

KENNETH MAYER, Ph.D.

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2
3 IN THE UNITED STATES DISTRICT COURT
4 FOR THE WESTERN DISTRICT OF WISCONSIN
5 * * * * *

6 WILLIAM WHITFORD, et al.,
7 Plaintiffs,
8 -vs- Case No. 15-CV-421-bbc
9 GERALD NICHOL, et al.,
10 Defendants.
11 * * * * *

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14
15 DEPOSITION OF KENNETH MAYER, Ph.D.
16 Monday, November 9, 2015
17 8:57 a.m.
18
19 Reported by: Lisa A. Creeron, RPR
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1 DEPOSITION of KENNETH MAYER, Ph.D., a witness in
2 the above-entitled action, taken at the instance of the
3 defendants, under the provisions of the Federal Rules of
4 Civil Procedure, taken pursuant to notice, before
5 LISA A. CREERON, a Registered Professional Reporter and
6 Notary Public in and for the State of Wisconsin, at the
7 Wisconsin Department of Justice, 17 West Main Street, in
8 the City of Madison, County of Dane, and State of
9 Wisconsin, on the 9th day of November, 2015, commencing at
10 8:57 a.m.

11 A P P E A R A N C E S

12 PAUL STRAUSS, RUTH GREENWOOD and ANNABELLE HARLESS,
13 CHICAGO LAWYERS' COMMITTEE FOR CIVIL RIGHTS
14 UNDER LAW, INC.,
15 Attorneys at Law,
16 100 North La Salle Street, Suite 600,
17 Chicago, Illinois 60602, appearing on
18 behalf of the plaintiffs;

19 BRIAN P. KEENAN,
20 Attorneys at Law,
21 WISCONSIN DEPARTMENT OF JUSTICE,
22 17 West Main Street,
23 Madison, Wisconsin 53703, appearing on
24 behalf of the defendants.
25

26 * * * * *

(Original transcript is filed with Attorney Keenan)

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

5 EXAMINATION

6 BY MR. KEENAN:

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

12 A Yes.

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

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

24 A Yes.

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

KENNETH MATER, Ph.D.

1 you don't understand my question, just let me know.
 2 We want to make sure you understood the question and
 3 give a truthful answer. So if you don't understand,
 4 just tell me. I'll try to rephrase the question or
 5 we can have her repeat it back. Do you understand?
 6 A Yes.
 7 Q Okay. Maybe I could just get your educational
 8 background. I know some of it's in your report, but
 9 maybe just the schools that you got, the degrees --
 10 the schools you went to, the degrees you obtained and
 11 the years.
 12 A My undergraduate degree is from the University of
 13 California-San Diego, and that was 1982. My Ph.D. is
 14 from Yale University, and I received that in 1988.
 15 And there are subsidiary degrees you get along the
 16 way, master's and master's of philosophy, which I
 17 think the dates were '86 and '87.
 18 Q And the Ph.D. was from where?
 19 A Yale.
 20 Q Yale. And then what was the Ph.D. in?
 21 A Political science.
 22 Q And then you are now a professor at the University of
 23 Wisconsin-Madison, correct?
 24 A Correct.
 25 Q Okay. How long have you been a professor there?

5

1 Q You're an expert -- serving as an expert witness for
 2 the plaintiffs in this case. Have you served as an
 3 expert witness in other cases?
 4 A Yes.
 5 Q And how many other times?
 6 A They are in my report. I think it is six or seven
 7 times. I'd have to go back and look to be sure.
 8 Q And how many of those deal with -- have dealt with
 9 districting situations as opposed to perhaps campaign
 10 finance or something else?
 11 A Well, let me think for a minute. Can I look at my
 12 report?
 13 Q Yeah. Actually why don't we mark that as
 14 Exhibit 1.
 15 A I just want to make sure I get this correctly.
 16 Q And then you can refer to that.
 17 MR. KEENAN: Here's a copy for
 18 Exhibit 1.
 19 MR. STRAUSS: Thank you.
 20 (Exhibit 1 is marked for identification)
 21 Q And just for the record, this is the Exhibit 1 that
 22 was provided by your counsel that has the -- I had a
 23 copy that didn't have the appendix with some data
 24 error -- or an annex, sorry. This one has the annex
 25 to it.

7

1 A Since 1989.
 2 Q So right after you got your Ph.D. at Yale?
 3 A I spent a year after I received my degree working for
 4 the RAND Corporation in Washington, DC.
 5 Q And what's your current title, so to speak, as a
 6 professor at Madison?
 7 A Professor of political science and affiliate faculty
 8 of LaFollette School of Public Affairs.
 9 Q And what are your research areas?
 10 A Research interests are American politics, the
 11 presidency, elections, elections administration, some
 12 interest in Australian politics, but mostly American
 13 politics.
 14 I teach courses in the undergraduate course,
 15 courses in the presidency, a course on campaign
 16 finance, various seminars, but all of them are
 17 focused on either elections, elections
 18 administration, the American presidency, and I taught
 19 one course on comparative electoral systems.
 20 Q Do you teach any classes that relate to districting
 21 or redistricting like that's at issue in this case?
 22 A Not specifically. I have taught courses that deal
 23 with various issues relating to election
 24 administration and that plays a role, but no courses
 25 specifically on redistricting.

6

1 A So this covers the last eight years, Baldus vs.
 2 Brennan was a redistricting case. Kenosha County vs.
 3 City of Kenosha was a redistricting case. I was an
 4 expert in 2001, and I think that was Baumgart vs.
 5 Wendelberger. Those are the -- as best I can recall,
 6 those are the only cases where I have testified as an
 7 expert on a redistricting matter.
 8 Q Okay. I'm familiar with the Baldus and the Baumgart
 9 case, but what was the Kenosha one about?
 10 A The Kenosha case involved a dispute between the City
 11 of Kenosha and the County of Kenosha over the drawing
 12 of wards and districts and it -- as I remember, it
 13 involved disputes over whether the -- how the city
 14 and county resolve discrepancies or disagreements
 15 over wards and as they affect county supervisory
 16 district lines and city aldermanic lines.
 17 Q Okay. That was going to be my next question. So it
 18 involved local election lines, not state assembly
 19 lines?
 20 A Correct.
 21 Q Okay. And which party did you represent in that --
 22 or not represent but provide an expert report for?
 23 A I provided an expert report on behalf of the city.
 24 Q Do you know what the end result of that case was?
 25 A The end result of the case -- again I'd have to go

8

1 back and look at the record. The end result was that
 2 the city was able to reconfigure its wards so that
 3 they were in compliance with the -- again I'm
 4 operating -- it's been a long time, it's been four
 5 years since I've looked at this, that the city was
 6 able to reconfigure its wards to address some of the
 7 disagreement.
 8 Q Okay. And do you know if there was a judicial
 9 decision that allowed that or was it a settlement or
 10 agreement or do you know?
 11 A I don't know.
 12 Q Okay. And then it says you have testified as an
 13 expert witness at trial or deposition. Which -- did
 14 you testify in a deposition, trial or both in that
 15 case?
 16 A Baldus was deposition and at trial. NAACP vs.
 17 Walker, both deposition and trial. The one case
 18 where I testified in deposition but not in trial was
 19 McComish vs. Brewer.
 20 Q Okay. So there was a trial in the Kenosha County
 21 one?
 22 A There was.
 23 Q In the Baldus vs. Brennan case, on behalf of which
 24 party did you submit an expert report -- or parties?
 25 A I'm pretty sure it was on behalf of Baldus because

1 But I would have to go back and look at the report to
 2 be more specific.
 3 Q And what's your understanding of the district that
 4 came into being as a result of the Baumgart case?
 5 Did the court accept either of the maps that were
 6 drawn by the parties, or did it draw its own map?
 7 A So are we back in 2001?
 8 Q 2001, yeah.
 9 A So my understanding is that the court took the
 10 submissions from both parties and produced its own
 11 map.
 12 Q Okay. Well, let's switch to this case. When did you
 13 first get approached about potentially being an
 14 expert in this case?
 15 A I believe it was somewhere around -- it was over the
 16 summer. Somewhere around July. I don't remember
 17 precisely.
 18 Q July of this -- 2015?
 19 A 2014.
 20 Q 2014. And who did you talk to about it?
 21 A I believe the initial conversations were with
 22 Peter Earl and Ruth, Ruth Greenwood.
 23 Q And after that initial contact, when did you
 24 officially become involved with the case?
 25 A I would have to look at the agreement letter. I'm

1 Brennan was on the GAB.
 2 Q Okay. And what was your understanding of who the
 3 plaintiffs were in that case?
 4 A People who were challenging the constitutionality of
 5 Act 43.
 6 Q And then in the Baumgart case from the 2000 round of
 7 redistricting, on which side did you -- on behalf of
 8 which -- sorry, on behalf of which parties did you
 9 submit an expert report?
 10 A That case I recall I worked -- one of the parties was
 11 the Senate Democratic Caucus I believe was the party
 12 that -- I worked for or provided the report for.
 13 Q And what were the issues you offered an opinion on in
 14 Baumgart to the extent you can remember?
 15 A In that case my role involved assessing the partisan
 16 consequences of the proposed plans submitted by all
 17 of the parties.
 18 Q And did you offer an opinion on perhaps which parties
 19 under the map that was the best in that case?
 20 A I would have to go back and look at my report, but my
 21 recollection is that both the party I was working for
 22 and the other party, which I believe was the Assembly
 23 Republicans, had submitted multiple maps and I
 24 analyzed those maps and provided analysis about the
 25 estimated consequences that those maps would have.

