

1 IN THE UNITED STATES DISTRICT COURT
2 FOR THE NORTHERN DISTRICT OF GEORGIA
3 ATLANTA DIVISION

4 DONNA CURLING, ET AL., :
5 PLAINTIFFS, :
6 vs. : DOCKET NUMBER
7 BRAD RAFFENSPERGER, ET AL., : 1:17-CV-2989-AT
8 DEFENDANTS. :

9
10 **TRANSCRIPT OF HEARING ON PRELIMINARY INJUNCTION PROCEEDINGS**
11 **BEFORE THE HONORABLE AMY TOTENBERG**
12 **UNITED STATES DISTRICT JUDGE**

13 **JULY 26, 2019**

14 **9:37 A.M.**

15 **VOLUME 2 OF 2**

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21 ***MECHANICAL STENOGRAPHY OF PROCEEDINGS AND COMPUTER-AIDED***

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P R O C E E D I N G S

(Atlanta, Fulton County, Georgia; July 26, 2019.)

THE COURT: Please have a seat. Who is the plaintiffs' next witness?

Good morning.

MR. POWERS: Good morning, Your Honor. John Powers representing the Coalition plaintiffs.

THE COURT: Yes.

MR. POWERS: The plaintiffs call Dr. Virginia Martin, election commissioner for Columbia County, New York.

COURTROOM DEPUTY CLERK: Please raise your right hand.

(Witness sworn)

COURTROOM DEPUTY CLERK: Please have a seat. Loudly and clearly state your full name, and spell your last name for the record, please.

THE WITNESS: Virginia Martin, M-A-R-T-I-N.

Whereupon,

DR. VIRGINIA MARTIN,

after having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. POWERS:

Q. Good morning, Dr. Martin.

A. Good morning.

Q. Dr. Martin, what is your current occupation?

1 **A.** I'm the Democratic election commissioner in Columbia
2 County, New York.

3 **Q.** Dr. Martin, how long have you been serving in that role?

4 **A.** Since December of 2008.

5 **Q.** And, Dr. Martin, how many staff members do you oversee?

6 **A.** In my office, I oversee three full-time and one part-time
7 person. And I will say I also oversee temporary workers --
8 election workers numbering about 150.

9 **Q.** Per election?

10 **A.** Yes.

11 **Q.** And, Dr. Martin, could you please inform the Court about
12 your duties and responsibilities as election commissioner.

13 **A.** Yes. As election commissioner, I represent one half of
14 the county board of elections. Our boards of elections are
15 bipartisan. And the board of elections is myself as Democratic
16 commissioner, and my counterpart is Republican commissioner
17 Jason Nastke.

18 So we are responsible for everything related to voter
19 registration, keeping the voter rolls current and accurate,
20 determining what candidates get on the ballot, and running
21 elections.

22 **Q.** Thank you. And, Dr. Martin, have you received any
23 certifications related to election administration?

24 **A.** Well, the one that comes to mind concerns HAVA, Help
25 America Vote Act, polling place accessibility, which I received

1 from the Independent Living Center of New York.

2 **Q.** Thank you. And, Dr. Martin, do you have experience in
3 transitioning an election system to a primarily hand-marked
4 paper ballot system?

5 **A.** Yes.

6 **Q.** Dr. Martin, were you responsible for overseeing that
7 transition to hand-marked paper ballots?

8 **A.** With my counterpart, yes.

9 **Q.** And tell me about your role in implementing the
10 transition.

11 **A.** We were responsible for making sure that all the
12 procedures that we needed for voters and for poll workers were
13 in place, were understandable, were clear and accessible.
14 Making sure that the optical scanners, which we use, were
15 programmed properly; that we had staff that knew how to do that
16 because we do all the programming in our county; to make sure
17 that we had all the ballots that we needed; to make sure that
18 the elections ran accurately and without incident and in a way
19 that was -- in a way that was good for the voters, that the
20 voters felt comfortable with; and made sure that the election
21 results after the fact were accurate. And we did that by doing
22 a hand count of all the ballots centrally after the election.

23 **Q.** Thank you. And, Dr. Martin, could you tell the Court
24 about the time frame of New York's transition to hand-marked
25 paper ballots.

1 **A.** New York -- excuse me -- did not transition to -- excuse
2 me --

3 THE COURT: Do you need some water?

4 THE WITNESS: Yes. Thank you.

5 **A.** -- made the transition in 2009 and 2010. And it spent a
6 fair amount of time determining exactly which machines to use.
7 So there were a number of counties in New York State that
8 transitioned to optical scanners from lever machines, which is
9 what we had been using and they did that in 2009 -- in
10 September of 2009. Other counties such as mine did not make
11 the transition until September 2010.

12 **Q.** (BY MR. POWERS) And what was the time frame for many of
13 the other counties that you referenced in New York?

14 **A.** Many of -- most of the counties in New York State did a
15 pilot in September 2010. And that was based on an order of the
16 Court that was issued in early June.

17 **Q.** So roughly how many months?

18 **A.** Roughly June, July, August, September. Three months.

19 **Q.** Thank you. And, Dr. Martin, have you been called on to
20 confer with and advise election integrity experts, other
21 election officials, and advocates about the feasibility of
22 transitioning to conducting elections by hand-marked paper
23 ballot?

24 **A.** Certainly.

25 **Q.** And could you tell the Court about that.

1 **A.** Yes. I have been -- I was questioned by the Colorado
2 Secretary of State when they were in the process of
3 transitioning to their risk-limiting audits. And they were
4 very interested in how we do our audits. I was invited to
5 attend a risk-limiting audit pilot project by the Rhode Island
6 State Board of Elections in January of this year.

7 I'm often called upon to make presentations about how it
8 is that we do our hand counts and run our elections generally
9 speaking. I did a presentation for the Election Verification
10 Network a couple of years ago for them showing them exactly how
11 we do that and followed that up with a conference call for
12 others in the network.

13 And I often get phone calls from people across the country
14 who are just interested in knowing how it is that we are able
15 to successfully do a very robust hand count of our paper
16 ballots.

17 **Q.** Is Columbia County's method considered kind of a model for
18 other jurisdictions moving to hand-marked paper ballots?

19 **A.** Apparently because I get phone calls all the time and many
20 requests to speak and present.

21 **Q.** And are the practical and logistical issues relating to
22 the conduct of hand-marked paper ballot elections similar
23 across different jurisdictions in the United States?

24 **A.** Certainly.

25 MR. BELINFANTE: Objection. There has been no

1 foundation at least as it relates to Georgia. She hasn't
2 mentioned the word Georgia in any of her testimony thus far in
3 her experience.

4 THE COURT: Why don't you reframe the question.

5 **Q. (BY MR. POWERS)** Dr. Martin, when you are speaking with
6 election officials and experts around the country, what are the
7 practical and logistical issues relating to the conduct of
8 hand-marked paper ballot elections that you talk about?

9 **A.** Well, the issues are having enough ballots, determining
10 how many ballots one needs, how to secure those ballots before
11 and after voting, how to maintain a very secure chain of
12 custody until the election is certified, how to confirm that
13 the result is accurate.

14 Most people -- most states that use hand-marked paper
15 ballots also use optical scanners. So they have the ballots
16 and the votes tabulated on the optical scanners. And what
17 people are interested in is the way that we do our hand count
18 audit after the fact.

19 So it is all about how we keep all those ballots safe and
20 secure, how the audit is conducted, how it is transparent so
21 that anybody can see it. And, frankly, the -- well, the public
22 transparency is a big piece of it as well that the people are
23 interested in.

24 **Q.** Dr. Martin, you have spoken with election officials in
25 other jurisdictions implementing hand-marked paper ballots?

1 **A.** Yes, I have.

2 **Q.** And what are the core foundational elements of the
3 hand-marked paper ballots that are common across those
4 different jurisdictions?

5 **A.** Well, the ballots are all pretty much the same. There
6 isn't much difference there. They have to be marked with a
7 pen. There isn't much difference there. They have to be
8 accounted for. That is very important. They have to be
9 counted, which, as I said, is usually done on an optical
10 scanner. And really there should be a very robust hand count
11 audit after the fact.

12 It is mostly about chain of custody and making sure you
13 get the count right.

14 **Q.** And, Dr. Martin, have you submitted three declarations in
15 this case?

16 **A.** I have.

17 **Q.** And do you still hold the opinions expressed in those
18 declarations?

19 **A.** I do.

20 **Q.** Let's turn to the methods that you're employing in
21 Columbia County. Can you tell me about Columbia County's
22 method of tabulating and counting hand-marked paper ballots
23 cast on election day?

24 MR. BELINFANTE: Objection, Your Honor. I would move
25 that it is irrelevant for the same reason that it was discussed

1 yesterday in Ms. Payton's deposition. We're not talking about
2 Georgia. I fail to see the relevance of this witness
3 testifying about what is happening in one county in New York.

4 MR. POWERS: We proffer --

5 THE COURT: All right. I mean, the thing about it is
6 this: The state has made a big deal about these are not
7 feasible alternatives. And I think that it is relevant for
8 that purpose.

9 My concern is something different. And this is
10 now -- I'll just again -- I'm going to go on my time and not
11 your time.

12 But even if I were to give the plaintiffs extra time
13 because I want to get to the bottom of the issues, because I
14 have the witness' affidavit in front of me, is there something
15 in particular that you want to focus on so that I'm not --
16 we're not wasting time?

17 As I recall, there was at least technically only an
18 hour-plus left in the plaintiffs' time. And I'm concerned that
19 there are a lot of issues left. So I urge counsel to chat for
20 a moment and decide this. Because the Court has a lot of
21 weighty issues in front of it.

22 And if I'm going to end up having to give any extra
23 time at all to plaintiffs, I don't want it to be because you
24 squandered the time here. It is not to say that the witness'
25 testimony is not important. But there is the affidavits.

1 **(There was a brief pause in the proceedings.)**

2 MR. POWERS: Your Honor, we've conferred, and there
3 are two discrete areas I would like to focus on.

4 THE COURT: All right.

5 **Q. (BY MR. POWERS)** Dr. Martin, I would like to turn to the
6 subject of pollbooks for a second.

7 **A.** Uh-huh (affirmative).

8 **Q.** Dr. Martin, does Columbia County currently employ paper
9 pollbooks?

10 **A.** Yes, we do.

11 **Q.** And is Columbia County going to be moving in the near
12 future to electronic pollbooks?

13 **A.** Yes, we are. By legislation enacted this year, we will
14 start doing early voting this year. And as a result, we are
15 going to be using electronic pollbooks at least for our early
16 voting. And we are still undecided as to whether we will use
17 them on election day.

18 **Q.** And to be clear, Dr. Martin, Columbia County will still be
19 employing paper pollbooks in conjunction with electronic
20 pollbooks?

21 **A.** Absolutely. Commissioner Nastke and I are very firm on
22 this, that we want to have both pollbooks available. And we
23 will have voters sign in to both pollbooks.

24 **Q.** And what are the benefits of that particular approach of
25 having dual pollbook systems?

1 **A.** Well, we really haven't had any problem with our paper
2 pollbook system. We know that there have been problems with
3 electronic pollbooks in different jurisdictions. We typically
4 like to be -- well, I shouldn't say typically. We definitely
5 do not like relying on electronic processes. So we always --
6 whenever we can, we rely on paper, which is why we do the
7 extensive hand count audit that we do. So we will be relying
8 on the paper pollbooks, as well as the electronic pollbooks.
9 They can go down. They can -- there can be problems.

10 **Q.** Dr. Martin, can you talk about the time frame in which
11 this switch to the dual pollbooks system is going to be
12 implemented?

13 **A.** It will be implemented for our early voting, which begins
14 on, I think, October 26th. So we have a few months to
15 determine who the vendor will be. We had chosen a vendor who
16 dropped out last week. So now we're starting the search all
17 over again. And we will have to determine what books we're
18 going to use, how they get used to develop our instructional
19 materials. And that is what we do.

20 **Q.** **(BY MR. POWERS)** Thank you. The last subject I would like
21 to address with you is the county's transition --

22 **A.** Uh-huh (affirmative).

23 **Q.** -- to hand-marked paper ballots from the mechanical
24 system.

25 Dr. Martin, what practical logistical steps did you take

1 during the first couple of elections using hand-marked paper
2 ballots to ensure things went smoothly?

3 **A.** We used the procedures and documentation that was provided
4 to us by the State Board of Elections, and we studied it very
5 carefully. We made modifications where we thought it was
6 appropriate and where it seemed to make sense for our county.

7 You know, we did training with our inspectors. And we
8 learned where inspectors needed a little bit more -- a little
9 more of this, a little bit less of that. We continually made
10 modifications.

11 We did -- then we did training with our inspectors. We
12 took the optical scanner voting machines around the county, and
13 everybody got to work with them.

14 THE COURT: What is an inspector?

15 THE WITNESS: I'm sorry?

16 THE COURT: In your type of work, what is an
17 inspector?

18 THE WITNESS: An inspector is a poll worker, yes.

19 **Q. (BY MR. POWERS)** I'm sorry. What steps practically
20 speaking do you advise election officials undertaking similar
21 transitions to take to make sure that the transition goes
22 smoothly in their jurisdictions?

23 **A.** Really to think about all the people that are going to be
24 affected: The voters, the poll workers, the administrators,
25 the staff in the office. To think very carefully about the

1 chain of custody of all the election materials. We do a really
2 good job in Columbia County with the chain of custody. To
3 consider that.

4 To consider the security of all the materials. And to
5 make sure that if you are relying on a technological electronic
6 process that there is some sort of backup, there is some sort
7 of very strong audit system to make sure that it worked right,
8 and that if it fails there is another way -- there is always a
9 Plan B. Sometimes it is in effect anyway.

10 **Q.** Are there resources that jurisdictions transitioning to
11 hand-marked paper ballots can draw on?

12 **A.** Well, yeah. Certainly in New York State, we were --
13 although we were one of the last states to give up our lever
14 voting machines and move to an electronic method of voting, we
15 had the benefit of many other states' experience.

16 So we were able to -- I will say the State Board of
17 Elections was able to draw on that and I think did a very
18 excellent job in choosing machines and making sure that all --
19 that the machines worked the best way absolutely possible.

20 So the state provides many -- very good instruction and
21 procedures for us. And I think any state that is considering
22 making a move has the benefit of all of these other states that
23 have gone before them.

24 And certainly I am a resource as well. You know, many
25 people reach out to me as a resource. And I provide our

1 documentation and our methods. And they seem to be very
2 grateful for that.

3 **Q.** During the --

4 THE COURT: Are you through? I'm just really trying
5 to move this along.

6 MR. POWERS: Yes.

7 Thank you. No further questions.

8 THE COURT: If there is something vital but it just
9 seems like we're -- thank you.

10 MR. BELINFANTE: Your Honor, I would move to strike
11 the entire testimony as irrelevant. She has not offered even
12 an opinion on whether this will be feasible in Georgia or any
13 underlying facts about Georgia at all.

14 THE COURT: I deny the motion. Let's proceed.
15 Who is your next witness?

16 MR. BELINFANTE: I was going to cross-examine.

17 THE COURT: I'm sorry. I thought that was the
18 totality of what you wanted to say is it is irrelevant. The
19 totality is it is irrelevant and therefore --

20 MR. KNAPP: We approve that motion.

21 THE COURT: Go for it.

22 CROSS-EXAMINATION

23 BY MR. BELINFANTE:

24 **Q.** Good morning, Ms. Martin.

25 **A.** Good morning.

1 Q. Your experience as an election official has been limited
2 to New York; correct?

3 A. Yes.

4 Q. And limited to Columbia County, New York?

5 A. Well, I certainly interact with a lot of other election
6 officials in New York.

7 Q. Right. I'm sorry. But your position has been always in
8 Columbia County?

9 A. My position has been in Columbia County.

10 Q. And Columbia County -- what is approximately the
11 population of Columbia County?

12 A. About 63,000 people.

13 Q. Okay. Do you know of any Georgia counties offhand that
14 are roughly the same population?

15 A. I'm sure there are. I know there are a lot of Georgia
16 counties. Very small to very large.

17 Q. You have not done any kind of comparison comparing
18 Columbia County to a Georgia county, have you?

19 A. How would I make that comparison? Between numbers of
20 people?

21 Q. So is the answer no, you have not compared what -- you
22 have not -- you have not compared what you have done in
23 Columbia County to any county in Georgia; is that right?

24 A. Not specifically to any county in Georgia. But I am aware
25 of what Georgia counties do. So whether large or small, I'm

1 not sure that it makes a difference.

2 **Q.** When you say what Georgia counties do, what do you mean
3 specifically?

4 **A.** How they run their elections, how their machines are
5 programmed, how their ballots are counted, how voters vote.

6 **Q.** Do you have personal knowledge of how machines are done in
7 Georgia?

8 **A.** I have not come down to an election and watched it.

9 **Q.** Okay. So then -- so do you have any personal knowledge
10 about how elections are conducted in Georgia, or is it based on
11 information supplied to you by the plaintiffs in this case?

12 **A.** My knowledge, it comes from many sources. News media.
13 Some of it is from these pleadings on both sides. I have a
14 lot -- I have a lot of colleagues who are very interested --
15 aside from plaintiffs who are very interested in what goes on
16 in Georgia. So I have been following it very closely.

17 **Q.** And you have never administered an election on a DRE
18 system like one in Georgia; correct?

19 **A.** No.

20 **Q.** And, in fact -- so your experience, as I understand it, is
21 limited to lever machines and the optical scans that Columbia
22 County uses now in terms of your own administration of the
23 election?

24 **A.** Yes. And hand counting ballots.

25 **Q.** Yes. And did I understand you to say that New York just

1 passed early voting this year?

2 **A.** That is right.

3 **Q.** And when was that legislation passed?

4 **A.** In January.

5 **Q.** Do you know -- did the governor sign it shortly
6 thereafter?

7 **A.** Yes.

8 **Q.** So you have known since January that early voting is
9 coming?

10 **A.** Yes.

11 **Q.** Is it true that the -- are you familiar with the budget of
12 the Board of Elections in Columbia County?

13 **A.** Yes.

14 **Q.** Is it true that it is approximately \$654,000?

15 **A.** Yes.

16 **Q.** And you have not looked at any county or city or municipal
17 budget in the State of Georgia for the election division, have
18 you?

19 **A.** Not specifically. I will say our budget in Columbia
20 County is also augmented by other grants that are available.
21 So we are not relying simply on our own budget.

22 **Q.** So it is higher -- I mean, the amount of money you have to
23 spend is higher than \$654,000?

24 **A.** I'm not sure -- you know, I'm not sure about that.

25 **Q.** The \$654,000 is the amount appropriated from the county

1 commissioners; is that right?

2 **A.** Uh-huh (affirmative).

3 **Q.** None of your declarations actually state that a Georgia
4 county could afford to do this expressly, do they?

5 **A.** No. But I don't think that would be -- well, no.

6 **Q.** And in forming the views that are in your declaration, did
7 you review any Georgia laws on procurement?

8 **A.** I don't think I did. But I do know that laws can be
9 changed and modified as need be.

10 **Q.** And in forming the views that are expressed in your
11 declarations, were you aware that there are going to be Georgia
12 elections in September of this year?

13 **A.** Yes.

14 **Q.** Okay. And are you familiar with Georgia's early voting
15 process?

16 **A.** A little bit.

17 **Q.** Do you know that early voting commences in Georgia on
18 those September elections 19 days from today?

19 **A.** I think I learned that yesterday.

20 **Q.** Okay. And is it still your view that -- well, you haven't
21 expressed a view on that. I'll leave it at that.

22 Did you have a chance to look at what is known as House
23 Bill 316, the legislation that the General Assembly passed this
24 year overhauling the election system?

25 **A.** Yes.

1 Q. Did you see the portion on audits?

2 A. You know, I did not look at it that carefully.

3 Q. You expressed an opinion or view in your declarations
4 about the 2018 election -- general election in the State of
5 Georgia. Do you recall that?

6 A. Yes.

7 Q. And you cited to an article in the Columbus
8 Ledger-Enquirer. Do you remember that?

9 A. Yes.

10 Q. Is that the -- other than information provided to you by
11 plaintiffs' counsel, is that article the basis of where you
12 made your views or concluded your views that are in those
13 declarations?

14 A. No.

15 Excuse me. Could you give me that question again. I
16 wanted to make sure I didn't get a double negative there.

17 Q. Understood. I have only had one cup of coffee this
18 morning. So that is possible.

19 In your declaration, the first supplemental declaration
20 filed in this case, which was submitted to the Court on
21 June 19, Paragraph 10 says, I understand from reviewing news
22 reports and reviewing affidavits from voters and poll watchers
23 that I received from Coalition for Good Governance that voters
24 experienced long waits at polls, problems with attempting to
25 check in at their precincts because of problems with the

1 electronic pollbook information, faulty operation of the DRE
2 machines in the polling places, including vote flipping or
3 incorrectly displayed or missing races on the electronic
4 ballot, and DRE voting sessions being canceled while the voter
5 was voting.

6 There is a footnote after the long lines in the polls, and
7 it cites a Columbus Ledger article. And that is the sole basis
8 of the citation.

9 So I want to make sure that in making those conclusions
10 you relied on information provided to you by plaintiffs'
11 counsel and the Columbus Ledger; is that right?

12 **A.** Well, I did. But that was not the sole source of my
13 information.

14 **Q.** Okay. So there is -- so you relied on information that is
15 outside of what is in your declaration?

16 **A.** Well, I think my declaration says that I relied on news
17 sources. Is that right?

18 **Q.** Well, in that paragraph --

19 **A.** You are citing that one particular article?

20 **Q.** Yes.

21 **A.** I saw more than one article.

22 **Q.** Okay.

23 THE COURT: What is the document number of the
24 affidavit?

25 MR. BELINFANTE: The declaration I was referring to

1 there, Your Honor, is Document Number 413.

2 THE COURT: It doesn't have an exhibit number? 413
3 blank dash something?

4 MR. BELINFANTE: 413 blank. Yes, Your Honor.

5 THE COURT: All right. Thank you.

6 **(There was a brief pause in the proceedings.)**

7 MR. BELINFANTE: That was one that was filed all
8 together. It is Document 413, Page 270 is when it begins.

9 **Q. (BY MR. BELINFANTE)** Now, you're aware in Georgia that --
10 well, in that article they cite a situation in Gwinnett County
11 where the county lacked power cords for the precinct.

12 Do you remember that?

13 **A.** Yes.

14 **Q.** And that would impact even if there's optical scanning
15 systems there as you have in Columbia County; correct?

16 **A.** Yes.

17 **Q.** And you are also aware in that article it cites people as
18 saying long-time poll workers are saying this is the largest
19 turnout they have ever seen.

20 Do you recall that?

21 **A.** I think so.

22 **Q.** Okay. And, again, because you have never administered an
23 election on the GEMS database like in Georgia as well; is that
24 right?

25 **A.** Correct. But we do have an election management system,

1 which is not so different.

2 **Q.** But it is not Georgia's; right?

3 **A.** It is not Georgia's.

4 **Q.** Now, you're a member or you're affiliated with the
5 National Election Defense Coalition; is that right?

6 **A.** Yes.

7 **Q.** The National Election Defense Coalition put out what is
8 called an election tool kit; is that correct?

9 **A.** Sounds right.

10 **Q.** Okay. And in that tool kit -- and just tell me if you
11 agree with this statement -- it says that the purchasing of
12 voting machines varies by state; is that right?

13 **A.** Certainly.

14 **Q.** Okay. And it also says that not everyone can mark a paper
15 ballot.

16 Do you agree with that?

17 **A.** Yes. Well, not everyone can mark a paper ballot by hand.

18 MR. BELINFANTE: All right. I have no further
19 questions.

20 THE COURT: Thank you.

21 MS. BURWELL: Your Honor, just a few questions.

22 THE COURT: Certainly.

23 Is there an extra copy of the declaration that was
24 referred to? I just don't want to start looking for it.

25 MR. POWERS: I have a couple.

1 THE COURT: Thank you.

2 (There was a brief pause in the proceedings.)

3 THE COURT: Holly?

4 (There was a brief pause in the proceedings.)

5 THE COURT: Go ahead.

6 CROSS-EXAMINATION

7 BY MS. BURWELL:

8 Q. Ms. Martin, your county completed the transition away from
9 a lever machine to using the optical scanners in September of
10 2010; correct?

11 A. Yes.

12 Q. And you knew as early as March of 2010 of the need to
13 transition; correct?

14 A. Yes.

15 Q. So you had more than three months to transition; isn't
16 that correct?

17 A. In our case, that's right.

18 Q. And you were transitioning again a county that had at that
19 point fewer than 45,000 registered voters?

20 A. Correct.

21 Q. And you had about 50 precincts at the time?

22 A. Correct.

23 Q. And --

24 THE COURT: I'm sorry. 43,000 or 63,000?

25 THE WITNESS: 43,000 voters at that time.

1 THE COURT: I see. This was when?

2 THE WITNESS: 2010.

3 THE COURT: In 2010. I see. Versus now 63,000?

4 THE WITNESS: 63,000 is the population. That is what
5 she asked. We now have about 45,000 voters.

6 THE COURT: All right.

7 **Q. (BY MS. BURWELL)** And you still have 50 precincts?

8 **A.** Yes.

9 **Q.** And when New York law required the use of optical scanners
10 in 2010, you already had optical scanners; correct?

11 **A.** Yes.

12 **Q.** You had already purchased 52 optical scanners in 2008;
13 right?

14 **A.** That is right.

15 **Q.** And at the time that the transition occurred in 2010, you
16 didn't think you would need to purchase additional optical
17 scanners; correct?

18 **A.** No, certainly not. Optical scanners can handle a lot of
19 voters.

20 **Q.** So you didn't purchase any additional optical scanners --

21 **A.** No.

22 **Q.** -- in 2010?

23 Now, your declaration doesn't mention how many registered
24 voters Fulton County has; correct?

25 **A.** No.

1 Q. So you didn't factor that in to your opinion in your
2 declaration?

3 A. I don't think it is relevant.

4 Q. Okay. And you didn't factor in how many registered voters
5 that were in Georgia as a whole; correct?

6 A. I don't think it is relevant because everything scales.
7 Everything scales. It can be done in any size county, small or
8 large.

9 Q. And you didn't factor in whether or not Fulton County
10 owned optical scanners; correct?

11 A. I think -- does Fulton -- I think Fulton County does own
12 some optical scanners.

13 Q. What is the basis of that thought?

14 A. I learned that from Coalition plaintiffs.

15 Q. So did the Coalition plaintiffs tell you that before in
16 your declaration or after?

17 A. Before.

18 Q. But you didn't factor that in to your declaration;
19 correct?

20 A. I'm sorry. The question is I didn't factor what in to my
21 declaration?

22 Q. Whether or not Fulton County had optical scanners.

23 A. I think I did.

24 Q. I thought you said you didn't think it was relevant.

25 A. To the previous question -- what was the previous

1 question? Oh, no. The budget. I think you were talking
2 about --

3 **Q.** I didn't ask anything about the budget.

4 **A.** Okay. You were talking about the number of optical
5 scanners?

6 **Q.** Yes. Did you know whether or not Fulton County had
7 optical scanners was my question. And you said the Coalition
8 plaintiffs advised you of that.

9 **A.** Yes.

10 **Q.** And I asked you whether that was before or after your
11 declaration, and you said before your declaration; correct?

12 **A.** Yes.

13 **Q.** But you didn't factor -- there is nothing in your
14 declaration about the fact that you believe Fulton County has
15 optical scanners; correct?

16 **A.** If it is not there, it is not there.

17 **Q.** And you didn't factor in how many optical scanners, if
18 they had any, Fulton County had; correct?

19 **A.** No. I was not concerned with the number.

20 **Q.** Just like you weren't concerned with the number of
21 registered voters there are in Fulton County; correct?

22 **A.** Because everything can be scaled. And transitions --
23 transitions when they need to be made can get made. That is
24 what election commissioners do. They make transitions when
25 they need to get made.

1 Q. But you made a transition from lever machines to optical
2 scanners, and you had six months to do that; correct?

3 A. That was a very large transition. That was a huge
4 transition. We had -- we had not used electronics at all in
5 our elections. All of our voters were voting on a mechanical
6 lever machine. It was a mammoth change for us.

7 Q. So the answer to my question is yes, you had six months to
8 transition from a lever machine to the optical scanners?

9 A. Yes.

10 Q. Correct? Even though you already had optical scanners?
11 Because you told us before you had purchased 50 --

12 A. Yes.

13 Q. -- in 2008; correct?

14 A. Yes.

15 Q. And it was a mammoth undertaking for a county with 43,000
16 registered voters and 50 precincts; correct?

17 A. Because we were going from a very different system to this
18 system.

19 MS. BURWELL: I understand. Thank you.

20 MR. POWERS: No further questions. No redirect.

21 THE COURT: May this witness be excused?

22 MR. POWERS: Yes.

23 THE COURT: Thank you very much.

24 MR. MANOSO: Would you like to move forward with the
25 next one before we have to break? I don't know if we can get

1 him up and down, but we can begin.

2 THE COURT: Who is your next witness?

3 MR. MANOSO: Mr. Lowell Finley on behalf of the
4 Curling plaintiffs.

5 **(There was a brief pause in the proceedings.)**

6 THE COURT: Is there anyone in the room that is here
7 for the hearing in the class action settlement?

8 Why don't we go ahead and get Mr. Finley on the
9 stand. And we'll proceed from there. Thank you.

10 MR. MANOSO: Sounds good, Your Honor.

11 THE COURT: This is Mr. Finley.

12 COURTROOM DEPUTY CLERK: Please raise your right
13 hand.

14 **(Witness sworn)**

15 COURTROOM DEPUTY CLERK: Please have a seat. Loudly
16 and clearly state your full name, and spell your last name for
17 the record, please.

