I believe the Democrats won 51 or so percent of the statewide assembly vote, is that correct?

A I don't think that number is correct, but I would have to check, but I --
Q Well, maybe I should just ask you like how do you in your Act 43 calculation, what would be the way to figure out the total statewide vote share for each respective party?
A Well, based on the model that I did, you would be able to look at the total number of votes cast for Democrats and Republicans and calculate the percentage that each party received.
Q So on Table 8, I guess is the right one, we have the total -- the total predicted Democratic votes, the total predicted Republican votes, we could add those two together to get the total votes and then we would figure out what the percentage was for each of them?
A Right. But again this is for the no incumbent baseline, so this is an estimate of what the vote -- what the baseline partisanship would be without taking incumbency into effect.
Q Now, in the differences between the presidential year and the nonpresidential year, is turnout affected equally in all parts of the state? Does it drop 30 percent everywhere or does it change in different areas?
A That I don't know.

Q The way you calculate the efficiency gap, for example, in districts, the turnout that has actually been seen in that district affects the total number of wasted votes for each party, is that correct?
A So, I'm sorry, say that again.
Q Sure. So like in -- the number of wasted votes in a district is partly a function of the total turnout in that district, correct, total number of votes cast?
A Not necessarily.
Q Why not?
A Because it's going to be more a function of what the distribution of the votes would be. If you had 100,000 votes cast in a district with a 51-49 split, the efficiency gap would be lower than it would be in an election with 20,000 votes that was 60-40. So it's not -- turnout can be one of the factors that explains it, but it is not the only one and it's probably not even the driving one.
It's the distribution of votes that makes the larger contribution to the efficiency gap calculations.
Q Sure. But in an individual district, if turnout in, for example, a district that is always going to be Republican, one of these uncontested races is very high in that district, that's going to increase the

wasted votes for that Republican candidate, correct, if that's higher than normal? Like, for example, in 2014 compared to 2012, if turnout increases in certain areas, there's going to be more wasted votes for all those winning candidates, correct?

A Well, in the specific example you gave in an uncontested district where the winning candidate gets 100 percent of the vote that if that -- the number of votes goes up, that would increase the number of surplus votes.

Q Okay. And similarly if the turnout is lower than normal in a district, that decreases the number of wasted votes for the winning candidate?

A Well, again in this specific example, yes, but again the dynamic will be very different in a contested race. I'm sorry, can we take a quick break?

Q Sure.

(Short recess is taken)

Q Back from the break, do you have any opinion on the baseline level of partisanship of a district that a party has a realistic chance of winning that seat?

A It's hard to make a definitive statement. The definition of the classification of districts into safe, leaning, tossup, I mean there are some generally used definitions, but they are not -- not

everybody uses the same rule.

Q Okay. So maybe I could get what you think if there is a generally accepted definition, what those are and then what your opinion is on those.

A So in my own work on state legislatures, I had defined as competitive districts that where the incumbent wins with less than 60 percent of the vote, that other people used definitions of 55 percent.

So generally somewhere in the range of 50 to 55, 55 to 60 percent is what is one threshold for classifying a race that is conceivably competitive. It doesn't mean that you can easily have races where an incumbent wins with 57 percent of the vote and that's going to be considered generally safe.

Q Okay. Kind of switching topics a little bit, what factors would a legislature who is going about trying to do a redistricting plan after a census, what would they have to do in order to if they wanted to base a plan on your version of the efficiency gap, what would they have to do to do that?

A So if I understand the question is how would you go about devising a plan that would have a small efficiency gap.

Q Yeah.

A Essentially the way that you would do it is minimize

the amount of packing and cracking that you do. So not excessively concentrating voters of one party into a small number of overwhelming districts, not splitting up voters, I mean so that you would essentially treat voters from the major parties equally.

Q What sort of like calculations do they have to make in order to figure out how well they're doing on that so that after the fact someone is going to come up with these calculations, what would they have to do?

A Well, I mean you would need information as the type that Professor Gaddie did with the likely partisan outcomes are -- that you expect to see in districts or you could use an alternative measure, which is what I did, and use that information in the course of creating the districts and measuring the results.

Q Now, would you have to make some sort of estimate as to how many votes are going to be cast in that next election?

A You could do it that way. It's not necessarily the way. Professor Gaddie did not. I did. So that's one way you could do it.

Q Looking at some -- your report, it mentions a specific example of packing and cracking on Page 41, I believe.

A 43.

Q It starts at 41 about Sheboygan, the City of Sheboygan and then it continues on, yeah, 43. So if I have it correctly, under the prior plan, the 26th Assembly District was -- it contained the City of Sheboygan itself in its entirety and also some of the surrounding areas?

A So in the 1992 and 2001 redistricting rounds, the city was entirely contained in a single assembly district.

Q And then in the most recent one, that was the 26th District?

A Well, the most recent was the 26th District entirely contained in the 26th in the 1992 and the 2001 rounds.

Q And then in the 2010 round, the 26th includes part of the City of Sheboygan, but you're saying it's cracked also into the 27th District?

A Correct.

Q Okay.

A So this is a classic example of cracking because you have a jurisdiction which was small enough to be included in a single assembly district, which it had been for 20 years. It's a Democratic city. I would classify it as reasonably strongly Democratic. My

calculation showed that if the entire city was in a single assembly district, it was very likely to result in a Democratic district, but you by splitting it, you take a portion of those Democrats or a portion of those -- that Democratic partisanship and you split it into two districts where they don't come close to forming a majority in either one.

So this is quite literally a textbook demonstration of the cracking phenomenon where you have a jurisdiction that you don't need to split and you split it for what appears to be no other reason than to crack a Democratic constituency into two separate constituencies to create two Republican districts.

Q In your version of the City of Sheboygan district, the 26th District under the demonstration plan, what's your baseline partisanship of the district you created?

A Well, I don't know that my baseline plan, that district is named the 26th because the numbering system was a little different, but I would have to go back and confirm, and that's just because what I call the 26th District in my plan may not be the plan -- I could go back and look, but it was -- actually we can even --

Q On 42 you say the result would have been a 54 to 56 percentile?

A Right, but I don't know that that is -- that's probably close to what happened, but -- what I did, but I would have to go back and actually look to get the precise numbers.

Q Okay. In the 26th District in the 2010 election, which party won that district?

A I'm not sure.

(Exhibit 9 is marked for identification)

Q I show you Exhibit 9, which this is the GAB printout for the fall election of 2010. Now, it says error on the first page because, I don't know, that's what it does when it prints out, but if you turn to the 26th District, I mean is it correct that the Republican won that district in the 2010 election?

A I'm looking at this, which is Page 15 of Exhibit 9. It shows that the Republican won by 151 votes if I'm calculating correctly.

Q So you're classifying that as a Democratic district, but under the prior plan, it wasn't impossible for a Republican to win that district, was it?

A Well, by definition that's true because a Republican won it just barely in 2010. But then the Republicans -- the vote percentage went up from 48.9

to 51.3 on the subsequent election.

Q Now, in a 51.3 percent race, it's not impossible for a Democrat to win that race either, is it?

A Not impossible.

Q And then in the 27th, you calculate the baseline open seat partisanship measure at 52.3 percent?

A Well, again I'm not sure that --

Q On Page 42 on your report.

A Let's take a look here. Correct, so my underlying partisanship estimate for the 27th was 52.3. That's the open seat baseline.

Q Okay. And so I mean would you characterize both of those seats as winnable for the democrats?

A I would classify the 26th as potentially winnable. I wouldn't classify the 27th as winnable for the Democrats. Not impossible, but extremely difficult.

Q Okay. At 52.3, it's extremely difficult for them to win that seat?

A As again this is the open seat baseline, I would classify this as difficult for the Democrats to win, not impossible.

Q Okay. Now, what your plan would do, though, it would make one safe Republican district and one safe Democratic district, correct?

A It would --

Q They would be safer, it would be having one district more Republican and one district more Democratic, right?

A I believe so, that's correct.

Q Have you tested any of your demonstration map districts that are narrow Democratic districts, how they would have fared in the 2014 election, whether the Democrats would have actually held onto those seats?

A No.

Q Let's transition into your demonstration plan.

A Okay.

Q How did you go about -- first let me just ask you what computer program did you use to do the demonstration plan?

A I used a GIS program called Maptitude, Maptitude for Redistricting.

Q Is that -- I just don't know, is that the program that the legislators used to draw the Act 43 map?

A I don't know.

Q Okay.

A There are -- the two most commonly used redistricting programs are Maptitude for Redistricting and another one called AutoBound. I don't know --

Q I believe the other one was AutoBound -- from reading

the deposition, I believe it was AutoBound. If there were two different -- if you used Maptitude and they used AutoBound, does that create -- is there any sort of like incompatibility where you can't compare a map drawn from one and a map drawn from the other?
A There shouldn't be, no.
Q How did you go about drawing the demonstration plan?
A So in drawing the plan, what I did was to draw -- to draw a plan that took into account the traditional redistricting requirements, which is population equality, contiguity, compactness, adherence to Section 2 of the Voting Rights Act, respect for political subdivisions, and then going through the map trying to draw it in a way that was balanced between the parties in terms of creating equal opportunities to elect the candidates so that there weren't a significantly different number of noncompetitive seats or a significantly different number of competitive seats. We're trying to treat the voters equally in terms of their creating districts that gave members of each party an equal opportunity to see their votes translated into -- converted into seats.
Q Did you start using a baseline of the prior districts that were in existence, or did you just start fresh?

A With one exception. I left the 8th District alone because that was a district created by the federal court in 2012, and I knew that that district was Voting Rights Act compliant.