1 not sure when I actually signed that.
 2 MR. KEENAN: Let's mark that then as
 3 No. 2.
 4 (Exhibit 2 is marked for identification)
 5 Q And you mentioned an agreement letter and we put
 6 before you Exhibit 2, and is this the agreement
 7 letter that you're referring to?
 8 A I believe it is, yes.
 9 Q And it's dated November 5th, 2014. Does that refresh
 10 your recollection about the time you were retained
 11 about?
 12 A I would say November.
 13 Q And it's your understanding that this letter contains
 14 the scope of work that you were asked to do on behalf
 15 of the plaintiffs in this case?
 16 A That's correct.
 17 Q And it says that your rate is \$300 an hour. That is
 18 your rate, correct?
 19 A Correct.
 20 Q Looking at your report, did anyone else assist you in
 21 doing the work that went into the production of your
 22 report?
 23 A In terms of the report, no.
 24 Q Okay. And when you said in terms of the report, that
 25 indicates that perhaps someone else assisted you in

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

1 suitable for the actual analysis.
 2 Q You used a couple terms there that I just want to get
 3 on the record what they are. You mentioned ward
 4 level data and block level data. Could you just
 5 explain what those are?
 6 A Sure. The data on elections and the redistricting
 7 data that the Legislative Technology Services Bureau
 8 produced were largely at the ward level or the voting
 9 tabulation district level. But I also used census
 10 data or the actual redistricting files, the map files
 11 that the Legislative Technology Services Bureau
 12 produced. And those include block level data, the
 13 250,000 or so blocks, census blocks that are defined
 14 by the Census Bureau, and in doing the analysis and
 15 preparing the maps, I did that at the block level.
 16 So it was necessary to take the ward level results
 17 and disaggregate them down to the census block level.
 18 Q Okay. So maybe if I could just also get you to
 19 define what disaggregate means when you're talking
 20 about the ward level down to the block level.
 21 A Sure. In this case it means assigning values to
 22 census blocks based on the percentage of the ward
 23 population, the voting eligible population that
 24 existed in each census block. And I explained a
 25 couple of examples in the report of how I did that.

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

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

KENNETH MAYER, Ph.D.

1 do you actually go into the demographic data and
 2 adjust for different types of populations that vary
 3 block to block?
 4 A I did do adjustments -- I made two adjustments. One
 5 is that we adjusted for citizenship using data that
 6 is data on people who are of voting age but are not
 7 eligible to vote because they're not citizens. And I
 8 also controlled for institutional -- prison
 9 populations which are similarly -- these are
 10 typically voting age, but they can't vote in
 11 Wisconsin and so it was -- I made a calculation of
 12 the voting eligible population in each ward and
 13 block.
 14 Q But after you accounted for those two issues, then
 15 were the votes assigned from the ward level to the
 16 block level based on just the percentage of voters
 17 that -- eligible voters that were in that block
 18 compared to the whole ward?
 19 A That's correct. And that's very common in both GIS
 20 and in political science as a way of doing that.
 21 Q Sure. And I'm just trying to make sure that I
 22 understand it correctly.
 23 A Sure.
 24 Q Okay. I've got a couple of documents here.
 25 (Exhibit 3 is marked for identification)

17

1 the invoices that listed Brad Jones on them.
 2 A Um-hum.
 3 Q And I tried to put them in chronological order. And
 4 you mentioned Brad Jones before. So are these the
 5 invoices for Mr. Jones' work on this case?
 6 A These look -- these are the invoice that he
 7 submitted, so reflecting the work that he did.
 8 Q And then do you know if he's been paid for his work?
 9 A He has.
 10 Q Okay. And who has paid him for the work?
 11 A I believe the same people who paid me.
 12 Q And who is that?
 13 A The Chicago Lawyers' Committee, and I did receive one
 14 check or a couple of checks from the national ACLU.
 15 Q And then I also --
 16 MR. KEENAN: We'll mark this as No. 4.
 17 (Exhibit 4 is marked for identification)
 18 Q Exhibit 4 is similar to what I did with Exhibit 3 was
 19 I took the invoices that had Kenneth Mayer
 20 Consulting, LLC on it and put them in chronological
 21 order and just grouped them together here. So if you
 22 want to take a look at that, and I'm just going to
 23 ask you if these invoices constitute all of the
 24 invoices that you've submitted for your work in this
 25 case.

19

1 Q And I guess first I should maybe back up a little
 2 bit. So you understand that there's a subpoena
 3 issued for documents related to this case, correct?
 4 A Yes.
 5 Q You turned over documents that were in your
 6 possession to your attorneys who then turned them
 7 over to me, do you understand that?
 8 A Correct.
 9 Q And so what was your understanding of the documents
 10 that you were supposed to give to your attorneys that
 11 they could provide to me?
 12 A My understanding was that I was to turn over
 13 documents that reflected the things that I took into
 14 account, all of the data sources that I took into
 15 account in preparing my report.
 16 Q Okay. And so there weren't any documents that you
 17 took into account in your report that you failed to
 18 give to your attorneys?
 19 A There were some things in the bibliography, I
 20 suppose, the publicly available things that I relied
 21 on, but there was nothing that I relied on in making
 22 my report that I did not turn over.
 23 Q So getting back to No. 3, I'll just tell you what I
 24 did. This is several different documents that were
 25 in your production that I put together. These were

18

1 A So this looks like -- it looks like there's one
 2 error. The invoice I submitted in February was for
 3 January, but it says the dates of services were
 4 December. So that looks like it's incorrect.
 5 Q Okay. But that's just a typographical error?
 6 A Right.
 7 Q Okay. It says Kenneth Mayer Consulting, LLC. What
 8 is that LLC?
 9 A That's a limited liability corporation that I set up
 10 in the State of Wisconsin.
 11 Q And is that the -- I guess the business forum for
 12 which you do the consulting work on these when you're
 13 an expert witness?
 14 A Correct.
 15 Q Looking at Exhibit 4, I noticed that there's one bill
 16 for a computer. Why did you submit a bill for what
 17 looks to be a computer to the plaintiffs' attorneys?
 18 A The software that I use to -- the GIS software only
 19 runs on Windows machines and all of my computers are
 20 Macs, so it was necessary to get a machine that could
 21 run the program.
 22 Q So if we add up all the total of these invoices, we
 23 could get the total amount you've billed to the
 24 plaintiffs in this case, correct?
 25 A Through these dates, correct.

20

1 Q Yeah. And has all that money been -- have you been
2 paid for all those invoices?
3 A I don't know.
4 Q Okay. And you mentioned that some of the checks came
5 from the Chicago Committee and others came from the
6 national ACLU. Do you know what percentage of your
7 invoices were paid by either entity?
8 A No.
9 Q What's your understanding of why the national ACLU
10 paid some of the bills?
11 A I don't know.
12 Q Perfectly fine answer. I think we can put -- like 2,
13 3 and 4 we probably won't refer much to again, so you
14 can probably just put somewhere. Exhibit 1 we will
15 refer to, so you might want to keep that handy.
16 Another thing I didn't say is that since we do
17 have documents and if I put a document in front of
18 you, feel free to read it over and refresh your
19 memory and look at it to the extent you need to to
20 answer a question when it relates to a document.
21 A Okay, thank you.
22 Q And also I forgot to mention we can take breaks when
23 you want, so if you're feeling like you have to go to
24 the bathroom or anything like that, just let us know
25 and we can take a break. I will add if there's a

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

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

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

1 performed and reallocated the reporting unit totals
 2 to the individual ward levels to get accurate -- an
 3 accurate representation of what those totals were.
 4 Q Okay. A lot in that answer, so I'm just going to try
 5 to break it down a little bit and just try to figure
 6 out what -- so for an assembly race, if we go to the
 7 GAB election data that says Candidate A had 17,000
 8 votes and Candidate B had 15,000 votes total
 9 throughout the district, you took that number as
 10 accurate, correct?
 11 A I took that number as authoritative.
 12 Q Authoritative might be a better word. And then if
 13 the GAB's ward level data didn't have an issue of
 14 combining certain wards into one reporting unit,
 15 would the GAB's ward level data be accurate or
 16 authoritative?
 17 A So are you asking whether the GAB's individual ward
 18 level data is authoritative?
 19 Q Yes.
 20 A I took the GAB data as authoritative.
 21 Q And at the ward level as well?
 22 A Correct.
 23 Q Okay. Now, some of the GAB data might be -- I think
 24 you said where there are several wards combined into
 25 one reporting unit, is that correct?

25

1 A Correct.
 2 Q Okay. So I think you used the City of Marshfield
 3 example of like 1, 3 and 5? Or it's 1, 3 and 5 are
 4 combined into one reporting --
 5 A Actually it might be better to use the Mequon because
 6 we actually have --
 7 Q Okay, yeah. Maybe. Where is that?
 8 A That's in the --
 9 Q Page 3 of the annex. So we see there's three columns
 10 here on this page. One says GAB reports, one says
 11 LTSB data and one says difference. So the GAB
 12 reports, for example, it has Ward 1, there's only one
 13 ward there and a list of Romney and Obama votes and
 14 vote totals. Did you take that line, Ward 1 in
 15 Mequon, as authoritative?
 16 A Yes.
 17 Q Okay. But then the LTSB data, that had some
 18 different numbers there, and I take it when you
 19 looked at that data and compared it to GAB data, you
 20 noticed a discrepancy and thought that the LTSB data
 21 for Ward 1 needed to be corrected, so to speak?
 22 A Well, there are two parts to that. I think it's more
 23 accurate to say that I looked at -- compared the LTSB
 24 data, ward level data to the GAB, so the LTSB was
 25 different and it required investigation as to why.