18 THE WITNESS: Lowell Finley, F-I-N-L-E-Y.

19 Whereupon,

20 LOWELL FINLEY,

21 after having been first duly sworn, testified as follows:

22 DIRECT EXAMINATION

23 BY MR. MANOSO:

24 **Q.** Morning, Mr. Finley.

25 **A.** Morning.

1 **Q.** Mr. Finley, the Court has your CV. Can you please just
2 briefly describe your relevant experience as it relates to
3 election voting systems, please?

4 **A.** From 2007 to 2014, I was the California Deputy Secretary
5 of State for Voting Systems Technology and Policy. It is a
6 mouthful. And in that capacity, I oversaw and administered the
7 drafting of voting system standards for the state, oversaw the
8 state voting system certification system, was responsible for
9 standards for ballot printers in the state, and in the first
10 year of 2007 was responsible for designing and administering a
11 statewide review of all electronic voting systems that were in
12 use in the state.

13 **Q.** Thank you. Any other experience beyond your role and your
14 duties as the Deputy Secretary of State that are relevant to
15 this case?

16 **A.** The Secretary of State appointed me as the state's
17 representative on the Standards Board of the Federal Election
18 Assistance Commission. And that body was concerned with the
19 standards that were applied for certification at the federal
20 level of all voting systems.

21 So I participated in that. And in that process, I learned
22 about the voting systems that were being used in many states
23 around the country, including Georgia.

24 MR. MANOSO: Thank you. Your Honor, we would like to
25 tender Mr. Finley as an expert in state election system

1 administration implementation.

2 MR. BELINFANTE: Your Honor, we would object. There
3 has been no -- again any mention of the State of Georgia in
4 that soliloquy. The only real mentions of Georgia in the
5 declaration are when he describes the technology in Georgia, as
6 well as a conclusory opinion that the transition would be
7 feasible without identifying any methodology or anything he has
8 reviewed in Georgia to reach that conclusion. I can go through
9 more. But it is more of what you have heard before.

10 MR. MANOSO: Your Honor, I'm happy to ask a couple of
11 questions and lay the foundation. I'm just trying to move
12 things along.

13 THE COURT: You can lay the foundation, but I'm
14 inclined to allow him. And I think some of this goes to the
15 weight of whatever he might -- and validity of what he might
16 say about something that's very particular to Georgia.

17 But Mr. Finley has been the representative of the
18 Standards Board of the Federal Election Assistance Commission.
19 He is certainly experienced on a statewide basis on dealing
20 with election issues. It doesn't -- and election processes and
21 voting systems as a state administrator.

22 I don't know that he's being proffered as an expert
23 on Georgia -- on Georgia, per se. We -- but we are still part
24 of the United States.

25 MR. MANOSO: Thank you, Your Honor. I will ask two

1 brief questions on that.

2 **Q. (BY MR. MANOSO)** Mr. Finley, could you generally describe
3 your experience with Georgia's election system prior to your
4 engagement in this case.

5 **A.** Yes. I heard Dr. King, who headed the Kennesaw State
6 University Election Center, describe the system in Georgia in
7 great detail several times at EAC-sponsored events.

8 THE COURT: By EAC, you are referring to --

9 THE WITNESS: The Election Assistance Commission and
10 the Standards Board. I participated in panels in which he was
11 the moderator for the EAC in which we discussed among other
12 things Georgia's system.

13 I have also read the state assembly bill that was
14 adopted this year -- I believe it is 316 -- providing for
15 adoption of new voting technology in the state. I have read
16 the voting system state certification regulations. And I have
17 reviewed election results from a number of Georgia counties in
18 the 2017 municipal elections and the 2018 general election.

19 **Q. (BY MR. MANOSO)** Thank you. Before we get to the other
20 matter, just two brief things on your experience with
21 California. Approximately -- well, let me back up.

22 Can you just in one sentence describe what happened in
23 2007 with respect to the use of DREs in California?

24 **A.** After a study conducted over many months by top computer
25 science professors and experts around -- from -- assembled from

1 around the country, our Secretary of State ordered that most
2 DREs used in the state be decertified because of their security
3 and reliability risks.

4 **Q.** And approximately how many DREs had to be replaced as a
5 result of this decertification?

6 **A.** It was tens of thousands of DREs.

7 **Q.** And approximately how many registered voters were impacted
8 by the decision to decertify DREs?

9 **A.** Approximately 4,300,000.

10 **Q.** Mr. Finley, based on your experience in administering and
11 learning about election systems, why do you believe that the
12 relief requested by the Curling plaintiffs is feasible?

13 **MR. BELINFANTE:** Objection. Same issue. He is
14 not -- I mean, if he is going to now talk about feasibility, he
15 has not identified anything in Georgia other than testimony,
16 which, frankly, was not disclosed to us when we requested. And
17 he has not identified any method by which he could evaluate
18 feasibility or even what factors go into feasibility.

19 **THE COURT:** You can touch on that.

20 Is counsel for the other case ready before we --

21 **COURTROOM DEPUTY CLERK:** Yes. They are all here.

22 **MR. MANOSO:** If I may briefly, Your Honor, in their
23 response, the state relied heavily on their new system as being
24 a panacea that no longer required relief from the Curling
25 plaintiffs. Mr. Finley is here simply to respond to that and

1 to explain how what the state is saying that they are going to
2 do, at least elements of that, can be incorporated and how it
3 relates to the feasibility of the Curling plaintiffs' relief.

4 MR. BELINFANTE: Your Honor, he is testifying -- I
5 mean, he is explaining what he is going to say. He is not
6 explaining how he has a basis of that opinion or anything that
7 goes into it.

8 THE COURT: All right. We're going to break now, and
9 you can decide how you are going to in part at least address
10 that in the questioning that you have of your witness, and you
11 can lay the foundation for it.

12 MR. MANOSO: Thank you, Your Honor.

13 THE COURT: How many counsel do we have in that
14 employment case?

15 COURTROOM SECURITY OFFICER: I think there's five or
16 six.

17 THE COURT: All right. So why don't the people in
18 the front row here move back or leave the room, whatever you
19 desire to do. This will take not long. But it will -- you
20 know, I think I have to assume that it might take 20 to 40
21 minutes. So counsel should not disappear. What the audience
22 wants to do, that is something else.

23 **(A brief break was taken at 10:26 A.M., and the**
24 **Court addressed another case.)**

25 THE COURT: Please have a seat.

1 All right. Are you ready to resume?

2 MR. MANOSO: Yes, Your Honor. I'm going to withdraw
3 the prior question, back up, and lay a few foundational
4 questions, Your Honor, to see if we can't move things along.

5 THE COURT: All right.

6 **Q. (BY MR. MANOSO)** Mr. Finley, what material related to
7 Georgia's election systems did you review in preparation for
8 your testimony today?

9 **A.** I have read descriptions of the voting system itself and
10 how it is administered at the state level passed down through
11 the counties.

12 **Q.** You might need to move into the mic a little bit.

13 **A.** I've read -- I believe I mentioned earlier I had read HB
14 316. I have read the state's voting system certification
15 regulations. And I've read voting results indicating turnout
16 levels from a number of counties in 2017 and 2018 in Georgia.

17 **Q.** What about the state's RFP requests for a new election
18 system? Have you reviewed that?

19 **A.** Yes. I read the RFP, as well as the attachment of the
20 plan and scope of work for the new voting system.

21 **Q.** And have you reviewed materials submitted by the state as
22 to the number of elections that are going to be held in Georgia
23 this year?

24 **A.** Yes. I reviewed an exhibit that was submitted by the
25 state and a slightly modified version of it that was, I

1 believe, just filed yesterday, very recently, that is
2 color-coded that indicates which portions -- which
3 municipalities within which counties are conducting elections
4 in 2019.

5 **Q.** Thank you. Based on your review of that material and
6 your --

7 MR. BELINFANTE: Objection, Your Honor. This goes to
8 a discovery issue. We had asked -- and I have got the email
9 correspondence -- what specifically Mr. Finley relied on in
10 terms of documents. Not experience but documents. We were
11 told that he relied on those documents which are attached to
12 his declaration. None of the documents just identified by
13 Mr. Finley were attached to his declaration at all.

14 MR. CROSS: I'm going to address this because that is
15 just simply wrong. We had -- I'm so tired of this. We had
16 time and time meet-and-confers. There was one in particular
17 Mr. Russo and I were on where we talked about experts. This
18 was the agreement. The parties do not have to produce publicly
19 available information because we were all in a crunch. If they
20 relied on public information, it is out there. You have it.
21 That is what the agreement was.

22 Nevertheless, for our experts, including
23 Dr. Halderman and others, we went the extra step to collect
24 public articles and others to disclose those to them so they
25 had the convenience of having them.

1 Now they once again pivot, misrepresent, and they
2 have everything they needed to know. If they wanted something
3 more than that, we should have heard it before today.

4 MR. BELINFANTE: Your Honor, may I respond?

5 THE COURT: Yes.

6 MR. BELINFANTE: And, you know, the claims of
7 misrepresentation are growing tiresome. On July 14 --

8 MR. CROSS: Stop doing it.

9 MR. BELINFANTE: I'm speaking. On July 14, we
10 received an email -- and I'm happy to distribute it -- from
11 Ms. Bentrrott, which says about Mr. Finley, in any event, there
12 is no need to debate this issue. As your email notes, the
13 documents Mr. Finley relied upon for his declaration are cited
14 in the declaration itself. Mr. Finley is not currently
15 withholding any documents, public or otherwise, that he
16 specifically relied on.

17 We took that to mean what it was. And now we are
18 hearing that he has gone and looked at a ton of things that are
19 not cited anywhere in his declaration or attached to it.

20 MR. CROSS: HB 316, it is a surprise to them that he
21 looked at that? The Georgia statutes, it is a surprise that he
22 looked at that? Come on. Where is the prejudice? This is
23 silly.

24 THE COURT: All right. The testimony was directed
25 toward -- is as a whole directed towards feasibility issues and

1 for him to understand the legal context of HB 316 and the
2 procurement, which are on the public record, is -- I think is
3 reasonable since I know I have seen the literature where you
4 have all talked about relying on things that are in the public
5 record.

6 I don't know if there is something that -- as to his
7 understanding the nature of the localities that were having the
8 elections, I think that is fine too.

9 I didn't -- is there anything else that you are
10 saying that he relied on that was not identified, other than
11 those three items that I didn't catch?

12 MR. MANOSO: Your Honor, he reviewed some election
13 data that he might not have reviewed at the time of his
14 declaration after he received the state's updated list of
15 elections. But we are not going to talk about that today, Your
16 Honor. So we can just move on with the three things that Your
17 Honor mentioned.

18 THE COURT: All right.

19 MR. MANOSO: Thank you.

20 **Q.** (BY MR. MANOSO) Mr. Finley, based on your review of the
21 material that you just discussed and your experience with
22 Georgia, which you mentioned earlier, are there any -- how does
23 Georgia's election system compare to California and other
24 states as it relates to the issues before us today?

25 **A.** Georgia is on one end of the spectrum nationally in terms

1 of having a single voting system state down model for deploying
2 its election system. California is a state that certifies the
3 use of any system that is submitted and passes testing and then
4 allows counties to acquire whichever certified system they
5 think will serve their needs the best. And that is a model
6 followed in many states around the country as well. So that is
7 the basic difference.

8 **Q.** Based on that, are there any material differences that
9 would lead you to believe that the Curling plaintiffs' relief
10 is not feasible?

11 **MR. BELINFANTE:** Objection. Same objection, Your
12 Honor. He is testifying as to how the systems have been
13 certified. But feasibility -- he has not identified any
14 methodology about how a local government is going to make the
15 transition, sometimes in 19 days when early voting commences.

16 **MR. MANOSO:** Your Honor, that is not what he says,
17 first of all. He doesn't say anything about 19 days. He
18 doesn't say anything about the specific elections in September
19 or August. Counsel will have the opportunity to cross-examine
20 him on that.

21 The -- sorry. Go ahead, Your Honor.

22 **THE COURT:** I think we would be more productive here
23 if we just allowed the testimony to proceed. Unless it is to
24 the extent that it is really problematic in terms of the 19
25 days, I feel very confident that you are going to bring that to

1 my attention.

2 I mean, 19 days is a problem no matter what
3 obviously. And if everyone wants to spend time on 19 days, if
4 it is a major county -- and is it Fulton County that we're
5 talking about?

6 MR. BELINFANTE: City of Atlanta.

7 THE COURT: Or the City of Atlanta School Board --
8 the only thing about it is -- the City of Atlanta School Board
9 race, is that it? Or is it also Fulton County?

10 MR. BELINFANTE: Fulton County commission has an
11 election too. So that's --

12 THE COURT: It is Emma Darnell's seat?

13 MR. BELINFANTE: There's the Coweta County house
14 district, and we have the City of Perry as well.

15 THE COURT: You know, if plaintiffs still want to
16 pursue that, you are authorized to. But that is a very quick
17 time frame. So if you are thinking about the allocation of
18 your time -- and I asked this before in this proceeding -- you
19 have to consider that because you could limit yourself also to
20 a later time, frankly.

21 MR. CROSS: Your Honor, to clarify, the November
22 elections, in all candor, is what we're focused on. The
23 problem is we can't endorse the current system for any
24 elections because of the flaws. But we recognize Your Honor is
25 going to have to weigh everything.

1 The November elections are certainly what we're
2 focused on. And so we think it is feasible for September.
3 Obviously not -- I don't think anyone in this courtroom is
4 going to say you can do it in 19 days. In terms of in-precinct
5 voting, we think it is feasible. That may create issues. But
6 by November, we certainly think it is feasible. And that is
7 ultimately our position, Your Honor.

8 THE COURT: All right.

9 MR. BELINFANTE: Your Honor, just for the record,
10 would -- I mean, to this point, would you just like us to have
11 a continuing objection to his testimony?

12 THE COURT: Yes. I think that would make sense.
13 Thank you very much. I appreciate it.

14 I'm just trying to get us so that -- let me just say:
15 When I talk about if I have to give extra time or whatever else
16 but I'm also pressuring you more is I have some very weighty
17 issues in front of me. I want to make sure I have the evidence
18 I need in order to understand the issues.

19 And -- so I'm going to do whatever I need to do to
20 get that. But I want -- but I also need you not to waste time
21 on things that are just not likely to happen either or not
22 helpful to the Court.

23 MR. MANOSO: Thank you, Your Honor.

24 **Q.** **(BY MR. MANOSO)** Mr. Finley, what components -- let me
25 back up.

1 Are you familiar with the components of the state's new
2 proposed voting system?

3 **A.** Yes, I am.

4 **Q.** What components of the state's proposed voting system
5 influence your opinions regarding the feasibility of the
6 Curling plaintiffs' relief?

7 **A.** There are elements of the state's proposed system that can
8 be leveraged to implement a system that doesn't use or rely on
9 the DREs in the current system. The proposed system involves
10 voting on hand-marked paper ballots. It involves the
11 acquisition and deployment of scanners at the precincts, and it
12 involves the acquisition of ballot marking devices.

13 And I think that using the scanners that are proposed in
14 that system and using just a single ballot marking device for
15 each polling place to provide for voters with disabilities, it
16 would be possible to deploy a system that relied primarily on
17 hand-marked paper ballots.

18 **Q.** Mr. Finley, you mentioned the scanners and the BMDs. But
19 you are also aware that the state's new election system
20 involves a new election management software system as well?

21 **A.** Yes. It would be a completely separate election
22 management system. And this is actually another factor
23 affecting feasibility.

24 Because the state has already embarked on this process
25 implementing an entirely new system on a very aggressive

1 schedule and they have scheduled pilots of that technology and
2 that system in November, it means that all the work is already
3 being done to implement an entirely different system.

4 And that means that it is possible that in the November
5 balloting only a single system would have to be deployed. It
6 would no longer be necessary to conduct two systems
7 side-by-side, the GEMS system that exists currently for the EMS
8 and the technology and then this new system in a pilot mode.

9 By expanding the deployment of elements of the new system,
10 you could -- the state and the counties could be implementing
11 only a single system. That would reduce the workload and the
12 comprehension of multiple moving parts dramatically.

13 **Q.** How does the state's implementation of precinct optical
14 scanners as part of their new system affect your opinion
15 regarding the feasibility of the Curling plaintiffs' relief?

16 **A.** Well, under the RFP, as I understand it, in the
17 approximately ten counties that will be participating in the
18 pilot, each of them is to receive from the state optical
19 scanning devices.

20 And only seven weeks after the November election, the RFP
21 provides for all counties in the state to receive precinct
22 optical scanners, as well as ballot marking devices. For the
23 November rollout and then later in December, there would also
24 be BMDs supplied for each polling place.

25 And by ramping up the deployment beyond the numbers that

1 are currently contemplated for the pilots, that system could be
2 put in place for the limited number of precincts that are going
3 to be conducting elections in November because it is not all
4 counties and it is not all parts of the counties in the state
5 that will be participating.

6 **Q.** Let's drill down on the scanners because you mentioned the
7 optical scanners. The optical scanners that are being rolled
8 out as part of the pilot program, you are not saying that those
9 are enough for all of the elections this November?

10 **A.** No. That is right.

11 **Q.** So how will the state acquire additional scanners
12 necessary to implement the Curling plaintiffs' proposed relief?

13 **A.** Well, the state is already planning to ask the new vendor
14 to provide a large number of scanners by the end of December
15 this year. So they are looking at a fast production schedule.

16 And what I'm suggesting is that by -- by advancing that
17 procurement, the state should be able to acquire enough
18 scanners to be able to supply the limited number of precincts
19 that will be participating in these November elections.

20 Also under the proposed relief of the plaintiffs, instead
21 of acquiring four or five ballot marking devices per precinct,
22 which is what is planned in the pilot areas, it would only be
23 necessary to provide one ballot marking device. And that would
24 free up money out of the, as I understand it,
25 150 million-dollar appropriation to purchase more optical

1 scanners early in the process than might have been
2 contemplated.

3 **Q.** Mr. Finley, in your experience, what are the alternatives
4 if a vendor cannot necessarily produce enough scanners in time
5 for an election? What are the other options that are
6 available?

7 **A.** Well, if they don't have enough for purchase, it may be
8 possible to lease existing equipment from that vendor. It is
9 also possible to borrow or on a more formal basis enter into a
10 short-term lease for use of equipment that is already owned by
11 counties in neighboring jurisdictions.

12 And this is something that I have observed during the time
13 I was with the EAC Standards Board. And within California when
14 there were shortages of equipment in one jurisdiction, it was
15 fairly commonplace for arrangements to be made to borrow
16 equipment from others that used the same equipment but were not
17 planning to use it because they didn't have an election
18 scheduled at the same time.

19 **Q.** Based on your experience, how could Georgia develop the
20 necessary poll worker training to conduct an election based on
21 the Curling plaintiffs' proposed relief?

22 **A.** Well, first of all --

23 MR. BELINFANTE: Objection, Your Honor. This is
24 outside the scope of his declaration. The declaration cites
25 two things. One is that there are experts willing to help and,

1 two, based on his experience in California this could be done.
2 The question was certainly broader than that.

3 MR. MANOSO: Your Honor, certainly the state will
4 say, I'm sure, that implementing policies and procedures are
5 part of a new -- and I can ask him about his experience in
6 developing those if it would lay the foundation. But, again,
7 we covered this.

8 THE COURT: There is sufficient room if they want to
9 let them in. Thank you.

10 I'm sorry. What were you wanting to say?

11 MR. MANOSO: I'm sorry. I was going to say, Your
12 Honor, that we kind of have been over this ground already. His
13 declaration talks about the feasibility and how it could be
14 implemented.

15 The state will say that training and developing
16 procedures is the reason it can't be done. Surely he has the
17 ability to say why it can be done based on his experience as we
18 have already talked about.

19 THE COURT: I'm going to allow it. I mean, it could
20 have been more specific. But I don't really think that in any
21 way that the able defense counsel is not equipped to be able to
22 address this in cross-examination. It is not -- we're not in
23 some unique computerized area what he is discussing. This
24 is -- so -- or forensic testing.

25 So go ahead.

1 **Q.** (BY MR. MANOSO) Go ahead, Mr. Finley.

2 **A.** Well, based on my experience in California and on the EAC
3 Standards Board, most training materials and guidelines and
4 technical guidance are produced at the state level and
5 distributed to county jurisdictions.

6 And many of those materials are produced initially by the
7 vendors and then just reviewed and approved by the state. So
8 when any new voting system is being rolled out, which is what
9 the state is in the process of doing right now, they already
10 have to have been moving very far along in the process of
11 developing those procedures, in my experience, in order to be
12 planning on implementing them in pilots in November of this
13 year.

14 So it is a matter of taking those policies and guidelines
15 and training materials and just extending their -- their reach.
16 Distributing them to more people, making them available.

17 And you can make use of digital resources. You can put
18 this information up on state and county websites. Vendors
19 typically have demonstration materials, videos showing how
20 their equipment and systems are used showing people what their
21 ballots look like.

22 There is a lot of material available both in print and
23 online to train poll workers, election administrators, and
24 voters.

25 **Q.** And just to clarify, Mr. Finley, something you said

1 earlier, you mentioned BMDs for 2019 elections. You are not
2 suggesting that BMDs be used for all voting, are you?

3 **A.** No. I think under the Help America Vote Act some solution
4 has to be provided in the polling place for voters with
5 disabilities who are unable to mark a ballot by hand. BMDs are
6 a reasonable option for that. But that only requires a single
7 device in each polling place.

8 **Q.** And what form of voting are you suggesting is feasible for
9 all voters except for those that have certain disabilities as
10 you just discussed?

11 **A.** I think voting on hand-marked paper ballots that are then
12 optically scanned is a feasible alternative for all other
13 voters.

14 **Q.** Final question, Mr. Finley, in your discussion of BMDs,
15 you are not suggesting that BMDs with bar codes be used, are
16 you?

17 MR. BELINFANTE: Objection. Outside the scope of his
18 declaration.

19 **A.** No, I'm not.

20 MR. MANOSO: Thank you. No further questions, Your
21 Honor.

22 THE COURT: Objection noted.

23 MR. BROWN: Your Honor, I have a few questions.

24 EXAMINATION

25 BY MR. BROWN:

1 Q. Mr. Finley, my name is Bruce Brown. I represent the
2 Coalition plaintiffs.

3 A. Good morning.

4 Q. I want to focus your attention on the recommendations that
5 you were offering opinions on and what happens after the DREs
6 are put away for good.

7 Are you with me?

8 A. Yes.

9 Q. And the recommendation is that pieces of the state's new
10 procurement be used along with hand-marked paper ballots; fair
11 to say?

12 A. Yes.

13 Q. And that that be deployed for, let's say, the November
14 elections? Are you with me?

15 A. Yes.

16 Q. And for the November elections, the ballot building would
17 need to start probably in September; correct?

18 MR. BELINFANTE: Objection. Leading.

19 THE COURT: You are leading.

20 Q. **(BY MR. BROWN)** When would the ballot building need to
21 start for the November election?

22 A. Because I don't know the vendor that the state is
23 selecting and the specific system, I don't know.

24 Q. Can you -- if you don't know -- so you don't know when the
25 ballot building will begin?

1 **A.** No, I don't. What I think I can assume based on my
2 experience with many different voting systems is that the
3 ballot voting building -- I'm sorry -- the ballot building
4 process will need the same amount of lead time as is the case
5 with DRE-based systems, paper-based systems.

6 The factor with paper-based systems is time needs to be
7 allowed for the printing of the ballots. But there are
8 specialized printers either in-house with voting system vendor
9 companies or those that they work with who are accustomed to
10 producing large numbers of ballots on a very fast turnaround.
11 That is the easiest to get in an off year like this because
12 there's not competing demand from all over the country.

13 **Q.** And -- but with the Curling plaintiffs' proposal, these
14 ballots would be built on the yet to be purchased EMS system;
15 correct?

16 **A.** That's correct.

17 **Q.** So between the Court's order and the time that ballots
18 have to start to be built, there would need to be the
19 procurement itself; right? They have to purchase --

20 MR. BELINFANTE: Objection. Leading.

21 **Q.** **(BY MR. BROWN)** What would have to happen between -- for
22 that to be enough time to get the ballots built on the new
23 system?

24 **A.** The contract would have to be signed. The system would
25 have to be submitted to the state for its certification

1 process. Following certification, the ballot building could
2 begin immediately on the EMS.

3 **Q.** Let me ask you about state certification. You are
4 familiar with that?

5 **A.** Yes, I am.

6 **Q.** What is involved in Georgia to certify a new system?

7 **A.** The first requirement is that the system is to already
8 have received the certification from the Election Assistance
9 Commission. And then the vendor submits the system. The state
10 hires any ITAs, independent testing authorities, that are
11 necessary to look at components of it. And then it delivers a
12 report. And if it finds it acceptable, it certifies the
13 system.

14 **Q.** It is not rubber stamped? Is it rubber stamped?

15 **A.** It is not rubber stamped. It is a much faster process in
16 my experience. I should say I reviewed the certification
17 regulations for Georgia, and they are very similar. They track
18 the same steps and model that California uses.

19 And the EAC process tends to take a year or more. The
20 state process in my experience tends to take from several weeks
21 to in the most extreme cases several months.

22 **Q.** So low several weeks to high several months for state
23 certification then?

24 **A.** Yes.

25 **Q.** Okay. And so this plan would be -- let's say an order

1 came out today. It would be hopeful that the state could get a
2 contract and then go through the bid protest process and then
3 start state certification, three more weeks, and then start
4 building the ballots and then deploy the new BMDs for 130
5 counties? That is the plan all before November?

6 MR. BELINFANTE: Objection. Leading.

7 MR. CROSS: Objection. It also misstates the relief
8 that we have requested.

9 THE COURT: I'm not going to consider it for purposes
10 of relief. I'm just trying to understand what the witness
11 thinks is a possible process here based on his experience. And
12 I'm not going to plug it into here at all.

13 But in that -- I have never heard a year for an EAC
14 certification so that we'll talk about that separately.

15 **Q. (BY MR. BROWN)** Let me ask another question. You said a
16 number of times for these limited elections in November. But
17 you understand that there's going to be 130 counties having
18 elections?

19 **A.** My understanding is that it was about 125 and that roughly
20 25 of them the county actually wasn't going to be administering
21 those municipal elections in their counties. But that is the
22 ball park.

23 **Q.** And hundreds of municipalities would be conducting
24 elections; correct?

25 **A.** That's correct.

1 Q. And so the pilot is for ten counties; is that correct?

2 A. Yes.

3 Q. So you would be wanting the state to explode that to about
4 tenfold?

5 A. I wouldn't use the word explode. But I think the scale
6 you are talking about is approximately right. I just note that
7 the state is already planning to meet that tenfold sort of
8 level of expansion just seven weeks later than for the pilot.

9 So they're talking about an aggressive schedule, and they
10 have to be talking with the vendor that responded to a proposal
11 with that kind of a productive -- I'm sorry -- aggressive
12 production schedule. They have to be dealing with a vendor to
13 carry out their plan that is prepared to produce and deliver
14 the equipment rapidly.

15 Q. This was not critical. I don't mean it to be. But I just
16 want to get the basis of your information.

17 It is based upon your experience that you are speculating
18 that those discussions are going on? You don't have personal
19 knowledge of those discussion?

20 MR. MANOSO: Object, Your Honor. He can make his
21 arguments later.

22 A. Yes. It is based on my familiarity with the RFP process
23 in many technology setting states that we administered with the
24 Secretary of State, including voting systems.

25 Q. **(BY MR. BROWN)** Did you know that Fulton County dropped

1 out of the ballot program -- pilot program?

2 **A.** I have been told that.

3 **Q.** Does that have an impact upon your review of the
4 feasibility of the Curling solution?

5 **A.** It does not because the counties are fungible. If there
6 are going to still be ten counties, we're still talking about
7 the same basic plan. One in which clearly you need to expand
8 the number of devices that are made available.

9 **Q.** If you learned that for some reason the use of the new
10 system, along with the Curling remedy, were impossible by the
11 November elections, would you then recommend that the state's
12 DREs be replaced with hand paper ballots?

13 MR. MANOSO: Your Honor, that --

14 **A.** Yes.

15 MR. MANOSO: Your Honor, that is gross speculation.
16 It is an incomplete hypothetical, and it is just a waste of
17 time.

18 MR. BELINFANTE: We'll join.

19 THE COURT: I'm sorry. What was your -- I didn't
20 hear what --

21 MR. BELINFANTE: I'm sorry. I said we'll join in the
22 objection.

23 THE COURT: I think we're going far afield at this
24 juncture. So --

25 MR. BROWN: Thank you, Your Honor.

1 THE COURT: -- I'm going to sustain the objections.

2 MR. BROWN: I'll withdraw the question. Thanks.

3 CROSS-EXAMINATION

4 BY MR. BELINFANTE:

5 Q. Morning, Mr. Finley.

6 A. Good morning.

7 Q. My name is Josh Belinfante. I'm one of the attorneys
8 representing the state in this case, as you probably gathered.

9 A. Yes.

10 Q. I want -- I know we've been down this road. But I want to
11 make sure that I'm clear on this.

12 In reaching your conclusions on feasibility, you have not
13 looked at any of Georgia's 159 county budgets; is that correct?