The African-American majority-minority districts in Milwaukee I treated similarly to what they were under the plan, which we also knew was compliant. But other than those districts, I started with a blank slate.
Q I believe you said this before, but what's the ideal population of an assembly district?
A So I believe it's 57,444.
Q And is that 57,444 what?
A That is the ideal population as calculated by looking at the total population of the state, dividing it by the number of districts in a legislative body and that gives you the -- in a district plan with perfect population equality, that's the number that you would hit. So that's essentially 57,444 is the total population of Wisconsin after the 2010 census divided by 99.
Q But that includes children who aren't going to be able to vote, correct?
A Correct.
Q And I think you mentioned like felons who can't vote?

A Correct.
Q And then does the 57,444 include noncitizens?
A The way the census calculates it, it's everybody.
Q Okay. So it's just 57,444 people are the voting numbers, but the number of eligible voters will be different than that?
A Yes.
Q Okay. How many districts did you draw that contain any part of the City of Milwaukee?
A I would have to look at the map. I could tell you I don't know off the top of my head.
Q Do you know how many you did that concluded -- included any part of the City of Madison?
A I would have to check. I don't remember off the top of my head.
Q And do you know how those compared -- even if you don't know the number, do you know how it compared in terms of comparing it to Act 43?
A I suspect they were very close, if not identical, but again I can't be certain.
Q You mentioned compactness was one of the factors that you looked at, and I know you did a comparison of your plan to the Act 43 plan in terms of compactness?
A Correct.
Q What was the standard you used to measure compactness

of yours?
A I used something called the Roeck standard, which is R-o-e-c-k.
Q What is that?
A The way that the Roeck standard is calculated is you take a district and you place that district inside the smallest circumscribing circle. So you draw a circle that is the smallest circle that contains the entire district, and the Roeck value is the area of the district divided by the area of the smallest circumscribing circle, and it gives you a value between 0 -- you can't really have a value of 0 -- and 1 where 1 would be you actually have a perfectly circular district, but basically as districts with more irregular shapes that are longer will tend to have lower measures on this index.
Q So lower is good or bad in terms of compactness?
A Higher values indicate more compactness.
Q Are there other ways to measure compactness?
A Yes.
Q What are some of the other ways?
A Other ways look at -- there are probably 10 or 12 methods of doing that. There is no universal agreement on which method is the best. One of the reasons I used the method that I did is that in

the -- in 2012, I have the record of that case shows what the Roeck number, the average compactness on the Roeck index is for Act 43. So I was able to compare it directly to that.
Q That was going to be one of my questions. So you got the compactness, the Roeck compactness on Act 43 from the Baldus litigation?
A Correct.
Q Do you know specifically where in that litigation?
A I'm not sure. I think it may have been in the -- there was a report that both parties submitted. It may have been called the Joint Stipulation of Facts. I'm not sure. But it was somewhere in those documents.
Q Okay. Now, as I understood it, it's an average of all the districts?
A Correct.
Q So it would take like District 1 through 29, they each get their own individual scores and then you average those scores together?
A Correct.
Q How did you calculate the Roeck score for your map?
A There's a feature in Maptitude that allows you to generate compactness scores and it gives you an option on it and it was able to do a report that

listed the compactness scores, and I'm pretty sure I put the table in either the annex or the -- yeah, so Page 13 of my annex shows the Roeck scores, the smallest circle scores for the district.
Q Okay. And the average is -- I guess it doesn't say on that table, but it's earlier in there.
A I believe it's .41.
Q And then did you use any of the other manners of measuring compactness to measure your demonstration plan?
A I did not.
Q And why not?
A I had the point of comparison and I didn't see any reason to generate the other numbers because I had nothing to compare them to.
Q Was the Roeck test the only measure of compactness of the Act 43 districts that you recall seeing?
A It's the only one I recall seeing.
Q How did some of the other ways of measuring compactness differ from the Roeck test?
A Well, I'll give you a couple of examples. One measure is the difference between the ratio of the long axis to the short axis of a district. So if you have a district that's very, very long and thin, that would tend to give you a high number as opposed to a

district that was more of a circle or a square.
There is something called the perimeter to area measure, which is you calculate the length of the perimeter of a district, which will be higher with highly irregularly shaped districts with lots of nooks and crannies, and you divide that by the area, and as the perimeter area gets -- or area to perimeter, as it gets smaller, it means the district is more irregularly shaped.
There are a variety of different ways to do this. Generally speaking, and there are lots of exceptions, generally these measures tend to move in the same direction, that if one measure shows a high degree of noncompactness or a high degree of compactness, that it is common -- it's not invariably true, but it's common for different measures to show similar results.
Q How does the Roeck test handle a district that's like, for example, in Wisconsin that's on Lake Michigan?
A So one of the issues of how you calculate the Roeck index for District 1, which is Door County, and you calculate that by looking at the circle and it just is a feature of the geography that there is no way to calculate a highly compact district in that part of

the state.
Q And then would the same hold true, for example, of someone -- it's on a border of another state, Illinois or Iowa or Minnesota somewhere, the circle is going to extend out into the bordering state and there's just nothing you can do about it?
A That's correct.
Q Going to the municipal split, what counts as a municipal split?
A So my understanding of the way Wisconsin counts municipal splits, it's a simple determination is if a district border bisects a city or county, then that municipality is split. That is as best as I am aware and -- actually I can say that a little more definitively, but that is how Maptitude calculates the split. I will give you a report of the number of municipalities that are in more than one district.
Q So just in my head so I have this clear, Milwaukee is going to be too big to have one district, there's going to be like several districts within Milwaukee?
A Right. Correct.
Q But drawing two districts in that doesn't count as a split, right, or does it?
A Will, as I understand, it is a municipality that is split into more than one districts.

Q When you have a number that says there's this many -- I'm trying to find the table where you list the --
MS. GREENWOOD: Page 37.
MR. KEENAN: Which one?
MS. GREENWOOD: Page 37.
Q Okay. Yeah, so I'm just trying to figure out what goes into the 64 city, town, village splits and 55 county splits, and then Act 43 has 62 city, town, village splits.
So if Milwaukee, for example, has like seven districts or six districts, I don't know how many, but does that -- but you need to have that just because of the equal population, you know, like there's nothing wrong with having six districts in Milwaukee, does that count as six splits, or does it count as zero splits?
A No, it counts as one split.
Q One split?
A Yeah. At least that's how I understand how Maptitude does it. The dividing line is whether a municipality is split.
Q But that split is going to happen under anyone's plan, I guess, because you just can't draw Milwaukee into --
A Correct.

Q And the same with some of these bigger cities?
A It would be the same in any larger jurisdiction that exceeded the ideal of population.
Q And then Milwaukee County I guess would be the same thing, that would count as a county split?
A I believe so, yes.
Q And then, now, say that there's a bunch of districts in Milwaukee, but then now we have one district that loops between Milwaukee and Waukesha. Is that still just one split, or is it one county split, or is it now do we have two county splits?
A I believe -- I would have to go back and check -- that that would count as -- it would depend on how many other splits that there were. So if -- because my understanding is that it's not the number of splits that a jurisdiction is put into. It's whether or not it is split. So I believe that that would count as one split.
Q Okay. And then now that we've split Waukesha County at least once, it's now -- it can only count as one split, even once then you could split it with Jefferson -- I don't know what the border is, but some other county on the border, there's still one split?
A Well, but that could also count as a split in

Jefferson County. So Jefferson County, it was possible to place that in a single district and there was a little finger from Waukesha, that that would count as a split in Jefferson County.
Q Okay. And then what about, now going to the smaller levels, like dealing with the villages, if there's a village that can fit entirely within one district, maybe there's two of them even right next to each other and they're totally encircled in a district, that would be zero splits?
A Correct.
Q Okay. But then if -- I guess if one of those districts, half of it is in one district and half is in the other --
MR. STRAUSS: Object to the form. You said two districts. You mean two towns?
MR. KEENAN: Yeah, sorry.
Q Yeah, like two villages -- or, no, sorry. If there's like one village, but then it ends up getting cut in half between two districts, that counts as one split?
A Correct.
Q Okay. But then if that town or village had been carved into three -- instead of two, it had been like divided up into three different districts, would that still be one split?

A I believe that it would still count as one split.
Q Okay. Is there a list that was generated that shows like what are the splits in the demonstration plan like when you run the report or something that gives you that information?
A It does produce a report, yes.
Q But does it just have a number?
A And it shows the locations of the splits.
Q Okay. Do you know if you'd say there's a version of that document or report that would have been produced?
A So I don't know that that was -- I actually submitted that report because what I was interested in was just the number.
Q When you were districting, did you attempt to keep communities of interest together?
A As a rule, yes.
Q So how did you go about trying to do that?
A Well, the communities of interest standard is very subjective and -- but part of that is keeping subdivisions together, but I tried to not have too many divisions or districts that combined vastly different parts of the state to ensure that different regions of the state were kept together.
Q Are you offering an opinion that the demonstration

plan keeps communities of interest together better than Act 43?
A I don't know that I would make the statement that it was better because I made an effort to keep that in mind. But that's a very loose and subjective standard that can be difficult to do.
Q Why don't you turn to Table 7, which is your calculation of the efficiency gap under the demonstration plan?
MS. HARLESS: What page is that?
MR. KEENAN: 48.
Q And I will mark a similar spreadsheet there which is the demonstration plan version.
(Exhibit 10 is marked for identification)
Q And Exhibit 10 is similar to what you've seen before, but I printed out the tab on the efficiency gap spreadsheet, and I think it was titled All Open Seat Data.
A Right.
Q Which I think is what I understood to be the demonstration plan calculations. Is that what it is?
A I believe so, yes.
Q So I guess we can look at either Exhibit 10 or the Table 7 in the report. How did you go about calculating the efficiency gap for the demonstration

plan?
A The same way that I did for the Act 43, that I had essentially block level estimates of the number of Republican and Democratic votes, the demonstration plan was created out of those blocks and so that meant that each district had a predicted number of Democratic and Republican votes which formed the first two columns and then I calculated the efficiency gap in the same way as I did for Act 43, calculating the lost and surplus votes for both parties.
Q Now, for -- if I take it the -- your districts are made out of -- did you define your districts in the demonstration plan based on specific ward numbers in various municipalities?
A No.
Q What were they made up of?
A I made them -- I did not use wards, and the reason I didn't use wards is those wards were actually created after Act 43 went into effect and so if I built the new districts out of those wards, I would be building them using essentially a template for -- that was used for Act 43.
I constructed them where I could out of entire jurisdictions, whether it's counties, municipalities.