26

1 Q Okay. But just looking at these two, if I pulled up
 2 these two spreadsheets, so to speak, that had both of
 3 the ward units reporting here and GAB as Ward 1 and
 4 then LTSB as Ward 1, if I wanted to know which one
 5 had the authoritative vote totals, that would be the
 6 GAB?
 7 A Right. As I understand it, the LTSB data has no
 8 official status. It is simply the data that is
 9 presented and I think that it's -- I am not aware of
 10 anything that suggests that that has any official
 11 status as opposed to something that they release.
 12 It's the GAB which I took to be authoritative.
 13 Q Okay. And then I guess we go to GAB like, for
 14 example, the GAB reports, there's reporting Units 3
 15 and 4 together, Wards 3 and 4 are together and if I
 16 understand your testimony correctly, in a situation
 17 like that, that may cause some errors in the LTSB
 18 data because there's one reporting unit for multiple
 19 wards?
 20 A Well, I'm not prepared to say that the second part of
 21 that is true.
 22 Q Okay.
 23 A But the -- correct to say that in the GAB data,
 24 Wards 3 and 4 produce results at the reporting unit
 25 level, and those numbers are off as well in the LTSB

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1 data.
 2 Q Okay. And then so when you did any sort of
 3 calculation in Mequon here, there's Wards 3 and 4
 4 report together, what did you do to disaggregate, so
 5 to speak, Ward 3 from Ward 4 based on the data in the
 6 GAB report?
 7 A Well, the disaggregation was the second step in this
 8 because the first step was to try to determine why
 9 these individual ward or reporting unit totals are
 10 off in the LTSB data. My experience tells me that
 11 this is an allocation issue because if you look at
 12 the totals, the last row, the total number of votes
 13 cast for Romney and Obama were all accurate. They
 14 match up perfectly.
 15 It's just the internal distribution of those
 16 votes in the LTSB data is incorrect, and that is why
 17 I concluded that this was a problem or there was an
 18 error in how the LTSB allocated those votes, and I
 19 don't know why that happened. I don't know why the
 20 LTSB when it had individual wards just didn't plug
 21 the GAB totals in there, I don't know why.
 22 But it's clear this was an erroneous allocation
 23 of votes in this case at the reporting unit level,
 24 and if the reporting unit level is wrong, it's not
 25 going to get better when you further disaggregate

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

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

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

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

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

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

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1 two votes and now the vote total is 50 to 48, is that
2 correct?
3 A Well, for the purposes of doing an analysis of a plan
4 that you would look at the 50 and the 48.
5 Q And so then the percentage ends up being a little bit
6 off where it's now the party that got 50 percent
7 actually got a little more than 50 percent because
8 it's --
9 A Well, I dispute the term off because that suggests
10 that there is a true measure that this departs from.
11 Q Fair enough.
12 A The political scientists and people who study
13 redistricting would say that the best measure of the
14 partisanship in that scenario would be 50 divided by
15 98, which would be a small majority. We could do the
16 math.
17 Q Yeah. That's just what I'm trying to get at.
18 A It would be 50 percent. It would be probably 51
19 percent.
20 Q So when you look at a GAB statewide election total,
21 President Obama or Scott Walker or someone might have
22 a total, but that's not quite exactly right because
23 someone -- it's not the exact percentage of the
24 two-party vote because there's some scattering of
25 some less than one percent of votes that are out

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

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1 number of wasted votes divided by the total number of
 2 votes cast and it gives you a measure of the relative
 3 number of wasted votes for the two parties.
 4 Q What's your understanding of where this version of
 5 the efficiency gap first came into being in the
 6 political science world?
 7 A Well, that's an ambiguous question because the method
 8 and quantity was explained in a University of Chicago
 9 Law Review article. I don't know exactly the
 10 publication date. It may have been October 2014 or
 11 something like that, but I can't tell you the history
 12 and evolution of the concept.
 13 Q So did that article from you think maybe October of
 14 2014 but may be off a little bit, did that article
 15 provide the basis for how you went about calculating
 16 the wasted votes in Wisconsin in 2012?
 17 A So my method of calculating the wasted vote relied on
 18 the methods and formulas outlined in that article.
 19 Q Okay. And then were there any other -- whether
 20 they're law reviews or political science articles or
 21 I don't want to limit it, but any other articles or
 22 maybe something else that you relied on in developing
 23 your method for calculating the wasted votes in
 24 Wisconsin?
 25 A Well, in terms of the actual calculation of the

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

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

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

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1 Q Okay. I guess to be clear, the method you used in
 2 this case isn't a measure of partisan bias in the
 3 50-50 election?
 4 A That's correct.
 5 Q Why don't you explain the -- how you went about
 6 determining the underlying partisanship of each
 7 district in the Wisconsin Assembly? And feel free to
 8 refer to your report to the extent you need to do
 9 that.
 10 A What I did in the report was construct the regression
 11 model that uses as the dependent variable the actual
 12 assembly vote in contested districts. And the
 13 independent variables, I'm going to refer to my
 14 report here just to make sure I get this correct.
 15 Q Sure. And just identify, please, the page where
 16 you're at and we can follow along.
 17 A Okay. So I'm on Page 10 and 11. So it explains --
 18 it is a model that uses as a dependent variable the
 19 assembly vote in a particular ward. This is ward
 20 level analysis.
 21 Q Maybe I could just stop you. In terms of the
 22 assembly vote just so -- I know they're small
 23 numbers, but is this the two-party vote or the total
 24 vote?
 25 A I did a separate model for Democrats and Republicans

1 some possible geographic effects.
 2 And I did this again for the underlying data
 3 with the actual vote totals in contested assembly
 4 districts in 2012.
 5 Q Okay. One thing is just with political scientists,
 6 you guys like to use these equations, and I'm not
 7 sure exactly how to say the letters and numbers and
 8 things that are there. So when it says y and then
 9 like little i , I guess, how would I just like refer
 10 to that?
 11 A That's Y_i or Y , sub i .
 12 Q Y , sub i , okay.
 13 A But that's just sort of a symbolic representation
 14 sort of explaining the regression and just sort of
 15 as -- expresses the fact that this is a linear model.
 16 Q And then the sub i is meant to refer to -- that's for
 17 one district?
 18 A For each ward.
 19 Q Each ward, okay, that's a ward. And then there's A ,
 20 do we just call that, or α ?
 21 A Alpha.
 22 Q And then is the next one beta?
 23 A Beta.
 24 Q Sub i or sub 1?
 25 A Yeah.

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

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

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

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

1 did you apply that to?
 2 A So I applied the voting age to the voting age
 3 population. Just to give a hypothetical example that
 4 in most parts of the state, the noncitizenship rate
 5 among White voting age, White non-Hispanic voting
 6 age, the noncitizenship rate is on the order of 1 to
 7 1.2 percent and so would reduce the ward level
 8 populations by that much. They tend to be very small
 9 with the exception of Hispanics where you have a
 10 larger noncitizenship rate.
 11 Q But you looked at each individual ward's demographic
 12 data to determine like how many Hispanics are in this
 13 ward and then applied the noncitizenship factor to
 14 that ward individually?
 15 A Correct.
 16 Q All right. I probably asked that poorly to get that
 17 simple answer, so I apologize.
 18 Why don't we just -- I think you probably can
 19 address Black and Hispanic voting age population
 20 together. Like what do those elements mean?
 21 A Those are again taken from census. The number of
 22 people identified in census as Black and Hispanic and
 23 again with the same adjustment made for voting
 24 eligible population.
 25 Q Okay. And then why did you break out Black voting

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

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

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

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

1 minus -- it's greater than 1.96 or smaller than minus
 2 1.96. That gives you a measure of the statistical
 3 significance. And the P-value is just an expression
 4 of the significance of the estimate.
 5 Q Okay. I think you may have just done this, but it
 6 slipped out of my head. The P-value, what's the
 7 cutoff for showing what's significant or not
 8 significant?
 9 A So the typical standard is using -- it's called a 95
 10 percent confidence interval and that in a data set of
 11 this size, that cutoff will be 1.96.
 12 So you can see just an example, the Republican
 13 presidential votes is .95, which means that each
 14 additional Republican presidential vote gives you .95
 15 votes for the candidate. The standard error is .01.
 16 The t-statistic is 110, which is -- that means that
 17 the probability that that number is actually zero is
 18 zero.
 19 Q Okay. Maybe you could explain why the Democratic
 20 Assembly incumbent and Republican Assembly incumbent
 21 are also significant.
 22 A Generally when there's an incumbent in a race, that
 23 incumbent will do better. There's long literature in
 24 political science explaining why this is true.
 25 Better name recognition, better candidates, they tend

1 to have more experience, more money. And so other
 2 things being equal, an incumbent will do better in a
 3 district than a non-incumbent of the same party would
 4 do.
 5 Q Looking at the numbers, could you just explain what
 6 those numbers signify in terms of their significance?
 7 A So generally a -- so we're looking at the number of
 8 votes that the Assembly Republican candidate would
 9 get. And the fact that the Democratic Assembly
 10 incumbent coefficient is negative, it's small, but
 11 it's negative, is that other things being equal in a
 12 race where the Democratic Assembly incumbent, the
 13 number of the votes for the Republican will go down.
 14 Q Okay.
 15 A And the reverse for the Republican incumbent, that in
 16 the case where you have a Republican incumbent, that
 17 will go up. And I need to make one correction. The
 18 Democrat -- the incumbency coefficients are weighted
 19 by the population of the ward.
 20 Q Explain what that means.
 21 A So if I just used -- typically you would just use a
 22 dummy variable. It's one in a ward where there's a
 23 Democratic incumbent and zero when there's not, but
 24 because the wards are unequal size and some of them
 25 they have populations ranging from a few hundred to a