14 A. That is right.

15 Q. You have not looked at any municipal budgets?

16 A. Correct.

17 Q. Have you looked at the Secretary of State's budget in the
18 elections division specifically?

19 A. No. No.

20 Q. Are you aware that early voting in Georgia -- in-person
21 early voting takes place on a DRE?

22 A. Yes.

23 Q. And -- or certainly can?

24 A. Yes. It is done that way in some places.

25 Q. And are you aware that for the November elections early

1 voting can commence in, I believe, 82 days, give or take a day
2 or two?

3 **A.** That is not a number that I, you know, can immediately
4 access.

5 **Q.** Did early voting on DREs factor into your conclusions that
6 Georgia's cities and counties could feasibly make the
7 transition from DREs to pure paper ballots?

8 **A.** Well, early voting on DREs may be the current system. But
9 it is always necessary with any voting system to have a paper
10 ballot alternative available in the event of failure of the
11 system.

12 It is also necessary to have provisional balloting
13 available, and that is done on paper ballots. So if you are
14 going to be making the changeover, if you are talking about
15 early voting, you can be -- you can change that aspect of the
16 system at the same time and use the paper ballots at that
17 phase.

18 **Q.** Let me ask just so I can be clear: When you were making
19 your conclusions, were you contemplating as you testified today
20 that it is feasible that it can be done in 82 days, the
21 transition from DREs to paper ballots in Georgia's cities and
22 counties?

23 MR. MANOSO: Your Honor, that is asked and answered.

24 MR. BELINFANTE: He did not answer. He talked about
25 -- I'm asking if he contemplated the time.

1 THE COURT: Proceed. Go ahead. I understand.

2 Proceed.

3 **A.** I focused on the November 5th election date. I did not
4 look at it in an 82-day period.

5 **Q.** **(BY MR. BELINFANTE)** I understand. Now, you have
6 served -- I understand you have served on national boards with
7 the EAC and whatnot. But your role as election official -- as
8 an appointed election official has been limited to the State of
9 California; correct?

10 **A.** Correct.

11 **Q.** Would you agree with the statement that the procedure for
12 replacing voting systems varies by state?

13 **A.** Yes.

14 **Q.** California has 58 counties; is that right?

15 **A.** That's correct.

16 **Q.** And 482 cities?

17 **A.** That sounds right.

18 **Q.** Okay. And isn't it true your declaration talks about how
19 DREs were once decertified in and around 2004? Do you recall
20 that?

21 **A.** Yes. One particular DRE was decertified, the Diebold's
22 AccuVote TSx.

23 **Q.** And it was recertified a year or two later?

24 **A.** A different device. It was decertified because it lacked
25 a voter-verifiable printer -- ballot printer. And the machine

1 that was recertified later was after that had been added to the
2 machine.

3 **Q.** Understood. And in both that case and in the
4 decertification you discussed in 2007, that did not impact all
5 of the counties -- all of California's cities and counties; is
6 that right?

7 **A.** That's correct.

8 **Q.** Do you know how many counties were impacted by the 2007
9 decertification?

10 **A.** In terms of moving away from DREs, it was 20 counties. 20
11 of the 58.

12 **Q.** And would you agree with me that in looking at the issue
13 of feasibility in a transition, there are several factors that
14 can come into play?

15 **A.** Certainly.

16 **Q.** And one certainly would be budget? Whether they can
17 afford to do it?

18 **A.** Yes.

19 **Q.** One would be time? Is there enough time to do it; right?

20 **A.** Yes.

21 **Q.** Now, you played a role in the 2007 top-to-bottom review;
22 correct? You oversaw it; is that fair?

23 **A.** That's correct.

24 **Q.** Okay. And your declaration attaches and cites an analysis
25 performed by a Diebold red team. Do you recall what I'm

1 talking about?

2 **A.** Yes.

3 **Q.** And the analysis that the Diebold red team did was
4 conducted in a laboratory-like environment; is that right?

5 **A.** Yes.

6 **Q.** It did not go into actual polling places and attempt to
7 manipulate machines?

8 **A.** No. That would have been illegal.

9 **Q.** But presumably the state could have authorized that if
10 that is what the state was interested in doing in the same way
11 that states authorize people to do what I think I heard a
12 phrase yesterday ethical hacking?

13 **A.** I don't believe you are correct about that.

14 **Q.** You talk about in Paragraphs 13 to 16 of your declaration
15 on the feasibility of hand-marked paper ballots, and you say
16 that dozens of counties including several with millions of
17 registered voters quickly and successfully transitioned to
18 hand-marked optically scanned ballots for voters.

19 Do you agree with that statement?

20 **A.** Yes.

21 **Q.** And the Secretary of State at that time was Debra Bowen;
22 isn't that right?

23 **A.** Yes.

24 **Q.** And Ms. Bowen or Secretary Bowen -- excuse me -- announced
25 her decision --

1 THE COURT: Could you turn down just slightly the
2 volume. Thank you.

3 MR. BELINFANTE: It may be me.

4 THE COURT: Thank you.

5 **Q. (BY MR. BELINFANTE)** Ms. Bowen announced -- I'm sorry --
6 Secretary Bowen announced her decision roughly August 3rd of
7 2007?

8 **A.** Yes.

9 MR. BELINFANTE: We're on 4?

10 **(There was a brief pause in the proceedings.)**

11 MR. BELINFANTE: All right. I'm going to approach --
12 may I approach, Your Honor?

13 THE COURT: Yes.

14 **Q. (BY MR. BELINFANTE)** I'm going to show you what we have
15 marked as Exhibit 4.

16 **A.** Thank you.

17 **Q.** This certainly purports to be -- and I pulled it from the
18 Secretary of State's website -- a public statement regarding
19 the decertification and recommendations of the top-to-bottom
20 review of voting systems from Secretary Bowen.

21 Do you agree with that?

22 **A.** Yes.

23 **Q.** Okay. If you turn to Page 2 in about the middle of the
24 paragraph, it quotes --

25 **A.** Which paragraph?

1 Q. I'm sorry. Good point. Third.

2 A. Thank you.

3 Q. It quotes Secretary Bowen, and she says that she's mindful
4 that the -- of the impact these decisions will have on voters.
5 That is in the first part. And it goes on to say, however, it
6 is important to remember that in last November's election at
7 least two-thirds and probably closer to 75 percent of the
8 8.9 million voters who cast ballots did so using paper absentee
9 or paper optical scan ballot.

10 Do you see that?

11 A. Yes.

12 Q. And you agree with her statement?

13 A. Yes. On the statewide level, that is an accurate
14 statement.

15 Q. Okay. And she goes on to say on the next page in the
16 last -- I guess third from the bottom paragraph beginning with
17 California law requires --

18 A. Yes.

19 Q. It says there in the two -- the last two sentences that
20 the law states that any such withdrawal can only affect
21 elections that are held six months or more after the date of
22 the election and then notes that the next statewide election
23 for California's 1.57 million registered voters will be the
24 presidential primary on February 5, 2008.

25 Do you see that?

1 **A.** I do. But I believe you misspoke. It is California's
2 15.7 million registered voters.

3 **Q.** What did I -- I'm sorry.

4 **A.** 1.5.

5 **Q.** Oh, sorry. Yeah. No. That would not be California. My
6 apologies. The document will speak for itself.

7 And so California at least when it was doing this had six
8 months to implement this change; right?

9 **A.** Yes.

10 **Q.** And didn't the Secretary a few months after the
11 decertification allow the machines back in under certain
12 circumstances? It was an August revision to the
13 decertification? Are you familiar with that?

14 **A.** Well, there may be some misunderstanding there. The
15 decertifications stood. There were revisions made to the
16 decertification orders after meetings with vendors and county
17 elections officials to streamline the implementation.

18 But the original August 3rd order allowed the same level
19 of continued restricted use of DREs as that August order -- as
20 the modification -- the revision.

21 **Q.** I see. Okay. So there could have been an opportunity to
22 use the DREs that are subject to the August order after or
23 during the February election as long as they met new
24 requirements; is that correct?

25 **A.** No. I need to explain. The original order prohibited the

1 use of DREs except a single machine in each polling place for
2 the use of voters with disabilities. And it placed specific
3 restrictions on even that use. It required, for example, that
4 the printed record of the voters' choices that was retained in
5 the machine be hand counted and that if there were any
6 discrepancies that the official results would be those hand
7 counts of the paper as opposed to the electronic memory. That
8 sort of thing.

9 So that was there in the original order. There were just
10 technical revisions made. But there was never an increased
11 deployment of DREs that was contemplated or allowed.

12 **Q.** And I want to make sure, just so the record is clear
13 because I know there are two different types of relief being
14 sought, you are testifying or it is your testimony that there
15 should be some form of either a BMD type or -- let me rephrase.
16 There should be some form of electronic voting to comply with
17 HAVA and to meet the needs of Georgia's disability population
18 at each precinct?

19 **A.** Yes.

20 **Q.** You testified --

21 THE COURT: Could I just ask you a question. My
22 time.

23 The DRE that was being used then was the upgraded
24 DRE, as I understood it -- the upgraded Diebold DRE that
25 doesn't -- that is -- has the capacity to actually print out a

1 hand ballot; is that right?

2 THE WITNESS: Right.

3 THE COURT: A ballot which somebody -- that
4 reflects --

5 THE WITNESS: The hardware was different because it
6 incorporated that voter-verifiable paper ballot. The software
7 had also been upgraded from the version that Georgia uses.

8 THE COURT: Okay.

9 **Q. (BY MR. BELINFANTE)** Following up on the Judge's question,
10 that was done after the 2004 decertification is when it shifted
11 to having the paper ballot record?

12 **A.** That is correct.

13 **Q.** Okay. So in those -- with those machines, would that
14 paper ballot record be scanned or was it kept electronically
15 how the vote was counted? Do you understand what I'm asking?

16 **A.** I'm not sure.

17 **Q.** Okay. In the machines that were there after 2004 and you
18 get a paper trail, was it an actual by ballot piece of paper or
19 was it a tape?

20 **A.** It is a tape that is retained within the machine that is
21 viewed under a plastic window by the voter and then rolls up
22 inside the machine.

23 **Q.** Okay. Let me ask you some questions about some more on
24 the relief. Are you aware that the money that is going toward
25 replacing the system was actually a bond issued by the State of

1 Georgia?

2 **A.** Yes.

3 **Q.** Okay. Have you looked at the bond sale document?

4 **A.** I have not.

5 **Q.** Okay. So you can't testify whether the bond sale document
6 limits the money to be spent on a particular type of equipment
7 or a particular vis-a-vis BMD or optical scan paper ballot;
8 correct?

9 **A.** Correct.

10 **Q.** And when you talk about -- you indicated -- you indicated
11 that the state was going to -- you believed that the state can
12 meet its goal of having ten counties pilot the BMD project
13 pursuant to the current procurement?

14 **A.** I have seen nothing that would indicate that the state
15 can't do that.

16 **Q.** Okay. And so in your opinion, the procurement is still
17 moving on time, so-to-speak?

18 **A.** Again, I have seen nothing to indicate that it is not.

19 **Q.** All right. Your testimony on what could be done to meet
20 the remedy focused on what the state could do. You're not
21 offering an opinion on what counties or cities could do to meet
22 or to get these machines into the precincts; correct?

23 **A.** Well, I am to the extent that the RFP provides for the
24 state distributing that equipment to the counties in the same
25 way that it has always done with the current system.

1 Q. Right. But you're not -- but if a county or a city better
2 yet wanted to go its own way, you don't have an opinion on
3 that, do you?

4 A. Well, again, from my understanding of Georgia law, the
5 counties don't have an option to go a different way. Some
6 municipalities may.

7 Q. Right. You're not expressing an opinion on those cities
8 that may choose to go a different way?

9 A. Correct.

10 Q. And by a different way, I mean something other than a
11 state-backed BMD.

12 A. Correct. I think they are outside of this process, as I
13 understand it.

14 Q. You testified that there are some other options that I'm
15 presuming the state could do in terms of leasing equipment. Do
16 you recall that?

17 A. Yes.

18 Q. And you were then focused on what the state would do? The
19 state would lease equipment?

20 A. Well, the state or the county could do it. I know that in
21 Berkeley -- excuse me -- I'm trying to get back home. In
22 Georgia law, counties are permitted under the most recent bill,
23 for example, to acquire their own equipment, to acquire
24 additional equipment of the type that the state provides. So
25 they always have that option.

1 Q. And in terms of whether -- you also testified about state
2 certification of the machines. Do you have any personal
3 knowledge of how long it takes the state to certify voting
4 equipment?

5 A. In Georgia, no.

6 Q. Okay.

7 THE COURT: What is typically at least in California
8 involved in the certification?

9 THE WITNESS: I'm sorry?

10 THE COURT: What is involved in California in
11 certification?

12 THE WITNESS: The voter -- I'm sorry -- the vendor
13 submits what is called a technical data package, which includes
14 all of the information about how the system is built and a
15 description of all of its components. It provides equipment
16 for testing.

17 And then the state's own testers, supplemented when
18 necessary by outside vendor companies that are called
19 independent testing authorities, conducts necessary reviews and
20 then submits a report to the Secretary of State who makes the
21 decision about whether to certify the system or not.

22 MR. BELINFANTE: Thank you. No further questions,
23 Mr. Finley.

24 CROSS-EXAMINATION

25 BY MS. BURWELL:

1 Q. Mr. Finley, I only have a few questions for you. In
2 looking through your declaration and specifically at
3 Paragraph 3, you don't identify any experience at the county
4 election level; is that correct?

5 A. Correct.

6 Q. And you don't have -- you have never been an election
7 administrator?

8 A. Correct.

9 Q. And you have never worked for an election administrator?

10 A. I was a poll worker.

11 Q. Okay. So you have been a poll worker?

12 A. Yeah. Long ago.

13 Q. But other than that, you don't have any experience with
14 the actual mechanics other than what you did as a poll worker
15 of putting together an election; is that correct?

16 A. I wouldn't say that that is correct. I have -- I have
17 been involved in discussions with local elections officials
18 about the specifics of how they conduct their elections when we
19 were being consulted on that.

20 Q. But my question was whether you personally had any
21 experience in conducting an election.

22 A. In actually conducting them, no.

23 Q. So that lack of experience is at both the county and
24 municipal level; correct?

25 A. Correct.

1 Q. Now, you've never other than being a poll worker had any
2 experience in things like finding polling places; correct?

3 A. Again, I have been involved in the process of finding
4 polling places because the state was responsible for seeing
5 that counties followed federal and state laws on selection of
6 polling places, including such things as disability access. So
7 I have been intimately involved in that process.

8 Q. Okay. So involved in the process. You actually went out
9 to find places? Or you -- after someone found a place, you
10 went in to determine whether or not you thought the place was
11 acceptable?

12 A. No. We were working at the standards level. Not looking
13 at individual sites.

14 Q. So your experience is in putting together standards for
15 finding polling places; correct?

16 A. And addressing specific complaints and issues that came up
17 about the application of those standards by jurisdictions.

18 Q. Making policy?

19 A. Yes.

20 Q. Right. Not --

21 A. And seeing that it was implemented properly.

22 Q. But you personally were not involved in implementing the
23 policy; correct?

24 A. Correct.

25 Q. That was done at the local level; correct?

1 **A.** Correct.

2 **Q.** And so you weren't involved in anything like the ordering
3 of supplies for an election?

4 **A.** Correct.

5 **Q.** Okay. And you worked as a poll worker, so you were
6 trained as a poll worker; correct?

7 **A.** Yes.

8 **Q.** But you weren't in charge of the actual training; is that
9 correct?

10 **A.** No. But I was in charge of the approval of training
11 materials that had to be submitted to the State of California
12 for approval.

13 **Q.** Right. Because your job with the state was a policy
14 position; correct?

15 **A.** Correct.

16 **Q.** Making policies for the state; right?

17 **A.** Again, not just making policies. But seeing to their
18 proper implementation.

19 **Q.** And you understand that my questions to you are about
20 whether or not you personally were involved in the conducting
21 of an election; right?

22 **A.** Yes.

23 **Q.** You understand that; right? So let me explain it. Do you
24 understand that those are my questions; right?

25 **A.** Well, I believe I said yes.

1 Q. So I'm asking about the sort of boots on the ground in
2 conducting an election, not the state level overseeing of the
3 election.

4 A. You are.

5 Q. Yeah. So that is what I'm asking about. And so I just
6 want the Court to be clear that you don't have any experience
7 with boots on the ground conducting of an election that an
8 election administrator would handle; correct?

9 A. I understand that that is what you are trying to express.

10 Q. Right. And my question to you is: You do not have that
11 experience; right?

12 A. Yes. I believe I already answered that question.

13 Q. Right. You answered the question that you don't have the
14 experience?

15 A. I did.

16 Q. Okay. And one last question: Isn't it true that in
17 California county election officials can begin opening vote by
18 mail ballot envelopes up to ten business days before election
19 day?

20 A. That sounds correct.

21 Q. Thank you.

22 MR. MANOSO: Just a couple of questions, Your Honor.

23 REDIRECT EXAMINATION

24 BY MR. MANOSO:

25 Q. Mr. Finley, you were asked about ballot building by the

1 Coalition plaintiffs' counsel. Will ballots have to be built
2 on the new EMS for the pilot elections that are occurring in
3 2019?

4 **A.** Yes.

5 **Q.** There was a lot of discussion about certification. Are
6 you aware of whether the RFP put out by the state requires that
7 any system submitting a response to that request be EAC
8 certified?

9 **A.** Yes, that is incorporated in the RFP.

10 **Q.** Opposing counsel asked you about having six months, I
11 believe, roughly to implement a change from DREs to paper
12 ballots in California.

13 Did that change precede municipal elections or a
14 presidential primary?

15 **A.** That change was first implemented in the February 2008
16 presidential primary, which was conducted statewide throughout
17 all counties.

18 **Q.** And the California Secretary of State news release that
19 opposing counsel showed you, does that identify 15.7 million
20 registered voters across the state? Did I hear that right?

21 **A.** Yes.

22 **Q.** You testified earlier that you reviewed voter turnout
23 information in local Georgia elections for the several past
24 years; is that correct?

25 **A.** Yes.

1 Q. How did the voter turnout in 2017 compare to the voter
2 turnout in November 2018, the elections that were just held
3 last year?

4 A. Well, at a general level, what I saw was that turnout
5 ranged from a low of about 10 averaged in the low teens and
6 went up as high as 30 percent in the Atlanta mayoral election.
7 So in the 2017 elections, that is what I saw about turnout.

8 In the comparable 2018 general election balloting in those
9 same jurisdictions, the turnout tended to be in the 40 to
10 65 percent range.

11 Q. Staying with that 2017 election data that you looked at,
12 how did the voter turnout in 2017 compare to the expected or
13 actual voter turnout of California voters when they voted in
14 the presidential primary in 2008?

15 A. I believe the turnout in that presidential primary was
16 approximately 60 percent statewide.

17 Q. Last question. Just a clarification. Is it your
18 understanding that the RFP requires any machine submitted in
19 response be already EAC certified?

20 A. Yes.

21 MR. MANOSO: Thank you.

22 No further questions, Your Honor.

23 EXAMINATION

24 BY THE COURT:

25 Q. What is involved in the EAC certification?

1 **A.** It is similar to the state process I described. The
2 vendor initiates the process often in conjunction with a state
3 or local jurisdiction by submitting a technical data package.
4 As soon as the EAC determines that it has all the material it
5 needs, including submission of new equipment, new software that
6 is loaded and ready to test, it conducts testing using its own
7 experts and in some cases farms out some of the work that is
8 very specialized, including cybersecurity type testing to
9 independent testing authorities.

10 And then it reviews all of the results of that material.
11 Sometimes it is an iterative process where if they identify
12 questions or problems they'll go back to the vendor and ask
13 them to make changes either in the documentation or in the
14 actual coding of the systems and then ultimately will make a
15 determination whether to certify or to reject certification of
16 the system.

17 **Q.** And you are saying that can take several months to a year?

18 **A.** Yes.

19 **Q.** And --

20 **A.** I'm aware of many cases in which there were several
21 iterations of going back and forth between the EAC and the
22 vendor to correct problems that were identified. And that
23 takes time.

24 **Q.** And let's say company X has been selling to a variety of
25 jurisdictions a software package and equipment for the last two

1 years and they basically are just selling to a new jurisdiction
2 the same.

3 Is it basically automatically given -- does the EAC
4 automatically give certification? Sort of basically whatever
5 the information was before is sufficient?

6 **A.** That is right. The certification travels with the system,
7 and it doesn't have to be renewed for each particular state or
8 locality's acquisition of the system. So long as they -- as
9 what they acquire conforms to what was tested, the
10 certification remains in effect.

11 **Q.** And how many years can the certification remain in effect?

12 **A.** The certifications are open-ended.

13 **Q.** And how does that -- you know, we just had the -- a lot of
14 different reports including, I think, yesterday the report of a
15 bipartisan Senate Intelligence Committee on Voting.

16 How does -- to the extent you know -- and please identify
17 if you don't know something based on your actual professional
18 involvement. How does that deal with the fact that either that
19 there may be new developments or new reports of weaknesses in a
20 system -- in a voting system in terms of -- I have already been
21 certified, let's say, in 2010 or 2012 and now it is 2016 or
22 2017. And --

23 **A.** Yeah. Unfortunately, the system is pretty inflexible and
24 slow moving. And there aren't any built-in mechanisms to
25 trigger reconsideration of certifications. So that has to be

1 initiated by someone.

2 I can speak to the state certification model in California
3 where that sort of thing comes up and the Secretary of State on
4 her own initiative or at the request of voters can reopen the
5 certification question with a system. And that has been done
6 in California with several systems as new information became
7 available about vulnerabilities or attacks.

8 MR. CROSS: Your Honor, I think there may be a little
9 bit of confusion, if I may help. My understanding -- and
10 Mr. Finley can clarify. Our understanding of the RFP process
11 is that the system that has to go into effect this year for the
12 pilots has to be EAC certified already. So we weren't
13 suggesting that there is an EAC process that is going to have
14 to play out in the future.

15 THE COURT: I see.

16 MR. CROSS: It already has to be in place. So the
17 time frame for EAC certification doesn't matter.

18 THE COURT: I see.

19 MR. CROSS: I didn't want Your Honor to spend more
20 time on that because I think we weren't clear about that.

21 THE COURT: All right. Everyone else agrees with
22 that?

23 MR. BROWN: We do, Your Honor. And I think this is
24 conceded also -- there is also the state certification that is
25 in the future, and that has not happened.

1 THE COURT: Does the state agree with that?

2 MR. RUSSO: Your Honor, to be able to -- for a vendor
3 to be able to qualify for negotiations for the contract, their
4 system had to have been certified by the state also.

5 THE COURT: So you have already certified each of the
6 systems that are currently -- you are --

7 MR. RUSSO: If they are not already certified, then
8 they are in the process of finalizing that.

9 THE WITNESS: Is that certification process public?

10 MR. RUSSO: Right. The machine. I'm talking about
11 the machines had to be certified.

12 THE COURT: All right.

13 MR. BROWN: Is there any evidence of that other than
14 counsel's statement that they have been certified?

15 MR. RUSSO: I said they have to qualify -- to qualify
16 for the contract, they have to have been certified. I don't
17 know which ones -- it is in the RFP documents. That is right.
18 So the machines still have to get certified.

19 THE COURT: The bond document that the defendants'
20 counsel referenced, is that something you can provide me with
21 the language of the bond document?

22 MR. BELINFANTE: We can certainly do our best to get
23 it to you.

24 THE COURT: Thank you very much. And, of course,
25 opposing counsel as well.

1 **Q. (BY THE COURT)** In reviewing your affidavit, I see that
2 you also serve at Chief Counsel to the Office of the California
3 Secretary of State --

4 **A.** Yes.

5 **Q.** -- as an attorney?

6 **A.** Yes.

7 **Q.** All right. And did California or you have any concerns
8 regarding any issues under the Americans with Disabilities Act
9 as to the use of the -- of the machines as long as they -- of
10 the voting machines if there was, in fact, a printout of the
11 vote?

12 **A.** We did.

13 **Q.** Or did they also have to do a hand ballot also? I wasn't
14 100 percent sure.

15 **A.** No, they did not also have to do a hand ballot. We did
16 have concerns. But even with the addition of the
17 voter-verified paper audit trail, there were still serious
18 trustworthiness problems with those DREs, which I could go
19 into.

20 But we -- in the procedures that we required be
21 implemented to continue to use those DREs for the limited
22 purposes of allowing voters with disabilities to vote, we did
23 everything we could procedurally to try to limit those risks.
24 And the primary thing was to require that whenever a ballot was
25 cast on the DRE the paper record of that voter's choice had to

1 be compared, the totals had to be added up, and if there was
2 any discrepancy between what was put on paper at the time of
3 voting and what the electronic record reflected that had up to
4 then been the official record of the vote, then the paper
5 result would be substituted. Because there are concerns about
6 whether that is a trustworthy -- whether the machine is capable
7 of printing one thing and showing on the screen another thing.

8 THE COURT: All right. Thank you.

9 Is there anything else?

10 MR. CROSS: No further questions.

11 MR. BELINFANTE: No.

12 THE COURT: Thank you very much.

13 MS. CHAPPLE: The Curling plaintiffs would like to
14 call Dr. Halderman next.

15 THE COURT: That's fine.

16 MR. RUSSO: Your Honor, just a quick housekeeping
17 note, could we get an update on how much time both sides have
18 left.

19 THE COURT: You can take my questions off, Ms. Cole.

20 MR. RUSSO: We're showing 37 minutes for plaintiffs.
21 I just want to make sure we are still on track.

22 LAW CLERK COLE: Curling plaintiffs have used two
23 hours and 13 minutes. Coalition plaintiffs have used one hour,
24 46 minutes.

25 MR. POWERS: Could you repeat that. We couldn't

1 hear.

2 LAW CLERK COLE: Two hours, 13 minutes for Curling.
3 One hour, 46 minutes for Coalition. You can add those
4 together.

5 MR. CROSS: Roughly four hours.

6 MS. BENTROTT: That's what we have. We have an hour
7 left.

8 MR. CROSS: We have just over one hour left.

9 MR. RUSSO: That is different than our numbers.

10 MR. MILLER: Does that include when the clock was
11 stopped for --

12 LAW CLERK COLE: I'm keeping it separately from what
13 is going on.

14 MR. CROSS: Our calculations are the same as your
15 clerk's, Your Honor.

16 THE COURT: All right. I know that you said that you
17 would only use, you thought, half an hour with this witness.
18 And I don't know how many witnesses at this point the
19 defendants plan to call. But, you know, I'm obviously not
20 going to forgo having an examination of the government's
21 witnesses.

22 So -- but I'm not -- obviously Dr. Halderman has been
23 an important witness. And I'm just going to have to play this
24 by ear. But if I give you any extra time, I'm obviously giving
25 the extra time to the government as well.

1 So I just want to be sure -- and we'll go over this
2 again. Thank you for raising the question so that we're all
3 clear.

4 Is there any dispute about the four hours? Did
5 defense counsel --

6 MR. RUSSO: No, Your Honor.

7 THE COURT: All right. Very good.

8 MR. CROSS: Your Honor, I apologize. We limited the
9 direct to 18 minutes. We didn't anticipate questions from the
10 Coalition. So sorry that that ran a little long.
11 Dr. Halderman knows to be focused and brief.

12 THE COURT: All right.

13 COURTROOM DEPUTY CLERK: Please raise your right
14 hand.

15 **(Witness sworn)**

16 COURTROOM DEPUTY CLERK: Please have a seat. Loudly
17 and clearly state your name, and spell your last name for the
18 record.

19 THE COURT: Just before he begins, I do need some
20 technical assistance. The computer is having some troubles. I
21 wanted to see whether anyone else other than me can get this
22 moving.

23 THE WITNESS: My name is Alex --

24 THE COURT: Wait. I'm sorry.

25 **(There was a brief pause in the proceedings.)**

1 THE COURT: All right. Everyone have a seat again.
2 We are ready. So thank you.

3 Would you go ahead and state your name.

4 THE WITNESS: My name is Alex Halderman. That is
5 H-A-L-D-E-R-M-A-N.

6 Whereupon,

7 J. ALEX HALDERMAN, PH.D.,

8 after having been first duly sworn, testified as follows:

9 DIRECT EXAMINATION

10 BY MS. CHAPPLE:

11 Q. Good afternoon, Dr. Halderman.

12 (There was a brief pause in the proceedings.)

13 Q. (BY MS. CHAPPLE) When we were here for last year's
14 hearing, you expressed some concerns regarding threats to
15 critical infrastructure, including election infrastructure from
16 nation states and others.

17 Does your opinion change at all when the elections we're
18 talking about are smaller, for example, the elections this fall
19 here in Georgia?

20 A. No, my opinion doesn't change. I worry based on the
21 intelligence reports that we've all seen about threats to
22 critical infrastructure from Russia and other nation states
23 that even local elections could be an ideal target for attacks
24 aimed at undermining voter confidence and voter belief in the
25 legitimacy of their elected leaders.

1 Q. Turning to yesterday's testimony from Mr. Barnes, did you
2 observe his testimony?

3 A. Yes, I did.

4 Q. Do you have an opinion about the fact that he has three
5 people building ballots from their homes?

6 A. I have to say I almost fell out of my seat when I heard
7 Mr. Barnes testify that. That goes even beyond the grave risks
8 that we already knew from his previous testimony existed in the
9 state's processes. And it largely undermines any value that
10 building ballots on an air-gapped network could provide.

11 Q. Why is that specifically?

12 A. Well, these computers that people are working on in their
13 homes are outside the secure facilities that the Secretary of
14 State maintains for ballot building. The ballots have to be
15 brought into the secured facility on USB sticks. And
16 Mr. Barnes testified that those USB sticks he copies the data
17 through his public internet-connected computer in order to
18 bring them into the air-gapped network.