Where that was not possible or whether when I created a district that in order to achieve population equality, I couldn't do that, then I worked with census blocks.
Q And then each of your districts is made up of a certain subset of the census blocks and jurisdictions?
A Well, it's a combination of again you can select entire jurisdictions, which can be efficient, and you can also build a district or create the district by selecting individual census blocks.
Q And then for your demonstration, District 1 is obviously different from Act 43, District 1, correct?
A Correct.
Q And so for your District 1, how did you determine the predicted Democratic vote and the predicted Republican vote?
A Once I had generated the expected Republican and Democratic votes at the -- using the original model, I then disaggregated or allocated those ward level results to the blocks inside that ward using the percentage of the voting eligible population in that ward. And so once that was done, I had a file that for each block in the state of the 250,000, 252,000 or so blocks, each block had an expected number of

Democratic and Republican votes again for the no incumbent baseline, and that would allow me to draw a hypothetical demonstration plan and generate estimates of what the partisanship, what the voting would be in those districts.
Q How is the total number of votes in the district determined? For example, I'm just looking at District 1, and it looks like your predictions show about 32,000-some votes. I realize that's a function of some sort of your equation, but I'm just trying to figure out how does it get to that number?
A That's simply adding up the number of Democratic and Republican -- predicted Democratic and predicted Republican votes in each block as you build that block into the district. That's the number that results.
Q Okay. What's your definition of gerrymandering?
MR. STRAUSS: Object to the form of the question to the extent it calls for a legal conclusion. But you can answer.
A So there are a variety of different ways of defining that. As a political scientist, it's most commonly defined as the drawing of district lines in a manner that intentionally provides a political benefit to one party over the other.

Q Do you have an opinion of whether the plan that was in effect in the 2000s assembly districts, whether that was a gerrymander?

MR. STRAUSS: Again object to the extent it calls for a legal conclusion. If you understand the question.

A Yeah, I mean that one was produced by courts and courts generally do not take partisanship into account. At the same time, my understanding of the way that the 2001 plan was drawn is that the judges in that case accepted submissions from the parties.

There were a number of maps the Democrats submitted, there were a number of maps that Republicans submitted and that they incorporated that into their drawing of the map. So the -- I'll leave it at that.

Q Do you know how many times the Democrats have won the Wisconsin Assembly in the last 20 years?

A I could look. I don't know off the top of my head.

Q Does your demonstration plan, would it give them -- give Democrats an advantage in terms of attempting to like control the assembly?

A I would have to look at the results. I'm not sure what the expected -- I think there's a table in there somewhere. Let me look.

So on Page 46 there's a table that shows the summary statistics and it shows that my plan would be expected to produce a 51 to 48 Democratic majority in the assembly.

Q Okay. And that's based off of just looking at the 2012 election data, though, right, your calculations?

A I just want to make sure I give a precise answer. That that's based on the underlying model, which is based on the 2012 election results.

Q Yes, that's sort of what I meant to say. So yes.

A Okay.

Q But thank you for clarifying. And do you know if that baseline partisanship would then hold under an election that -- in like 2014 where a Republican won the highest office on the ballot that year?

A Well, I haven't done the numbers, but it's quite possible that if you did that result for 2014 that it would show a Republican majority, but I don't know.

Q And then just going back to your demonstration plan partisanship model, I'm looking at Exhibit 10, but I guess it's probably the same. The column D percent and R percent are PCT, but I think it's percent, it's about the seventh one in, it says D PCT?

A Okay.

Q And then the ninth one, it says R percent, do you see

those two columns?

A Yes.

Q If I wanted to look at a particular district under your demonstration plan and determine what your view of the underlying partisanship is, those are the two columns I'd look at?

A Correct, if you were interested in the percentages.

Q Yeah. So like, for example, when it says party split, 48 to 51 on Page 46 of your report, that's looking at those two columns and seeing where -- which party's over 50 percent?

A Correct.

Q And just doing this again, I think I know the answer, but those are two party percentages, so just the two-party vote?

A Correct.

Q So someone is going to be 50 percent over in each one of those races?

A Correct.

MR. KEENAN: I think I want to take a break.

(Short recess is taken)

Q Well, back on the record. I just have a few more follow-up questions. Where did you get the number of municipal splits that Act 43 had? Where did you get

that number from?

A I believe I got that from within Maptitude using the same method, but I'm not sure.

Q So you think you imported the Act 43 districts into your Maptitude program and ran a report like that?

A I think so.

Q So I guess if that's the case, Maptitude was using the same measurements?

A I believe so. I would have to go back and double check.

Q Are you expressing an opinion about the durability of the efficiency gap in Wisconsin over the course of --

A I think on that I will defer to Professor Jackman and his report.

Q Very good.

MR. KEENAN: That's all I have.

MR. STRAUSS: Just give us a minute and let us talk and see if we have any questions to ask.

(Short recess is taken)

MR. STRAUSS: So on the record.

EXAMINATION

BY MR. STRAUSS:

Q In your calculations of the efficiency gap, you used what you described as estimates. What do you mean by

estimates?
A So these were -- these estimates were generated by the underlying model, which looked at the relationship between the independent variables that I used in the actual assembly vote and then I used the results of that model to generate forecasts, estimates of what the underlying partisanship was in each of the 99 assembly districts and also used that to generate estimates in the demonstration plan that I drew.

But one thing to note about this model is that it was a highly accurate, you know, with very extraordinarily high R squares, which you rarely see in social science models, so I'm very confident that these are accurate estimates of the existing partisanship and what it would have been in my demonstration plan.

Q And do you consider -- when you use the word estimate, do you -- how would you compare that to using the word guess?
A I'm using the estimate in the statistical sense, that it is a number that is produced through analysis, that there is obviously going to be some degree of error, but I'm confident that that error is very small and in no sense is it a guess.

MR. STRAUSS: Okay. I don't have any further questions.
MR. KEENAN: No further questions.
MR. STRAUSS: We'll reserve signature.
(1:39 p.m.)

ERRATA SHEET

Witness Name: Kenneth Mayer, Ph.D.
Date Taken: November 9, 2015
Case Name: Whitford, et al., vs. Nichol, et al.

Page/Line	Reads	Should Read	Reason

Kenneth Mayer, Ph.D.

STATE OF WISCONSIN)
) ss.
COUNTY OF DANE)

I, LISA A. CREERON, a Registered Professional Reporter and Notary Public in and for the State of Wisconsin, do hereby certify that the foregoing is a true record of the deposition of KENNETH MAYER, Ph.D., who was first duly sworn by me; having been taken on the 9th day of November, 2015, at the Wisconsin Department of Justice, 17 West Main Street, in the City of Madison, County of Dane, and State of Wisconsin, in my presence, and reduced to writing in accordance with my stenographic notes made at said time and place.

I further certify that I am not a relative or employee or attorney or counsel for any of the parties, or a relative or employee of such attorney or counsel, or financially interested in said action.

In witness whereof, I have hereunto set my hand and affixed my seal of office this 14th day of November, 2015.