1 Republican or Democrat would get would be different
 2 in those two.
 3 Q Okay. So if I'm looking at just a district-wide vote
 4 total that isn't broken down into each individual
 5 ward, is there a way to take your number and just
 6 kind of like convert that into like a total
 7 percentage of the vote that's a bump due to
 8 incumbency, you know, like five percent, two percent,
 9 one percent just to kind of get an idea as to like
 10 the magnitude of that effect?
 11 A I'm just trying to work out in my head whether you
 12 could do that. The way that this model expresses
 13 that is that you would get an increment in each ward
 14 based on the coefficient and the size of the ward,
 15 and I think it's possible that you could simply apply
 16 that to the district-wide total. But that's -- I
 17 would not be comfortable doing that.
 18 The way that I would want to do that is to do
 19 the analysis and actually look at the incremental
 20 number of votes you get on a district by district
 21 basis. You might be able to get a first
 22 approximation of what that might look like, but
 23 it's -- there are reasons why you would want to
 24 interpret that with caution.
 25 But the general rule holds is that -- the other

1 few thousand, that would bias the results because you
 2 would expect more votes for the Democratic candidate
 3 when you have a Democratic incumbent in a ward of
 4 3,000 people as opposed to a ward of 100 people or
 5 300 people.
 6 And so this is -- you would have to multiply
 7 this number by the population of the ward to get the
 8 number of additional votes that the candidate would
 9 receive.
 10 Q When you're calculating the raw like actual total
 11 numbers, but is the percentage effect the same? You
 12 know, like a 100-vote ward might get two more votes
 13 or something, but then you'd upscale that to 1,000
 14 and it gets a load of 20 more votes or something? Or
 15 is there a difference added to that?
 16 A Well, the coefficient is that the -- let me think
 17 here for a minute. The independent effect of
 18 incumbency would be -- as a theoretical quantity
 19 would be constant across wards, although the effects
 20 would not. So basically for each additional person,
 21 you would expect an effect based on incumbency and
 22 that effect -- that effect on that individual person
 23 or that individual level effect would be the same in
 24 a ward of 100 people as opposed to a ward of 3,000
 25 people even though the total number of votes that the

1 issue here is that that coefficient exists after you
 2 have taken into account the Republican and
 3 presidential -- Republican and Democratic
 4 presidential vote. So you wouldn't be able to look
 5 at that number and say, ah, there were 50,000 votes
 6 or 40,000 votes cast in the assembly race, .02, that
 7 means that the Republican advantage was 800 votes.
 8 You would have to look at that and say that
 9 would be after you take into account all of the other
 10 variables. So this is the independent effect of
 11 incumbency once you've controlled for the other
 12 variables. So in that sense, you wouldn't be able to
 13 take this coefficient and just apply it to a district
 14 to come up with an estimate of the total effect of
 15 incumbency.
 16 Q So the effect of the incumbency, will it be
 17 different, for example, a ward that has 55 percent
 18 that voted for the Republican presidential candidate
 19 versus another ward that has 40 percent that voted
 20 for the Republican candidate? You know, how does the
 21 effect of this Republican Assembly incumbent differ
 22 there?
 23 A This is a linear estimate and so that assumes that
 24 the effects would be the same at different levels of
 25 Republican support or Democratic support.

1 Q Okay.

2 A But again the number -- that that would be after you

3 take into account the Republican and Democratic

4 presidential votes, so you would not see the same

5 presidential number of votes for Republicans and

6 Democrats in the 55 percent Republican district as

7 opposed to 55 percent Democratic district. So you

8 need to keep that in mind that this is controlling

9 for all of these factors, including population and

10 counties and all of these things.

11 Q I think I understand it. So we've been talking about

12 the Democratic and Republican incumbents. I think

13 we've gone over those. And then the county, what

14 exactly is the county effect?

15 A Well, there are different areas of the county that

16 may have particular political dispositions that these

17 don't capture and it was -- struck me as prudent to

18 put this in. You can see most of the effects are

19 actually not significant, and even the effects on

20 which you would think of the most Republican and most

21 Democratic districts, like the effect in Washington

22 County, Waukesha County, Ozaukee County, Dane County,

23 Milwaukee County, those are all not significant, but

24 it gives me a little more analytical leverage to

25 include those.

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1 particular candidates in an assembly district?

2 A I would say they all do because the actual vote is

3 the dependent variable. So these all reflect the

4 estimate of the effect these variables have on the

5 actual vote. So in that sense, they are all related

6 to what actually occurred in the -- in contested

7 districts.

8 Q But in terms of actually like plugging in the numbers

9 of Candidate A in District 1 got 12,000 votes and

10 Candidate B in District 1 got 15,000 votes, where do

11 those numbers go into the equation?

12 A They go in on the left-hand side.

13 Q The assembly vote?

14 A Right.

15 Q Where you add up total votes Republican and total

16 votes for Democrats?

17 A Well, again we'd need to be precise here that the

18 dependent variable is the ward level totals. So I'm

19 not adding anything up there. And that the model

20 estimates the effect of all of these independent

21 variables on the actual vote. So in that sense, they

22 are all connected and they all are a function -- all

23 of the estimates are a function of the actual vote.

24 Q Let's go to something else quick. Page 40, there's

25 like Figures 10, 11 and 12. I'll just ask you some

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1 Q And what page?

2 A We're looking at the coefficients on Page 6 and 7.

3 Q It's the same that these ones that are bolded are the

4 ones that have a significant -- statistically

5 significant effect?

6 A Correct.

7 Q So then you mentioned Dane and Milwaukee and

8 Washington. And those are not bolded, that's the way

9 you reference it?

10 A Right. That means once you take into account all

11 these other variables, being in Dane County does not

12 have an independent effect on the Republican

13 presidential vote.

14 Q So just going back to Page 10 and 11 -- 11, I guess,

15 in this -- should I call it an equation?

16 A Sure. Or model.

17 Q Model. Which elements take the actual votes cast

18 in -- for the assembly candidates in that district --

19 as maybe I should say you applied this model to

20 several different -- to Act 43 actual elections and

21 then to your demonstration plan. I'm kind of

22 focusing on the Act 43 since there's no actual

23 elections under your demonstration plan.

24 When looking at Act 43, which elements of this

25 model take into account the actual votes cast for the

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1 questions on those, but you can look at them to

2 familiarize yourself.

3 A Okay.

4 Q So we'll just start at Figure 10 and it says actual

5 2012 Republican Assembly vote in Act 43 districts.

6 What did the numbers in Figure 10 represent?

7 A This is a histogram that shows the distribution of

8 the actual results. And the way that you would look

9 at -- so the X axis here is the Republican vote

10 percentage in 2012 going from zero to 100 and what

11 this shows is that the left-hand bar, the one with

12 the 23, that is 23 districts in which there was no

13 Republican running, so that Republican vote

14 percentage shows up as zero.

15 You look at the right-hand side where there's

16 the bar with the 4, that shows that there were four

17 districts where there was a Republican on the ballot

18 but no Democrat. And so the rest of these figures

19 show that, for example, there was one -- this is just

20 the Republican votes.

21 If you looked at the Democratic vote, it would

22 be the mirror image of this. There was one district

23 in which the Republican got between 25 and 30 percent

24 of the vote, nine where the Republican got between 40

25 and 45 percent. The bold vertical line is 50

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

6 I counted 51 Republicans won with between 50 and
7 65 percent of the vote. So this shows the
8 distribution of the actual results.

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

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

14 Q So someone might have got 47. -- or 49.8 percent, but
15 they would actually be counted as above 50 percent
16 because once you look at if they won the seat, they
17 would have gotten more than 50 percent of the
18 two-party vote? And it's like a hypothetical of a
19 guy -- you know, a close race where there's 48 to
20 49.6 and then there's scattering.

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

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

3 A I used the 2012 election results.

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

7 A Correct.

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

11 A We're on Page 50?

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

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

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

1 examples of that.

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

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

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

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

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

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

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

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

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

1 those up across all districts and the difference
 2 between the wasted Democratic and wasted Republican
 3 votes gives you a net wasted votes which when divided
 4 by the total number of votes cast gives you the
 5 efficiency gap.
 6 Q I'm going to mark a document.
 7 (Exhibit 5 is marked for identification)
 8 Q And I've put before you Exhibit 5. What this is is
 9 there was a document that your counsel provided
 10 called -- it was a spreadsheet called Efficiency Gap
 11 Calculations, and there were several tabs in that
 12 Excel spreadsheet, and then this was the one that was
 13 labeled Act 43 Direct. So it had a lot of columns,
 14 so I printed out on legal size paper here, but I
 15 think it matches up with the calculations done on
 16 Table 8 in terms of the -- you can check that over to
 17 make sure I gave you the right document.
 18 A So this looks like the spreadsheet I used to generate
 19 this table.
 20 Q Okay. So I was just going to ask you some questions
 21 on the spreadsheet and the columns and just what they
 22 are. So obviously district is the district and then
 23 there's Pop, what does that mean?
 24 A That I believe is the population of the district,
 25 total population.