19 That means that the election programming for every county
20 that is programmed by those external contractors, which he
21 testified included I believe every county during the November
22 election, has to travel through an internet-attached computer
23 where it could potentially be tampered with in a way that would
24 spread malware to voting machines.

25 Q. Along the same lines, do you have an opinion about the

1 process Mr. Barnes described for the way that he transfers
2 files using his own USB stick?

3 **A.** Yes. So the process that he described yesterday at the
4 hearing exposes the data unfortunately to tampering in a number
5 of ways. Although he mentioned using a USB stick that has a
6 lock, presumably a write protect switch. He has to have it
7 unlocked in his internet-attached computer in order to format
8 it in order to copy files to it.

9 All of that exposes both the data and potentially the USB
10 stick to tampering with by attackers or to being infiltrated
11 with malware that could spread into the rest of the election
12 system.

13 **Q.** And was the process you described your understanding --
14 your previous understanding of his process, or were there any
15 differences?

16 **A.** The process was with the additional detail that he
17 provided yesterday even less secure than I had previously been
18 led to believe.

19 **Q.** Have you reviewed Mr. Beaver's declaration in this case?

20 **A.** Yes, I have.

21 **Q.** Are the protections including end point and others that he
22 describes sufficient in your opinion to protect the election
23 system?

24 **A.** No, they are not.

25 **Q.** Moving now to the GEMS database, in mid-July you received

1 copies of what the state represented to be the current GEMS
2 databases; is that right?

3 **A.** That's correct.

4 **Q.** Have you had a chance to review those in depth and to
5 conduct a thorough analysis of them?

6 **A.** Not in depth. Not yet. That is analysis that is still in
7 progress. We have only had the databases for a few days while
8 I've been in Michigan because of the other demands of this
9 case.

10 **Q.** Have you been busy on other things in this case?

11 **A.** Yes.

12 **Q.** Based on the limited review you've had time to do so far,
13 what, if any, vulnerabilities have you identified on the GEMS
14 databases?

15 **A.** Perhaps the biggest vulnerability in the GEMS system is
16 that in the databases that I have reviewed is that contrary to
17 the expressed position of the state that there was something
18 unique to Georgia about these databases that would -- in
19 their -- it is their assertion make it more difficult for
20 attackers to infiltrate, there is actually nothing whatsoever
21 unique about the structure of the Georgia GEMS databases. It
22 is identical to the structure of databases in several other
23 states, including databases that are public on the internet.

24 **Q.** When you received the GEMS databases, the Secretary of
25 State provided you with a password to open the encrypted

1 contents of the CD; is that right?

2 **A.** That is true.

3 **Q.** Have you reviewed Georgia's Secretary of State's password
4 policies?

5 **A.** I have.

6 **Q.** Did the password the Secretary of State provided meet
7 their own password protocols?

8 **A.** I think it did not, no.

9 **Q.** Would you be comfortable describing generally how it did
10 not meet the protocols.

11 **A.** Well, among the password policy rules that the state has
12 implemented is that passwords should not contain the -- the
13 name of the Georgia Secretary of State's office, those words or
14 things derived from it. And that was not true of the passwords
15 that the state used to protect the database on its way to me.

16 **Q.** Moving now to talk briefly about Dr. Shamos' deposition
17 testimony and declaration, have you reviewed the declaration
18 Dr. Shamos put forward?

19 **A.** Yes, I have.

20 **Q.** And did you attend his deposition?

21 **A.** Yes, I did.

22 **Q.** Would you join Dr. Shamos in recommending a forensic
23 analysis, quote, involving the type of AccuVote DREs that are
24 used in Georgia to look for malware?

25 **A.** I would. That might reveal evidence of malware.

1 Q. And Dr. Shamos says in his declaration that you haven't
2 put forward a concrete risk scenario for the operation here in
3 Georgia.

4 How do you respond to that?

5 A. Well, so putting forth a single concrete risk scenario
6 doesn't really make sense because security is an asymmetric
7 kind of question. As an attacker -- an attacker just needs to
8 find one way that works to get into the parts of the system he
9 wants.

10 But as a defender, you need to defend against every single
11 one of those potential ways in. It is like you have to make
12 sure all of the doors, all the windows are locked and barred.

13 Q. In other words, it would be incomplete to just put one
14 risk scenario forward?

15 A. That is what I'm saying, yes.

16 Q. Did you prepare some slides for your testimony today?

17 A. I did.

18 MS. CHAPPLE: Your Honor, may I approach?

19 THE COURT: Yes.

20 Q. **(BY MS. CHAPPLE)** So there are four slides here. But we
21 will go very quickly to Number 4. But first let me lay the
22 foundation.

23 And were you able to -- I think we're working on getting
24 them up on the projector.

25 Are these slides based on information from depositions,

1 declarations, and testimony last year?

2 **A.** Yes, they are.

3 MS. CHAPPLE: I would like to move these slides into
4 evidence as Exhibit 12.

5 THE COURT: Let me see them first. They can be
6 demonstrative evidence. We'll see --

7 MR. TYSON: We're looking at them.

8 THE COURT: They haven't looked at them yet.

9 MS. CHAPPLE: Right.

10 THE COURT: And I haven't looked at them. So why
11 don't we just treat them for now as demonstrative evidence, and
12 then we'll proceed.

13 Are we having technical issues?

14 MS. CHAPPLE: I think we are.

15 COURTROOM DEPUTY CLERK: We can use the document cam
16 if we can.

17 MS. CHAPPLE: We can also go ahead with the hard copy
18 while they -- whatever Your Honor prefers.

19 THE COURT: Have a different one of your team working
20 with the document camera if you can't pull it up so that the
21 audience who has bothered to be here can see it.

22 MS. CHAPPLE: Thank you.

23 THE COURT: I appreciate that you are trying to keep
24 the 18 minutes. But I still have to -- this is an important
25 witness, and I still have to understand.

1 MS. CHAPPLE: Yes. Absolutely.

2 **Q. (BY MS. CHAPPLE)** Okay. This first slide is a
3 representation of -- or I'm sorry. Can you walk very briefly
4 through this first slide just saying what it is?

5 **A.** The first slide shows the information flows that the
6 California Secretary of State's office involving --

7 **Q.** I'm sorry.

8 **A.** -- the election system and explains some of the ways in
9 which an infection could be introduced in the system and lists
10 some of the mitigations that are inadequate.

11 **Q.** At the Secretary of State level?

12 **A.** At the Secretary of State level.

13 **Q.** I'm going to turn now --

14 THE COURT: You said California. Are you talking
15 about --

16 **A.** I'm sorry. Excuse me. Georgia Secretary of State. I'm
17 reading the California Secretary of State code review line
18 below it.

19 **Q. (BY MS. CHAPPLE)** The second slide -- let me straighten it
20 out. Can you give the same level of detail regarding the
21 second slide?

22 **A.** It is the same questions about the county level GEMS
23 systems are diagrammed and outlined in this slide.

24 **Q.** So the potential infection points and the inadequate
25 mitigations?

1 **A.** That is right.

2 **Q.** And then this third slide?

3 **A.** The third slide discusses the potential infection routes
4 and inadequate mitigations as applied to individual voting
5 machines in Georgia.

6 **Q.** Thank you. And then this is the slide that we will
7 discuss. Can you please walk the Court through this slide?

8 **A.** So the last slide brings the entire system together and
9 summarizes some of the most important ways that malware could
10 spread through the system and what it could do.

11 We start at the top with this Georgia Secretary of State's
12 office where there are risks from where the state's central
13 GEMS system is maintained. There is a risk that malware could
14 be spread into the system from the internet via an attacker who
15 was able to exploit the kinds of weaknesses that Ms. Payton's
16 testimony examined.

17 **Q.** I'm sorry. Could you give a little more detail regarding
18 that aspect of this.

19 **A.** Yes. So Ms. Payton's company's security analyses of the
20 Secretary of State's network found in November 2017 that her
21 group was able to hack into the Secretary of State's computer
22 network from the outside and gain complete domain administrator
23 access to their network.

24 With that access, an attacker could spread -- could spread
25 an infection or could reach computers within the Secretary of

1 State's domain, including Mr. Barnes' computer, which was part
2 of that network on which he copies data from his contractors
3 into the GEMS network.

4 **Q.** And would the remediations that we have heard about
5 yesterday do anything to correct what would -- what could
6 already be in there from such an attack?

7 **A.** No. If an attack has already spread through that route,
8 it could still be there affecting machines to this day.

9 **Q.** Can you continue?

10 **A.** Yes. So that attack could potentially spread through the
11 USB stick into the GEMS network and thereby infect the CDs that
12 are sent out to counties in order to load into their GEMS
13 system. That is not --

14 **Q.** Were there anything about the CDs that would make them
15 particularly vulnerable?

16 **A.** Yes. So I noted that the CDs -- that the way the CDs are
17 encrypted by the Secretary of State's office is a little bit
18 unusual. And we got to see this with the CDs that were
19 transferred to us with the GEMS database copies on them, as
20 well as in Mr. Barnes' testimony yesterday.

21 So the way that these encrypted CDs work, there's actually
22 a program on the CD that is run by the recipient in order to
23 decrypt the password and enter the data. If an attacker were
24 able to either infect -- to infect the system on which the CD
25 was created, they could essentially implant a virus into that

1 decryptor program, which would then spread to the recipient
2 when they went to decrypt the CD.

3 That is unusual. That is not how most forms of encrypted
4 data transport are implemented.

5 **Q.** And this slide also discusses risks to the DREs
6 themselves?

7 **A.** Yes, it does.

8 **Q.** Would you please walk through those.

9 **A.** Yes. So the DREs themselves can be infected we know from
10 previous research and published reviews in California and Ohio
11 from a -- from the memory cards that election officials load in
12 before every election, which if the files on those cards are
13 infected with malware it can -- it can infect and load itself
14 into the DREs in a persistent way that will infect not only the
15 votes in the current election but could also affect future
16 elections.

17 The machines can also be infected by someone who has brief
18 physical access to them at any time before votes are -- before
19 they are used for the last election. And that infection too
20 can be done in a way that would persist over time.

21 Or someone who just had brief physical access to the
22 memory cards that are loaded in, even if they didn't have
23 access to the GEMS system itself, could infect those cards in a
24 way that would spread malware into the machines.

25 And this could -- the malware that could be spread through

1 these routes could alter vote totals. It could sabotage the
2 machine so that they wouldn't work properly or wouldn't even
3 turn on.

4 **Q.** And has anything that you've seen in any of the
5 submissions from the defendants or testimony -- has anything
6 changed -- have you seen anything that would suggest that these
7 risks would not continue to be at issue after the risk analysis
8 and other remediations that they have put forward?

9 **A.** No, unfortunately not. I think even the totality of the
10 mitigations doesn't change my opinion. The system is highly
11 vulnerable.

12 **Q.** And in your opinion, what, if anything, could the state do
13 to reliably secure at this point the current DRE-based system
14 before this fall?

15 **A.** I don't think there is anything that the state could do to
16 secure the current DRE system unfortunately. The
17 vulnerabilities just exist at too many levels. And the system
18 is too large and complex with not only the Secretary of State
19 but 159 counties and 27,000 machines attached to those
20 counties, all of which are potential points of infection.

21 **Q.** And do you have an opinion on the continued use of GEMS?

22 **A.** I think GEMS is obsolete software that is not wise to
23 continue using.

24 **Q.** And, similarly, do you have an opinion on the continued
25 use of AccuVote TSx scanners?

1 **A.** The TSx DREs you mean?

2 **Q.** Yes.

3 **A.** The TSx DREs are unsafe to use.

4 THE COURT: But you were talking about the scanners
5 or we're talking about -- I'm trying to make sure --

6 MS. CHAPPLE: I can ask also about the scanners, Your
7 Honor.

8 **A.** The TSx is the touchscreen model. And the scanner is the
9 OS.

10 **Q.** **(BY MS. CHAPPLE)** Do you have an opinion on the continued
11 use of the AccuVote-OS scanners?

12 **A.** The AccuVote-OS because it has a voter-verifiable paper
13 trail can be used safely so long as it is robustly audited.

14 **Q.** And, finally, what is your opinion regarding the safest
15 most secure method of voting?

16 **A.** The safest most secure method in my assessment is precinct
17 count optical scan.

18 **Q.** And why is that?

19 **A.** Because a precinct count optical scan system generates two
20 very different kinds of records of every vote and right in
21 front of the voter: A voter-marked ballot that the voter has
22 completed themselves and then electronic scan of that ballot
23 that is stored in a computer memory.

24 And as long as we audit rigorously these two records to
25 make sure they reflect the same election outcome, an attack

1 that would change the election result would be very difficult
2 to carry out because it would have to manipulate both very
3 different kinds of records at the same time and in a way that
4 agreed.

5 MS. CHAPPLE: Thank you, Dr. Halderman. No more
6 questions.

7 THE COURT: Mr. Brown, is anyone from the Coalition
8 going to be asking questions?

9 MR. BROWN: No, Your Honor. Thank you.

10 MR. TYSON: Your Honor, I have a rather lengthy
11 cross-examination of Dr. Halderman. Do you want to go ahead
12 and just proceed with that?

13 THE COURT: No. We could wait.

14 Would you mind if I just get clarification on a few
15 things beforehand --

16 MR. TYSON: Certainly.

17 THE COURT: -- on my time. Could we just get the
18 picture back up.

19 MS. CHAPPLE: The final slide?

20 THE COURT: Right.

21 I just want to talk a little bit about Mr. Barnes'
22 insertion -- method of reproduction in getting the information
23 from -- the ballot from his contractors.

24 And my impression was he viewed the -- his computer
25 as air gapped -- his private computer as air gapped. I'm not

1 sure under Dr. Shamos' definition that that is air gapped.

2 I'm just trying to understand. Your concern was that
3 he was using the USB stick and sticking it in. Was it your
4 understanding that he was connected to the internet?

5 THE WITNESS: Mr. Barnes referred I thought in my
6 opinion quite clearly to his putting the USB sticks into his
7 computer on the Secretary of State's public network. He
8 referred to the way that the USB sticks were, he saw them being
9 scanned as he put them in, which the state's witnesses have
10 testified or it may be in the -- in Mr. Beaver's declaration
11 only is implemented on the public-facing computer, not on the
12 air-gapped -- the so-called air-gapped network.

13 MR. CROSS: Your Honor, it if helps, I don't think
14 there is any dispute that the computer that Mr. Barnes is
15 plugging the USB drive into is his internet-connected
16 public-facing computer.

17 THE COURT: I just want to make 100 percent sure.

18 MR. RUSSO: I think it depends on which computer
19 we're talking about and at which point.

20 THE COURT: I'm sorry. I just didn't catch anything
21 you said.

22 MR. RUSSO: I think it depends on which computer
23 we're talking about. There is an internet -- a public-facing
24 computer that Mr. Halderman, I think, is referring to where he
25 is talking about -- excuse me -- Dr. Halderman where he is

1 referring to the scan and so on and so forth where he pulls the
2 data from the voter registration system or from the third
3 parties. When they provide him a CD, he puts it on the
4 public-facing computer is what he was saying. And then he puts
5 that onto the flash drive, which then goes into the private
6 computer, the private computer being the GEMS -- the GEMS
7 server, the air-gapped computer, which there may be some
8 dispute over whether it is air gapped or not, but that is what
9 we are referring to as the GEMS.

10 THE COURT: But when his contractor -- a member of
11 his three-person contractor staff gives him a thumb drive or
12 some other similar device, is he -- what is your understanding
13 as to what -- I mean, I went through this at length yesterday.
14 But I still want to make 100 percent sure what your
15 understanding as to what the state's representation is as to
16 what happens next.

17 MR. RUSSO: Yes, Your Honor. My understanding is
18 that the state has their -- has the third-party vendors who are
19 on their air-gapped computers themselves. They built the --
20 assist with building the ballot, provide the CD or the flash
21 drive to Mr. Barnes. Mr. Barnes puts it into the state's
22 public-facing computer. And at that point whatever the state's
23 system does that is in Mr. Beaver's affidavit occurs. It is
24 scanned for malware. And then Mr. Barnes puts it onto a
25 formatted flash drive and from there into the air-gapped

1 system.

2 THE COURT: And there is some dispute about whether
3 his system is air gapped or not?

4 MR. RUSSO: Yes.

5 MR. CROSS: I'm sorry.

6 THE COURT: But his GEMS --

7 MR. RUSSO: So there's a question -- I guess there
8 will be a question as to whether -- if there is malware that is
9 getting around, whatever the systems are the state is running
10 on that public-facing system. But -- so I think that is
11 probably where the rubber meets the road.

12 THE COURT: Wait a second. I want to make sure I
13 understand what they believe the facts are and then you can say
14 anything else.

15 MR. CROSS: If it helps, Your Honor, I think what
16 Mr. Russo said is accurate acknowledging that we disagree that
17 any of that is air gapped. That is an issue of fact for the
18 Court.

19 THE COURT: I understand.

20 MR. CROSS: But the point you are focused on, when
21 the flash drive or CD comes in from the ballot builders, that
22 is getting plugged into the public internet-facing computer.

23 THE COURT: All right. And when the county offices
24 send in their information, that is going into -- where is that
25 going?

1 MR. RUSSO: So that -- so Mr. Barnes testified
2 yesterday they receive the CDs. If it is -- or if it is the
3 results, the results go into a different system, the Election
4 Night Reporting system. That's the website that you see
5 online.

6 The CDs that are from the county GEMS databases, the
7 state collects them. They don't do anything with them
8 unless -- if they do want to look at them though, which they --
9 you know, whatever they do, they create a separate air-gapped
10 system. They do not go on the state's air-gapped system. They
11 go -- I mean, they do not go on the GEMS system. They go on a
12 different one that is built is what he testified to.

13 MR. CROSS: I think the key point, Your Honor, is
14 that when those GEMS databases and the ballots come in from the
15 builders, the third parties who work in their homes, that gets
16 plugged into a computer that is connected to the internet.
17 That then moves from the public-facing computer to the GEMS
18 server.

19 THE COURT: All right. All right. I just wanted to
20 make sure I understood before you ended up examining the
21 witness and I ended up interrupting you.

22 MR. CROSS: I thought it might help because I didn't
23 think those facts were in dispute. It is really a dispute
24 about the sufficiency.

25 THE COURT: Is there any objection to the plaintiffs

1 introduction of this exhibit?

2 MR. TYSON: I don't believe so, Your Honor. I'm
3 planning to cross Dr. Halderman on it.

4 THE COURT: Do you want to just tell me when we
5 start -- commence?

6 MR. TYSON: Yes, Your Honor, if that would be all
7 right.

8 THE COURT: Do you have an exhibit number?

9 MS. CHAPPLE: 12.

10 THE COURT: 12. Because even -- I will just remind
11 you that even if something gets declined as an exhibit I need
12 to have an exhibit number.

13 MS. CHAPPLE: Yes, Your Honor. Thank you.

14 May I take this off or should we leave it for after?

15 THE COURT: You can take it off.

16 MS. CHAPPLE: Great.

17 MR. CROSS: Are we stopping for lunch?

18 THE COURT: We're going to stop for lunch, and we're
19 going to start at 1:15.

20 MR. BELINFANTE: Your Honor, right before you stop,
21 you reminded me -- and we can do this later. I forgot to
22 tender into evidence the exhibit we had for Mr. Finley. I can
23 do that now or later. I just --

24 THE COURT: Sure. They objected to it or not?

25 MR. BELINFANTE: They have not. I would just move to

1 enter Defendants' Exhibit 4, which is the statement from the
2 Secretary of State of California.

3 MR. BROWN: No objection, Your Honor.

4 MR. MANOSO: Your Honor, it is obvious -- we object,
5 Your Honor. We object to hearsay.

6 THE COURT: All right.

7 MR. BELINFANTE: It is a government document.

8 THE COURT: It is a government document. I don't
9 know what it is. So let me see it and let me just change the
10 begin time because -- and that it will be 20 after 1:00 so that
11 people can actually get some lunch. Thank you.

12 COURTROOM SECURITY OFFICER: All rise.

13 **(A lunch break was taken.)**

14 THE COURT: Have a seat. Before you begin, I just
15 wanted to just touch base about the contracts I had asked for.
16 Are those going to be coming?

17 MR. TYSON: Yes, Your Honor. I apologize. I was
18 going to raise this earlier with you. What we have is the
19 contract with PCC is apparently hundreds of pages of
20 attachments and various components.

21 The feature that Mr. Beaver was talking about in
22 terms of audit capacity is addressed by moving the hosting from
23 PCC to a vendor under the control of the Secretary of State
24 directly. So what I have is --

25 THE COURT: But it is to another vendor?

1 MR. TYSON: It is the state's data center. I'm
2 sorry, Your Honor. And so I have the contract with that
3 vendor. But there is not a provision that says you get to
4 audit this in the contracts that was addressed by shifting the
5 control of the data. So I mean if that's what you are looking
6 for, we're happy to do that. Or I can provide all the various
7 pieces. But I wanted to address your needs given the length of
8 the attachments.

9 THE COURT: Do you have something -- like you have
10 something that -- at least if you have a tab that indicates
11 where you think it is different or the same or --

12 MR. TYSON: Yes, Your Honor. So what I have is a
13 cover letter from the Secretary of State canceling two of the
14 pieces that included hosting and then the new agreement that
15 has the new hosting provider. If you want me to provide that
16 to the Court --

17 THE COURT: Yes. And whatever the language is as to
18 the auditing. But you are saying it is not -- it is not there?

19 MR. TYSON: The auditing is in the language for the
20 new hosting setup. Where now that the data will be under the
21 control of the Secretary of State's office, the only function
22 PCC continues to fulfill is a licensing function for the
23 software and yearly maintenance.

24 And so since everything is housed in the Secretary of
25 State's data center, they can always audit their own security

1 in their own center.

2 THE COURT: Let me look at the materials. Maybe it
3 will be clearer.

4 MR. TYSON: Thank you, Your Honor.

5 THE COURT: All right. And I don't have to have them
6 this moment.

7 But -- all right. Was there an objection to -- was
8 it 12?

9 MR. TYSON: Yes, Your Honor, to 12. We do object.
10 This is -- we have no problem with it being a demonstrative.
11 But since it is a summary of other evidence, we don't believe
12 it is evidence itself, that it should be admitted as such.
13 We're fine with it coming in as a demonstrative and it being
14 considered but not as an exhibit admitted into evidence.

15 MS. CHAPPLE: We're fine with that, Your Honor.

16 THE COURT: All right. Exhibit 12 then just will be
17 introduced solely as demonstrative evidence. As to the -- I'm
18 not sure what the purpose of introducing Defendants' Exhibit 4
19 is, which is the press release, since the witness who had
20 personal knowledge of what happened was not impeached with
21 this. And he simply explained what happened. So I don't
22 really know that it has independent evidentiary value unless it
23 is explained to me.

24 MR. BELINFANTE: As Your Honor indicated, we read it
25 into the record. He agreed with it. So we're happy to have

1 it. And we think it is relevant. But --

2 THE COURT: I just -- he -- there is a lot of other
3 things here. And I just don't know that -- since he agreed and
4 explained what the recertification was, I just think that there
5 is no independent evidentiary value of it. So I'm going to
6 decline to admit Defendants' Exhibit 4. But we'll keep it here
7 someplace.

8 And you can go ahead and proceed. Thank you.

9 MR. TYSON: Thank you.

10 THE COURT: And somebody sent something to whoever
11 your contacts at the state are about the bond issue that I --

12 MR. TYSON: Yes, Your Honor.

13 MR. BELINFANTE: We're working on that still.

14 THE COURT: Go ahead. Sorry.

15 CROSS-EXAMINATION

16 BY MR. TYSON:

17 **Q.** Good afternoon, Dr. Halderman. I'm Bryan Tyson, one of
18 the lawyers for the state in this case.

19 **A.** Good afternoon.

20 **Q.** I thought since we obviously are on different sides in
21 this case I would start with some things that I think we can
22 all agree on about security.

23 And so, first, you heard Ms. Payton testify yesterday that
24 everything is hackable; correct?

25 **A.** I did.

1 Q. And you would agree with me, wouldn't you, that every
2 computer system has vulnerabilities; right?

3 A. Yes. There are degrees of vulnerability. But I don't
4 think there has yet been made an utterly impervious system.

5 Q. And you would agree with me, wouldn't you, that every
6 election system has vulnerabilities too; correct?

7 A. Again, there are shades of gray. But yes.

8 Q. So you would say it is a range? Security is a sliding
9 scale? Is that a fair thing to say?

10 A. That it isn't -- it isn't binary.

11 Q. So would it be correct to say that it is not a matter of a
12 secure system and insecure system; it is a more secure system
13 and a less secure system?

14 A. I think that is true. But normally when we're talking
15 about something being insecure, we're talking about it being --
16 we use that as a way of expressing that it is not -- it is not
17 amply secure to defend against the threats that it is going to
18 face in practice.

19 Q. And so is insecure a term of art in the cybersecurity
20 community?

21 A. A term of art? I would say it is a word we use in a
22 certain way.

23 Q. And the way in which you use it again expresses degrees of
24 security, not absolute insecurity versus absolute security;
25 correct?

1 **A.** I guess I would have to agree with that.

2 **Q.** And you would agree with me, wouldn't you, that in your
3 work on software and other kinds of vulnerabilities in the
4 cybersecurity arena that sometimes when you find a
5 technological vulnerability it can be remediated through a
6 physical security measure; correct?

7 **A.** That is sometimes true.

8 **Q.** And so, for example, the memory card that you presented to
9 the Court last fall, is that memory card protected by a
10 password or encryption or any other technology?

11 **A.** The memory card that we -- protected against what?

12 **Q.** Against access. If anyone stuck it into a computer or
13 into a PC card reader, would they be able to read the
14 information on the card without entering a password?

15 **A.** They would be able to read some of the information on the
16 card. That is true.

17 **Q.** And you consider that a vulnerability because someone can
18 access it without a password; correct?

19 **A.** If what we are trying to secure is the data from being
20 read, then yes, it is a kind of vulnerability if someone can
21 read it with -- if someone can read it who is not supposed to
22 read it.

23 **Q.** And so you mitigate that potential vulnerability by
24 physical security measures? You keep it on your person? You
25 keep it locked in your lab; correct?

1 **A.** Yes.

2 **Q.** You would agree with me, wouldn't you, that if you were
3 given complete physical access to an unencrypted computer you
4 could eventually gain access to all parts of it; correct?

5 **A.** Yes.

6 **Q.** And you would agree with me, wouldn't you, that all
7 software has vulnerabilities; correct?

8 **A.** Yes.

9 **Q.** Would you agree with me that people with access are an
10 important part of cybersecurity and security generally?

11 **A.** That people with access, yes. Because if you have access
12 and you use that access, you can -- that is what's called an
13 insider attack.

14 **Q.** And are processes and procedures around computer equipment
15 also an important part of cybersecurity?

16 **A.** Yes, they are.

17 **Q.** And you would agree with me also that the ability to
18 detect a cyber -- I'm sorry -- let me start over again.

19 You would agree with me that having an ability to detect
20 an attack is an important part of cybersecurity as well;
21 correct?

22 **A.** Yes.

23 **Q.** You would agree with me that sitting here today you don't
24 have any evidence that a DRE in use in an actual election has
25 ever been compromised by malware; correct?

1 **A.** A DRE in use in an actual election? No, I do not.

2 **Q.** And you would agree with me if the -- since your chart
3 expresses concerns about the internet-public facing side of the
4 Secretary of State's network, that improvements in the
5 cybersecurity of the Secretary of State's network are relevant
6 to the election system; correct?

7 **A.** That would be one way of mitigating some of the
8 vulnerabilities, at least partially mitigating them, to have
9 further improvements.

10 **Q.** And you heard Ms. Payton's testimony yesterday about Dell
11 SecureWorks; is that correct?

12 **A.** Yes.

13 **Q.** And are having solutions like Dell SecureWorks and
14 Fortalice red team efforts something that could be used to
15 detect an attack?

16 **A.** The Fortalice red teaming -- I'm not sure the relevance to
17 detecting an attack. But having -- having systems like
18 SecureWorks in place, that is one thing that is I think a
19 positive, although small, step because it is a security best
20 practice that they are implementing.

21 **Q.** And it is at least a step towards a more secure network;
22 correct?

23 **A.** It is a step.

24 **Q.** Let's talk a little bit about paper ballot systems. You
25 talk about paper ballot systems in your declarations. It is

1 correct, isn't it, that you have never published a paper
2 analyzing the security of paper ballot systems; correct?

3 **A.** No, that is not true.

4 **Q.** Can you tell me about a paper you have published regarding
5 the security of paper ballot systems?

6 **A.** So the California top-to-bottom review papers of which
7 that study, which is published and available at the California
8 Secretary of State's office, included a thorough examination of
9 the source code to the optical scanners used in Georgia,
10 actually the AccuVote-OS system.

11 **Q.** All right. I was talking specifically about a -- let me
12 clarify my term.

13 So is the California top-to-bottom review a study of
14 vulnerabilities related to the use of a hand-marked paper
15 ballot system?

16 **A.** That is a hand-marked paper ballot system. The
17 AccuVote-OS scanners are a hand-marked -- that is the
18 electronic component of a hand-marked paper ballot system.

19 **Q.** But the California top-to-bottom review only considered
20 the electronic component, not the physical security components
21 related to hand-marked paper ballots; correct?

22 **A.** The top-to-bottom review as a whole also considered
23 physical security.

24 **Q.** But that wasn't part of your work on that?

25 **A.** My work was about the software source code and

1 vulnerability analysis.

2 **Q.** So it is correct to say that you have never published a
3 paper regarding the physical security vulnerabilities of a
4 hand-marked paper ballot system?