Notary Public, State of Wisconsin
My Commission Expires: 1/29/17

Act 43 Direct

District	Pop	Dev	% Dev	dhat_open	Dem %	rhat_open	Rep %	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
1	57220	-224	-0.39%	16,235	0.49402	16,628	0.50598	16235	-	-	197	16,235	197	16,038	1
2	57649	205	0.36%	12,398	0.431159	16,357	0.568841	12398	-	-	1,980	12,398	1,980	10,419	1
3	57444	0	0.00%	12,623	0.431425	16,636	0.568575	12623	-	-	2,006	12,623	2,006	10,617	1
4	57486	42	0.07%	13,926	0.472034	15,576	0.527966	13926	-	-	825	13,926	825	13,101	1
5	57470	26	0.05%	12,710	0.442439	16,017	0.557561	12710	-	-	1,654	12,710	1,654	11,056	1
6	57505	61	0.11%	10,929	0.422505	14,938	0.577495	10929	-	-	2,005	10,929	2,005	8,924	1
7	57498	54	0.09%	13,793	0.539399	11,778	0.460601	0	11,778	1,007	-	1,007	11,778	(10,771)	0
8	57196	-248	-0.43%	7,342	0.808608	1,738	0.191392	0	1,738	2,802	-	2,802	1,738	1,064	0
9	57283	-161	-0.28%	10,023	0.688604	4,533	0.311396	0	4,533	2,745	-	2,745	4,533	(1,787)	0
10	57428	-16	-0.03%	25,306	0.897289	2,897	0.102711	0	2,897	11,205	-	11,205	2,897	8,308	0
11	57503	59	0.10%	21,698	0.865628	3,368	0.134372	0	3,368	9,165	-	9,165	3,368	5,797	0
12	57494	50	0.09%	19,700	0.79048	5,222	0.20952	0	5,222	7,239	-	7,239	5,222	2,018	0
13	57452	8	0.01%	13,345	0.39597	20,358	0.60403	13345	-	-	3,506	13,345	3,506	9,839	1
14	57597	153	0.27%	14,499	0.408139	21,025	0.591861	14499	-	-	3,263	14,499	3,263	11,235	1
15	57372	-72	-0.13%	13,006	0.429006	17,310	0.570994	13006	-	-	2,152	13,006	2,152	10,853	1
16	57458	14	0.02%	22,293	0.904922	2,342	0.095078	0	2,342	9,975	-	9,975	2,342	7,633	0
17	57354	-90	-0.16%	24,088	0.856153	4,047	0.143847	0	4,047	10,020	-	10,020	4,047	5,973	0
18	57480	36	0.06%	22,204	0.891874	2,692	0.108126	0	2,692	9,756	-	9,756	2,692	7,064	0
19	57546	102	0.18%	22,759	0.687113	10,364	0.312887	0	10,364	6,198	-	6,198	10,364	(4,166)	0
20	57428	-16	-0.03%	16,066	0.555485	12,856	0.444515	0	12,856	1,605	-	1,605	12,856	(11,252)	0
21	57449	5	0.01%	12,566	0.450565	15,324	0.549435	12566	-	-	1,379	12,566	1,379	11,187	1
22	57495	51	0.09%	11,290	0.329657	22,958	0.670343	11290	-	-	5,834	11,290	5,834	5,456	1
23	57579	135	0.24%	14,260	0.397291	21,633	0.602709	14260	-	-	3,687	14,260	3,687	10,573	1
24	57282	-162	-0.28%	13,885	0.405749	20,335	0.594251	13885	-	-	3,225	13,885	3,225	10,659	1
25	57322	-122	-0.21%	12,032	0.430255	15,933	0.569745	12032	-	-	1,950	12,032	1,950	10,082	1
26	57581	137	0.24%	13,639	0.467121	15,559	0.532879	13639	-	-	960	13,639	960	12,679	1
27	57536	92	0.16%	14,709	0.473423	16,360	0.526577	14709	-	-	826	14,709	826	13,883	1
28	57467	23	0.04%	12,719	0.453914	15,302	0.546086	12719	-	-	1,291	12,719	1,291	11,428	1
29	57537	93	0.16%	12,909	0.468215	14,662	0.531785	12909	-	-	876	12,909	876	12,033	1
30	57241	-203	-0.35%	14,019	0.452666	16,951	0.547334	14019	-	-	1,466	14,019	1,466	12,553	1
31	57240	-204	-0.36%	13,273	0.459469	15,615	0.540531	13273	-	-	1,171	13,273	1,171	12,102	1
32	57524	80	0.14%	11,255	0.422892	15,359	0.577108	11255	-	-	2,052	11,255	2,052	9,203	1
33	57565	121	0.21%	11,226	0.380229	18,298	0.619771	11226	-	-	3,536	11,226	3,536	7,690	1
34	57387	-57	-0.10%	12,445	0.391359	19,355	0.608641	12445	-	-	3,455	12,445	3,455	8,991	1
35	57562	118	0.21%	12,270	0.441447	15,525	0.558553	12270	-	-	1,628	12,270	1,628	10,643	1
36	57432	-12	-0.02%	11,403	0.421178	15,672	0.578822	11403	-	-	2,134	11,403	2,134	9,269	1
37	57507	63	0.11%	12,707	0.439556	16,202	0.560444	12707	-	-	1,747	12,707	1,747	10,960	1

EXHIBIT
Mayer
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LC 11-9-15
PENGAD 800-631-6989

Act 43 Direct

District	Pop	Dev	% Dev	dhat_open	Dem %	rhat_open	Rep %	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
38	57493	49	0.09%	12,668	0.398397	19,129	0.601603	12668	-	-	3,231	12,668	3,231	9,437	1
39	57387	-57	-0.10%	11,491	0.400349	17,211	0.599651	11491	-	-	2,860	11,491	2,860	8,630	1
40	57366	-78	-0.14%	11,485	0.457903	13,597	0.542097	11485	-	-	1,056	11,485	1,056	10,429	1
41	57337	-107	-0.19%	11,719	0.447095	14,492	0.552905	11719	-	-	1,387	11,719	1,387	10,332	1
42	57285	-159	-0.28%	13,705	0.469871	15,462	0.530129	13705	-	-	879	13,705	879	12,826	1
43	57443	-1	0.00%	17,380	0.57068	13,075	0.42932	0	13,075	2,153	-	2,153	13,075	(10,923)	0
44	57395	-49	-0.09%	16,680	0.618152	10,304	0.381848	0	10,304	3,188	-	3,188	10,304	(7,116)	0
45	57658	214	0.37%	15,153	0.609941	9,691	0.390059	0	9,691	2,731	-	2,731	9,691	(6,959)	0
46	57458	14	0.02%	19,173	0.624385	11,534	0.375615	0	11,534	3,819	-	3,819	11,534	(7,714)	0
47	57465	21	0.04%	21,609	0.698214	9,340	0.301786	0	9,340	6,135	-	6,135	9,340	(3,205)	0
48	57506	62	0.11%	24,517	0.762539	7,635	0.237461	0	7,635	8,441	-	8,441	7,635	806	0
49	57346	-98	-0.17%	12,307	0.474661	13,621	0.525339	12307	-	-	657	12,307	657	11,650	1
50	57624	180	0.31%	12,467	0.502844	12,326	0.497156	0	12,326	71	-	71	12,326	(12,256)	0
51	57580	136	0.24%	14,173	0.520666	13,048	0.479334	0	13,048	563	-	563	13,048	(12,485)	0
52	57232	-212	-0.37%	11,294	0.419067	15,656	0.580933	11294	-	-	2,181	11,294	2,181	9,113	1
53	57240	-204	-0.36%	9,875	0.37086	16,753	0.62914	9875	-	-	3,439	9,875	3,439	6,437	1
54	57250	-194	-0.34%	15,180	0.540935	12,882	0.459065	0	12,882	1,149	-	1,149	12,882	(11,733)	0
55	57493	49	0.09%	12,634	0.426748	16,971	0.573252	12634	-	-	2,169	12,634	2,169	10,465	1
56	57582	138	0.24%	12,564	0.403477	18,576	0.596523	12564	-	-	3,006	12,564	3,006	9,559	1
57	57501	57	0.10%	14,387	0.551995	11,676	0.448005	0	11,676	1,355	-	1,355	11,676	(10,321)	0
58	57227	-217	-0.38%	8,843	0.282875	22,417	0.717125	8843	-	-	6,787	8,843	6,787	2,055	1
59	57391	-53	-0.09%	8,784	0.287912	21,725	0.712088	8784	-	-	6,471	8,784	6,471	2,313	1
60	57385	-59	-0.10%	9,848	0.291044	23,989	0.708956	9848	-	-	7,071	9,848	7,071	2,778	1
61	57614	170	0.30%	13,145	0.44369	16,481	0.55631	13145	-	-	1,668	13,145	1,668	11,477	1
62	57345	-99	-0.17%	14,828	0.461406	17,309	0.538594	14828	-	-	1,240	14,828	1,240	13,588	1
63	57365	-79	-0.14%	13,233	0.440164	16,830	0.559836	13233	-	-	1,799	13,233	1,799	11,434	1
64	57270	-174	-0.30%	15,702	0.581374	11,307	0.418626	0	11,307	2,198	-	2,198	11,307	(9,109)	0
65	57455	11	0.02%	15,105	0.655765	7,929	0.344235	0	7,929	3,588	-	3,588	7,929	(4,341)	0
66	57545	101	0.18%	16,162	0.747076	5,472	0.252924	0	5,472	5,345	-	5,345	5,472	(127)	0
67	57239	-205	-0.36%	13,769	0.484078	14,674	0.515922	13769	-	-	453	13,769	453	13,316	1
68	57261	-183	-0.32%	13,663	0.512334	13,005	0.487666	0	13,005	329	-	329	13,005	(12,676)	0
69	57649	205	0.36%	11,083	0.435819	14,347	0.564181	11083	-	-	1,632	11,083	1,632	9,451	1
70	57552	108	0.19%	12,211	0.459086	14,387	0.540914	12211	-	-	1,088	12,211	1,088	11,123	1
71	57519	75	0.13%	17,614	0.60744	11,383	0.39256	0	11,383	3,115	-	3,115	11,383	(8,267)	0
72	57449	5	0.01%	14,294	0.50707	13,895	0.49293	0	13,895	199	-	199	13,895	(13,696)	0
73	57453	9	0.02%	17,353	0.616729	10,784	0.383271	0	10,784	3,284	-	3,284	10,784	(7,500)	0
74	57494	50	0.09%	17,095	0.553832	13,772	0.446168	0	13,772	1,662	-	1,662	13,772	(12,110)	0