1 vote -- or you divide each party's side by that total
 2 and that gives you the percentage of the two-party
 3 vote.
 4 Q And it says rhat_open. I think I know what that
 5 means, but you can explain it.
 6 A That's the estimate of the number of votes that a
 7 Republican candidate would receive in a contested
 8 race with no incumbent.
 9 Q And then I would think Republican percentage, that's
 10 the baseline --
 11 A That's the Republican share of the two-party vote.
 12 Q Okay. And then D Lost?
 13 A So that's -- I think those just matched the lost
 14 Democratic, lost Republican, surplus Democratic,
 15 surplus Republican, the total of the Democratic and
 16 Republican wasted votes.
 17 Q All right. And then Rep Win, it says 1, I take it
 18 that means the Republican would win that district?
 19 A Correct.
 20 Q How is the R surplus determined? I was trying to
 21 figure that out by just adding and subtracting these
 22 numbers, but I wasn't quite sure how it worked out.
 23 A It should be that if you subtract the Republican vote
 24 from the Democratic vote in District 1, for example,
 25 that gives you 383 -- 393, I believe that's right.

1 Q And then there's a column that says Dev, do you know
 2 what that --
 3 A That's deviation, which is the difference between the
 4 population and the ideal population, which I believe
 5 is 57,444. Yeah, that's what it is.
 6 Q Okay. And then percent?
 7 A The percent deviation.
 8 Q And then there's dhat_open. Do you know what that --
 9 A So typically when you're dealing with an estimate,
 10 you use -- if you were to write it down, it would be
 11 a D with a caret over it, so dhat, rhat. So that was
 12 how I identified that it was a predicted value, and
 13 then open reflects the fact that it assumes -- it's
 14 an estimate after the incumbency advantage has been
 15 extracted. So it assumes that the seats are open.
 16 Q So that -- you see that 16.235 is what's listed on
 17 the Table 8 as predicted Democratic votes?
 18 A Correct.
 19 Q And so that column is what your model predicts would
 20 be the Democratic votes in the Assembly District 1?
 21 A Correct.
 22 Q The Dem percent, what does that mean?
 23 A That's the percentage of the Democratic vote of the
 24 two-party vote. Basically you add up the Democratic
 25 and Republican vote and you divide the Democratic

1 So that gives you 393, the margin of victory, you
 2 divide that by two, which gives you 196.5, which I
 3 rounded.
 4 Q Okay. To 197, all right. And so for every one of
 5 these districts, we can just do that same calculation
 6 and we'll get that R wasted or the D wasted if
 7 they're the winner?
 8 A Correct.
 9 Q Okay. Now, so if we look at the District 1, you can
 10 look at either the spreadsheet or the table, this is
 11 a pretty close election, correct, in that there's 197
 12 surplus votes?
 13 A That's a close election.
 14 Q Okay. Then how would you characterize the seat as
 15 like a toss-up seat or a swing seat, or is there a
 16 name that you characterize kind of a 50-50 seat like
 17 this?
 18 A It would be accurately characterized as a toss-up
 19 seat.
 20 Q Okay. Now, I take it if the surplus Republican
 21 votes, it's only 197, if this election goes a little
 22 bit differently in real life rather than in the model
 23 and the Democratic candidate wins narrowly, then
 24 these numbers flip in the sense that the Republican
 25 is going to have 16,000-some wasted votes and the

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

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

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

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

1 A Well, the total turnout is the predicted number of
 2 votes that would be cast and it's going to be
 3 different than the actual total. It's going to be
 4 very close. I think in this one I was off by 350
 5 votes, which that's pretty good. But so let's go
 6 back a step here. If we look at the regression
 7 results on -- I'm on Page 21.
 8 So these are the substantive variables. So if
 9 you look at the effects of incumbency for the
 10 Democratic and Republican Assembly incumbent that you
 11 can see that those -- the coefficients are -- the
 12 coefficient for Democratic Assembly incumbent is
 13 positive for Democrats, .028, negative for Republican
 14 votes, minus .021.
 15 Now, those numbers are different. They're not
 16 the mirror image of each other. They show that the
 17 number of votes that the Democratic Assembly
 18 candidate gets is higher when the Democrat is a
 19 Republican, they get more Democratic votes and fewer
 20 Republican votes. In extracting that advantage, you
 21 use this -- the results of the model to generate the
 22 results, but you set both of these equations, both of
 23 these coefficients to zero.
 24 So that means that you are -- you are, in fact,
 25 when you subtract the incumbency advantage, it has

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1 that's based on the 2012 election and measures of
 2 underlying partisanship.
 3 When Professor Gaddie did his underlying
 4 partisanship estimate in 2011, he did them -- he did
 5 not have the 2012 election results. He had previous
 6 election results, 2010, 2008, 2003. And he did it in
 7 a different way. It is analogous in terms of what
 8 he's trying to measure, but his methods were slightly
 9 different than mine. If you look at -- so you look
 10 at Page 30, which is Professor Gaddie's baseline
 11 partisan metric plotted against mine. You can see
 12 that there are some differences, but they are very
 13 strongly related in that the correlation, the R
 14 squared between these two measures are .96, which is
 15 almost perfect.
 16 And my conclusion looking at this is that we are
 17 measuring the same thing in that the fundamentals of
 18 the districts do not change even when the actual
 19 votes that might be cast in an election do change.
 20 So it is likely that the -- well, these numbers would
 21 be different if you used 2014, but that's a separate
 22 problem. You could not -- you couldn't take this
 23 model and simply say we're going to plug in the 2014
 24 numbers and get what the -- see what the results are.
 25 But my conclusion is that this model is an

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1 the effect in a race with a Democratic incumbent,
 2 that reduces the number of votes that the Democratic
 3 candidate gets. It increases the number of votes
 4 that the Republican candidate gets, but those numbers
 5 are not equal. It's not like you take 100 votes.
 6 It depends on what the coefficients are, and so
 7 it would affect both totals, but it's not you're
 8 taking marbles from one jar and transferring them to
 9 the other. It depends on what the underlying data
 10 show.
 11 Q That makes sense.
 12 A Okay.
 13 Q But there would be some sort of, so to speak, like
 14 reduction for the incumbent and bump for the
 15 non-incumbent candidate, but we can't say that
 16 they're equivalently sized?
 17 A Correct.
 18 Q Do you have an opinion as to whether your baseline
 19 partisanship numbers for all of these districts would
 20 hold also for the 2014 election?
 21 A I think that they would be similar. I don't know how
 22 they would line up exactly. The reason I have some
 23 confidence that they would be similar is that my --
 24 if you look at my estimates using 2012 data to
 25 generate the estimate of underlying partisanship,

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1 accurate measure of the underlying partisanship of
 2 the districts that were created in Act 43.
 3 Q So do you think the partisan gerrymandering should be
 4 based on underlying partisanship of the district or
 5 based on the votes that were actually cast in the
 6 legislative elections?
 7 A It's hard to give a clear answer to that because it
 8 depends on what you're measuring. Now, looking at
 9 the actual results gives you one indication of what
 10 happened. But as I explained here and is well-known
 11 in the discipline that there are other things that
 12 you need to look at, in particular, trying to deal
 13 with the question of uncontested districts.
 14 Q What's the margin of error for determining the
 15 baseline partisanship of the district?
 16 A So my -- with the Act 43, I would have to go back and
 17 look at the standard error of the regression, but
 18 it's probably on the order of plus or minus one and a
 19 half percentage points. I'd have to look
 20 specifically, but these are very precise estimates.
 21 It's not a large margin of error.
 22 Q Although for determining the efficiency gap for
 23 districts that are somewhere between 48 and 52
 24 percent, that 1.5 percent margin of error could flip
 25 a district from one to the other, can't they?

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

8 So in a 49 percent -- in a 51-49 percent
9 district, the margin of error suggests that there is
10 some likelihood that the actual number is different,
11 and it is not impossible that that actually might be
12 51-49, but that's not equally likely. You can't say
13 that, oh, the margin of error is 1.5 and the -- my
14 estimate is a victory margin of 1.5 percent, so it's
15 a coin flip. That's not how you calculate the
16 probabilities.

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

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

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

24 A Um-hum.

25 Q Do you think that it is possible to get the

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

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

16 A Correct.

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

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

1 partisanship down to like hundredths and thousandths
2 of a percentage?

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

11 MR. KEENAN: Off the record.

12 (Discussion off the record)

13 (Exhibit 7 is marked for identification)

14 Q Can you read it okay, Mr. Mayer?

15 A Yes.

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

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

21 (Exhibit 8 is marked for identification)

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

24 A Yes.

25 Q What is that?

1 method of converting those percentages to actual
2 votes.

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

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

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

20 A I believe that's true.

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

24 A That's correct.

25 Q So this again is a straight two-party vote

1 calculation?

2 A Right, which again is consistent with how the problem

3 was handled in the literature.

4 Q And then in terms of the predicted number -- the

5 total number of votes, obviously you needed to apply

6 the 51.22 percent to a total vote number to get to

7 the Republican vote total. How did you come up with

8 like the total number of votes in this district?

9 A As I mentioned, I believe what I did is -- we can

10 actually check this if you would like. I believe

11 that the total number of Democratic and Republican

12 votes is the same in this model. Or in here, I think

13 I took that in the total that I generated in my model

14 to come up with an estimate of the total number of

15 votes, and we can check that if you'd like.

16 Q Okay. I can look at that, too, over the lunch break.

17 Now, Professor Gaddie himself, though, to your

18 understanding did not make projections of the

19 expected turnout in the 2012 elections when he did

20 this chart in Exhibit 7?

21 A I don't believe he did, but I don't know for sure.

22 Q Okay. And then how is -- you've gone into this a

23 little bit before, but what's your understanding as

24 to how Professor Gaddie arrived at his Republican

25 percentage there?

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1 then the surplus votes is the differential divided by

2 two?