5 **A.** Is that true? That may be true.

6 **Q.** Sitting here today, you can't think of a paper where you
7 have done research on that topic, have you?

8 **A.** I have done research relevant to that topic. But I may
9 not have published a paper that is specifically focused on
10 those questions. I have taught about it.

11 **Q.** So you would agree with me that election systems that use
12 hand-marked paper ballots do have vulnerabilities; correct?

13 **A.** Yes. But those vulnerabilities can be -- those
14 vulnerabilities compared to the vulnerabilities in a DRE system
15 are of a totally different kind.

16 **Q.** So let's talk about some of those differences in
17 vulnerabilities. In your declaration, you talk about precinct
18 count optical scan systems.

19 THE COURT: I'm sorry. Which of the affidavits?

20 MR. TYSON: I believe that's the second declaration,
21 Your Honor, attached to the reply brief, which would be 508-1.

22 **Q.** **(BY MR. TYSON)** Dr. Halderman, in Document 508-1, in
23 Paragraph 32, you say that PCOS systems are less risky. And is
24 that a statement that indicates you still think there are risks
25 with PCOS systems?

1 **A.** Yes, there are risks. There's a risk that the -- that an
2 attacker who had both a high-tech conspiracy, able to
3 manipulate the scanner, and a broad low-tech conspiracy, able
4 to manipulate ballot boxes across a large part of the
5 jurisdiction, could change both records in the same way.

6 But I think because you have to compromise both records in
7 the same way, as I explained in that declaration, that is much
8 harder to pull off than an attack solely against an electronic
9 system like a DRE.

10 **Q.** And so is that the basis for the statement later in that
11 paragraph that you still need, quote, effective chain of
12 custody procedures and rigorous auditing of the paper ballots?
13 That is how you remediate that risk of the high-tech conspiracy
14 you posited?

15 **A.** Well, so I don't know if I would categorize it so much as
16 a mitigation. But it is having a rigorous audit coupled with a
17 precinct count optical scan as a part of the entire election
18 system that provides the best security in my view.

19 **Q.** And it is fair to say that that is a process or a
20 procedure that kind of surrounds the technological aspects of
21 the PCOS system; correct?

22 **A.** Well, the audit itself is a form of technology. But it is
23 coupled with the precinct count optical scan methodology.

24 **Q.** And when you opined that PCOS systems offer excellent
25 security, that doesn't mean zero vulnerabilities; correct?

1 **A.** No, it doesn't mean zero vulnerabilities.

2 **Q.** If a hand-marked paper ballot was marked again and
3 overvoted between the time it was scanned at the precinct and a
4 recount, that is still a vulnerability; right?

5 **A.** It is a kind of vulnerability. Although in that case,
6 what could be done in a precinct count optical scan system is
7 that workers can compare the electronic record and the paper
8 record, know there is a discrepancy, and then investigate the
9 cause of the discrepancy.

10 **Q.** You would agree with me that doing a hash compare of two
11 different files is a valid way of ensuring files have not been
12 changed; correct?

13 **A.** Depending on the kind of hash and depending on who is
14 doing the comparison, there are a lot of -- there are a lot of
15 question marks in just that statement. But it can be an
16 important tool.

17 **Q.** In the course of this litigation, have you heard of a tool
18 called GEMS Verify?

19 **A.** Yes, I have.

20 **Q.** And do you know how GEMS Verify works?

21 **A.** On a -- to a fairly good technical degree, I do.

22 **Q.** Can you explain that to the Court, please?

23 **A.** So GEMS Verify is a tool that was developed, I believe, at
24 Kennesaw State that compares the hash of certain files on the
25 GEMS server to what are believed to be -- hashes of what are

1 believed to be known good files.

2 Now, that is useful in identifying -- assuming GEMS Verify
3 is working correctly and hasn't been tampered with and assuming
4 there is no malware on the system where it is running, then it
5 might be able to tell you that yes, these files are unchanged.

6 However, it can be compromised if there is malware running
7 on the system where GEMS Verify is running or it can be
8 compromised if there is malware that is simply hiding in files
9 that aren't part of what GEMS Verify compares.

10 **Q.** Okay. Thank you.

11 Now, you have never actually observed DREs in use in a
12 Georgia precinct on election day; correct?

13 **A.** Not with those qualifications, no.

14 **Q.** And so you have never personally observed the security or
15 physical access to DREs that are in use in a Georgia election;
16 correct?

17 **A.** I rely on the declaration of Mr. Bernhard who has for
18 physical security of DREs preceding elections.

19 **Q.** So when you opine that Georgia's DRE system has
20 vulnerabilities which make it incredibly insecure, you are
21 relying on Mr. Bernhard's statements about physical security as
22 part of that opinion?

23 **A.** Specifically for any statements that I've made that DREs
24 in Georgia are not -- are -- only in part actually. Only in
25 part. I have seen photographs -- I have seen photographs of

1 DREs as they were -- as they were stored prior to elections, I
2 think, including in newspaper reports.

3 **Q.** But you've never personally gone to a facility in Georgia
4 where DREs are stored; correct?

5 **A.** I haven't, no.

6 **Q.** Have you ever reviewed the State Election Board rules that
7 govern the storage and use of DREs in the State of Georgia?

8 **A.** I can't remember whether I have or not.

9 **Q.** So you don't know for sure whether the physical security
10 requirements surrounding DREs in Georgia can mitigate some of
11 the vulnerabilities that you have identified; correct?

12 **A.** Based on Mr. Bernhard's description of what he witnessed
13 when he visited a county facility where DREs were stored, based
14 on what he describes, I conclude that the security is
15 inadequate.

16 **Q.** And that is for 1 county out of 159; correct?

17 **A.** I don't have -- I have seen nothing to indicate that other
18 counties are better secured.

19 **Q.** But you see nothing to indicate that there is any
20 difference at all? You haven't visited each one; correct?

21 **A.** That is correct.

22 **Q.** Mr. Bernhard hasn't visited each one either; correct?

23 **A.** I don't know.

24 **Q.** Now, you maintain a secured facility in your lab, and we
25 have had some discussions about that and with the Court on

1 calls before.

2 Does your secured facility include physical security
3 measurements like limitations on physical access to certain
4 individuals?

5 **A.** Yes.

6 **Q.** And does it include air-gapping computers in that lab?

7 **A.** It does.

8 **Q.** Does it include an independently secured room?

9 **A.** For certain things, yes.

10 **Q.** And an independently secured room is a room that is
11 separate from the other portions of the lab?

12 **A.** Yes.

13 **Q.** Does your secured facility include video surveillance?

14 **A.** Yes, for certain things.

15 **Q.** Does it include motion detectors?

16 **A.** As part of the video surveillance, it does.

17 **Q.** Does it include facilities to physically lock computers?

18 **A.** Yes.

19 **Q.** Does it include seals on locked units?

20 **A.** We don't include seals, no.

21 **Q.** I'm assuming it has a lock on the door?

22 **A.** Yes.

23 **Q.** Is there an audit log of individuals who have access?

24 **A.** For some things, yes.

25 **Q.** So you take all of these actions to limit the physical

1 access to increase the physical security of what is inside the
2 lab; correct?

3 **A.** I do.

4 **Q.** And limiting the physical access provides a mitigation of
5 the technological vulnerabilities of whatever systems you might
6 be analyzing inside the lab; correct?

7 **A.** It provides a kind of protection.

8 **Q.** When you say a kind of protection, do you believe that
9 there is still security issues even with all those precautions?

10 **A.** Unfortunately, yes. I don't believe that the facility
11 that we've set up could withstand a determined attack by a
12 nation state. But fortunately I don't run elections out of my
13 lab. I'm sorry.

14 **Q.** So you agree with me that your lab is not secure enough to
15 withstand the attack of a nation state attacker?

16 **A.** Oh, absolutely I agree with you.

17 **Q.** And you are a leading expert in cybersecurity; correct?

18 **A.** I won't call myself that. But if you would like to.

19 **Q.** So it is correct to say that your opinions have nothing to
20 do when you -- let me start that over again.

21 So when you reach your conclusions about the
22 vulnerabilities of Georgia DREs, are you accounting for the
23 physical security components of the election system at all when
24 you are reaching those conclusions?

25 **A.** Yes, I am.

1 Q. And you are accounting for those even recognizing that
2 they share many of the same features of your lab?

3 A. Yes. In fact, all the more so because I've tried to
4 implement features myself and thought about who might be able
5 to attack them and bypass them. And against the kinds of
6 attackers that are facing the State of Georgia, I really
7 wouldn't want to be in the state's position trying to defend it
8 with systems that don't have a physical paper trail. It is
9 just -- it is not tenable.

10 Q. Now, I want to turn next to the demonstration that you did
11 for the Court back in September with the infected memory card.
12 And I recognize and I'll signal for the judge that there are I
13 know some security sensitivity issues you have, Dr. Halderman,
14 regarding these questions.

15 A. Yes.

16 Q. I believe my questions are going to be at a high enough
17 level that that would not be a problem. But if they are, just
18 let me know and we can figure out a solution.

19 A. Thank you.

20 Q. Have you ever allowed an independent review of your
21 malware?

22 A. No.

23 MR. CROSS: Objection, Your Honor. It literally just
24 happened on Monday. I think the question was misleading
25 because he wasn't thinking about the review that they

1 themselves did.

2 THE WITNESS: Oh, I'm sorry. That is true.

3 MR. TYSON: I didn't mean to mislead the witness.

4 Let me try that again.

5 **Q. (BY MR. TYSON)** Prior to the review by defendants' counsel
6 or defendants' experts on Monday of the memory card, have you
7 ever allowed an independent review of your malware?

8 **A.** Of the -- prior to that, of the malware that I used in the
9 September demonstration, the answer is no. Although all of the
10 vulnerabilities that the malware exploits are ones that were
11 published in the California top-to-bottom review and then
12 independently confirmed by the Ohio Secretary of State's
13 review.

14 **Q.** And you would agree with me that researchers usually share
15 findings about malware to in great detail try to help other
16 researchers in the same space; correct?

17 **A.** That is a typical practice we share with other trusted
18 researchers anyway.

19 **Q.** But you had not done that with your malware?

20 **A.** No. In fact, I write about this in a paper about ethical
21 issues in voting security analysis. That because of the
22 heightened sensitivity surrounding elections, it is quite
23 typical for election security researchers to take a different
24 tact.

25 **Q.** Are you familiar with the term red team exercise in the

1 context of cybersecurity?

2 **A.** Yes.

3 **Q.** And you have never allowed a red team exercise to look at
4 your malware; correct?

5 **A.** A red team exercise typically would be attempting to break
6 into a system, not to analyze a piece of software.

7 **Q.** Okay. All right. So when you began your demonstration
8 for the Court last September, you began by saying a poll worker
9 would load the ballot programming on the machine using a memory
10 card; correct?

11 **A.** That is probably what I said. I don't have the
12 transcript.

13 **Q.** And do you know who in Georgia is responsible for loading
14 the ballots onto the memory cards and then placing those memory
15 cards in the voting machines?

16 **A.** I think I have since learned that that typically happens
17 at the county by a county worker rather than a poll worker.
18 But it really doesn't make any difference from a spread of
19 malware perspective.

20 **Q.** And so it is your understanding that the memory cards are
21 inserted into the machines before the election at a county
22 facility; correct?

23 **A.** That is my current understanding.

24 **Q.** And is it also your understanding that logic and accuracy
25 tests are performed by election officials at the county prior

1 to an election?

2 **A.** Yes.

3 **Q.** Are you aware that Georgia memory cards are labeled with
4 numbers that are tracked once they are inserted into a DRE?

5 **A.** I wasn't aware of that. But that doesn't have any
6 implication for this malware attack vector as we are talking
7 about it.

8 **Q.** Do you know if you can remove a memory card after the
9 election is underway from a DRE without any sort of error
10 message?

11 **A.** You might produce an error message depending on the mode
12 that the -- that the machine is in. Although that is an error
13 message that could be -- yes, it might well produce a log
14 message or an error message.

15 **Q.** You would agree with me, wouldn't you, that someone
16 wishing to insert an infected memory card would have to do that
17 before it was opened for business on election day; correct?

18 **A.** Well, they could do it while it was open for business on
19 election day too.

20 **Q.** Would they have to -- but you would agree with me they
21 would have to insert it before the machine entered election
22 mode; correct?

23 **A.** Well, they could just cause the error message.

24 **Q.** So is that a no?

25 **A.** I'm sorry. I missed the --

1 Q. What I'm trying to get to is: In terms of when this
2 attack vector that you have identified there is a
3 vulnerability --

4 A. Yeah.

5 Q. Once the election is underway, if someone removes a memory
6 card to insert an infected memory card, would there be a
7 detection mechanism for that? That is what I'm trying to get
8 to here.

9 A. Actually I think it may be possible to remove and reinsert
10 the memory card. Yes, it is possible to remove and reinsert
11 the memory card without causing an error message if the machine
12 is powered down while it happens.

13 Q. So an individual would have to power down a machine that
14 was already in election mode, switch cards, and then boot it
15 back up; is that correct?

16 A. Well, the machine is not necessarily going to be powered
17 up the entire time between when the card --

18 Q. If you could just answer my question. Someone would need
19 to power down the machine and then change the memory cards and
20 then turn the machine back on; correct?

21 A. Well, if the machine is powered down when the person gets
22 to it, they wouldn't have to power it down themselves.

23 Q. And the memory cards used for your demonstration is not
24 the same thing as a voter access card; correct?

25 A. That's correct.

1 Q. And you have never designed malware that could be put on
2 to a DRE through a voter access card; correct?

3 A. Not malware, per se. I have designed other forms of
4 attack that work through the voter access card.

5 Q. Are those forms of attack limited to calling up the wrong
6 ballot?

7 A. No.

8 Q. Your malware was created for a special mock election
9 between George Washington and Benedict Arnold; correct?

10 A. That is true.

11 Q. And you set the correct date and time on the DRE when you
12 are performing your demonstration; right?

13 A. I am not sure if it was set correctly.

14 Q. When you use a memory card in a DRE, are files on the
15 memory card changed by running the election?

16 A. I'm sorry. Can you repeat the question?

17 Q. Sure. When you are using -- have inserted the memory card
18 in the DRE and are voting in the election, when the election is
19 concluded or when the election is ongoing, either stage, are
20 files on the memory card changing?

21 A. Yes.

22 Q. And those files would be collecting ballot images I'm
23 assuming; correct?

24 A. One file collects ballot images, and another is a kind of
25 log file.

1 Q. Now, it is correct, isn't it, that you did not use a GEMS
2 database to create the infected memory card used for the Court?

3 A. That is right. Instead, I used a program I created that
4 stands in for the version of GEMS.

5 Q. And the malware that you used had a single election coded
6 on it; correct?

7 A. That is true. It had a single election coded on -- well,
8 excuse me. I don't know if I understand what you mean. The
9 malware itself wasn't coded for a particular election. But the
10 memory card was coded for a particular election.

11 Q. And that was my question. The memory card was coded for a
12 particular election; correct?

13 A. Yes.

14 Q. Once you completed the mock election, you did not attempt
15 to upload the election results into a GEMS server, did you?

16 A. No, I did not.

17 Q. You would agree with me that you have no evidence that
18 self-propagating malware has been used in a DRE that was used
19 in an actual election; correct?

20 A. I don't have evidence one way or another unfortunately
21 because the machines just have not been examined to look
22 forensically is that true and they don't produce a paper trail
23 that would provide evidence if the electronic record had been
24 changed.

25 Q. To clarify, my question was: Sitting here today, you

1 don't have any evidence that self-propagating malware has been
2 used in a DRE in an actual election; correct?

3 **A.** I don't know one way or the other.

4 **Q.** You would agree with me that the malware you used is not
5 in the category of an advanced persistent threat; right?

6 **A.** What do you mean? Advanced persistent threat is a
7 category we use to describe a kind of attacker, not a kind of
8 malware.

9 **Q.** Okay. So you would say that that is not in the same
10 category because it is two different things?

11 **A.** Yeah. These are two different kinds of taxonomy.

12 **Q.** I believe you mentioned at some point that the malware
13 took you over a year to create; is that right?

14 **A.** If you include the preliminary research that I did to
15 discover vulnerabilities in the machines. Unfortunately a lot
16 of those vulnerabilities have now been in the public record for
17 the last decade.

18 **Q.** So when you testified that someone could launch this kind
19 of attack, you are saying it is theoretically possible but you
20 have never seen it done in an actual election; correct?

21 **A.** I think I'm saying something a little bit more than
22 theoretical. But I have never -- what are you asking that I
23 have never seen done?

24 **Q.** The type of malware that you used in your demonstration
25 for the Court, you have never seen malware or have any evidence

1 that malware like that particular kind of malware has ever been
2 used in an actual election; correct?

3 **A.** I don't know whether it has or not.

4 **Q.** But sitting here today, you don't know of any situation
5 where that kind of malware has been used in a DRE in an
6 election; correct?

7 **A.** I don't. But I can't rule it out either.

8 **Q.** You also described your potential malware or a potential
9 malware -- there is a different category now -- in one of your
10 declarations that could evade parallel testing by knowing the
11 voter was following a script versus participating in an actual
12 election.

13 Do you recall those statements?

14 **A.** I do, yes.

15 **Q.** Have you ever seen any article identifying what behaviors
16 of actual voters are when using DREs?

17 **A.** Identifying what actual voter behavior is? I have seen
18 articles about usability factors of DREs in actual elections
19 that do talk to some degree about voter behavior.

20 **Q.** So it is correct, isn't it, that you have never seen a
21 piece of software or malware that could detect whether it was
22 being voted by an actual voter or by a script; correct?

23 **A.** I have never -- it is true I have never observed a sample
24 of such malware that someone else has written. Although I have
25 put some thought into how I would design such a piece of

1 malware if I were the attacker.

2 **Q.** And it is correct, isn't it, that the only thing you have
3 identified about voter behaviors in your declarations is the
4 pace of voting; correct?

5 **A.** That may be the only one I identify in my declaration.
6 But there are all sorts of behaviors including the pattern of
7 votes that people vote, how long they take to vote, whether
8 they make errors that would be relevant to the design of the
9 kind of malware you are contemplating.

10 **Q.** But it is correct, isn't it, that you have never designed
11 malware that looks for voter behavior on an election system?

12 **A.** I have thought about how such malware would be designed,
13 but I haven't written such malware.

14 **Q.** And you are not aware of anyone else who has designed
15 malware for an election that evade parallel testing through
16 that method; correct?

17 **A.** I have had conversations with colleagues who thought about
18 the problem too. But I'm not sure they have gone ahead and
19 written the actual malware. It would be -- it would be
20 dangerous and wouldn't serve very much of a purpose.

21 **Q.** So I want to give you a hypothetical based on the malware
22 that you used for the -- with the Court in September of 2018
23 and see if I have this correct.

24 For the purposes of this hypothetical, I would like for
25 you to assume that you were using the malware that you

1 demonstrated for the Court, not some theoretical other version
2 of it and that there was no infection of the central election
3 administration system. So this is limited to a one DRE
4 infection.

5 **A.** Okay.

6 **Q.** First, you would need to know the candidates' races and
7 ballot configurations that would appear on the GEMS database
8 for that electronic ballot and that particular precinct,
9 wouldn't you?

10 **A.** Well, not necessarily. The voting machine knows not only
11 the candidates and races. But it knows the party affiliation
12 of all of the different candidates. So it could be programmed
13 without knowing those things to search for the race for, say,
14 the office of governor and for the Democratic party, for
15 instance, and to advantage the Democrats.

16 **Q.** Let me be clear: Your malware -- we're asking about your
17 malware in September.

18 **A.** Oh, pardon me. I see. Only my September malware.

19 **Q.** Right. You needed to know the candidates' races and
20 ballot configurations in order to program that malware because
21 you didn't use a GEMS database; correct?

22 **A.** Well, no. So I needed to know those things in order to
23 program the election onto it. The malware that I wrote is
24 programmed to advantage a candidate in a particular position on
25 the ballot.

1 **Q.** Let me be a little -- a little clearer on this. In the
2 design of the infected memory card -- if you were going to
3 design an infected memory card that could be inserted without
4 detection, you would need to know the candidates and ballot
5 combinations; correct?

6 **A.** Well, also no, not necessarily. So an infected memory
7 card that could be inserted -- and here it sounds like this is
8 diverting a little bit from the question about my particular
9 malware.

10 But if I were to design a memory card that would just
11 infect the machine, it wouldn't need to know anything about the
12 ballot. You would just need to temporarily insert it, power on
13 the machine, and then put the original one back in.

14 **Q.** So you would agree with me you would gain physical access
15 to the DRE to do that; correct?

16 **A.** Well, no. In fact, you can also infect the machine
17 without physical access and without knowing the other things on
18 the ballot by modifying a file on the memory card that doesn't
19 have anything to do with the actual contents of the ballot.
20 That is another issue in the top-to-bottom review.

21 **Q.** Dr. Halderman, let me make sure I'm clear. You are saying
22 the infection vector -- you do not need to have physical access
23 to a DRE to infect it when the central administration system
24 has not been infected? Is that your testimony?

25 **A.** All I would need is access to a memory card that would

1 later be put into the machine.

2 **Q.** But you still require physical access to one of those
3 pieces of the election system; correct?

4 **A.** Either to the memory card, the machine, or -- and you're
5 trying to exclude this, I understand -- to one of the GEMS
6 servers or one of the pieces of media that is moving material
7 among the GEMS servers or to an internet-attached computer
8 that's upstream of them, et cetera.

9 **Q.** Dr. Halderman, you have conducted a review of the GEMS
10 databases that the state provided to you; correct?

11 **A.** I have begun to conduct such a review.

12 **Q.** And you said a few minutes ago when Ms. Chapple asked you
13 that the greatest vulnerability you have identified is the
14 structure of the database; is that fair to say?

15 **A.** I have had time to look at very little but the structure
16 of the database due to the other needs of the case so far.

17 **Q.** And it is correct, isn't it, that you haven't found any
18 malware in any GEMS database from Georgia?

19 **A.** Not yet.

20 **Q.** Sitting here today, you haven't found any; correct?

21 **A.** Sitting here today, I haven't yet found any.

22 **Q.** You testified earlier about the password that was provided
23 to you on those GEMS databases. Do you know what protocols the
24 Secretary of State uses for the passwords on GEMS databases
25 sent to counties?

1 **A.** No, I don't. I hope it would be at least as strong as the
2 password they used for log-ins on their average desktop
3 machine.

4 **Q.** It is correct, isn't it, that those CDs that were being
5 brought to you were being physically transported by counsel for
6 the state? So there was an additional layer of security beyond
7 sending it through some other means; correct?

8 **A.** It is true that one of the CDs -- that both of the CDs
9 were provided by counsel for the state.

10 **Q.** You would agree with me that physical security of
11 transporting something personally like you do with your malware
12 on the memory card is an appropriate physical security
13 mechanism; correct?

14 **A.** It can be a useful security mechanism.

15 **Q.** Dr. Halderman, you have never been involved in counting
16 hand-marked paper ballots through an optical scan system, have
17 you?

18 **A.** What do you mean through an optical scan system?

19 **Q.** Have you ever worked as an election official in counting
20 hand-marked paper ballots in an optical scan system?

21 **A.** I have -- I have worked as part -- as an auditor counting
22 hand-marked paper ballots as part of an election system.

23 **Q.** In the counting process you were using, were you using
24 scanners or were you counting them by hand?

25 **A.** This was examining them by hand after they had been

1 counted by a scanner. So as part of the process of doing a
2 risk-limiting audit to confirm that the scanner had produced
3 the right result.

4 **Q.** And you would agree with me, wouldn't you, that Georgia's
5 current optical scanners are infrared scanners and do not take
6 an image of the ballot; correct?

7 **A.** I am not sure that that is true of all of the optical
8 scanners in Georgia. So I -- that they are what is called
9 infrared scanners. That in part refers to -- that can refer
10 to -- and the term is a bit ambiguous actually. That can refer
11 to an older technology of optical scan.

12 **Q.** Are you aware whether Georgia has a requirement that all
13 counties use the same election equipment?

14 **A.** Well, even for the AccuVote-OS, there are apparently two
15 different models.

16 **Q.** And my question was: Are you aware of a requirement in
17 the law about Georgia voting equipment being the same among
18 counties?

19 **A.** Yes, I am.

20 **Q.** And your testimony is you don't know what kind of optical
21 scanners Georgia currently uses; is that right?

22 **A.** They use the AccuVote-OS optical scanner. But even within
23 that, there are -- depending on what year you bought them,
24 there may be slight differences.

25 **Q.** So you don't know which version Georgia uses; correct?

1 **A.** I know Georgia has bought them over several different
2 years.

3 **Q.** Can you please answer my question? You don't know what
4 version Georgia uses; correct?

5 **A.** Whether it is -- I believe that it is the newer one.

6 **Q.** It is yes or no, Dr. Halderman. Either you know or you
7 don't.

8 **A.** I will have to go back and look at the papers that have
9 been filed.

10 **Q.** So sitting here, you don't know; is that correct?

11 THE COURT: If you want to look, that is fine. If
12 you think you do know whether -- it is -- basically you are
13 saying there are two models --

14 THE WITNESS: For purposes of this question -- excuse
15 me, Your Honor.

16 For purposes of this question, I'll admit that I
17 don't remember -- I don't know whether all of the models are
18 the older type or the newer type of the OS. Although those two
19 models have many commonalities for many questions. I know it
20 is one or the other.

21 **Q.** **(BY MR. TYSON)** Thank you. You don't have any knowledge
22 of Georgia procurement processes, do you?

23 **A.** Of Georgia procurement processes? Well, I know something
24 about the RFP process that is going on for the new system.

25 **Q.** But in terms of the law related to procurement, you don't

1 have familiarity with that; correct?

2 **A.** Not beyond the request -- the RFP process currently.

3 **Q.** You're not offering an opinion for this Court about the
4 feasibility of obtaining voting systems in any particular
5 timeline under Georgia law for procurement; right?

6 **A.** I'm not offering an opinion about that.

7 **Q.** Have you ever studied the ways to manipulate paper ballots
8 so that -- have you ever studied the ways to manipulate
9 scanners that do not take images of ballots so that the count
10 comes back incorrectly?

11 **A.** I have studied that.

12 **Q.** And are there physical ways that you can manipulate a
13 paper ballot to evade or make the count be wrong on an optical
14 scan machine?

15 **A.** Yes, that is true.

16 **Q.** And one of those ways would be ink that absorbs infrared
17 light but is invisible to the human eye?

18 **A.** That might -- that might change the electronic count but
19 would be detectable through an audit.

20 **Q.** So you would agree with me that optical scan ballots can
21 be manipulated; correct?

22 **A.** Yes. It is possible one-by-one, for instance, to
23 manipulate them. But it is detectable through a rigorous audit
24 comparing the paper and electronic records.

25 **Q.** And if there was an audit that showed a discrepancy

1 between the paper and the electronic records, which record
2 would control?

3 **A.** If there was a discrepancy, my view is that the
4 discrepancy should be investigated. And which record is more
5 credible should prevail. And there is going to be evidence
6 that one record or the other has been tampered with if someone
7 investigates the reason why the discrepancy occurred.

8 **Q.** Dr. Halderman, I'll hand you what we have marked as --
9 actually, before I do this: Are you familiar with the report
10 of the Select Committee on Intelligence for the U.S. Senate
11 that was released yesterday?

12 **A.** I am familiar with it. I have to admit I have only
13 skimmed it so far since it was only released yesterday, and we
14 got out of the hearing quite late.

15 **Q.** I'll hand you what we have marked as Defendants'
16 Exhibit 3. We're slightly out of sequence. So we'll be going
17 from 3 to 5.

18 Dr. Halderman, is Defendants' Exhibit 3 consistent with
19 the report that you said you had skimmed regarding elections
20 from the Senate Intelligence Committee?

21 **A.** It appears to be, yes, the one that was released
22 yesterday.

23 **Q.** If you could turn to Page 3 of that report. There are
24 several redactions. But could you read the last sentence of
25 Paragraph 1.

1 THE COURT: Redactions, I assume, are in the report
2 that was available to the public?

3 MR. TYSON: Yes, Your Honor. This is the publicly
4 released version.

5 THE COURT: So all the redactions reflected here
6 are --

7 MR. TYSON: National security interest. Yes, Your
8 Honor.

9 **A.** Yes. It says that the committee has seen no evidence that
10 any votes were changed or that any voting machines were
11 manipulated. And I assume this is referring to the 2016
12 presidential election.

13 **Q. (BY MR. TYSON)** Okay. And if you could turn next to
14 Page 36, one of the individuals identified in the report, just
15 for interest of time, is a former special assistant to the
16 President and cybersecurity coordinator named Michael Daniel.
17 He is identified on Page 7 of that report.

18 But on Page 36, he is testifying -- it reports what he
19 told the committee. In the middle of that page, you would
20 agree with me that it says, while any one voting machine is
21 fairly vulnerable as has been demonstrated over and over again
22 publicly, the ability to actually do an operation to change the
23 outcome of an election on the scale you would need to and to do
24 it surreptitiously is incredibly difficult.

25 Do you agree with that statement?

1 MS. CHAPPLE: I'm sorry. I have to object to this as
2 hearsay. And I also would like a little time to read the full
3 paragraph, if I may.