Act 43 Direct

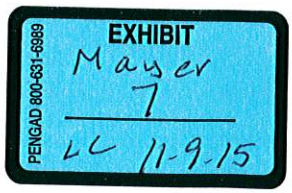
District	Pop	Dev	% Dev	dhat_open	Dem %	rhat_open	Rep %	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
75	57462	18	0.03%	15,000	0.527835	13,418	0.472165	0	13,418	791	-	791	13,418	(12,627)	0
76	57617	173	0.30%	30,939	0.819701	6,805	0.180299	0	6,805	12,067	-	12,067	6,805	5,262	0
77	57433	-11	-0.02%	26,925	0.816763	6,041	0.183237	0	6,041	10,442	-	10,442	6,041	4,402	0
78	57546	102	0.18%	24,163	0.710254	9,857	0.289746	0	9,857	7,153	-	7,153	9,857	(2,704)	0
79	57461	17	0.03%	20,753	0.59759	13,975	0.40241	0	13,975	3,389	-	3,389	13,975	(10,586)	0
80	57585	141	0.25%	20,369	0.617747	12,604	0.382253	0	12,604	3,882	-	3,882	12,604	(8,722)	0
81	57403	-41	-0.07%	16,310	0.56896	12,356	0.43104	0	12,356	1,977	-	1,977	12,356	(10,379)	0
82	57430	-14	-0.02%	12,168	0.402209	18,085	0.597791	12168	-	-	2,959	12,168	2,959	9,210	1
83	57423	-21	-0.04%	10,186	0.300106	23,755	0.699894	10186	-	-	6,784	10,186	6,784	3,401	1
84	57365	-79	-0.14%	12,503	0.399877	18,765	0.600123	12503	-	-	3,131	12,503	3,131	9,373	1
85	57480	36	0.06%	13,613	0.512962	12,925	0.487038	0	12,925	344	-	344	12,925	(12,581)	0
86	57454	10	0.02%	13,425	0.439056	17,152	0.560944	13425	-	-	1,863	13,425	1,863	11,561	1
87	57358	-86	-0.15%	11,780	0.437956	15,118	0.562044	11780	-	-	1,669	11,780	1,669	10,111	1
88	57556	112	0.20%	13,141	0.477489	14,380	0.522511	13141	-	-	620	13,141	620	12,521	1
89	57634	190	0.33%	11,610	0.42801	15,516	0.57199	11610	-	-	1,953	11,610	1,953	9,658	1
90	57608	164	0.29%	12,080	0.623026	7,309	0.376974	0	7,309	2,385	-	2,385	7,309	(4,924)	0
91	57359	-85	-0.15%	17,942	0.603883	11,769	0.396117	0	11,769	3,086	-	3,086	11,769	(8,683)	0
92	57431	-13	-0.02%	14,285	0.555278	11,441	0.444722	0	11,441	1,422	-	1,422	11,441	(10,019)	0
93	57548	104	0.18%	15,268	0.497965	15,393	0.502035	15268	-	-	62	15,268	62	15,206	1
94	57266	-178	-0.31%	17,408	0.573345	12,954	0.426655	0	12,954	2,227	-	2,227	12,954	(10,727)	0
95	57372	-72	-0.13%	19,804	0.672888	9,627	0.327112	0	9,627	5,088	-	5,088	9,627	(4,539)	0
96	57484	40	0.07%	10,950	0.424041	14,873	0.575959	10950	-	-	1,962	10,950	1,962	8,989	1
97	57279	-165	-0.29%	10,826	0.375032	18,042	0.624968	10826	-	-	3,608	10,826	3,608	7,219	1
98	57513	69	0.12%	10,182	0.317822	21,855	0.682178	10182	-	-	5,837	10,182	5,837	4,346	1
99	57496	52	0.09%	8,346	0.246334	25,535	0.753666	8346	-	-	8,594	8,346	8,594	(248)	1
				1,454,717		1,389,958		702,148	401,975	175,297	142,918	877,445	544,893	332,552	57
														11.690%	

Final Map

Assembly				Senate			
DISTRICT	Current	New	Delta	DISTRICT	Current	New	Delta
1	51.15%	51.22%	0.07%	1	54.04%	53.73%	-0.31%
2	54.93%	54.84%	-0.09%				
3	56.10%	55.58%	-0.52%				
4	53.31%	53.47%	0.16%	2	55.44%	55.23%	-0.21%
5	53.74%	54.28%	0.54%				
6	59.77%	58.33%	-1.44%				
7	48.20%	45.38%	-2.82%	3	40.52%	38.12%	-2.40%
8	22.39%	30.48%	8.09%				
9	36.73%	29.14%	-7.59%				
10	10.27%	12.59%	2.32%	4	17.58%	19.63%	2.05%
11	11.91%	19.58%	7.67%				
12	29.23%	27.51%	-1.72%				
13	43.67%	58.67%	15.00%	5	50.62%	57.72%	7.10%
14	59.06%	58.64%	-0.42%				
15	48.21%	55.48%	7.27%				
16	14.21%	10.54%	-3.67%	6	14.12%	15.55%	1.43%
17	13.21%	19.84%	6.63%				
18	15.28%	14.94%	-0.34%				
19	29.15%	28.03%	-1.12%	7	41.13%	40.53%	-0.60%
20	43.71%	43.12%	-0.59%				
21	51.92%	52.94%	1.02%				
22	39.05%	66.82%	27.77%	8	52.82%	60.88%	8.06%
23	51.70%	57.64%	5.94%				
24	67.29%	58.49%	-8.80%				
25	52.79%	53.26%	0.47%	9	52.96%	55.19%	2.23%
26	45.42%	55.97%	10.55%				
27	59.20%	56.19%	-3.01%				
28	54.85%	55.00%	0.15%	10	53.14%	53.32%	0.18%
29	51.32%	50.97%	-0.35%				
30	53.29%	53.78%	0.49%				
31	67.57%	56.33%	-11.24%	11	67.64%	60.13%	-7.51%
32	61.06%	62.27%	1.21%				
33	72.24%	61.81%	-10.43%				
34	54.51%	55.22%	0.71%	12	53.37%	54.39%	1.02%
35	52.30%	52.99%	0.69%				
36	53.06%	54.84%	1.78%				
37	51.33%	58.11%	6.78%	13	59.22%	60.17%	0.95%
38	65.80%	60.45%	-5.35%				
39	60.35%	62.00%	1.65%				
40	58.50%	58.07%	-0.43%	14	55.86%	56.02%	0.16%
41	60.60%	55.16%	-5.44%				
42	48.54%	54.94%	6.40%				
43	44.14%	43.06%	-1.08%	15	41.20%	40.17%	-1.03%
44	36.74%	37.22%	0.48%				
45	42.39%	40.08%	-2.31%				
46	42.07%	42.39%	0.32%	16	39.06%	34.13%	-4.93%
47	48.69%	33.35%	-15.34%				
48	28.03%	27.56%	-0.47%				
49	49.68%	49.59%	-0.09%	17	48.46%	49.23%	0.77%
50	52.08%	52.06%	-0.02%				
51	44.01%	46.23%	2.22%				
52	57.39%	59.06%	1.67%	18	54.96%	55.01%	0.05%
53	62.74%	61.85%	-0.89%				
54	45.08%	45.22%	0.14%				
55	49.34%	55.06%	5.72%	19	53.32%	53.02%	-0.30%
56	61.05%	58.86%	-2.19%				
57	47.26%	44.50%	-2.76%				
58	70.90%	70.54%	-0.36%	20	70.55%	69.46%	-1.09%
59	72.74%	68.31%	-4.43%				
60	68.12%	69.52%	1.40%				
61	35.98%	57.22%	21.24%	21	49.86%	57.77%	7.91%
62	44.35%	56.56%	12.21%				
63	63.09%	59.64%	-3.45%				
64	35.66%	42.72%	7.06%	22	47.56%	36.97%	-10.59%
65	45.44%	35.92%	-9.52%				
66	59.12%	31.71%	-27.41%				
67	51.72%	51.67%	-0.05%	23	49.98%	51.75%	1.77%
68	45.01%	49.38%	4.37%				
69	54.06%	54.16%	0.10%				
70	49.74%	50.73%	0.99%	24	46.72%	47.51%	0.79%
71	41.68%	40.72%	-0.96%				
72	49.03%	51.49%	2.46%				
73	39.55%	40.16%	0.61%	25	44.88%	44.88%	0.00%
74	43.78%	42.89%	-0.89%				
75	51.71%	52.18%	0.47%				
76	24.29%	14.49%	-9.80%	26	20.85%	20.98%	0.13%
77	23.88%	19.23%	-4.65%				
78	14.09%	30.84%	16.75%				
79	37.49%	41.80%	4.31%	27	38.38%	41.49%	3.11%
80	42.15%	38.55%	-3.60%				
81	36.16%	44.56%	8.40%				
82	58.59%	57.08%	-1.51%	28	64.48%	60.93%	-3.55%
83	69.70%	68.31%	-1.39%				
84	64.99%	57.10%	-7.89%				
85	48.91%	48.38%	-0.53%	29	52.00%	52.47%	0.47%
86	54.56%	55.08%	0.52%				
87	52.16%	53.74%	1.58%				
88	44.85%	53.19%	8.34%	30	50.38%	50.55%	0.17%
89	55.76%	55.73%	-0.03%				
90	49.59%	40.40%	-9.19%				
91	45.87%	39.57%	-6.30%	31	46.89%	44.94%	-1.95%
92	50.79%	44.30%	-6.49%				
93	44.73%	51.10%	6.37%				
94	51.57%	51.91%	0.34%	32	44.43%	44.63%	0.20%
95	36.02%	36.36%	0.34%				
96	45.32%	46.40%	1.08%				
97	59.96%	62.91%	2.95%	33	68.84%	68.60%	-0.24%
98	70.96%	67.02%	-3.94%				
99	73.35%	74.85%	1.50%				

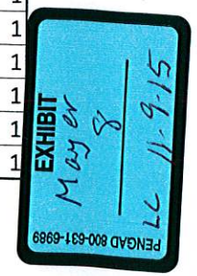
Current Map	Assembly	Senate
Strong GOP (55%+)	27	7
Lean GOP (52.1-54.9%):	13	8
Total GOP Seats (strong + lean):	40	15
Swing (48-52%):	19	5
Lean DEM (45.1-47.9%):	7	3
Strong DEM (-45%):	33	10
Total DEM Seats (strong + lean):	40	13