3 A Correct.

4 Q Now, it's not your testimony that Dr. Gaddie himself

5 went ahead and performed any sort of calculation like

6 this?

7 A Not that I'm aware of.

8 Q Okay. Basically what you did is you took his

9 underlying baseline partisanship numbers and plugged

10 them into -- I guess you didn't plug them into your

11 model, but you applied them to the total votes

12 produced by your model?

13 A Correct. I'm glad you rephrased that -- that was

14 very nicely done.

15 MR. KEENAN: Actually I think I'm at a

16 good stopping point to go to lunch and then come

17 back.

18 (Lunch recess is taken)

19 (11:18 p.m. to 12:19 p.m.)

20 Q We're back on the record after lunch. Let's just go

21 back to some of the stuff we were talking about

22 before lunch. One was uncontested seats and we had

23 talked a little bit about how those were handled. I

24 just wanted to look at first maybe just generally

25 explain for any of the Act 43 calculations that you

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1 A So my understanding as he described it is that he

2 looked at past electoral performance in certain

3 elections, and I don't recall precisely which ones

4 that he looked at, and he concluded that that was an

5 effective way to come up with an accurate estimate of

6 the partisanship. So my understanding is that is how

7 he generated these numbers.

8 Q Okay. And then where did your understanding of how

9 he did this come from?

10 A From his deposition in which he described his methods

11 and the different files that he produced that I was

12 able to examine.

13 Q And that's the deposition from the Baldus litigation?

14 A See, the problem is that the Baldus vs. Brennan --

15 there's so many B's in these cases.

16 Q Baumgart, yeah.

17 A To be precise.

18 Q Okay. So here's your report. And in your report,

19 the Gaddie metric calculation is at Table 9, I

20 believe, which is on Page 52. And just to confirm,

21 so the way that the wasted votes were calculated was

22 the same way that we went over with respect to the

23 Act 43 calculations?

24 A Yes.

25 Q All the losing candidate votes count as wasted and

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1 did how your model predicted the votes in an

2 uncontested race.

3 A So the model itself utilized data from contested

4 districts. I think there were 72 contested

5 districts. And all of the independent variables, the

6 incumbency, the presidential votes, demographics, the

7 county fixed effects, those are all exogenous to the

8 characteristics of any particular district.

9 And so I was able to use the relationships that

10 the model produced in the 72 contested districts to

11 create evidence of the uncontested districts because

12 we still have a presidential vote, we still have the

13 ballots cast for both the Republican and Democratic

14 presidential candidates. We have the demographics.

15 So I essentially developed a model using the

16 contested districts and then applied the results of

17 that model using the values of the independent

18 variables in uncontested districts to generate the

19 vote, the estimated vote totals for the uncontested

20 districts.

21 Q Okay. So in terms of the total number of votes that

22 would be cast in an uncontested race, how is that

23 determined?

24 A It was a function of the number of votes cast in the

25 presidential, so the turnout is related to that, but

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1 again the nature of that relationship was a function
 2 of the relationship that you observed in contested
 3 districts.
 4 Q Okay. And so the number of total votes that you
 5 see -- that your model predicts between both of the
 6 parties' candidates, is that going to be greater than
 7 the total number of votes that the candidate received
 8 undefeated?
 9 A So can we find --
 10 Q Sure. I was thinking maybe we could look at your
 11 exhibit, Table 8, Page 50. And if you want to for
 12 reference go to Exhibit 6, I think District 8 is the
 13 first uncontested one. And then 9 and 10 I think are
 14 uncontested. And if I look at the votes for
 15 District 8, you know, Jocasta Zamarripa received
 16 78-69 votes.
 17 MR. STRAUSS: I'm sorry, I missed it.
 18 Where are you?
 19 MR. KEENAN: Sure. It's Page 10 of
 20 Exhibit 6. So it's Assembly District 8.
 21 MR. STRAUSS: Okay, thanks. Yes.
 22 Q So there is 78-69 votes for the uncontested
 23 Democratic candidate and then I see that -- looks
 24 like there's about 9,000 estimated votes for your
 25 Act 43 calculation.

1 almost invariably lower turnout, sometimes much lower
 2 turnout in an uncontested race rather than a
 3 contested race.
 4 So that explains the reason why my model
 5 estimates that there would be 9,000 votes cast in a
 6 contested race with no incumbent as opposed to the
 7 result which was an uncontested race with an
 8 incumbent.
 9 Q Okay. And then when we go to the Gaddie calculation,
 10 did you take, for example, the total number of votes,
 11 you know, the 7,342 and 1,738 equals -- there's a
 12 certain amount of total turnout in that. Did you
 13 then just apply Gaddie's percentages to that number?
 14 A I believe I did. I'd have to sit down and do the
 15 calculations. My recollection is that's the way that
 16 I calculated the total number of votes is using the
 17 estimates generated by my model and as for the totals
 18 in applying them to Professor Gaddie's calculations.
 19 Q Did your calculations for the efficiency gap for
 20 Act 43 have any instances where the model predicted a
 21 winner from the wrong party?
 22 A There were I believe two instances where the model
 23 picked the wrong winner and I explained -- there's a
 24 table and it shows -- I think those two races, it
 25 was, you know, the winner got between 50 and 51

1 A Okay.
 2 Q So maybe just explain like what -- how you end up
 3 with 9,000 votes here when there was 7,800-some cast.
 4 A I don't see 9,000 votes. Where are we?
 5 Q If I look at No. 8, I see predicted Democratic vote,
 6 73-42, predicted Republican vote, 1,738.
 7 A I see. So again the no incumbent baseline is the
 8 estimated partisanship of a contested race with no
 9 incumbent, and then in this District 8 is -- I
 10 believe Zamarripa was the incumbent. The reason
 11 that -- so basically the fact that there was no
 12 Republican on the ballot in District 8 doesn't mean
 13 that there were no Republicans in the district.
 14 If you looked at the presidential vote, you
 15 would see that Romney did get some votes in that
 16 district and so the no incumbent baseline is an
 17 estimate of what the votes would have been had that
 18 race been contested and had there been no incumbent.
 19 And so a couple of things are going on here.
 20 One is that turnout will go up in a contested race as
 21 opposed to in an uncontested race because those 1,700
 22 people who would have voted Republican under my
 23 model, they have no Republican to vote for. And so
 24 the most common thing for them to do is simply to
 25 abstain, and that's one of the reasons why you see

1 percent, 52 percent. They were both very close.
 2 Q So how was that handled? Did the wasted vote
 3 calculation proceed on the basis that your model was
 4 correct, or did it flip that, so to speak, to show
 5 who actually won the race?
 6 A When my model -- I used the results from my model. I
 7 didn't go back and manually correct the errors. The
 8 results are what they are.
 9 Q Did you do an efficiency gap calculation for the 2014
 10 legislative elections?
 11 A I did not.
 12 Q Is there any reason why you did not?
 13 A A couple of reasons. One is that I concluded that
 14 the presidential year was the -- was going to give
 15 you the most accurate estimate of the underlying
 16 partisanship. And that's what's typically done for
 17 trying to assess a redistricting plan.
 18 I had Professor Gaddie's estimates that he
 19 produced of what he anticipated what the results
 20 would be. And doing -- repeating the results for
 21 2014 was actually a very involved process. It's not
 22 sitting down and saying, oh, I'm going to just change
 23 this number and punch a button. It would take quite
 24 a bit of work to do that.
 25 But I did 2012 because in my view that the first

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

1 generated that, whereas I went through on a district
 2 by district basis looking at the actual number of
 3 votes.
 4 Q Can you explain for me how those two different
 5 calculations yield basically the same end result?
 6 A Because the reason they yield the same or very
 7 similar results is that they're both measuring the
 8 same thing, that the seat share and vote share
 9 calculation is the equivalent of what you would get
 10 if you did the district by district calculations with
 11 equal turnout. And my method was to look at district
 12 by district and actually counting the votes, and I
 13 did that for two reasons.
 14 One is that I had the data available to do it.
 15 The second is that in the second step of my analysis,
 16 I was going to estimate what the partisan effect
 17 would be under an alternative district configuration.
 18 And if I was just looking at the percentage, there
 19 was no way to know what would happen if you have a
 20 district that's 47 percent-53 percent, if you changed
 21 the boundaries so the district is different, there's
 22 no way just looking at the percentages -- there's no
 23 way to calculate or estimate what the vote would be
 24 in the alternative district. For that you needed a
 25 measure of actual votes.