4 MR. TYSON: Sure.

5 THE COURT: I'm sorry. Who is Mr. Daniel? Where is
6 he described on Page 7?

7 MR. TYSON: His name was found on Page 7, Your Honor,
8 yes.

9 THE WITNESS: Where can Mr. Daniel's biographical
10 information be found?

11 THE COURT: Page 7.

12 THE WITNESS: Page 7. Thank you, Your Honor.

13 THE COURT: It is brief.

14 Yes?

15 MS. CHAPPLE: I'm objecting to it as hearsay if they
16 are offering it for the truth of the matter asserted. We don't
17 know -- Mr. Daniel is not here.

18 THE COURT: Well, you know, I haven't had the full
19 report in front of me, and I didn't download it in the time
20 that we had because I was working on actual evidence here.

21 But I think that certainly it is appropriate still
22 for -- that counsel can ask him a question about whether he
23 agrees on it. I don't know that it can be introduced at this
24 point for the truth of the matter.

25 There are a lot of different opinions that are

1 explained here, and I think that when Mr. McCabe was originally
2 interviewed he is trying to -- he seems to be talking about the
3 additional heightened probing of internet -- he says on Page 7,
4 by late September I guess we determined the internet connected
5 to election-related networks in 21 states were potentially
6 targeted by Russian government cyber actors. And I guess this
7 is the part of the follow-up. I see Dr. Halderman was also
8 interviewed at Page 42.

9 MS. CHAPPLE: Your Honor, part of the issue is that
10 it is so heavily redacted that it is very difficult to know the
11 full context for a lot of these statements. So to take it as
12 the truth, it is just --

13 THE COURT: I'm not taking it as the truth. I'm
14 assuming you are offering it -- asking him to comment on it.

15 MR. TYSON: I am, Your Honor.

16 THE COURT: And it may not be a complete statement of
17 his views. I understand that because of the heavy redactions.

18 MR. TYSON: Yes, Your Honor. In terms of hearsay, we
19 are at a preliminary injunction. We have heard from a lot of
20 poll workers about what other people said. I think it is
21 appropriate for the Court to take into account what was said in
22 these contexts related to elections.

23 THE COURT: All right. Go ahead.

24 MR. TYSON: Thank you.

25 **Q. (BY MR. TYSON)** Dr. Halderman, having read that sentence

1 from Mr. Daniel, do you agree with Mr. Daniel's assessment?

2 THE COURT: I'm sorry. What page was it?

3 MR. TYSON: I'm sorry. Page 36.

4 **A.** So no, I don't agree with Mr. Daniel's assessment that it
5 would be incredibly difficult. I think it would be more -- I
6 think that this is a view unfortunately that is shared by --
7 has been in the past shared by people with only a limited
8 understanding of how election systems are coordinated across
9 the level of an entire state through something like the GEMS
10 system.

11 **Q.** (BY MR. TYSON) And if you could turn next to Page 40.
12 There is a beginning of a section there entitled the security
13 of voting machines.

14 **A.** Yes.

15 **Q.** On Page 41 into that section, the second bullet on that
16 page, can you read the first sentence of that bullet, please?

17 **A.** The bullet that begins when state seven decommissioned its
18 direct-recording electronic voting machines?

19 **Q.** I'm sorry. I was introducing the section on Page 40. On
20 Page 41, the second bullet that begins DHS briefed the
21 committee.

22 **A.** Yes, I see the paragraph.

23 **Q.** Can you please read the first sentence?

24 **A.** DHS briefed the committee in August 2018 that these
25 results were in part because the hackers had extended physical

1 access to the machines, which is not realistic for a true
2 election system.

3 **Q.** You would agree with me, wouldn't you, Dr. Halderman, that
4 physical access as we discussed is important in terms of
5 accessing an election system if it is not connected to the
6 internet; correct?

7 **A.** Yes. But this paragraph is talking about exercises that
8 the DEF CON voting village where -- where there were some
9 demonstrations that I do think exceeded plausibility. Having a
10 child hack into an election management system, that is not the
11 threat we're talking about here.

12 THE COURT: So this is the -- DEF CON is the -- as I
13 understand it, is the world's largest -- longest running
14 underground hacking conference? Is that what it is?

15 THE WITNESS: That is what it is, yes.

16 **Q.** **(BY MR. TYSON)** Dr. Halderman, let's look next at
17 Exhibit 12. Do you still have that up here with you, your
18 PowerPoint presentation?

19 **A.** I do, yes.

20 **Q.** Let's look at the first page. And what you have
21 identified on the very first page -- the first physical page of
22 Exhibit 12 is possible methods of infection; is that fair to
23 say?

24 **A.** Yes. These are some examples.

25 **Q.** And the first one you identify is Mr. Barnes' USB stick;

1 correct?

2 **A.** Yes. That is a shortened way of saying that the USB
3 stick -- that other ways that he's moving data into the network
4 could be a way of spreading an infection.

5 **Q.** And in your declarations, you have cited Stuxnet as a
6 system that jumped an air gap.

7 Do you have any reason to disagree with Dr. Shamos'
8 declaration that the system was actually programmed by a
9 manufacturer instead of being transmitted over a USB stick?

10 **A.** Yes, I do have reason to disagree with Mr. Shamos'
11 assessment.

12 **Q.** Let me ask you about Number B on your list. You say the
13 infection could come from employee errors?

14 **A.** That's right.

15 **Q.** That's true of any election system, paper or electronic;
16 correct?

17 **A.** Well, what do you mean paper?

18 **Q.** Let me clarify because that was not a clear question. I'm
19 sorry.

20 In terms of manipulating vote counts or changing a count
21 of a vote, an employee error is one way that a vote count could
22 be off in a paper system or any other system; correct?

23 **A.** What I'm explaining here -- what I'm --

24 **Q.** Answer my question first. Could you answer my question
25 first and then explain.

1 **A.** Well, I'm trying to understand your question but -- and
2 how it relates to what I've written here. But yes, human error
3 can result in errors in a system that involves paper ballots as
4 well. Although it would be much more likely to be caught
5 during a risk-limiting audit.

6 **Q.** And dishonest insiders is your next item there. Dishonest
7 insiders are also a vulnerability for a paper ballot system or
8 any other election system; correct?

9 **A.** Yes. But, again, it is a difference in kind. Here a
10 single dishonest insider could change every vote in the State
11 of Georgia. In a system based on optical scan that was
12 appropriately audited, you would need an enormous conspiracy to
13 change every physical ballot.

14 **Q.** And physical intrusion, D, is also a vulnerability for
15 paper systems and for electronic systems; correct?

16 **A.** Again, yes. But it is a difference in kind once again.
17 You need a single momentary physical intrusion to potentially
18 infect every voting machine in the State of Georgia here versus
19 you need an intrusion so large that someone -- that a very
20 large number of people would have access to every single piece
21 of paper.

22 **Q.** And you mentioned as, F, legacy KSU data. You heard
23 Mr. Beaver's testimony yesterday that the GEMS ballot building
24 system was entirely rebuilt after the KSU access of
25 information; correct?

1 **A.** I've seen the GEMS databases, and they are dating back
2 from KSU times.

3 **Q.** And to my question, my question was you heard Mr. Beaver's
4 testimony that the GEMS ballot building system was rebuilt from
5 the ground up after the KSU incident; correct?

6 **A.** He testified. But my -- I believe he was testifying as to
7 the software and not as to the data. And the data itself is
8 another potential vector by which malware could have been
9 spread from KSU.

10 **Q.** But to this point, you have not found any malware in any
11 GEMS database from Georgia you reviewed; correct?

12 **A.** Not to this point. Not in the first very brief period of
13 the analysis. But there's a lot more work to do.

14 THE COURT: What is the period of analysis?

15 THE WITNESS: Well, Your Honor, as I wrote in my
16 declaration about it, I think a complete analysis is likely to
17 take several weeks by several of us. I have to this point had
18 perhaps two days to interact with the database because of the
19 travel associated with this case.

20 **Q.** **(BY MR. TYSON)** Turning to the next physical page,
21 Dr. Halderman, you have what you describe as a county GEMS
22 system.

23 And are you aware that county GEMS systems may not be
24 connected by modem or phone lines?

25 **A.** I am aware they may not be, yes.

1 Q. Why does a modem and phone line appear on your chart here?

2 A. Because I'm aware that some of them are or have been in
3 the past.

4 Q. So today you have not analyzed any county data -- county
5 GEMS environments and found someone connected to a phone line;
6 correct?

7 A. We have testimony about them having been connected.

8 Q. I'm asking about you personally. You haven't personally
9 examined any county facility?

10 A. I'm relying on the testimony of -- the testimony from one
11 of the state's witnesses in the last -- the last hearing.

12 MS. CHAPPLE: I'm sorry to object a little belatedly.
13 I think it assumes facts not in evidence that the phone modems
14 are no longer being used. I don't remember testimony to that
15 effect.

16 MR. TYSON: I'm sorry. I believe Mr. Barnes had
17 testified to that. And then there are state regulations that
18 govern county GEMS databases and how they can be stored that
19 would address that question.

20 MS. CHAPPLE: I'm sorry. I don't -- I don't believe
21 we have seen the evidence that it has been eliminated.

22 THE COURT: All right. Well, this is something you
23 can address in your case.

24 MR. TYSON: Certainly, Your Honor.

25 Q. **(BY MR. TYSON)** Now, the next page, Dr. Halderman, you

1 have options of ways that AccuVote machines could be infected?

2 **A.** Yes.

3 **Q.** And you have the infected county ballot programming, and
4 then you have physical access. So, again, we agree physical
5 access, if lacking an infected county ballot program, is
6 necessary to infect a DRE; correct?

7 **A.** This isn't an exhaustive list of means of infecting the
8 DRE. But those are two ways of infecting it.

9 **Q.** Are you changing your testimony from earlier that you had
10 to have physical access to a DRE or to a memory card if you had
11 not infected the county database?

12 **A.** I may have misunderstood your question if I said it was
13 either one or the other because there are other means that
14 someone could infect a DRE.

15 **Q.** What would those means be if the county ballot programming
16 was not infected?

17 **A.** Well, for instance, the DRE may have been infected from
18 the moment it was manufactured.

19 **Q.** Do you have any evidence that that is true of Georgia
20 DREs?

21 **A.** I don't know one way or the other.

22 **Q.** Dr. Halderman, do you believe that an anomalous undervote
23 in an election is sufficient evidence to say a system was
24 hacked?

25 **A.** An anomalous undervote? I don't think on the basis --

1 what is an -- what do you mean?

2 **Q.** If there was an election -- assume for purposes of this
3 question there was an election where the undervote in one
4 statewide race was lower than it had historically been.

5 **A.** I see.

6 **Q.** Would you conclude from that fact alone that the election
7 system had been hacked?

8 **A.** I would conclude that the reason for the undervote needs
9 to be investigated and explained. And an attack on the
10 election system is a possible explanation.

11 **Q.** But you would not conclude that the election system had
12 been hacked based on that alone? You would need to know more;
13 right?

14 **A.** That is right. That alone doesn't prove that the system
15 has been hacked.

16 **Q.** Do you believe that an anomalous lack of an undervote --
17 so instead of a roll-off on ballots, it stayed higher than it
18 usually -- would be evidence that a system was hacked?

19 **A.** I think anomalous features in the election data in general
20 are a reason to investigate and determine the cause.

21 **Q.** But standing alone -- an anomalous result standing alone
22 is not sufficient evidence of a hack for you? You would need
23 to know more; correct?

24 **A.** It wouldn't prove that the election had been hacked.

25 **Q.** Dr. Halderman, let me ask you just a couple of more

1 questions to wrap up here.

2 First, I believe we established you have never studied the
3 physical security vulnerabilities of a hand-marked paper ballot
4 election that resulted in you publishing a paper about it;
5 correct?

6 **A.** I'm sorry. There are a bunch of qualifications there.
7 The physical security?

8 THE COURT: Go ahead and ask the question again.

9 **Q.** (BY MR. TYSON) Sure. I'll ask it.

10 Dr. Halderman, I believe we established earlier that you
11 have never published a paper regarding the physical security
12 vulnerabilities of a paper ballot system; correct?

13 **A.** The physical security vulnerabilities of a paper ballot
14 system? I have published papers that are mechanisms for
15 addressing those vulnerabilities. But I haven't published a
16 paper that is examining the vulnerabilities.

17 **Q.** And I believe we established that you have never observed
18 or personally observed the processes used by Georgia or studied
19 those processes for providing physical security to the DREs; is
20 that correct?

21 **A.** The processes for providing physical security -- I have
22 only reviewed the declaration of Mr. Bernhard.

23 **Q.** I think we agreed at the beginning that every voting
24 system has vulnerabilities; correct?

25 **A.** To varying degrees.

1 Q. And you would agree with me that the National Academy of
2 Sciences report on election systems, *Securing the Vote*, agrees
3 that ballot marking devices that generate paper ballots are
4 acceptable for use because they provide independent auditing;
5 correct?

6 A. I think that is what it says. I don't have it in front of
7 me.

8 Q. In your declaration in May, you stated that the only
9 practical way to safeguard Georgia's upcoming elections was to
10 require the use of optical scan ballots with auditing. Do you
11 recall that statement?

12 A. I do.

13 Q. Isn't that contrary to what the National Academy of
14 Sciences says? Because they also say that a ballot marking
15 device system is an appropriate method of security as long as
16 it generates a paper ballot.

17 A. So there has been new research since the National --

18 Q. Answer my question first and then explain. That is not
19 consistent with what the National Academy of Sciences report
20 says; correct?

21 A. Yes. Because there has been new research since the
22 National Academy's result -- report that in my mind does call
23 into question the security of ballot marking devices.

24 But -- does that answer your question?

25 Q. Yes.

1 You also say in your declaration that ballot marking
2 devices are new and untested technology. But they have been
3 around for decades, haven't they?

4 **A.** What I was referring to was the use of ballot marking
5 devices for all voters within a precinct, which is a new
6 development in the voting system world.

7 **Q.** And is it your testimony to this Court that hand-marked
8 paper ballots are the only way to have a secure election
9 system?

10 **A.** I think that the only practical way to have a secure
11 election system, given the current state of election technology
12 and vulnerability, is to have one where the primary method of
13 voting for individuals who can fill out a hand-marked paper
14 ballot is a hand-marked paper ballot.

15 **Q.** And you reached that conclusion having never published a
16 paper regarding the vulnerabilities of hand-marked paper
17 ballots and especially related to physical security; correct?

18 **A.** The vulnerabilities of hand-marked paper ballots are going
19 to be strictly less than the vulnerabilities of the system that
20 incorporates a -- excuse me -- are going to be strictly -- I'm
21 getting my logical direction wrong here.

22 The vulnerabilities in a system that is a -- what I'm
23 referring to in that paragraph, hand-marked paper ballot that
24 is optically scanned, are going to be strictly less than
25 vulnerabilities of a system that only has an electronic record

1 or one that is a ballot marking device sitting between the
2 voter and the piece of paper.

3 **Q.** And your conclusion that hand-marked paper ballots is the
4 only way to have a secure election, is that just your personal
5 belief and not based on any scientific review process?

6 **A.** Well, I have reviewed the security of a wide range of
7 election systems. So --

8 **Q.** Would you agree -- I'm sorry.

9 **A.** -- it is based on my scientific experience reviewing the
10 security of multiple modes of voting and modeling the threats
11 against different kinds of voting systems.

12 **Q.** But you agree it is inconsistent with the recommendations
13 of the National Academy of Sciences; correct?

14 **A.** Well, it is based on new information. So there may be
15 some difference.

16 **Q.** But you would agree it is not -- it is not consistent with
17 the National Academy of Sciences?

18 MS. CHAPPLE: Objection. Objection. Asked and
19 answered.

20 MR. TYSON: I don't believe he has answered it yet,
21 Your Honor.

22 MR. CROSS: Three times.

23 THE COURT: Answer it again. Is it inconsistent or
24 not? I know you've given an explanation why it is different.

25 THE WITNESS: I see. Excuse me.

1 It may be inconsistent. I don't have the National
2 Academy's report in front of me to confirm.

3 MR. TYSON: Thank you, Your Honor. I don't have any
4 other questions.

5 REDIRECT EXAMINATION

6 BY MS. CHAPPLE:

7 **Q.** Just one question. Dr. Halderman, you were asked you have
8 no evidence that a DRE used in an actual election has ever been
9 compromised.

10 Has the state allowed you to conduct the forensic
11 examination needed to look for that evidence here in Georgia?

12 **A.** Well, no. No, it hasn't. We need to actually look at --
13 we need the opportunity to look at memory cards, at server disc
14 images, at the internal memory of voting machines in order to
15 conclude one way or another.

16 And that is -- even unfortunately a negative result there
17 wouldn't necessarily rule out that it had happened. But if you
18 wanted to exhaustively -- or if you wanted to have a rigorous
19 forensic analysis, it would have to include all of those
20 components.

21 **Q.** And to your knowledge, has the state allowed any
22 independent computer scientist to conduct such an examination
23 of GEMS, DREs, memory cards, or scanners in Georgia?

24 **A.** I don't believe it has.

25 **Q.** Then this is my final question: Have you seen any

1 evidence of any such examination by anyone -- by anyone for
2 Georgia's GEMS, DREs, memory scanners, memory cards, or
3 existing scanners?

4 **A.** No, I have seen no evidence that anyone has ever done a
5 forensic analysis.

6 **Q.** I do have one more question. So turning again to, I
7 believe it was, Defendants' Exhibit 4, the Senate report, and
8 turning to Page 59, I'm going to read a sentence and ask you if
9 you agree.

10 It says, as states look to replace HAVA-era machines that
11 are now out of date, they should purchase more secure machines.

12 Would you agree with that?

13 **A.** Yes.

14 MS. CHAPPLE: Okay. Thank you. No further
15 questions.

16 MR. CROSS: Catherine, you have to finish the
17 sentence.

18 MS. CHAPPLE: There is another sentence. Paper --
19 I'll continue the paragraph.

20 **Q. (BY MS. CHAPPLE)** Paper ballots and optical scanners are
21 the least vulnerable to cyber attack. At a minimum any machine
22 purchased going forward should have a voter-verified paper
23 trail and remove or render inert any wireless networking
24 capability.

25 Do you agree?

1 **A.** Yes, I do.

2 MS. CHAPPLE: Okay. Thank you.

3 THE COURT: Can you tell me which bullet that is?

4 MS. CHAPPLE: I'm sorry, Your Honor. It is the
5 first -- it is the first bullet on the top of Page 59.

6 MR. TYSON: Just one brief question.

7 RECROSS-EXAMINATION

8 BY MR. TYSON:

9 **Q.** Dr. Halderman, the bullet that Ms. Chapple just had you
10 read, machines that include voter-verified paper trails include
11 ballot marking device systems; correct?

12 **A.** Yes, they can include ballot marking device systems.

13 MR. TYSON: Thank you.

14 MR. BROWN: Your Honor, I have one.

15 THE COURT: Sure.

16 EXAMINATION

17 BY MR. BROWN:

18 **Q.** You were not shown the National Academy of Sciences
19 report, were you, when you were questioned about it?

20 **A.** No, I wasn't.

21 **Q.** Dr. Halderman, let me hand to you my computer. And I'll
22 refer you to --

23 **A.** That is a dangerous thing to do.

24 THE COURT: Go for it. Take a risk.

25 **Q.** **(BY MR. BROWN)** If you find anything on it, it is

1 Vincent's. I promise.

2 MR. TYSON: Your Honor, could we see what Mr. Brown
3 is referring to? I'm sorry.

4 MR. BROWN: I am referring to Document 285-1,
5 Page 108 of 188. It is a page from Securing the Vote,
6 Protecting American Democracy by the National Academy of
7 Sciences.

8 **Q. (BY MR. BROWN)** If you would read into the record the
9 third complete paragraph.

10 MR. TYSON: Your Honor, could we get the page number
11 of the National Academy of Sciences -- 108 of the report or 108
12 of the document?

13 THE WITNESS: It says Page 80.

14 MR. TYSON: Thank you.

15 **A.** I'm sorry. I'm sorry. Which paragraph?

16 **Q. (BY MR. BROWN)** The third complete paragraph.

17 **A.** Additional research on ballots produced by ballot marking
18 devices, BMDs, will be necessary to understand the
19 effectiveness of such ballots.

20 **Q.** Is it your understanding that additional research is, in
21 fact, underway?

22 **A.** It is, yes.

23 **Q.** Are the findings conclusive or inconclusive?

24 **A.** They are suggestive.

25 MR. CROSS: Your Honor, could we just have one

1 moment?

2 **(There was a brief pause in the proceedings.)**

3 MS. CHAPPLE: Thank you, Your Honor. No further
4 questions from us.

5 MR. TYSON: Could I ask one more follow-up?

6 THE COURT: Yes.

7 RE CROSS-EXAMINATION (Further)

8 BY MR. TYSON:

9 **Q.** Dr. Halderman, I'm going to hand you the sheet that
10 Mr. Brown was having you look at on the computer. Does that
11 look like the same piece of paper from the same document?

12 **A.** Yes.

13 **Q.** Could you read the recommendation 4.11.

14 **A.** 4.11, elections should be conducted with human readable
15 paper ballots. These may be marked by hand or by machine using
16 a ballot marking device. They may be counted by hand or by
17 machine using an optical scanner. Recounts and audits should
18 be conducted by human inspection of the human readable portion
19 of paper ballots. Voting machines that do not provide the
20 capacity for independent auditing, for example, machines that
21 do not produce a voter-verifiable paper audit trail, should be
22 removed from service as soon as possible.

23 MR. TYSON: Thank you. Nothing further, Your Honor.

24 EXAMINATION

25 BY THE COURT:

1 **Q.** Well, this may seem strange to ask you this. But just
2 going back to my original order in September of 2018, which is
3 at Document 309, I went over the -- obviously there were
4 particular issues about how out of date the DREs were here in
5 terms of the software and the supporting software and the lack
6 of patches available and the Windows issues, et cetera.

7 But is there -- and I know the National Science Academy
8 has also, as well as an array of other organizations -- have
9 basically been highly critical of DRE systems and in particular
10 those without any type of voter verification capacity.

11 But what is -- just to sort of just get me the big picture
12 again, because we still have DREs functional -- though there
13 is -- the legislation calls for a change.

14 What is the essence of the problem with the DRE -- the
15 Diebold DRE that are still right now operational?

16 **A.** The essence of the problem with the DREs is that they are
17 part of an enormous system that spans the state, from the
18 Secretary of State's office to the 159 counties to 27,000
19 devices that are talking back and forth to those counties. And
20 that because these machines are vulnerable systems with known
21 vulnerabilities, because they are systems what are called
22 non-software independent, there is no record that -- there is
23 no mechanism that would detect a software error or hack that
24 changed the vote totals. In other words, every vote record is
25 under the control of the software. Because of those things,

1 one small -- one -- excuse me. I'm not distilling it to
2 essence very well.

3 Because of the scale and complexity of the system, because
4 of its vulnerability, and because there is no physical
5 fail-safe, an attacker who struck at various parts of the
6 system could introduce an attack that would affect the whole
7 state and there would be nothing we could reliably hope would
8 happen to detect it.

9 That is the essence. That there is no means of
10 detecting -- of recovering from an attack that is spread via
11 malware through the system. We know that malware can spread
12 through it because of the known vulnerabilities in the system.

13 And all of this just makes it tremendously fragile and I
14 think strikes at -- I think it both creates -- it both creates
15 an extremely high risk and creates abundant reason for doubt
16 about the accuracy of results.

17 **Q.** What are the other systems that are, if you know,
18 vulnerable and out of date by the report of the Select
19 Committee on Intelligence of the United States Senate that just
20 came out or of the Academy of Sciences that came out a year
21 ago?

22 **A.** Those -- without having them -- do I have it in front of
23 me? I have this, but I have not read the entire report. But
24 the -- what I believe they are referring to, based on my
25 knowledge of the discussions that -- of the testimony that has

1 led up to this report in the Senate and my reading of the
2 National Academy's study is -- when they say vulnerable and
3 out-of-date systems, they are talking about not only Georgia's
4 DREs but DREs used in other states as well, machines that don't
5 have a paper trail or don't have a paper trail that can be
6 reliably audited because of the physical limitations of that
7 record.

8 **Q.** And do you happen to know -- because it is cited here that
9 in 2017 -- in here meaning the Senate Committee Report -- that
10 DEF CON researchers were able to find and exploit
11 vulnerabilities in five different electronic voting machines?
12 Do you happen to know what those were?

13 **A.** I don't have the DEF CON report in front of me. But I
14 was -- I believe I was present at the DEF CON that they were --
15 that they are talking about. And those machines included other
16 DREs. They included certain kinds of optical scan machines and
17 I think an older model of a central count scanner.

18 But that underscores why you need not only the paper trail
19 in place but also to make sure that it is being audited so that
20 any error in the scanner or any compromise of the scanner can
21 be detected by reference to that paper trail.

22 **Q.** While I have you here, just simply so I don't have to
23 recall you, there has been this use of the word risk-limiting
24 audits. And you had previously talked about why the parallel
25 audits didn't work for purposes of the DREs -- the Diebold DREs

1 software.

2 But what would you anticipate is needed -- assuming the
3 state proceeds in one fashion or another with its current
4 system, what is needed for purposes of a risk-limiting audit?
5 What is the best protocol from your perspective?

6 **A.** So risk-limiting audits are very different from parallel
7 testing, which is what I was referring to.

8 **Q.** Right. I understand that.

9 **A.** They are two very different kinds of defenses. A
10 risk-limiting audit -- the most important -- the most important
11 factor of a risk-limiting audit is that in advance of the
12 election we're going to agree on a level of statistical
13 confidence that the audit should achieve.

14 Whatever the results are, we want to limit the risk that
15 fraud will go undetected in the audit to, say, five percent or
16 ten percent across all the different sets of ballots that could
17 be examined in the audit. And it is going to be a randomly
18 selected sample of ballots.

19 And then in a risk-limiting audit, officials will then go
20 and select at random that fraction of ballots -- a fraction of
21 ballots that is large enough to meet that risk limit.
22 Essentially you're taking a big enough sample to reduce the
23 risk that the sample will miss evidence of fraud below your
24 predefined risk limit.

25 So in contrast, an audit that is based on just deciding in

1 advance we're going to look at a ten percent sample or a
2 five percent sample of ballots, that will in a close election
3 probably be too few ballots to have a high probability of
4 detecting fraud if it occurred.

5 So the important things are setting a risk limit in
6 advance, using statistics to figure out how large a sample you
7 need to get. If you find evidence of fraud, enlarging the
8 sample until you rule it out or confirm it. Making sure that
9 the analysis is being done by having people physically examine
10 the physical ballots that voters saw and not by using a proxy,
11 like just looking at a digital image from the scanner.

12 **Q.** You are saying afterwards?

13 **A.** This is afterwards. And making sure it is done prior to
14 certification so that if it determines that there was an error
15 it is not too late to correct the result.

16 These are some of the most important factors. People have
17 written guidelines for performing risk-limiting audits as
18 guides to states that are implementing them, which would be a
19 more complete description of what is necessary. But that is an
20 outline.

21 **Q.** I'm not asking you now to be a scholar about the Georgia
22 law. But the Georgia law does include this provision in
23 Section 42(e), the Secretary of the State shall conduct a
24 risk-limiting audit pilot program with a risk limit of not
25 greater than ten percent in one or more counties by

1 December 31st, 2021.

2 The Secretary of State shall review the results of the
3 pilot program and within 90 days following the election in
4 which such pilot program is used shall provide the members of
5 the General Assembly with a comprehensive report, including a
6 plan on how to implement risk-limiting audits statewide.

7 If such risk-limiting audit is successful in achieving the
8 specified confidence level within five business days following
9 the election for which it was conducted, then all audits
10 performed to this code section shall be similarly conducted
11 beginning not later than November 1st, 2024.

12 Just as somebody who specializes in elections and teaches
13 in this field and apparently has expertise in this issue of
14 risk auditing, among other issues, from what I looked at your
15 bio, can you explain to me whether in your view that will give
16 you an adequate -- the General Assembly an adequate basis for
17 determining that ten percent in one or more counties -- and
18 there is some -- it is not -- obviously the Secretary of State
19 here retains the authority to do more than one county.

20 Does that process give the state potentially enough
21 information?

22 **A.** Excuse me, Your Honor. The ten percent, was that a risk
23 limit of not less than?

24 **Q.** It says conduct a risk-limiting audit pilot program with a
25 risk limit of not greater than ten percent in one or more

1 counties and then --

2 **A.** I see. So --

3 **Q.** I'm just trying to understand what that means from your
4 perspective, which may not be accurate. But just at least as
5 somebody who has -- I'm not sure I understand it, and I'm going
6 to ask the state's folks too. But I don't want to have to drag
7 you back up here.

8 **A.** So I have read that, and I'm familiar with risk-limiting
9 audit pilot programs that other states are conducting,
10 including in Michigan where I'm co-chairing a commission for
11 the Secretary of State to improve the state's cybersecurity
12 posture for elections.

13 And in Michigan -- in Michigan, they are conducting county
14 scale pilots too this year and with some hope of implementing a
15 statewide audit in time for -- as soon as November 2020.

16 The Georgia text that -- the law you read about a pilot
17 program in Georgia, it sounds like there were two things that I
18 see that are concerning about that. One, that it is only
19 contemplating a pilot and not a statewide risk-limiting audit
20 unless that pilot is successful.

21 **Q.** I haven't read you everything about risk-limiting audits
22 either. So I'm sorry. But I'm just trying to understand what
23 that means.

24 **A.** And the timeline for implementation is a great cause for
25 concern. Because if you are not doing a risk-limiting audit,

1 then -- then you are not making use of that paper trail -- that
2 voter-verified paper trail. You are not guaranteed to be
3 making use of the voter-verified paper trail.