New Map	Assembly	Senate
Strong GOP (55%+)	38	12
New Lean GOP (52.1-54.9%):	14	5
Total GOP Seats (strong + lean):	52	17
New Swing (48-52%)	10	3
New Lean DEM (45.1-47.9%):	4	1
Strong DEM (-45%):	33	12
Total DEM Seats (strong + lean):	37	13



Gaddie Metric

District	Pop	Dev	% Dev	Predicted Dem Votes	Dem %	Predicted Rep Votes	Rep %	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
1	57220	-224	-0.39%	15,857	0.4878	16,651	0.5122	15857	-	-	397	15,857	397	15,461	1
2	57649	205	0.36%	12,983	0.4516	15,766	0.5484	12983	-	-	1,391	12,983	1,391	11,591	1
3	57444	0	0.00%	12,976	0.4442	16,236	0.5558	12976	-	-	1,630	12,976	1,630	11,346	1
4	57486	42	0.07%	13,742	0.4653	15,791	0.5347	13742	-	-	1,025	13,742	1,025	12,717	1
5	57470	26	0.05%	13,134	0.4572	15,593	0.5428	13134	-	-	1,230	13,134	1,230	11,904	1
6	57505	61	0.11%	10,779	0.4167	15,088	0.5833	10779	-	-	2,155	10,779	2,155	8,624	1
7	57498	54	0.09%	13,967	0.5462	11,604	0.4538	0	11,604	1,181	-	1,181	11,604	(10,423)	0
8	57196	-248	-0.43%	6,178	0.6952	2,709	0.3048	0	2,709	1,735	-	1,735	2,709	(974)	0
9	57283	-161	-0.28%	10,173	0.7086	4,184	0.2914	0	4,184	2,995	-	2,995	4,184	(1,189)	0
10	57428	-16	-0.03%	24,623	0.8741	3,547	0.1259	0	3,547	10,538	-	10,538	3,547	6,992	0
11	57503	59	0.10%	20,235	0.8042	4,927	0.1958	0	4,927	7,654	-	7,654	4,927	2,728	0
12	57494	50	0.09%	18,066	0.7249	6,856	0.2751	0	6,856	5,605	-	5,605	6,856	(1,251)	0
13	57452	8	0.01%	13,929	0.4133	19,774	0.5867	13929	-	-	2,922	13,929	2,922	11,007	1
14	57597	153	0.27%	14,693	0.4136	20,831	0.5864	14693	-	-	3,069	14,693	3,069	11,624	1
15	57372	-72	-0.13%	13,497	0.4452	16,819	0.5548	13497	-	-	1,661	13,497	1,661	11,835	1
16	57458	14	0.02%	22,223	0.8946	2,618	0.1054	0	2,618	9,803	-	9,803	2,618	7,184	0
17	57354	-90	-0.16%	22,553	0.8016	5,582	0.1984	0	5,582	8,486	-	8,486	5,582	2,904	0
18	57480	36	0.06%	21,176	0.8506	3,719	0.1494	0	3,719	8,728	-	8,728	3,719	5,009	0
19	57546	102	0.18%	23,838	0.7197	9,284	0.2803	0	9,284	7,277	-	7,277	9,284	(2,007)	0
20	57428	-16	-0.03%	16,451	0.5688	12,471	0.4312	0	12,471	1,990	-	1,990	12,471	(10,482)	0
21	57449	5	0.01%	13,125	0.4706	14,765	0.5294	13125	-	-	820	13,125	820	12,305	1
22	57495	51	0.09%	11,364	0.3318	22,885	0.6682	11364	-	-	5,761	11,364	5,761	5,603	1
23	57579	135	0.24%	15,182	0.4236	20,658	0.5764	15182	-	-	2,738	15,182	2,738	12,444	1
24	57282	-162	-0.28%	14,205	0.4151	20,015	0.5849	14205	-	-	2,905	14,205	2,905	11,299	1
25	57322	-122	-0.21%	13,065	0.4674	14,887	0.5326	13065	-	-	911	13,065	911	12,154	1
26	57581	137	0.24%	12,853	0.4403	16,338	0.5597	12853	-	-	1,743	12,853	1,743	11,110	1
27	57536	92	0.16%	13,611	0.4381	17,458	0.5619	13611	-	-	1,923	13,611	1,923	11,688	1
28	57467	23	0.04%	12,609	0.45	15,412	0.55	12609	-	-	1,401	12,609	1,401	11,208	1
29	57537	93	0.16%	13,519	0.4903	14,054	0.5097	13519	-	-	267	13,519	267	13,251	1
30	57241	-203	-0.35%	14,267	0.4622	16,601	0.5378	14267	-	-	1,167	14,267	1,167	13,101	1
31	57240	-204	-0.36%	12,616	0.4367	16,273	0.5633	12616	-	-	1,829	12,616	1,829	10,787	1
32	57524	80	0.14%	10,038	0.3773	16,566	0.6227	10038	-	-	3,264	10,038	3,264	6,773	1
33	57565	121	0.21%	11,274	0.3819	18,247	0.6181	11274	-	-	3,487	11,274	3,487	7,788	1
34	57387	-57	-0.10%	14,239	0.4478	17,558	0.5522	14239	-	-	1,660	14,239	1,660	12,579	1



Gaddie Metric

District	Pop	Dev	% Dev	Predicted Dem Votes	Dem %	Predicted Rep Votes	Rep %	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
35	57562	118	0.21%	13,067	0.4701	14,729	0.5299	13067	-	-	831	13,067	831	12,236	1
36	57432	-12	-0.02%	12,227	0.4516	14,848	0.5484	12227	-	-	1,310	12,227	1,310	10,917	1
37	57507	63	0.11%	12,110	0.4189	16,799	0.5811	12110	-	-	2,345	12,110	2,345	9,766	1
38	57493	49	0.09%	12,574	0.3955	19,218	0.6045	12574	-	-	3,322	12,574	3,322	9,251	1
39	57387	-57	-0.10%	10,899	0.38	17,782	0.62	10899	-	-	3,442	10,899	3,442	7,457	1
40	57366	-78	-0.14%	10,514	0.4193	14,561	0.5807	10514	-	-	2,024	10,514	2,024	8,490	1
41	57337	-107	-0.19%	11,761	0.4484	14,467	0.5516	11761	-	-	1,353	11,761	1,353	10,407	1
42	57285	-159	-0.28%	13,152	0.4506	16,036	0.5494	13152	-	-	1,442	13,152	1,442	11,710	1
43	57443	-1	0.00%	17,339	0.5694	13,113	0.4306	0	13,113	2,113	-	2,113	13,113	(10,999)	0
44	57395	-49	-0.09%	16,941	0.6278	10,043	0.3722	0	10,043	3,449	-	3,449	10,043	(6,595)	0
45	57658	214	0.37%	14,886	0.5992	9,957	0.4008	0	9,957	2,464	-	2,464	9,957	(7,493)	0
46	57458	14	0.02%	17,681	0.5761	13,010	0.4239	0	13,010	2,336	-	2,336	13,010	(10,674)	0
47	57465	21	0.04%	20,628	0.6665	10,322	0.3335	0	10,322	5,153	-	5,153	10,322	(5,169)	0
48	57506	62	0.11%	23,290	0.7244	8,861	0.2756	0	8,861	7,215	-	7,215	8,861	(1,646)	0
49	57346	-98	-0.17%	13,071	0.5041	12,859	0.4959	0	12,859	106	-	106	12,859	(12,752)	0
50	57624	180	0.31%	11,887	0.4794	12,908	0.5206	11887	-	-	511	11,887	511	11,376	1
51	57580	136	0.24%	14,637	0.5377	12,584	0.4623	0	12,584	1,026	-	1,026	12,584	(11,558)	0
52	57232	-212	-0.37%	11,034	0.4094	15,918	0.5906	11034	-	-	2,442	11,034	2,442	8,592	1
53	57240	-204	-0.36%	9,930	0.3815	16,099	0.6185	9930	-	-	3,084	9,930	3,084	6,846	1
54	57250	-194	-0.34%	15,372	0.5478	12,690	0.4522	0	12,690	1,341	-	1,341	12,690	(11,348)	0
55	57493	49	0.09%	13,302	0.4494	16,297	0.5506	13302	-	-	1,498	13,302	1,498	11,804	1
56	57582	138	0.24%	12,809	0.4114	18,326	0.5886	12809	-	-	2,759	12,809	2,759	10,050	1
57	57501	57	0.10%	14,436	0.555	11,575	0.445	0	11,575	1,431	-	1,431	11,575	(10,145)	0
58	57227	-217	-0.38%	9,211	0.2946	22,056	0.7054	9211	-	-	6,422	9,211	6,422	2,789	1
59	57391	-53	-0.09%	9,669	0.3169	20,843	0.6831	9669	-	-	5,587	9,669	5,587	4,083	1
60	57385	-59	-0.10%	10,307	0.3048	23,508	0.6952	10307	-	-	6,601	10,307	6,601	3,706	1
61	57614	170	0.30%	12,661	0.4278	16,935	0.5722	12661	-	-	2,137	12,661	2,137	10,524	1
62	57345	-99	-0.17%	13,959	0.4344	18,175	0.5656	13959	-	-	2,108	13,959	2,108	11,851	1
63	57365	-79	-0.14%	11,973	0.4036	17,692	0.5964	11973	-	-	2,860	11,973	2,860	9,113	1
64	57270	-174	-0.30%	15,452	0.5728	11,524	0.4272	0	11,524	1,964	-	1,964	11,524	(9,560)	0
65	57455	11	0.02%	14,760	0.6408	8,274	0.3592	0	8,274	3,243	-	3,243	8,274	(5,031)	0
66	57545	101	0.18%	14,776	0.6829	6,861	0.3171	0	6,861	3,957	-	3,957	6,861	(2,904)	0
67	57239	-205	-0.36%	13,748	0.4833	14,698	0.5167	13748	-	-	475	13,748	475	13,273	1
68	57261	-183	-0.32%	13,508	0.5062	13,177	0.4938	0	13,177	165	-	165	13,177	(13,011)	0