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

1 But that measure is not necessary if all you
 2 were interested in doing is calculating the
 3 efficiency gap, and that is why his estimate and my
 4 estimate are very close.
 5 Q So you mentioned assuming equal turnout, I think was
 6 the phrase?
 7 A Correct.
 8 Q Could you just explain what that means?
 9 A Well, so one way of doing the efficiency gap is that
 10 you just look at the percentages in each district
 11 without looking at the votes, and by looking just at
 12 the percentages, you are making an assumption that
 13 turnout is going to be equal in every district, and
 14 that way, that is mathematically identical to doing
 15 it as he did, which is using the seats and votes.
 16 In looking at the actual votes or, more
 17 properly, the estimated votes, I'm able to take
 18 advantage of the fact that in this case, I can derive
 19 estimates of the numbers of votes that are cast in
 20 each district, and it gives me a method of
 21 calculating the efficiency gap that I can compare to
 22 an alternative district configuration such as my
 23 demonstration plan.
 24 Q So if I'm understanding, equal turnout means it's
 25 assuming District 1 has the same number of voters as

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

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

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

1 Q The way you calculate the efficiency gap, for
 2 example, in districts, the turnout that has actually
 3 been seen in that district affects the total number
 4 of wasted votes for each party, is that correct?
 5 A So, I'm sorry, say that again.
 6 Q Sure. So like in -- the number of wasted votes in a
 7 district is partly a function of the total turnout in
 8 that district, correct, total number of votes cast?
 9 A Not necessarily.
 10 Q Why not?
 11 A Because it's going to be more a function of what the
 12 distribution of the votes would be. If you had
 13 100,000 votes cast in a district with a 51-49 split,
 14 the efficiency gap would be lower than it would be in
 15 an election with 20,000 votes that was 60-40. So
 16 it's not -- turnout can be one of the factors that
 17 explains it, but it is not the only one and it's
 18 probably not even the driving one.
 19 It's the distribution of votes that makes the
 20 larger contribution to the efficiency gap
 21 calculations.
 22 Q Sure. But in an individual district, if turnout in,
 23 for example, a district that is always going to be
 24 Republican, one of these uncontested races is very
 25 high in that district, that's going to increase the

1 wasted votes for that Republican candidate, correct,
 2 if that's higher than normal? Like, for example, in
 3 2014 compared to 2012, if turnout increases in
 4 certain areas, there's going to be more wasted votes
 5 for all those winning candidates, correct?
 6 A Well, in the specific example you gave in an
 7 uncontested district where the winning candidate gets
 8 100 percent of the vote that if that -- the number of
 9 votes goes up, that would increase the number of
 10 surplus votes.
 11 Q Okay. And similarly if the turnout is lower than
 12 normal in a district, that decreases the number of
 13 wasted votes for the winning candidate?
 14 A Well, again in this specific example, yes, but again
 15 the dynamic will be very different in a contested
 16 race. I'm sorry, can we take a quick break?
 17 Q Sure.
 18 (Short recess is taken)
 19 Q Back from the break, do you have any opinion on the
 20 baseline level of partisanship of a district that a
 21 party has a realistic chance of winning that seat?
 22 A It's hard to make a definitive statement. The
 23 definition of the classification of districts into
 24 safe, leaning, tossup, I mean there are some
 25 generally used definitions, but they are not -- not

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1 the amount of packing and cracking that you do. So
 2 not excessively concentrating voters of one party
 3 into a small number of overwhelming districts, not
 4 splitting up voters, I mean so that you would
 5 essentially treat voters from the major parties
 6 equally.
 7 Q What sort of like calculations do they have to make
 8 in order to figure out how well they're doing on that
 9 so that after the fact someone is going to come up
 10 with these calculations, what would they have to do?
 11 A Well, I mean you would need information as the type
 12 that Professor Gaddie did with the likely partisan
 13 outcomes are -- that you expect to see in districts
 14 or you could use an alternative measure, which is
 15 what I did, and use that information in the course of
 16 creating the districts and measuring the results.
 17 Q Now, would you have to make some sort of estimate as
 18 to how many votes are going to be cast in that next
 19 election?
 20 A You could do it that way. It's not necessarily the
 21 way. Professor Gaddie did not. I did. So that's
 22 one way you could do it.
 23 Q Looking at some -- your report, it mentions a
 24 specific example of packing and cracking on Page 41,
 25 I believe.

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1 everybody uses the same rule.
 2 Q Okay. So maybe I could get what you think if there
 3 is a generally accepted definition, what those are
 4 and then what your opinion is on those.
 5 A So in my own work on state legislatures, I had
 6 defined as competitive districts that where the
 7 incumbent wins with less than 60 percent of the vote,
 8 that other people used definitions of 55 percent.
 9 So generally somewhere in the range of 50 to 55,
 10 55 to 60 percent is what is one threshold for
 11 classifying a race that is conceivably competitive.
 12 It doesn't mean that you can easily have races where
 13 an incumbent wins with 57 percent of the vote and
 14 that's going to be considered generally safe.
 15 Q Okay. Kind of switching topics a little bit, what
 16 factors would a legislature who is going about trying
 17 to do a redistricting plan after a census, what would
 18 they have to do in order to if they wanted to base a
 19 plan on your version of the efficiency gap, what
 20 would they have to do to do that?
 21 A So if I understand the question is how would you go
 22 about devising a plan that would have a small
 23 efficiency gap.
 24 Q Yeah.
 25 A Essentially the way that you would do it is minimize

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1 A 43.
 2 Q It starts at 41 about Sheboygan, the City of
 3 Sheboygan and then it continues on, yeah, 43. So if
 4 I have it correctly, under the prior plan, the 26th
 5 Assembly District was -- it contained the City of
 6 Sheboygan itself in its entirety and also some of the
 7 surrounding areas?
 8 A So in the 1992 and 2001 redistricting rounds, the
 9 city was entirely contained in a single assembly
 10 district.
 11 Q And then in the most recent one, that was the 26th
 12 District?
 13 A Well, the most recent was the 26th District entirely
 14 contained in the 26th in the 1992 and the 2001
 15 rounds.
 16 Q And then in the 2010 round, the 26th includes part of
 17 the City of Sheboygan, but you're saying it's cracked
 18 also into the 27th District?
 19 A Correct.
 20 Q Okay.
 21 A So this is a classic example of cracking because you
 22 have a jurisdiction which was small enough to be
 23 included in a single assembly district, which it had
 24 been for 20 years. It's a Democratic city. I would
 25 classify it as reasonably strongly Democratic. My

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1 calculation showed that if the entire city was in a
 2 single assembly district, it was very likely to
 3 result in a Democratic district, but you by splitting
 4 it, you take a portion of those Democrats or a
 5 portion of those -- that Democratic partisanship and
 6 you split it into two districts where they don't come
 7 close to forming a majority in either one.
 8 So this is quite literally a textbook
 9 demonstration of the cracking phenomenon where you
 10 have a jurisdiction that you don't need to split and
 11 you split it for what appears to be no other reason
 12 than to crack a Democratic constituency into two
 13 separate constituencies to create two Republican
 14 districts.
 15 Q In your version of the City of Sheboygan district,
 16 the 26th District under the demonstration plan,
 17 what's your baseline partisanship of the district you
 18 created?
 19 A Well, I don't know that my baseline plan, that
 20 district is named the 26th because the numbering
 21 system was a little different, but I would have to go
 22 back and confirm, and that's just because what I call
 23 the 26th District in my plan may not be the plan -- I
 24 could go back and look, but it was -- actually we can
 25 even --

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1 to 51.3 on the subsequent election.
 2 Q Now, in a 51.3 percent race, it's not impossible for
 3 a Democrat to win that race either, is it?
 4 A Not impossible.
 5 Q And then in the 27th, you calculate the baseline open
 6 seat partisanship measure at 52.3 percent?
 7 A Well, again I'm not sure that --
 8 Q On Page 42 on your report.
 9 A Let's take a look here. Correct, so my underlying
 10 partisanship estimate for the 27th was 52.3. That's
 11 the open seat baseline.
 12 Q Okay. And so I mean would you characterize both of
 13 those seats as winnable for the democrats?
 14 A I would classify the 26th as potentially winnable. I
 15 wouldn't classify the 27th as winnable for the
 16 Democrats. Not impossible, but extremely difficult.
 17 Q Okay. At 52.3, it's extremely difficult for them to
 18 win that seat?
 19 A As again this is the open seat baseline, I would
 20 classify this as difficult for the Democrats to win,
 21 not impossible.
 22 Q Okay. Now, what your plan would do, though, it would
 23 make one safe Republican district and one safe
 24 Democratic district, correct?
 25 A It would --

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1 Q On 42 you say the result would have been a 54 to 56
 2 percentile?
 3 A Right, but I don't know that that is -- that's
 4 probably close to what happened, but -- what I did,
 5 but I would have to go back and actually look to get
 6 the precise numbers.
 7 Q Okay. In the 26th District in the 2010 election,
 8 which party won that district?
 9 A I'm not sure.
 10 (Exhibit 9 is marked for identification)
 11 Q I show you Exhibit 9, which this is the GAB printout
 12 for the fall election of 2010. Now, it says error on
 13 the first page because, I don't know, that's what it
 14 does when it prints out, but if you turn to the 26th
 15 District, I mean is it correct that the Republican
 16 won that district in the 2010 election?
 17 A I'm looking at this, which is Page 15 of Exhibit 9.
 18 It shows that the Republican won by 151 votes if I'm
 19 calculating correctly.
 20 Q So you're classifying that as a Democratic district,
 21 but under the prior plan, it wasn't impossible for a
 22 Republican to win that district, was it?
 23 A Well, by definition that's true because a Republican
 24 won it just barely in 2010. But then the
 25 Republicans -- the vote percentage went up from 48.9

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1 Q They would be safer, it would be having one district
 2 more Republican and one district more Democratic,
 3 right?
 4 A I believe so, that's correct.
 5 Q Have you tested any of your demonstration map
 6 districts that are narrow Democratic districts, how
 7 they would have fared in the 2014 election, whether
 8 the Democrats would have actually held onto those
 9 seats?
 10 A No.
 11 Q Let's transition into your demonstration plan.
 12 A Okay.
 13 Q How did you go about -- first let me just ask you
 14 what computer program did you use to do the
 15 demonstration plan?
 16 A I used a GIS program called Maptitude, Maptitude for
 17 Redistricting.
 18 Q Is that -- I just don't know, is that the program
 19 that the legislators used to draw the Act 43 map?
 20 A I don't know.
 21 Q Okay.
 22 A There are -- the two most commonly used redistricting
 23 programs are Maptitude for Redistricting and another
 24 one called AutoBound. I don't know --
 25 Q I believe the other one was AutoBound -- from reading

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

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

1 A With one exception. I left the 8th District alone
 2 because that was a district created by the federal
 3 court in 2012, and I knew that that district was
 4 Voting Rights Act compliant.
 5 The African-American majority-minority districts
 6 in Milwaukee I treated similarly to what they were
 7 under the plan, which we also knew was compliant.
 8 But other than those districts, I started with a
 9 blank slate.
 10 Q I believe you said this before, but what's the ideal
 11 population of an assembly district?
 12 A So I believe it's 57,444.
 13 Q And is that 57,444 what?
 14 A That is the ideal population as calculated by looking
 15 at the total population of the state, dividing it by
 16 the number of districts in a legislative body and
 17 that gives you the -- in a district plan with perfect
 18 population equality, that's the number that you would
 19 hit. So that's essentially 57,444 is the total
 20 population of Wisconsin after the 2010 census divided
 21 by 99.
 22 Q But that includes children who aren't going to be
 23 able to vote, correct?
 24 A Correct.
 25 Q And I think you mentioned like felons who can't vote?