4 So in a close election or one that is just close enough
5 not to trigger a recount if there is also an automatic recount
6 provision, which I don't recall whether there is in the Georgia
7 Election Code, then you may end up as the statistics work out
8 having a very low confidence in whatever audit you do.

9 So my main concern is: If Georgia is going to have audits
10 by risk-limiting audits eventually but perhaps not until 2024,
11 then what is our basis for confidence in elections in the
12 meantime?

13 THE COURT: Well, there are some provisions for
14 earlier, but it is just not clear in this provision. This was
15 probably not fair to throw you in the middle of.

16 But -- all right. Thank you very much.

17 THE WITNESS: Thank you, Your Honor.

18 THE COURT: Anything else?

19 RE CROSS-EXAMINATION (Further)

20 BY MR. TYSON:

21 **Q.** Could I just ask one thing, Dr. Halderman.

22 **A.** Yes.

23 **Q.** Dr. Halderman, do you know how many states currently
24 conduct statewide risk-limiting audits?

25 **A.** I believe the number today -- and the states keep adding

1 statewide risk-limiting audit provisions. But I believe the
2 states that require one now are Colorado, Virginia, and Rhode
3 Island. And Arizona conducts one that is arguably
4 risk-limiting.

5 **Q.** So that is four states?

6 **A.** Yes. With others where the legislation is in some form of
7 progress. Yes.

8 REEXAMINATION

9 BY THE COURT:

10 **Q.** So I'm just trying to understand. For instance, we had
11 somebody here who was the -- had been the commissioner of
12 one -- part of a bipartisan commission that you heard testify
13 in New York. And she indicated -- and maybe it wasn't a
14 risk-limiting audit. But they are targeted -- a certain number
15 of counties in any election are targeted for audit in a
16 heightened way.

17 Is that something different?

18 **A.** Yes. Usually that is going to be different from a
19 risk-limiting audit.

20 In a risk-limiting audit, the key thing to think about is
21 you are going to start with this notion of how much confidence
22 do you want to have in the result. And then how much work you
23 need to do is going to depend on how close the election result
24 actually was.

25 Because if you don't do that -- just thinking to give you

1 an -- to give the Court an intuition, if the election is a
2 landslide, you only need to look at a very small number of
3 ballots or counties or any unit to confirm that it probably was
4 a landslide.

5 But if it was a tie, well, you need to look at everything
6 to confirm that it really was a tie. And a risk-limiting audit
7 is going to use actual statistical formulae to figure out where
8 on that scale you need to be.

9 **Q.** Just so I can understand from your perspective, what does
10 it mean when it says -- I mean, this is going to be in one or
11 more counties according to the legislation. It says with a
12 risk limit of not greater than ten percent.

13 And what do we mean when we say with a risk limit of not
14 greater than ten percent?

15 **A.** The risk limit refers to your confidence in having
16 detected fraud. And ten percent is a very common risk limit to
17 use.

18 THE COURT: All right. Thank you.

19 MS. CHAPPLE: Your Honor, I do have one clarification
20 question for Dr. Halderman.

21 REDIRECT EXAMINATION (Further)

22 BY MS. CHAPPLE:

23 **Q.** The Court asked you about risk-limiting audits. You're
24 not suggesting that a RLA would be adequate to address the
25 vulnerabilities identified with the Georgia elections system

1 currently in use, are you?

2 **A.** No. Because you can't do a risk-limiting audit with the
3 system currently in use because there is no physical record, no
4 paper, no hand-marked ballot to examine.

5 MS. CHAPPLE: Thank you.

6 MR. BROWN: Your Honor, I have one question about
7 risk-limiting audits.

8 REDIRECT EXAMINATION (Further)

9 BY MR. BROWN:

10 **Q.** Dr. Halderman, do you have confidence that the sample of
11 votes or ballots that you would obtain from a ballot marking
12 device are sufficient to conduct a risk-limiting audit?

13 **A.** Well, that is an excellent question. And there are
14 several reasons why a ballot marking device might record a vote
15 that doesn't match the voter's intent.

16 For this purpose, the most important is just that the --
17 if the ballot marking device is hacked -- let's say that you
18 put -- you type -- you pick one candidate on the screen. It
19 prints a ballot that reflects the name of another candidate.

20 Well, how many voters are going to notice the discrepancy
21 is actually an open question in the research literature. There
22 is science from this past year suggesting that that number is
23 likely only a very small fraction of voters will notice the
24 error.

25 So in a close election if only a small fraction of voters

1 notice an error of that form, then a hack of the ballot marking
2 devices could be sufficient to change the outcome of the close
3 election.

4 MR. BROWN: Thank you, sir.

5 MS. CHAPPLE: No further questions, Your Honor.

6 MR. TYSON: No more, Your Honor.

7 THE COURT: All right. Is Dr. Halderman excused?

8 MS. CHAPPLE: Yes, please.

9 THE COURT: Thank you.

10 MR. CROSS: Your Honor, two quick things before our
11 last witness. We have a copy of the transcript of the
12 Dr. Shamos video that we can give the Court.

13 THE COURT: Thank you. You are going to use that
14 now?

15 MR. CROSS: No. The other thing I want to do before
16 our case closes is offer one final exhibit.

17 THE COURT: So you are offering the testimony so that
18 we have it as part of the record?

19 MR. CROSS: Yes. For the Dr. Shamos stuff, we wanted
20 to give --

21 THE COURT: Go ahead and offer it.

22 All right. Are there any objections to it? We'll
23 get the number later.

24 MR. RUSSO: Not with Dr. Shamos.

25 MR. CROSS: Then the last thing, Your Honor, is we

1 had one exhibit we wanted to put in, which is an email exchange
2 with opposing counsel that we would mark as Exhibit --
3 Exhibit 12 -- Exhibit 13.

4 THE COURT: Have they seen it?

5 MR. CROSS: Could I approach, Your Honor?

6 Well, it is their email exchange. It just concerns
7 the risk assessments. And it just clarifies a factual point
8 about what has been remedied and what hasn't. So we just
9 wanted to provide that to the Court so the Court had that
10 information.

11 MR. TYSON: Your Honor, this isn't evidence, first of
12 all. But, again, the -- Your Honor, this, first of all, is not
13 evidence we're offering with the witness. But this is an
14 exchange between Mr. Cross and me and others regarding how we
15 were going to handle the Fortalice assessments.

16 And the request was -- our request was just to leave
17 them protected and confidential. Mr. Cross had requested
18 redactions.

19 Given the timeline we were on Wednesday at 7:30 P.M.
20 getting ready for this hearing on Thursday morning, we were not
21 able to determine for the 2018 report which vulnerabilities
22 have already been remediated because there has not been a
23 subsequent Fortalice report nor were we in a way to go through
24 it with Mr. Beaver.

25 So in an abundance of caution, we redacted all of the

1 2018 vulnerabilities. And I know -- I'm certain Mr. Cross is
2 going to say that proves that none of them have been
3 remediated. That is not the situation. The issue is we didn't
4 have time.

5 MR. CROSS: The only reason why we're offering it,
6 Your Honor -- and we can take a stipulation as well -- is that
7 we were trying to find out which of the vulnerabilities have
8 been remediated. They said they were only going to redact
9 those that have not been remediated. They have widespread
10 redactions.

11 So the statement from Mr. Tyson was -- and it is
12 evidence because they represent the state -- for the 2018
13 report we have not determined whether each of the identified
14 vulnerabilities have been remediated. So we have left those
15 vulnerabilities redacted.

16 So our only point is that is the evidence that we
17 have of the current state of affairs with 2018. And they go on
18 to say the redactions in the 2017 report are for unremediated
19 vulnerabilities and the testing work around those.

20 So the representation by the state is their best
21 evidence was Your Honor can compare the redacted versions to
22 the unredacted and figure out what has been remediated or not
23 for 2017. And for 2018 they just don't know. They had an
24 opportunity to put evidence up with Mr. Beaver, Ms. Payton --

25 THE COURT: Well, their case hasn't even been put on.

1 MR. CROSS: I understand. But they are not calling
2 those witnesses, Your Honor.

3 THE COURT: Well, I don't know who they are calling.
4 And I will -- I will reserve ruling on this. You have offered
5 it so that it is not like you have deferred doing that. And I
6 haven't seen this either.

7 MR. CROSS: Can I hand this up to Your Honor?

8 THE COURT: You can hand it up, and I'll look at it
9 later.

10 MR. CROSS: Thank you, Your Honor.

11 MR. TYSON: What exhibit number is it?

12 MR. CROSS: 13. Again, as to the admissibility, it
13 is non-hearsay. It is from the state, and they have
14 authenticated it. So there is no basis to keep it out.

15 MR. BROWN: Your Honor, the Coalition would call Matt
16 Bernhard.

17 COURTROOM DEPUTY CLERK: Please raise your right
18 hand.

19 **(Witness sworn)**

20 COURTROOM DEPUTY CLERK: Please have a seat. Loudly
21 and clearly state your full name, and spell your last name for
22 the record please.

23 THE WITNESS: Matthew Bernhard, B-E-R-N-H-A-R-D.

24 Whereupon,

25 MATTHEW BERNHARD,

1 after having been first duly sworn, testified as follows:

2 DIRECT EXAMINATION

3 BY MR. BROWN:

4 **Q.** Mr. Bernhard, have you submitted declarations in this
5 case?

6 **A.** Yes.

7 **Q.** And have you submitted declarations that include your
8 qualifications and your CV?

9 **A.** Yes.

10 **Q.** Have you been qualified as an expert witness before?

11 **A.** Yes.

12 **Q.** The Court in its 2018 order in this case --

13 MR. MILLER: Your Honor, I just want to clarify here
14 just so we are not waiving any challenge to the expert's
15 admission as an expert. Was that question meaning to go beyond
16 that? Or -- I don't want to waive our objection. Because if
17 it was, then I want to go ahead and put it on the record.

18 MR. BROWN: We are tendering him as an expert.

19 MR. MILLER: I was just making sure the question was
20 not inferring that he was as an expert now. If that is the
21 case, that is perfectly fine. I apologize.

22 THE COURT: You are offering -- I don't remember all
23 of the qualifications -- I'm sorry -- of Mr. -- what should I
24 look at as his -- you are not -- you don't agree he is an
25 expert or not?

1 MR. MILLER: That is right, Your Honor. We plan to
2 challenge his qualifications subject to voir dire wherever that
3 fits in. I just wanted to make sure we didn't move beyond that
4 before we had that opportunity.

5 THE COURT: All right.

6 MR. BROWN: I was just trying to speed it up, Your
7 Honor. But I will now slow it down.

8 THE COURT: Where -- just tell me where his resume is
9 again or if you have it with you or if you can point me to it
10 in the record.

11 MR. BROWN: It is in 258-1, which was our 2018 motion
12 for preliminary injunction. And I'll --

13 THE COURT: I'm not saying you have to use up the
14 time. We can refer to it.

15 Is there anything materially changed?

16 **Q. (BY MR. BROWN)** What are you doing now, Mr. Bernhard?

17 **A.** I'm still a graduate student at the University of
18 Michigan. I think since I submitted that resume I have
19 published a couple of more papers. I have also started
20 assisting the State of Michigan in rolling out risk-limiting
21 audits.

22 THE COURT: You also what?

23 THE WITNESS: Started assisting the State of Michigan
24 in rolling out risk-limiting audits statewide.

25 **Q. (BY MR. BROWN)** Does your study include studying security

1 of election systems?

2 **A.** Yes.

3 **Q.** And have you published papers on that subject?

4 **A.** Yes.

5 **Q.** And those papers have been peer reviewed; correct?

6 **A.** Yes. All of them have.

7 **Q.** And in what case were you qualified as an expert?

8 **A.** I was qualified in -- I don't remember the case name. It
9 was the lieutenant governor's undervote race in the State of
10 Georgia.

11 **Q.** The Martin case?

12 **A.** Yes.

13 **Q.** Okay.

14 THE COURT: Why don't you proceed. Somebody should
15 give me the actual page number because 258-1 is a 369-page
16 document.

17 Go ahead.

18 **Q. (BY MR. BROWN)** Mr. Bernhard, the Court in its 2018 order
19 denying our motion for preliminary injunction says the
20 following, the defendants presented no witness with actual
21 computer science, engineering, and forensic expertise at the
22 preliminary injunction hearing to address the impact -- the
23 impact of the Kennesaw State University breach.

24 You have sat here through this entire hearing; correct?

25 **A.** Yes.

1 Q. And you are also familiar with the pleadings that have
2 been filed; correct?

3 A. Yes.

4 Q. Have the defendants presented any witness with actual
5 computer science expertise to address the impact of the KSU
6 breach?

7 A. Not that I have seen.

8 MR. MILLER: Your Honor, at this point we're moving
9 beyond the voir dire stage. If you would like me to handle
10 that later, that's perfectly fine.

11 THE COURT: You can handle it later. Thank you.

12 MR. BROWN: Your Honor, may I approach the bench?

13 THE COURT: Yes.

14 MR. BROWN: I have a printout of his first
15 declaration.

16 THE COURT: All right. Thank you. Just for the
17 record, it is 258-1. It says Page 33 though I think -- of that
18 filing. Thank you.

19 MR. MILLER: Your Honor, I apologize. One last
20 thing. Can we clarify where or what subject matter he is being
21 offered as an expert on?

22 THE COURT: Yes. I think that is fair.

23 MR. BROWN: Your Honor, we would tender Mr. Bernhard
24 on the subject on election security, on the security of systems
25 like the GEMS database and the DRE machines, and on the

1 functionality and the security of e-pollbooks and all of those
2 topics.

3 THE COURT: Do you have a supplement to his resume?
4 I know you said you wrote some more papers, and I realize what
5 you have worked on. But I do think you can say what the other
6 papers have been.

7 THE WITNESS: Sure.

8 THE COURT: Are they peer-reviewed papers?

9 THE WITNESS: Yes, they are all peer-reviewed. We
10 have a workshop paper about a new risk-limiting audit method.
11 We just got a paper accepted about an optical scanner hack, as
12 well as some other papers that are unrelated to elections.

13 **Q. (BY MR. BROWN)** You've written papers -- I'm not
14 suggesting that you're not also esteemed. But you have written
15 papers with some very well-known other scientists?

16 **A.** Yes, sir. I have been very fortunate.

17 **Q.** And, for example, Public Evidence from Secret Ballots, do
18 you see that?

19 **A.** Uh-huh (affirmative).

20 **Q.** One of your co-authors is Dr. Halderman; is that correct?

21 **A.** Correct.

22 **Q.** And Dr. Rivest, he is from MIT; is that right?

23 **A.** That is correct.

24 **Q.** And is he also on the National Academy of Sciences
25 Protecting Democracy Committee?

1 **A.** Yes, as was Josh Benaloh who he was also an author on that
2 paper.

3 **Q.** And that's B-E-N-A-L-O-H?

4 **A.** Correct.

5 THE COURT: So identify the topics. Because if he is
6 going to go beyond that and we're going to spend time on this,
7 I think, in fact, it might -- I want to be sure we're not
8 wasting our time.

9 MR. BROWN: My questions are very limited. The main
10 question was the one I just gave. And that was about whether
11 there had been any testimony about the impact of the KSU
12 breach. And he testified there wasn't any.

13 And my only next question, since Dr. Halderman has
14 covered a lot of this, has to do with audits. And then I'll
15 have one question on the new system and the operating system
16 for the new system. That is it.

17 THE COURT: All right. You can go on the audits
18 because he's working on audits right now -- risk-limiting
19 audits.

20 **Q.** **(BY MR. BROWN)** The Coalition plaintiffs and I believe the
21 Curling plaintiffs have asked for auditing of hand-marked paper
22 ballots without necessarily specifying risk-limiting audits.

23 From your perspective and your work in the field,
24 risk-limiting audits would be the best practice; fair to say?

25 **A.** Yes. That's correct.

1 THE COURT: Don't lead.

2 **Q.** (BY MR. BROWN) But would robust non-risk-limiting audits
3 also provide security if you have hand-marked paper ballots and
4 optical scanners?

5 **A.** They would provide security. Depending on the election
6 results, that level of security will vary. So if you have a --
7 if you have what is called a fixed percentage audit, which is
8 what a lot of U.S. states do and what I believe the first
9 portion of House Bill 316 -- the first -- the 2020 audit
10 requirement entails -- I need to double-check -- you basically
11 randomly select, say, five percent of precincts and hand count
12 them.

13 If you are in a really close race, that will not get you
14 to a level of confidence in your election just because you
15 counted these precincts over here but maybe the wrong ballot
16 was in that one over there. Whereas, a risk-limiting audit
17 would address that.

18 But in the vast majority of cases, a five percent random
19 audit or a three percent random audit is more than sufficient
20 to mitigate the risk at a high level.

21 **Q.** And many times a random audit to give you a higher level
22 of confidence is inefficient?

23 **A.** Correct. Yes. If your elections -- if the margins are
24 fairly wide, which they tend to be in most elections, there
25 is -- you know, a risk-limiting audit could cap the risk

1 counting only, you know, one percent or half a percent of
2 ballots. Whereas, a fixed percentage audit, you are always
3 going to be counting the same number of precincts regardless of
4 the outcome.

5 **Q.** But in your view even with the GEMS system -- GEMS EMS
6 system, hand-marked paper ballots with the AccuVote scanner,
7 and a robust risk-limiting audit would address the security
8 issues that are caused by, for example, the three contractors
9 building GEMS in their garages; right?

10 **A.** It would certainly mitigate the issues. You are still
11 going to have problems where, you know, if some other facet of
12 the system, for instance, the voter registration data, is
13 compromised, a risk-limiting audit can't really address that.

14 But regarding, you know, malware on voting machines or
15 mistaken programming of race IDs or whatever, a risk-limiting
16 audit even with the GEMS system that Georgia currently uses,
17 provided there are hand-marked paper ballots, would address
18 those concerns.

19 **Q.** And then, Mr. Bernhard, have you seen news reports on what
20 type of operating system the systems from which the State of
21 Georgia will choose from are operating?

22 **A.** Yes. I believe two of the systems run Windows 7, I think,
23 embedded. Then one of them runs Windows 10, I believe.

24 **Q.** And now does Microsoft still support Windows 7?

25 **A.** They do, but they are phasing it out.

1 MR. MILLER: Leading. And this is beyond the scope
2 of his declaration. Plaintiffs established yesterday that we
3 weren't going to go beyond the declarations for experts.

4 Additionally, all I thought they were talking about
5 here is risk-limiting audits and a handful of other things.
6 You know, just -- if we're only keeping it to declarations,
7 just --

8 MR. BROWN: I'll withdraw the question, Your Honor.

9 THE COURT: All right. Thank you.

10 MR. BROWN: Thank you, Mr. Bernhard.

11 THE COURT: All right.

12 EXAMINATION

13 BY MR. CROSS:

14 Q. Just briefly, Mr. Bernhard. We heard testimony today from
15 Mr. Barnes that when he plugs his thumb drive into his
16 public-facing computer with the GEMS databases and other
17 information on it he reformats it.

18 Just for clarification, in your experience and based on
19 your understanding of the computer science behind this, would
20 that be sufficient to ensure that the thumb drive itself could
21 not become infected by malware or other compromise?

22 MR. MILLER: Objection, Your Honor. I'm just going
23 to rehash the issue in terms of the areas of expertise that
24 we're talking about here. I'm not sure that we've confined
25 that and cybersecurity generally as opposed to the

1 risk-limiting audits. I'm just trying to make sure we're clear
2 on what his expertise is.

3 MR. CROSS: This is just a basic computer science
4 question, Your Honor. It is about as basic as we can get in
5 terms of --

6 MR. MILLER: I think --

7 MR. CROSS: -- files moving from one device to
8 another. It doesn't --

9 MR. MILLER: And it is based on technical knowledge;
10 correct?

11 MR. CROSS: He is a graduate student that is advising
12 the State of Michigan. He has graduate level studies on
13 computer science.

14 THE WITNESS: And if I may, I have also published a
15 paper about malware.

16 THE COURT: All right. I think that we had every
17 opportunity to hear about this from Dr. Halderman. So I'm not
18 sure why we would pile on at this point.

19 MR. CROSS: It is just one question, Your Honor.
20 That is --

21 THE COURT: Ask your one question.

22 MR. CROSS: That's it.

23 THE COURT: Then go ahead.

24 **A.** No. Simply reformatting a USB drive may not be enough.
25 Especially if the malware in question is sophisticated, it can

1 either attack the firmware of the USB drive itself, which means
2 that, you know, you can't -- reformatting it doesn't actually
3 affect that piece of it.

4 Or the malware can just lie to the system that it is
5 reformatting it. You know, the computer says, hey, reformat
6 yourself. The USB stick says, sure, did it. But it didn't
7 actually do it.

8 **Q.** So switching gears, just one final point for a few
9 questions. Were you here for the testimony of Ms. Payton and
10 Mr. Beaver where they walked through the Fortalice assessments
11 and the dozens of significant risks that were identified there?

12 **A.** Yes.

13 **Q.** Did you hear testimony about how on two different
14 occasions, including November of 2018, Fortalice was able to
15 penetrate the system and get administrative domain access?

16 **A.** Yes.

17 **Q.** Were you here for testimony about how the state relies on
18 three individuals who work out of their homes on home computers
19 to build ballots and GEMS databases?

20 MR. MILLER: Your Honor, I'm going to object again.
21 We are summarizing testimony here and leading the witness into
22 a yes or no question. Then, finally, I just assume this is
23 leading to an opinion-based question as to what he thinks about
24 all those things. If that's not the case, then --

25 MR. CROSS: How about I get to ask my questions on

1 foundation and we get there?

2 THE COURT: Ask the question. But I have been very
3 flexible with y'all.

4 MR. CROSS: It is very brief.

5 THE COURT: What is the question?

6 MR. CROSS: These are foundation to make sure he has
7 the facts. It was simply: Did he hear the testimony that the
8 state relies on three individuals who work out of their homes?

9 THE COURT: He said yes already, I think.

10 MR. CROSS: He did.

11 **Q. (BY MR. CROSS)** Okay. We just talked about the USB
12 formatting. So that is already there.

13 Here is the question. Sorry. One more foundational
14 question and then the last.

15 THE COURT: Just tell me what the questions is.

16 MR. CROSS: Here is the question that I want to get
17 to.

18 **Q. (BY MR. CROSS)** Based on everything that you have heard
19 about the way the state currently operates its system and
20 vulnerabilities that have been discussed, are you offering an
21 opinion in this case that it would be reliable for the state to
22 proceed under its current system using GEMS and DREs? Is that
23 an opinion you are offering?

24 **A.** Using only GEMS and DREs?

25 **Q.** Well, using the current components --

1 THE COURT: I really feel like this is piling on. I
2 mean, I'm sure he does have an opinion. But I mean, the fact
3 is that Dr. Halderman has offered testimony about this. He
4 has -- and if you didn't bring it out during his testimony, I
5 can't imagine why we -- I mean, this is all with due respect.
6 It seems like Mr. Bernhard has a very promising career in front
7 of him and is deep into it.

8 But why wouldn't you have used Dr. Halderman for this
9 purpose?

10 MR. CROSS: We have. Dr. Halderman is adamant on
11 this.

12 THE COURT: Well --

13 MR. CROSS: But this is a different expert for
14 different parties. I'm just trying to confirm that.

15 THE COURT: No. For purposes of -- I'm giving you
16 extra time but not for this purpose.

17 MR. CROSS: Your Honor, could I explain why it
18 matters. Part of what the Coalition plaintiffs have done is to
19 suggest that there are -- it goes to the relief that the
20 Coalition plaintiffs are asking for. And so I'm just trying to
21 understand Mr. Bernhard's position on that as their expert.

22 If he's not offering that opinion, which I don't
23 think he is, then I just want to get that in the record. That
24 is all. Because I haven't heard it.

25 THE COURT: I don't know what -- I really don't know

1 what the distinction is. And you are going to have to then
2 refine this more. You can then -- than what you have. I don't
3 understand that that is getting us to it.

4 It is 3:25. I haven't heard from the defendants'
5 witnesses. If this becomes a problem later on, I'll let you
6 figure out how to get it in. But I would rather really at this
7 point like -- let the defendants do what they are going to do
8 and put on their case. It is not fair even if I have to run
9 over to Monday and do something, but we have got to move on.
10 Thank you.

11 MR. CROSS: Thank you.

12 MR. MILLER: Your Honor, it will be a very brief
13 cross-examination since he has already submitted a declaration.

14 THE COURT: All right.

15 CROSS-EXAMINATION

16 BY MR. MILLER:

17 **Q.** Good afternoon, Mr. Bernhard.

18 **A.** Good afternoon.

19 **Q.** My name is Carey Miller. I represent the state defendants
20 in this case. I'm just going to ask you a few questions here.
21 And I assure you I'll be brief. As Your Honor mentioned, we're
22 going late.

23 Just to go back to your qualifications, you are a Ph.D.
24 candidate at Michigan; correct?

25 **A.** Correct.

1 Q. Under Dr. Halderman?

2 A. That's correct.

3 Q. And have you had any other jobs?

4 A. I've worked at Microsoft Research and Cloudflare.

5 Q. As an intern; right?

6 A. Yes.

7 Q. Have you -- and you mentioned earlier that you were
8 previously admitted as an expert witness; correct?

9 A. That is correct.

10 Q. And that was in the case Coalition vs. Crittenden?

11 A. I believe.

12 Q. Mr. Brown was the plaintiffs' attorney there?

13 A. Yes.

14 Q. Would you mind -- excuse me. Do you recall testifying
15 under oath in that case?

16 A. I do, yes.

17 Q. Do you recall testifying under oath before Judge Grubbs
18 that you were a qualified expert witness in the Curling vs.
19 Kemp case in the Northern District?

20 A. I don't recall saying that.

21 MR. MILLER: Your Honor, if I may, I'm pulling out
22 what is already in the record at Doc. 449-11. This is the
23 transcript from the Coalition vs. Crittenden case.

24 Given that it is in the record, I assume we do not
25 need to mark it as an exhibit. But we can.

1 THE COURT: All right.

2 Q. (BY MR. MILLER) Mr. Bernhard, would you mind reading the
3 title of the first page here.

4 THE COURT: What page?

5 MR. MILLER: Just the very front page.

6 A. The Coalition for Good Governance, et al., vs. Robyn A.
7 Crittenden, et al.

8 Q. Superior Court of Fulton County; correct?

9 A. Yes.

10 MR. MILLER: And, Your Honor, just to be clear, this
11 is a section of the transcript. Again, because the whole
12 transcript is in the record, we didn't print the entire thing.

13 THE COURT: That is fine.

14 Q. (BY MR. MILLER) I had to make it easier on Mr. Bernhard
15 so he doesn't get a paper cut.

16 Could you turn to Page 143, please. Are you with me?

17 A. Yes.

18 Q. Do you see on Line 12 -- could you read that question.

19 A. Yes. Have you ever been qualified as an expert in a case?

20 Q. And do you see Lines 14 through 16 below?

21 A. Yes.

22 Q. Could you read that answer.

23 A. Sure. Yes, sir. I'm an expert -- qualified expert
24 witness in the Curling vs. Kemp case in the Northern District
25 of Georgia.

1 Q. That is not correct, is it?

2 A. I was mistaken.

3 Q. Do you remember testifying in the same case that you had
4 never worked on a political campaign?

5 A. Yes.

6 Q. Would you mind turning -- but you had also previously
7 worked on the Jill Stein recount campaign; correct?

8 A. Yes. I did not perceive that as a political campaign.

9 Q. Even though it reports to the FEC?

10 A. It wasn't an election. She wasn't running for office.

11 Q. Were you paid for that work?

12 A. Yes.

13 Q. How much?

14 A. I believe it was \$200 an hour.

15 Q. Are you aware the amount of money Ms. Stein raised for
16 these recounts?

17 A. Yes.

18 Q. 7 million sound about right to you?

19 A. I think it was closer to 10 if I recall.

20 Q. With all that money and effort, you never found anything
21 to confirm your hacking speculation; correct?

22 A. In fact, we found limited evidence to the contrary.

23 That's correct.

24 Q. In fact, you found some additional hand-marked paper
25 ballot votes in Wisconsin; correct?

1 **A.** That is -- well, we didn't find them. But the State of
2 Wisconsin found them.

3 **Q.** As a result of your recount?

4 **A.** Yes.

5 MR. MILLER: Okay. Your Honor, a few brief questions
6 regarding risk-limiting audits, and then I will sit down.

7 **Q.** **(BY MR. MILLER)** First, you heard Dr. Halderman's
8 testimony earlier; correct?

9 **A.** Yes.

10 **Q.** That four states have introduced risk-limiting audits?

11 **A.** Yes.

12 **Q.** And that Georgia will then be the fifth?

13 **A.** I must have missed that.

14 **Q.** Assuming somebody -- I'm asking you to logically deduce
15 there.

16 THE COURT: I thought the question to
17 Dr. Halderman -- I may have missed it -- was statewide ones.
18 And I'm not sure that the state is doing a statewide audit
19 provision in the statute. I'm trying to understand what it
20 provides.

21 MR. MILLER: Well, I'm not trying to mischaracterize
22 Dr. Halderman's testimony.

23 THE COURT: No. I meant the question to him.

24 MR. MILLER: Right. I think the aspect was related
25 to House Bill 316 and the matters that are in there to

1 eventually go statewide in at least some counties and to use
2 that aspect.

3 Now I will move on. But I did not want to
4 mischaracterize there.

5 **Q. (BY MR. MILLER)** One last portion. You mentioned the
6 operating system in ballot marking devices; correct?

7 **A.** Yes.

8 **Q.** And you suggested that Windows 7 support will end soon?

9 **A.** Yes.

10 **Q.** Would it end in 2023?