Gaddie Metric

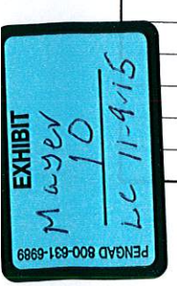
District	Pop	Dev	% Dev	Predicted Dem Votes	Dem %	Predicted Rep Votes	Rep %	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
69	57649	205	0.36%	11,657	0.4584	13,773	0.5416	11657	-	-	1,058	11,657	1,058	10,599	1
70	57552	108	0.19%	13,105	0.4927	13,493	0.5073	13105	-	-	194	13,105	194	12,911	1
71	57519	75	0.13%	17,189	0.5928	11,807	0.4072	0	11,807	2,691	-	2,691	11,807	(9,116)	0
72	57449	5	0.01%	13,674	0.4851	14,514	0.5149	13674	-	-	420	13,674	420	13,254	1
73	57453	9	0.02%	16,837	0.5984	11,300	0.4016	0	11,300	2,769	-	2,769	11,300	(8,531)	0
74	57494	50	0.09%	17,628	0.5711	13,239	0.4289	0	13,239	2,195	-	2,195	13,239	(11,044)	0
75	57462	18	0.03%	13,590	0.4782	14,829	0.5218	13590	-	-	620	13,590	620	12,970	1
76	57617	173	0.30%	32,275	0.8551	5,469	0.1449	0	5,469	13,403	-	13,403	5,469	7,934	0
77	57433	-11	-0.02%	26,627	0.8077	6,339	0.1923	0	6,339	10,144	-	10,144	6,339	3,804	0
78	57546	102	0.18%	23,528	0.6916	10,492	0.3084	0	10,492	6,518	-	6,518	10,492	(3,974)	0
79	57461	17	0.03%	20,211	0.582	14,516	0.418	0	14,516	2,848	-	2,848	14,516	(11,668)	0
80	57585	141	0.25%	20,251	0.6145	12,704	0.3855	0	12,704	3,773	-	3,773	12,704	(8,931)	0
81	57403	-41	-0.07%	15,887	0.5544	12,770	0.4456	0	12,770	1,559	-	1,559	12,770	(11,211)	0
82	57430	-14	-0.02%	12,985	0.4292	17,269	0.5708	12985	-	-	2,142	12,985	2,142	10,843	1
83	57423	-21	-0.04%	10,756	0.3169	23,185	0.6831	10756	-	-	6,215	10,756	6,215	4,541	1
84	57365	-79	-0.14%	13,414	0.429	17,854	0.571	13414	-	-	2,220	13,414	2,220	11,194	1
85	57480	36	0.06%	13,703	0.5162	12,843	0.4838	0	12,843	430	-	430	12,843	(12,413)	0
86	57454	10	0.02%	15,780	0.5162	14,789	0.4838	0	14,789	495	-	495	14,789	(14,294)	0
87	57358	-86	-0.15%	12,413	0.4626	14,420	0.5374	12413	-	-	1,004	12,413	1,004	11,409	1
88	57556	112	0.20%	12,882	0.4681	14,638	0.5319	12882	-	-	878	12,882	878	12,004	1
89	57634	190	0.33%	12,009	0.4427	15,118	0.5573	12009	-	-	1,554	12,009	1,554	10,455	1
90	57608	164	0.29%	11,556	0.596	7,833	0.404	0	7,833	1,861	-	1,861	7,833	(5,972)	0
91	57359	-85	-0.15%	18,044	0.6043	11,816	0.3957	0	11,816	3,114	-	3,114	11,816	(8,701)	0
92	57431	-13	-0.02%	14,313	0.557	11,383	0.443	0	11,383	1,465	-	1,465	11,383	(9,919)	0
93	57548	104	0.18%	15,014	0.489	15,690	0.511	15014	-	-	338	15,014	338	14,676	1
94	57266	-178	-0.31%	14,601	0.4809	15,761	0.5191	14601	-	-	580	14,601	580	14,022	1
95	57372	-72	-0.13%	18,730	0.6364	10,701	0.3636	0	10,701	4,014	-	4,014	10,701	(6,687)	0
96	57484	40	0.07%	13,841	0.536	11,982	0.464	0	11,982	930	-	930	11,982	(11,052)	0
97	57279	-165	-0.29%	10,706	0.3709	18,158	0.6291	10706	-	-	3,726	10,706	3,726	6,979	1
98	57513	69	0.12%	10,566	0.3298	21,472	0.6702	10566	-	-	5,453	10,566	5,453	5,113	1
99	57496	52	0.09%	8,517	0.2515	25,349	0.7485	8517	-	-	8,416	8,517	8,416	102	1
				1,448,901		1,394,018		726,238	402,334	160,165	132,723	886,403	535,057	351,346	58

Gaddie Metric

District	Pop	Dev	% Dev	Predicted Dem Votes	Dem %	Predicted Rep Votes	Rep %	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
						Correlation	1							12.36%	
						correlation 8th S	1								
						Corr Gaddie and C	0.80622								
						Corr Gaddie Memo	0.318163								
							All Tot Corr Gaddie								

All Open Seat Data

District	Pop	Dev	% Dev	Net D	Predicted Dem	D Pct	Predicted Rep	R PCT	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
1	57487	43	0.07%		16,259	49.8%	16414	50.2%	16259	-	-	78	16,259	78	16,181	1
2	57590	146	0.25%		11,805	54.1%	10025	45.9%	0	10,025	890	-	890	10,025	(9,136)	0
3	57686	242	0.42%		11,243	38.7%	17807	61.3%	11243	-	-	3,282	11,243	3,282	7,961	1
4	57406	-38	-0.07%		10,881	46.0%	12790	54.0%	10881	-	-	955	10,881	955	9,926	1
5	57633	189	0.33%		13,497	49.4%	13845	50.6%	13497	-	-	174	13,497	174	13,323	1
6	57480	36	0.06%		11,045	38.5%	17627	61.5%	11045	-	-	3,291	11,045	3,291	7,753	1
7	57208	-236	-0.41%		22,822	69.1%	10214	30.9%	0	10,214	6,304	-	6,304	10,214	(3,910)	0
8	57196	-248	-0.43%		7,192	80.9%	1695	19.1%	0	1,695	2,749	-	2,749	1,695	1,054	0
9	57420	-24	-0.04%		10,497	65.1%	5635	34.9%	0	5,635	2,431	-	2,431	5,635	(3,205)	0
10	57195	-249	-0.43%		25,348	88.6%	3270	11.4%	0	3,270	11,039	-	11,039	3,270	7,769	0
11	57455	11	0.02%		22,374	82.2%	4855	17.8%	0	4,855	8,759	-	8,759	4,855	3,904	0
12	57420	-24	-0.04%		20,041	83.2%	4039	16.8%	0	4,039	8,001	-	8,001	4,039	3,962	0
13	57248	-196	-0.34%		15,950	49.1%	16510	50.9%	15950	-	-	280	15,950	280	15,670	1
14	57333	-111	-0.19%		13,575	49.6%	13799	50.4%	13575	-	-	112	13,575	112	13,464	1
15	57514	70	0.12%		13,412	47.4%	14901	52.6%	13412	-	-	745	13,412	745	12,667	1
16	57282	-162	-0.28%		21,234	88.1%	2856	11.9%	0	2,856	9,189	-	9,189	2,856	6,333	0
17	57437	-7	-0.01%		21,769	85.9%	3569	14.1%	0	3,569	9,100	-	9,100	3,569	5,531	0
18	57241	-203	-0.35%		23,817	82.8%	4954	17.2%	0	4,954	9,431	-	9,431	4,954	4,477	0
19	57313	-131	-0.23%		15,160	58.2%	10904	41.8%	0	10,904	2,128	-	2,128	10,904	(8,776)	0
20	57410	-34	-0.06%		14,118	52.3%	12901	47.7%	0	12,901	609	-	609	12,901	(12,292)	0
21	57434	-10	-0.02%		12,257	42.0%	16911	58.0%	12257	-	-	2,327	12,257	2,327	9,930	1
22	57526	82	0.14%		18,335	55.3%	14831	44.7%	0	14,831	1,752	-	1,752	14,831	(13,079)	0
23	57476	32	0.06%		10,922	30.0%	25459	70.0%	10922	-	-	7,268	10,922	7,268	3,654	1
24	57369	-75	-0.13%		8,667	25.1%	25868	74.9%	8667	-	-	8,601	8,667	8,601	66	1
25	57480	36	0.06%		12,179	40.0%	18248	60.0%	12179	-	-	3,034	12,179	3,034	9,145	1
26	57552	108	0.19%		13,251	47.7%	14527	52.3%	13251	-	-	638	13,251	638	12,613	1
27	57191	-253	-0.44%		14,935	56.0%	11755	44.0%	0	11,755	1,590	-	1,590	11,755	(10,165)	0
28	57515	71	0.12%		12,617	44.7%	15591	55.3%	12617	-	-	1,487	12,617	1,487	11,131	1
29	57300	-144	-0.25%		14,180	52.3%	12954	47.7%	0	12,954	613	-	613	12,954	(12,341)	0
30	57407	-37	-0.06%		11,308	42.7%	15165	57.3%	11308	-	-	1,929	11,308	1,929	9,379	1
31	57429	-15	-0.03%		11,304	41.2%	16117	58.8%	11304	-	-	2,406	11,304	2,406	8,898	1
32	57349	-95	-0.17%		12,685	47.9%	13787	52.1%	12685	-	-	551	12,685	551	12,135	1
33	57391	-53	-0.09%		14,609	59.0%	10151	41.0%	0	10,151	2,229	-	2,229	10,151	(7,922)	0
34	57651	207	0.36%		13,139	45.6%	15690	54.4%	13139	-	-	1,275	13,139	1,275	11,864	1
35	57528	84	0.15%		11,288	40.6%	16503	59.4%	11288	-	-	2,607	11,288	2,607	8,681	1
36	57377	-67	-0.12%		11,516	43.4%	14997	56.6%	11516	-	-	1,741	11,516	1,741	9,775	1