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

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

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

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

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

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

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

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

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

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

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

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

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

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1 Q Do you have an opinion of whether the plan that was
2 in effect in the 2000s assembly districts, whether
3 that was a gerrymander?
4 MR. STRAUSS: Again object to the
5 extent it calls for a legal conclusion. If you
6 understand the question.
7 A Yeah, I mean that one was produced by courts and
8 courts generally do not take partisanship into
9 account. At the same time, my understanding of the
10 way that the 2001 plan was drawn is that the judges
11 in that case accepted submissions from the parties.
12 There were a number of maps the Democrats
13 submitted, there were a number of maps that
14 Republicans submitted and that they incorporated that
15 into their drawing of the map. So the -- I'll leave
16 it at that.
17 Q Do you know how many times the Democrats have won the
18 Wisconsin Assembly in the last 20 years?
19 A I could look. I don't know off the top of my head.
20 Q Does your demonstration plan, would it give them --
21 give Democrats an advantage in terms of attempting to
22 like control the assembly?
23 A I would have to look at the results. I'm not sure
24 what the expected -- I think there's a table in there
25 somewhere. Let me look.

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1 So on Page 46 there's a table that shows the
2 summary statistics and it shows that my plan would be
3 expected to produce a 51 to 48 Democratic majority in
4 the assembly.
5 Q Okay. And that's based off of just looking at the
6 2012 election data, though, right, your calculations?
7 A I just want to make sure I give a precise answer.
8 That that's based on the underlying model, which is
9 based on the 2012 election results.
10 Q Yes, that's sort of what I meant to say. So yes.
11 A Okay.
12 Q But thank you for clarifying. And do you know if
13 that baseline partisanship would then hold under an
14 election that -- in like 2014 where a Republican won
15 the highest office on the ballot that year?
16 A Well, I haven't done the numbers, but it's quite
17 possible that if you did that result for 2014 that it
18 would show a Republican majority, but I don't know.
19 Q And then just going back to your demonstration plan
20 partisanship model, I'm looking at Exhibit 10, but I
21 guess it's probably the same. The column D percent
22 and R percent are PCT, but I think it's percent, it's
23 about the seventh one in, it says D PCT?
24 A Okay.
25 Q And then the ninth one, it says R percent, do you see

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1 those two columns?
2 A Yes.
3 Q If I wanted to look at a particular district under
4 your demonstration plan and determine what your view
5 of the underlying partisanship is, those are the two
6 columns I'd look at?
7 A Correct, if you were interested in the percentages.
8 Q Yeah. So like, for example, when it says party
9 split, 48 to 51 on Page 46 of your report, that's
10 looking at those two columns and seeing where --
11 which party's over 50 percent?
12 A Correct.
13 Q And just doing this again, I think I know the answer,
14 but those are two party percentages, so just the
15 two-party vote?
16 A Correct.
17 Q So someone is going to be 50 percent over in each one
18 of those races?
19 A Correct.
20 MR. KEENAN: I think I want to take a
21 break.
22 (Short recess is taken)
23 Q Well, back on the record. I just have a few more
24 follow-up questions. Where did you get the number of
25 municipal splits that Act 43 had? Where did you get

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1 that number from?
2 A I believe I got that from within Maptitude using the
3 same method, but I'm not sure.
4 Q So you think you imported the Act 43 districts into
5 your Maptitude program and ran a report like that?
6 A I think so.
7 Q So I guess if that's the case, Maptitude was using
8 the same measurements?
9 A I believe so. I would have to go back and double
10 check.
11 Q Are you expressing an opinion about the durability of
12 the efficiency gap in Wisconsin over the course of --
13 A I think on that I will defer to Professor Jackman and
14 his report.
15 Q Very good.
16 MR. KEENAN: That's all I have.
17 MR. STRAUSS: Just give us a minute
18 and let us talk and see if we have any questions
19 to ask.
20 (Short recess is taken)
21 MR. STRAUSS: So on the record.
22 EXAMINATION
23 BY MR. STRAUSS:
24 Q In your calculations of the efficiency gap, you used
25 what you described as estimates. What do you mean by

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KENNETH MAYER, Ph.D.

1 estimates?
 2 A So these were -- these estimates were generated by
 3 the underlying model, which looked at the
 4 relationship between the independent variables that I
 5 used in the actual assembly vote and then I used the
 6 results of that model to generate forecasts,
 7 estimates of what the underlying partisanship was in
 8 each of the 99 assembly districts and also used that
 9 to generate estimates in the demonstration plan that
 10 I drew.
 11 But one thing to note about this model is that
 12 it was a highly accurate, you know, with very
 13 extraordinarily high R squares, which you rarely see
 14 in social science models, so I'm very confident that
 15 these are accurate estimates of the existing
 16 partisanship and what it would have been in my
 17 demonstration plan.
 18 Q And do you consider -- when you use the word
 19 estimate, do you -- how would you compare that to
 20 using the word guess?
 21 A I'm using the estimate in the statistical sense, that
 22 it is a number that is produced through analysis,
 23 that there is obviously going to be some degree of
 24 error, but I'm confident that that error is very
 25 small and in no sense is it a guess.

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1 ERRATA SHEET
 2 Witness Name: Kenneth Mayer, Ph.D.
 3 Date Taken: November 9, 2015
 4 Case Name: Whitford, et al., vs. Nichol, et al.
 5 Page/Line Reads Should Read Reason
 6 _____
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 24 _____
 25 _____ Kenneth Mayer, Ph.D.

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1 MR. STRAUSS: Okay. I don't have any
 2 further questions.
 3 MR. KEENAN: No further questions.
 4 MR. STRAUSS: We'll reserve signature.
 5 (1:39 p.m.)

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1 STATE OF WISCONSIN)
 2) ss.
 3 COUNTY OF DANE)
 4)
 5 I, LISA A. CREERON, a Registered Professional
 6 Reporter and Notary Public in and for the State of
 7 Wisconsin, do hereby certify that the foregoing is a
 8 true record of the deposition of KENNETH MAYER, Ph.D., who
 9 was first duly sworn by me; having been taken on the 9th
 10 day of November, 2015, at the Wisconsin Department of
 11 Justice, 17 West Main Street, in the City of Madison,
 12 County of Dane, and State of Wisconsin, in my presence,
 13 and reduced to writing in accordance with my stenographic
 14 notes made at said time and place.
 15 I further certify that I am not a relative
 16 or employee or attorney or counsel for any of the
 17 parties, or a relative or employee of such attorney
 18 or counsel, or financially interested in said action.
 19 In witness whereof, I have hereunto set my hand
 20 and affixed my seal of office this 14th day of November,
 21 2015.
 22 _____
 23 Notary Public, State of Wisconsin
 24 My Commission Expires: 1/29/17
 25 _____

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| 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 |

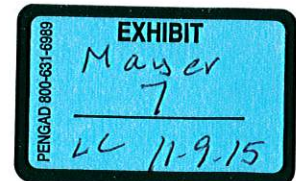
EXHIBIT
Mayer
 5
 2011-9-15
 PENGAD 800-681-6888

| 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 |

| 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 | | | | | | | |
|-----------|----------|--------|---------|----------|---------|--------|---------|
| DISTRICT | Assembly | | | DISTRICT | Senate | | |
| | Current | New | Delta | | 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% | 45.23% | 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 | 71.74% | 68.31% | -3.43% | | | | |
| 60 | 68.17% | 69.57% | 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 | 69.12% | 31.71% | -37.41% | | | | |
| 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 | | | New Map | |
|----------------------------------|-------------|--------|----------------------------------|----------|--------|
| | Assembly | Senate | | Assembly | Senate |
| Strong GOP (55%+) | 27 | 7 | Strong GOP (55%+) | 38 | 12 |
| Lean GOP (52.1-54.9%): | 13 | 8 | New Lean GOP (52.1-54.9%): | 14 | 5 |
| Total GOP Seats (strong + lean): | 40 | 15 | Total GOP Seats (strong + lean): | 52 | 17 |
| Swing (48-52%): | 19 | 5 | New Swing (48-52%): | 10 | 3 |
| Lean DEM (45.1-47.9%): | 7 | 3 | New Lean DEM (45.1-47.9%): | 4 | 1 |
| Strong DEM (-45%): | 33 | 10 | Strong DEM (-45%): | 33 | 12 |
| Total DEM Seats (strong + lean): | 40 | 13 | Total DEM Seats (strong + lean): | 37 | 13 |



| 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 |

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

| 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 |

| 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 |

| 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 |

EXHIBIT
Mayer
10
LC 11-415
PENGAD 800-631-6989

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 |

| 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 |