All Open Seat Data

District	Pop	Dev	% Dev	Net D	Predicted Dem	D Pct	Predicted Rep	R PCT	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
37	57671	227	0.40%		9,222	29.3%	22240	70.7%	9222	-	-	6,509	9,222	6,509	2,713	1
38	57572	128	0.22%		9,710	28.0%	25021	72.0%	9710	-	-	7,655	9,710	7,655	2,055	1
39	57457	13	0.02%		10,747	38.0%	17526	62.0%	10747	-	-	3,390	10,747	3,390	7,357	1
40	57495	51	0.09%		15,061	51.9%	13947	48.1%	0	13,947	557	-	557	13,947	(13,391)	0
41	57671	227	0.40%		16,784	56.1%	13120	43.9%	0	13,120	1,832	-	1,832	13,120	(11,288)	0
42	57559	115	0.20%		13,254	51.9%	12282	48.1%	0	12,282	486	-	486	12,282	(11,796)	0
43	57444	0	0.00%		12,658	48.2%	13606	51.8%	12658	-	-	474	12,658	474	12,184	1
44	57434	-10	-0.02%		16,477	60.2%	10886	39.8%	0	10,886	2,795	-	2,795	10,886	(8,091)	0
45	57242	-202	-0.35%		16,352	54.6%	13589	45.4%	0	13,589	1,382	-	1,382	13,589	(12,207)	0
46	57463	19	0.03%		20,583	64.3%	11418	35.7%	0	11,418	4,582	-	4,582	11,418	(6,835)	0
47	57494	50	0.09%		20,208	67.1%	9888	32.9%	0	9,888	5,160	-	5,160	9,888	(4,728)	0
48	57568	124	0.22%		24,457	73.5%	8840	26.5%	0	8,840	7,808	-	7,808	8,840	(1,032)	0
49	57389	-55	-0.10%		13,625	50.3%	13477	49.7%	0	13,477	74	-	74	13,477	(13,403)	0
50	57465	21	0.04%		12,289	47.3%	13709	52.7%	12289	-	-	710	12,289	710	11,579	1
51	57247	-197	-0.34%		14,760	52.6%	13323	47.4%	0	13,323	718	-	718	13,323	(12,605)	0
52	57384	-60	-0.10%		12,376	38.9%	19416	61.1%	12376	-	-	3,520	12,376	3,520	8,857	1
53	57444	0	0.00%		12,388	48.1%	13362	51.9%	12388	-	-	487	12,388	487	11,902	1
54	57443	-1	0.00%		14,032	53.4%	12240	46.6%	0	12,240	896	-	896	12,240	(11,344)	0
55	57446	2	0.00%		13,565	47.0%	15300	53.0%	13565	-	-	868	13,565	868	12,697	1
56	57342	-102	-0.18%		12,553	46.4%	14518	53.6%	12553	-	-	983	12,553	983	11,570	1
57	57404	-40	-0.07%		14,897	53.4%	13016	46.6%	0	13,016	941	-	941	13,016	(12,075)	0
58	57436	-8	-0.01%		9,325	30.6%	21180	69.4%	9325	-	-	5,927	9,325	5,927	3,398	1
59	57554	110	0.19%		11,565	34.5%	21984	65.5%	11565	-	-	5,209	11,565	5,209	6,356	1
60	57547	103	0.18%		8,756	28.1%	22415	71.9%	8756	-	-	6,830	8,756	6,830	1,926	1
61	57605	161	0.28%		12,933	43.8%	16576	56.2%	12933	-	-	1,822	12,933	1,822	11,112	1
62	57632	188	0.33%		15,181	60.3%	9999	39.7%	0	9,999	2,591	-	2,591	9,999	(7,408)	0
63	57299	-145	-0.25%		15,640	61.2%	9902	38.8%	0	9,902	2,869	-	2,869	9,902	(7,033)	0
64	57266	-178	-0.31%		15,089	52.8%	13470	47.2%	0	13,470	810	-	810	13,470	(12,660)	0
65	57601	157	0.27%		12,721	39.1%	19816	60.9%	12721	-	-	3,547	12,721	3,547	9,173	1
66	57459	15	0.03%		16,286	71.9%	6362	28.1%	0	6,362	4,962	-	4,962	6,362	(1,401)	0
67	57378	-66	-0.11%		15,321	51.9%	14226	48.1%	0	14,226	547	-	547	14,226	(13,678)	0
68	57254	-190	-0.33%		11,958	49.7%	12124	50.3%	11958	-	-	83	11,958	83	11,875	1
69	57424	-20	-0.03%		17,902	59.8%	12022	40.2%	0	12,022	2,940	-	2,940	12,022	(9,083)	0
70	57415	-29	-0.05%		18,661	60.3%	12266	39.7%	0	12,266	3,197	-	3,197	12,266	(9,069)	0
71	57228	-216	-0.38%		15,081	52.1%	13884	47.9%	0	13,884	599	-	599	13,884	(13,285)	0
72	57654	210	0.37%		11,180	40.3%	16542	59.7%	11180	-	-	2,681	11,180	2,681	8,500	1

All Open Seat Data

District	Pop	Dev	% Dev	Net D	Predicted Dem	D Pct	Predicted Rep	R PCT	D Lost	R Lost	D Surplus	R Surplus	D Wasted	R Wasted	R-D Net	Rep Win
73	57491	47	0.08%		17,137	61.4%	10785	38.6%	0	10,785	3,176	-	3,176	10,785	(7,609)	0
74	57320	-124	-0.22%		17,712	55.5%	14219	44.5%	0	14,219	1,747	-	1,747	14,219	(12,472)	0
75	57255	-189	-0.33%		13,902	44.0%	17700	56.0%	13902	-	-	1,899	13,902	1,899	12,002	1
76	57586	142	0.25%		30,929	82.0%	6811	18.0%	0	6,811	12,059	-	12,059	6,811	5,248	0
77	57398	-46	-0.08%		26,708	81.5%	6059	18.5%	0	6,059	10,325	-	10,325	6,059	4,266	0
78	57579	135	0.24%		24,413	71.3%	9847	28.7%	0	9,847	7,283	-	7,283	9,847	(2,564)	0
79	57341	-103	-0.18%		20,439	60.6%	13294	39.4%	0	13,294	3,572	-	3,572	13,294	(9,722)	0
80	57385	-59	-0.10%		20,179	63.4%	11644	36.6%	0	11,644	4,267	-	4,267	11,644	(7,377)	0
81	57266	-178	-0.31%		13,703	51.8%	12741	48.2%	0	12,741	481	-	481	12,741	(12,260)	0
82	57641	197	0.34%		9,871	31.8%	21201	68.2%	9871	-	-	5,665	9,871	5,665	4,206	1
83	57612	168	0.29%		9,241	28.6%	23075	71.4%	9241	-	-	6,917	9,241	6,917	2,324	1
84	57375	-69	-0.12%		11,990	34.6%	22700	65.4%	11990	-	-	5,355	11,990	5,355	6,634	1
85	57529	85	0.15%		10,028	43.2%	13190	56.8%	10028	-	-	1,581	10,028	1,581	8,448	1
86	57477	33	0.06%		13,853	50.7%	13494	49.3%	0	13,494	180	-	180	13,494	(13,314)	0
87	57661	217	0.38%		11,358	40.0%	17003	60.0%	11358	-	-	2,823	11,358	2,823	8,535	1
88	57533	89	0.15%		14,209	56.0%	11142	44.0%	0	11,142	1,533	-	1,533	11,142	(9,609)	0
89	57490	46	0.08%		13,374	45.9%	15771	54.1%	13374	-	-	1,199	13,374	1,199	12,175	1
90	57617	173	0.30%		11,349	39.4%	17468	60.6%	11349	-	-	3,059	11,349	3,059	8,290	1
91	57374	-70	-0.12%		14,807	51.7%	13845	48.3%	0	13,845	481	-	481	13,845	(13,364)	0
92	57421	-23	-0.04%		14,907	50.5%	14594	49.5%	0	14,594	157	-	157	14,594	(14,437)	0
93	57280	-164	-0.29%		12,441	40.8%	18057	59.2%	12441	-	-	2,808	12,441	2,808	9,633	1
94	57509	65	0.11%		16,171	57.9%	11759	42.1%	0	11,759	2,206	-	2,206	11,759	(9,553)	0
95	57496	52	0.09%		19,769	66.5%	9949	33.5%	0	9,949	4,910	-	4,910	9,949	(5,040)	0
96	57406	-38	-0.07%		14,665	51.5%	13836	48.5%	0	13,836	415	-	415	13,836	(13,421)	0
97	57487	43	0.07%		11,492	32.2%	24222	67.8%	11492	-	-	6,365	11,492	6,365	5,128	1
98	57485	41	0.07%		9,864	28.5%	24773	71.5%	9864	-	-	7,454	9,864	7,454	2,410	1
99	57657	213	0.37%		10,783	36.0%	19160	64.0%	10783	-	-	4,188	10,783	4,188	6,594	1
	5686986	30	0.86%		1,454,117		1,388,991		566,634	536,783	175,350	142,787	741,984	679,570	62,414	48