11 **A.** My understanding is that Microsoft has scheduled Windows 7
12 for phasing out starting January of 2020.

13 **Q.** And support will continue through 2023 for Microsoft?

14 **A.** That might be possible. I know that they have done phased
15 retirements in the past.

16 **Q.** So you don't know?

17 **A.** I don't know.

18 **Q.** But you're also an expert in election cyber equipment;
19 right?

20 **A.** Yes.

21 **Q.** Are you aware that Windows 10 is being prepared for many
22 of those ballot marking devices?

23 **A.** Yes.

24 **Q.** You are aware that that has to go through federal EAC
25 certification before it can be installed?

1 **A.** Yes.

2 **Q.** And that takes some time, does it not?

3 **A.** It does.

4 **Q.** So for now, with support through 2023, operating systems
5 of BMDs are, frankly, not at issue; is that correct?

6 **A.** To some degree, yes. The issue -- right? -- is that if
7 they -- even with support, if they patch the systems, they
8 still have to be recertified under the current standards --
9 under the current certification regime.

10 MR. MILLER: Thank you. Your Honor, I'm just going
11 to renew my objection to Mr. Bernhard's admission as an expert
12 witness. The only case he has been qualified in before he
13 actually was incorrect or testified incorrectly under oath
14 about his admission in this case.

15 Based on his training and experience, I don't believe
16 he qualifies as an expert. And further, Your Honor, though we
17 didn't get into it, the methodology in his report is somewhat
18 lacking. He is citing mostly Dr. Halderman's reports.

19 And, frankly, the reason why I'm doing such a limited
20 cross-examination is that the vast majority of this was covered
21 by Dr. Halderman as well.

22 THE COURT: All right. Thank you.

23 Is there anything, Mr. Brown, you wanted to say in
24 response?

25 MR. BROWN: Just -- you had questions?

1 MS. BURWELL: Yes.

2 CROSS-EXAMINATION

3 BY MS. BURWELL:

4 **Q.** Good afternoon, Mr. Bernhard. Your declaration shows that
5 you do some work with Verified Voting; correct?

6 THE COURT: I want to make sure we're referencing all
7 the same declaration. We're talking about 258-1?

8 MS. BURWELL: Yes.

9 THE COURT: All right. Go ahead.

10 **Q.** **(BY MS. BURWELL)** You work with Verified Voting?

11 **A.** That's correct.

12 **Q.** And that is an organization that was incorporated for the
13 purpose of invalidating the electronic voting machines, such as
14 the kind that are used in Georgia; correct?

15 **A.** That is one way of putting it, I suppose.

16 **Q.** Okay. And let me ask you about your testimony that you've
17 provided either in your declaration or today.

18 Did you coordinate with any of the other expert witnesses
19 that have testified for the plaintiffs?

20 **A.** No.

21 **Q.** Now, Dr. Halderman is your adviser; correct?

22 **A.** That's correct.

23 **Q.** And he is also on the advisory board of Verified Voting;
24 correct?

25 **A.** I think so.

1 Q. Did you have any discussions with him at all about your
2 testimony?

3 A. No.

4 Q. Did you have any discussions with him about his testimony?

5 A. No.

6 Q. Did you review his declaration?

7 A. I did, yes.

8 Q. Did you review the declarations of the other experts that
9 have testified?

10 A. Not all of them. But some of them.

11 Q. Let me ask you now a couple of things from your
12 declaration. And you don't have a copy -- do you have a copy
13 of it, 258-1?

14 A. No.

15 Q. Excuse me. Let me give you this copy.

16 THE COURT: Let me ask you so we are not doing
17 anything redundant. I know that the witness gave some
18 testimony relating to what he observed in Fulton County. But
19 are we just going -- this is sort of what I was getting at with
20 Mr. Cross.

21 Are we just going to pile on what Mr. Miller already
22 did in terms of qualification issues? And how much time are we
23 going to spend on it? I'm just concerned about getting to the
24 defendants' case because I can take all of that under -- so
25 just --

1 MS. BURWELL: I wasn't going to ask him about his
2 qualifications. I was going to only ask him about a few items.

3 THE COURT: Fine. Go for it.

4 **Q. (BY MS. BURWELL)** The first one I wanted to ask you about
5 was Paragraph 31 where you were talking about the seals that
6 are in use.

7 **A.** Uh-huh (affirmative).

8 **Q.** Now, your declaration doesn't say that you received any
9 information from any county or state regarding the seals that
10 are purchased for use with the machines; correct?

11 **A.** No. But I have observed them firsthand.

12 **Q.** So you saw seals; correct?

13 **A.** Yes.

14 **Q.** Okay. So when you say, we observed that the seals used
15 can be purchased on Amazon, who is the we?

16 **A.** Myself, Ms. Marks, and Logan Lamb.

17 **Q.** And you are not suggesting, are you, that counties or the
18 state purchased seals from Amazon, are you?

19 **A.** No.

20 **Q.** So what you are saying is that what you saw you then went
21 on Amazon and saw something that you thought was similar, and
22 so that is what you are reflecting in Paragraph 31; correct?

23 **A.** Yes. I'm trying to show what an attacker could reasonably
24 achieve. If they wanted to try to break the seals that Fulton
25 County used or Georgia uses, they could practice by buying them

1 on Amazon -- by buying similar seals on Amazon.

2 **Q.** Now, you don't say that you personally have purchased any
3 of these seals; correct?

4 **A.** I have. But I don't say that.

5 **Q.** Okay. But -- so you have purchased some. You just didn't
6 say that you purchased some; correct?

7 **A.** Yes.

8 **Q.** Now, the seals that you purchased, were they preprinted
9 or --

10 **A.** I acquired several. Some of them are just -- they don't
11 have any embossing on them at all. Some of them, yes, they do
12 have serial numbers on them.

13 **Q.** And you don't say in your declaration that you have done
14 anything to sort of etch a serial number?

15 **A.** No.

16 **Q.** Have you tried to etch a serial number on --

17 **A.** Not on the plastic seals, no.

18 **Q.** But you say here that it would be simple for someone to
19 etch a serial number on a seal; correct?

20 **A.** Yes.

21 **Q.** But you haven't tried that yourself?

22 **A.** No. But I have seen people do it.

23 **Q.** Now, you have here starting I guess at Paragraph 34 some
24 information regarding times that you visited the Fulton County
25 Election Preparation Center; correct?

1 **A.** Yes.

2 **Q.** And that was in 2017 and 2018?

3 **A.** That's correct.

4 **Q.** And that was for the purposes of testifying; correct?

5 **A.** I suppose.

6 **Q.** So the reason you visited was at that point in time for
7 the sole purpose of testifying?

8 **A.** It was to better understand the physical security of
9 Georgia's election systems. I didn't at the time have a mind
10 that I was going to be testifying about it at least the first
11 time. The second time, yes.

12 **Q.** But you're not from Georgia; correct?

13 **A.** No, not originally.

14 **Q.** So you are saying that -- you're from Michigan; right?

15 **A.** I live in Michigan. I'm not from there.

16 **Q.** Well, but you are not from Georgia?

17 **A.** I have lived in Georgia. But I am not --

18 **Q.** Were you a registered voter in the State of Georgia in
19 2017?

20 **A.** No, ma'am.

21 **Q.** Were you a registered voter in the State of Georgia in
22 2018?

23 **A.** No, ma'am. I have never been a registered voter in the
24 State of Georgia.

25 **Q.** So is it then a coincidence that this lawsuit was filed in

1 2017 and in 2017 you visited the Fulton County Election
2 Preparation Center?

3 **A.** No, I suppose not.

4 **Q.** You visited for purposes of testifying?

5 **A.** I suppose, yes. If that is the rubric, yes.

6 **Q.** Now, the complaints you have about what you saw in Fulton
7 County relates to the fact that poll workers weren't doing what
8 you thought they ought to be doing; correct?

9 **A.** It is a little more than just that.

10 **Q.** Well, what you say is you saw poll workers stack voting
11 machines, sealed them, left the gym, which left yourself and
12 your colleagues; right?

13 **A.** Yes.

14 **Q.** But you didn't touch the machines; right?

15 **A.** No, of course not.

16 **Q.** You and your colleagues didn't touch the machines?

17 **A.** No.

18 **Q.** And you didn't see anybody touch the machines?

19 **A.** No, ma'am.

20 **Q.** So what you're complaining about there is that the poll
21 workers had left the machines; correct?

22 **A.** Yes. What I'm complaining about there is that poll
23 workers left them. And if I had decided to, I could have
24 broken the seals on the machines and opened them.

25 **Q.** But you didn't?

1 **A.** No, of course not.

2 **Q.** And you didn't see anybody do that?

3 **A.** No, ma'am.

4 **Q.** And then in Paragraph 35, you talk about going through the
5 Preparation Center, and you say on several occasions. How many
6 occasions?

7 **A.** I think I have been there at least three times.

8 **Q.** Was one of those in connection with attempting to do some
9 sort of review of machinery?

10 **A.** Yes, ma'am.

11 **Q.** So that was in 2018?

12 **A.** I think I have actually been there twice for -- so last --
13 earlier this year as well for forensic review.

14 **Q.** So when you went to the Preparation Center, did you sign
15 in when you went?

16 **A.** Two of the times, no, I was not asked to.

17 **Q.** And were you there doing logic and accuracy testing?

18 **A.** No, ma'am.

19 **Q.** So none of those occasions were for logic and accuracy
20 testing?

21 **A.** I observed logic and accuracy testing on at least one of
22 those occasions. But I was not there to do it myself.

23 **Q.** I'm sorry. I didn't suggest that you were doing it. But
24 you were there to view it?

25 **A.** Yes. Correct.

1 Q. Okay. So one of the -- at least one of the times you are
2 saying you were there to view logic and accuracy testing?

3 A. Yes, ma'am.

4 Q. And that occurs before an election; correct?

5 A. Yes.

6 Q. And the other times you went, were those before or after
7 an election?

8 A. One time we went, I think it was, on election night. So
9 we saw them processing all of the absentee ballots. The other
10 times were, you know, in between -- in between elections. So I
11 was in January after the midterm election there to look at
12 discovery for the state -- the lieutenant governor's case, for
13 example.

14 Q. So, again, you were there for purposes of testifying in a
15 case?

16 A. Yes, ma'am.

17 Q. Now, some of the things that you saw there that you didn't
18 agree with had to do with the way that poll workers had secured
19 certain things; correct?

20 A. Yes, ma'am.

21 Q. And the way they secure certain things would be the same,
22 whether we were talking about an electronic system or paper
23 ballots; correct?

24 A. I'm not quite sure what you are getting at.

25 Q. So there is going to be a process for security; correct?

1 **A.** Yes.

2 **Q.** And the poll workers are supposed to follow; right?

3 **A.** Yes.

4 **Q.** There are going to be processes whether you are talking
5 about an electronic machine, and there are going to be
6 processes -- security processes if you are talking about paper
7 ballots; correct?

8 **A.** Yes. But it is not clear to me that those -- those
9 processes doesn't necessarily map on to each other. Right.

10 **Q.** Right. I didn't suggest that they did. I was asking you
11 about whether or not there would be processes for security for
12 both.

13 **A.** Yes, ma'am.

14 **Q.** Okay. And so if -- if a poll worker doesn't follow, let's
15 say, security procedures for paper ballots, it is possible that
16 paper ballots could be stolen; correct?

17 **A.** Correct. A small batch of paper ballots could be stolen,
18 yes.

19 **Q.** And if they don't follow the security procedures -- then
20 if they have procedures, say, for securing paper ballots by
21 locks, if they don't follow those, there could be a problem;
22 correct?

23 **A.** Correct. Just like with DREs.

24 **Q.** And if they had seals that could be compromised, that
25 would be the same whether we're talking about paper ballots or

1 a machine; right?

2 **A.** Yes. But as Dr. Halderman mentioned, the scope of risk is
3 radically different in those two scenarios.

4 **Q.** I wasn't asking you about the scope of risk. I was asking
5 you about whether or not there was a risk.

6 **A.** I understand.

7 **Q.** And you agree with me that there is a risk?

8 **A.** Yes.

9 **Q.** Correct? That is because people are imperfect; right?

10 **A.** Uh-huh (affirmative).

11 **Q.** Whenever you have to rely on people, there is a
12 possibility that the process in place won't be followed?

13 **A.** Correct.

14 **Q.** Correct?

15 **A.** Yes.

16 **Q.** That is with machines?

17 **A.** Yes, ma'am.

18 **Q.** As well as with paper ballots?

19 **A.** Right.

20 MS. BURWELL: That is it, Your Honor.

21 THE COURT: I'll rule later on the objections to his
22 serving as an expert. Let's take a five-minute break.

23 COURTROOM SECURITY OFFICER: All rise. Court is now
24 in recess.

25 **(A brief break was taken at 3:44 P.M.)**

1 THE COURT: As I said, I'm going to rule later about
2 Mr. Bernhard. I do want to just simply state though on the
3 record right now so that there is not a suggestion that he --
4 that Mr. Bernhard was falsely testifying. He may have
5 misunderstood his status. And he is young, I recognize.

6 But in my order of September 17, 2018, at Document
7 309, I found that Page 6 other cybersecurity elections experts
8 have shared in Professor Halderman's observations of the data
9 manipulation and detection concealment capacity of such malware
10 or viruses, as well as the ability to access the voting system
11 via a variety of entry points. Plaintiffs filed affidavits in
12 the record for several of these experts. And then I cited in
13 the footnote Dr. DeMillo's affidavit and one from Dr. Buell,
14 Stark, Bernhard.

15 And I think this is simply perhaps a lack of
16 sophistication about the legal process about being qualified as
17 an expert rather than being referred to by the Court as an
18 expert that may have occurred here, and I'm sure that he won't
19 make that same mistake again.

20 MR. BROWN: Your Honor, I'm sure you noticed, but I
21 asked the question have you been qualified as an expert.

22 THE COURT: Right. I understood that. So counsel
23 erred probably as well.

24 But because it goes to the integrity of the witness,
25 I didn't want him to be bearing that as a badge of dishonor

1 that he was making a misrepresentation to the Court on any type
2 of intentional basis.

3 MR. MILLER: Your Honor, and just to be clear, while
4 the impeachment thing is a separate matter, it was the reality
5 of how many cases had he been qualified in and that kind of
6 thing.

7 THE COURT: I understand. That was the other issue.
8 And that I will consider and consider his affidavit again. But
9 in the interest of time, I'm just going to proceed.

10 Is the witness excused at this time?

11 MR. BROWN: Yes, Your Honor.

12 THE COURT: All right. There was another exhibit you
13 wanted to get in, and I said I'll look at it later. It was 13;
14 is that right, Mr. Cross?

15 It was the letter from the defense counsel, and I
16 haven't looked at that either. But I'm just trying to move
17 forward.

18 MR. CROSS: Yes.

19 THE COURT: You have already made argument about it,
20 and I'll look at it later.

21 MR. CROSS: Yeah, Your Honor. It is not a big deal.
22 It just gives the status of the state on those particular
23 vulnerabilities. That is a big deal.

24 THE COURT: Well, except that in this context I
25 thought that they were saying we just can't respond to you in

1 time. And you had that as well really, frankly, about the --
2 in a different context I can't get back to you about Dr. --
3 what portions of Dr. Shamos' testimony we're going to use.
4 We're flying.

5 MR. CROSS: Understood, Your Honor. To be clear, I'm
6 not attributing any fault or anything. This is a substantive
7 matter, which is there has been some confusion including
8 between Mr. Beaver and Ms. Payton as to what vulnerabilities
9 were remediated and where they stand.

10 I'm only offering this as a substantive position of
11 the state that this is their most recent information. So if
12 you look at the redactions and compare them, that would give
13 Your Honor some sense of where they stand. Again, this is not
14 a criticism of the state. It is just the best evidence we
15 have.

16 THE COURT: I understand that. I just don't know
17 that -- my problem is I can't read it with a degree of clarity
18 that I would like to at the moment. I understood both of your
19 positions, and I'm saying let's move on. I'll look at it
20 again.

21 MR. CROSS: Yes. I agree. I agree.

22 THE COURT: All right. I'm trying to get to their
23 case and try to avoid having to go over to Monday. You are
24 lucky there was a constitutional challenge to the criminal
25 charges in the case on Monday that got raised also at the last

1 moment. So I had to defer that case. But that is not a reason
2 for us to have to go over. So just to clarify my own
3 schedule --

4 MR. CROSS: Your Honor, one final thing before the
5 Curling plaintiffs rest, Dr. Halderman did want to correct one
6 thing in his testimony. He was asked about other states, and I
7 don't remember the exact context.

8 MS. CHAPPLE: It was -- sorry. For the risk-limiting
9 audits statewide, he said that Arizona was one of them and he
10 meant to say New Mexico.

11 MR. CROSS: With that, we rest, Your Honor.

12 MS. CHAPPLE: Thank you, Your Honor.

13 THE COURT: Just so I understand, is this statewide
14 audits or is it -- I mean, the one I was reading about was
15 an -- in the statute was a county for potential larger use --

16 MR. TYSON: Yes, Your Honor.

17 THE COURT: -- as I understood that provision.

18 MR. TYSON: Yes, Your Honor. The way the statute
19 works is there are county audits that have to happen as soon as
20 possible but no later than November 2020. Risk-limiting audits
21 would go into effect after a pilot program looking towards a
22 statewide structure.

23 My question to Dr. Halderman was just how many other
24 states have adopted a statewide risk-limiting audit. That was
25 the only clarity there.

1 MS. CHAPPLE: And the clarification was that New
2 Mexico is statewide rather than Arizona.

3 THE COURT: I got it. I understand.

4 And Mr. Brown?

5 MR. BROWN: We rest.

6 THE COURT: All right. Mr. Russo or Mr. Tyson?

7 MR. TYSON: Your Honor, I think we were going to have
8 Fulton County proceed next with their case, and then we would
9 follow.

10 THE COURT: Okay. Is Chatham County's representative
11 still here?

12 MR. RUSSO: Yes, ma'am.

13 THE COURT: Because I did want to talk with him.

14 MR. RUSSO: He is here.

15 THE COURT: Go ahead.

16 MS. RINGER: Your Honor, Fulton County calls Richard
17 Barron.

18 COURTROOM DEPUTY CLERK: Please raise your right
19 hand.

20 **(Witness sworn)**

21 COURTROOM DEPUTY CLERK: Please have a seat. Loudly
22 and clearly state your full name, and please spell your last
23 name for the record.

24 THE WITNESS: Richard Barron,
25 R-I-C-H-A-R-D B-A-R-R-O-N.

1 THE COURT: Is there water still left in there?

2 THE WITNESS: No, there is not.

3 THE COURT: We'll get you some water. If you'll give
4 me -- thank you so much.

5 Whereupon,

6 RICHARD BARRON,

7 after having been first duly sworn, testified as follows:

8 DIRECT EXAMINATION

9 BY MS. RINGER:

10 **Q.** Good afternoon, Mr. Barron. We've heard a lot about the
11 counties using modems.

12 Could you tell us whether or not Fulton County currently
13 uses a modem as part of its voter tabulation.

14 **A.** We disconnected using it before the 2018 general election.

15 **Q.** So tell us what you do now with respect to vote tabulation
16 at the end of election day.

17 **A.** We collect all of the memory cards at the check-in
18 centers, and then we have those driven in to the main Election
19 Preparation Center, and then we tabulate them there.

20 **Q.** How are they driven in?

21 **A.** We have the poll workers come in -- well, they are
22 escorted by the police, either marshals, Fulton County police,
23 or sheriff.

24 **Q.** I want to talk some about the impact of the proposed paper
25 ballot solution in this case. If the Court were to order that

1 paper ballots be used, what would be the financial impact for
2 Fulton County?

3 **A.** Well, that is unclear at this point. It depends on
4 whether the Court orders it for September and November, and we
5 also have to determine how many paper ballots we're going to
6 need, how extensive we are going to use early voting, if we're
7 going to keep the same number of early voting sites.

8 **Q.** Let's take that piece by piece. What's your budget for
9 2019?

10 **A.** It is a little over \$2 million.

11 **Q.** Is that \$2 million left for the year, or did you have
12 \$2 million for the entire year?

13 **A.** That is our operational budget. In odd-numbered years, we
14 have an operational budget. We don't have an election budget.
15 When we run municipal elections, the municipal -- the
16 municipalities pay for those elections. So we get -- we
17 collect money from municipalities or Atlanta Public Schools.
18 And we conduct those elections from that -- those monies.

19 **Q.** So of your 2 million-dollar budget for 2019, you have
20 about a million dollars left in the operating budget; is that
21 correct?

22 **A.** That is probably close to it. Yes.

23 **Q.** Would there be any additional monies that would be
24 allocated to your office in any way?

25 **A.** Currently, no.

1 Q. So if you needed additional monies in order to implement a
2 paper ballot solution, where would you get those funds from?

3 A. We would have to do a soundings request in front of the
4 board of commissioners. So we would have to write a
5 resolution. And then submit that to be put on the agenda for
6 board of commissioners at their next meeting.

7 Q. If you submit a soundings request, is it guaranteed that
8 it would be granted?

9 A. No, not necessarily because the county has a
10 constitutional mandate to keep their budget balanced. So they
11 have to take money from other departments in order to come up
12 with that money unless there -- I think sometimes the county
13 has some money that is set aside. It is usually, I think,
14 somewhere around a million dollars that they set aside that
15 they can use. But I'm unaware of how much of that has been
16 drawn down over the year.

17 Q. How many registered voters do you have in Fulton County?

18 A. As of Monday, it was a little over 811,000.

19 Q. What percentage of Fulton County voters currently vote via
20 absentee ballot?

21 A. I think in the 2016 presidential we had approximately
22 six percent, seven percent, somewhere in there. For a
23 municipal election, it is a tiny percentage.

24 Q. Could you tell the Court what would be some of the things
25 that you would have to procure in order to do a paper ballot

1 election.

2 **A.** Well, one of the first things we would have to do is find
3 a source for optical scan units that are compatible with the
4 GEMS -- with our GEMS server.

5 Last year at this time or in September of last year when
6 we were in court, we had contacted ES&S. I think they said
7 they could probably get 75 for the whole State of Georgia. We
8 would need -- we currently have 41 operational units. 36 -- 5
9 are on litigation hold. So we have access to 36.

10 Usually during logic and accuracy testing, some of those
11 fail. So we end up having to get those repaired. So we would
12 need to have at least 130 for the September election. For the
13 November election, it is going to be quite a bit more.

14 **Q.** Let me stop you just a minute. When you say you would
15 need 130 for the September election, what is the September
16 election you are referring to?

17 **A.** That is for Board of Commissioners District 6 and for the
18 Atlanta Public Schools District 2.

19 **Q.** What is the date of that election?

20 **A.** That is September 17 with a runoff date of October 15th.

21 **Q.** Where are you in your preparations for the election?

22 **A.** Well, we've started online training with poll workers, and
23 we are preparing to begin early voting -- the training for
24 early voting. We have selected the sites that we are going to
25 take to the Board of Registration & Elections to have them

1 approve that at their next meeting.

2 We are beginning to recruit poll workers. We just brought
3 all of our temporary staff on board on Wednesday of this week.
4 So we are starting to ramp up all of the preparations for the
5 election.

6 **Q.** When does early voting start for September 17?

7 **A.** August 26. A month from today.

8 **Q.** That is true.

9 THE COURT: This is for the school board election
10 or --

11 THE WITNESS: That's for Commissioner District 6 and
12 APS District 2.

13 **Q.** (BY MS. RINGER) APS being?

14 **A.** Atlanta Public Schools.

15 **Q.** Thank you. So you were telling us about the need for
16 printers. You have determined that you need how many printers
17 to run the September election if we were to do it via paper
18 ballot?

19 **A.** We need to purchase 94, assuming that all of them make it
20 through logic and accuracy.

21 **Q.** Okay. And where would you purchase 94 optical scanners
22 from?

23 **A.** I have no idea.

24 THE COURT: I'm sorry. How many precincts?

25 THE WITNESS: I think we're going to have 58 polling

1 places for that -- that election.

2 **Q.** (BY MS. RINGER) Okay. So can you explain to the Court --

3 MS. RINGER: Thank you, Your Honor.

4 **Q.** (BY MS. RINGER) -- if we have 58 precincts how that comes
5 down to the number of scanners you are saying you need?

6 **A.** We'll need scanners for early voting. And considering the
7 reliability, we'll have to -- for each early voting site, if we
8 do use 10, we would need 20 for early voting and probably a
9 couple of extras.

10 And then for election day, we're going to need 58. And
11 then we would need probably a second one in each precinct to
12 make sure that we have an extra there during the day. It
13 depends on what we're going to do though with early voting. I
14 anticipate that we would probably have to reduce our early
15 voting footprint.

16 **Q.** Okay. We'll get to that in just one second. Tell us
17 again --

18 **A.** We're actually -- for September's election, we're going to
19 do three early voting sites. November's is going to be ten.

20 **Q.** Okay. So let's talk about September for right now. So
21 you say that you are not able to purchase enough scanners?

22 **A.** Well, a year ago, ES -- from what I was told, ES&S had 75
23 that they could distribute around.

24 MR. BROWN: Object, Your Honor. From what I was
25 told, that is hearsay.

1 THE COURT: All right. Try to keep to what you --
2 what you know at this juncture based on your own investigation.
3 And I mean -- I don't really care that it is actually hearsay
4 if you tell me who you right now -- what your efforts have been
5 to determine that.

6 THE WITNESS: Now I'm unsure where we would -- where
7 we would get them now or how many are available.

8 **Q. (BY MS. RINGER)** Would you be able to just go out and
9 purchase optical scanners from any vendor?

10 **A.** The only vendor we can purchase from would be to get them
11 through ES&S because those are compatible with GEMS. So we
12 would have to get those -- the AccuVote-OS scanners.

13 **Q.** And if you were able to find scanners somewhere somehow,
14 if ES&S was able to produce them, would they have to be
15 certified by the state before you could use them?

16 **A.** Once we received them, they would -- they would have to
17 certify them. They would probably be shipped to our warehouse.
18 And then they would come and do acceptance testing on them.

19 But there would be a -- there is a procurement process.
20 And we would have to get monies approved from the board of
21 commissioners and then find these. So it would probably take,
22 I would imagine, weeks before we would determine did we have
23 the money and where we could get them.

24 **Q.** You stated that you would have optical scanners in each
25 precinct. So it is your preference to have them in the

1 precinct and not as a centralized scanner?

2 **A.** The optical scan units that we have are meant to be in the
3 precinct. We use them now for central count when it comes to
4 absentee by mail. We use them -- for example, in a
5 presidential election, we only had 26, I think, available. And
6 we had to count almost 30,000 ballots. And it took us from the
7 morning of election day until, I think, 5:30 P.M. on Wednesday
8 around the clock to count all of those because you have to feed
9 them in one at a time.

10 **Q.** You heard the testimony of, I believe, Ms. McReynolds
11 yesterday. She spoke about high speed scanners that they use
12 in Denver.

13 Do you have the ability to buy high speed scanners?

14 **A.** There are none available that are compatible with the
15 firmware that we have in the State of Georgia.

16 **Q.** Do you have any other observations about how easy the
17 transition would be similar to what was experienced in Denver?

18 **A.** Well, I think the main difference -- Denver was using
19 paper in the precincts alongside -- from the way it sounds, the
20 voter had the choice of whether they wanted to vote on a DRE or
21 by paper. And they were also -- they had -- 33 percent of
22 their voters were voting absentee.

23 And so if you are already using paper in the precinct to
24 the extent that they were as well, it is much easier to
25 transition. Because you already have the procedures in place

1 and you have already trained the poll workers on those
2 procedures to deal with paper as well as DREs.

3 We haven't -- I believe Fulton County last used paper
4 ballots in 1964. The only paper procedures that we have are
5 for provisional ballots, which that is a completely different
6 procedure than checking in a voter. And so we would just
7 have -- we would have to train the poll workers on how to deal
8 with paper ballots.

9 **Q.** Now, let's talk a little bit about the --

10 THE COURT: They don't work at all with them for
11 absentee ballots?

12 THE WITNESS: Our poll workers, no.

13 THE COURT: Your office staff does?

14 THE WITNESS: Our office staff does, yes.

15 MS. RINGER: Your Honor, were you finished?

16 THE COURT: Yes.

17 **Q. (BY MS. RINGER)** You started to tell us about elections in
18 November. Do you have concerns about having a paper ballot
19 election in November?

20 **A.** Well, if we're running -- if we run a DRE election, for
21 example, in September and we have the runoff in October, which
22 we will have a runoff because there are nine candidates in each
23 of those races, we will start -- we would have to start early
24 voting on October 15 for the November election.

25 And if the Court ordered a paper election, we would have

1 paper early voting starting on October 15th. And October 15th
2 is also election day for the September -- September election
3 runoff.

4 So therefore we would be running two different types of
5 elections on the same day. And we would have poll workers that
6 would be overlapped that we would have to then train -- we
7 would have to train those workers -- while they are already
8 working either through early voting or on election day, we
9 would have to then retrain them on a new -- on a new system.
10 And that would get complicated.

11 **Q.** We've heard that Fulton County dropped out of the pilot
12 program for the ballot marking devices. Can you tell us more
13 about that? Is that accurate?

14 **A.** Yes. The City of Atlanta was going to jump on to the
15 November election. They were going to have a MOST election,
16 which is a municipal option sales tax election. They
17 ultimately decided against it.

18 But at the time when it was up in the air and there was
19 going to be several weeks before they were going to make their
20 decision, I called Chris Harvey at the state and told him that
21 if the City of Atlanta is going to be on the election,
22 especially considering the amount of equipment that we were
23 going to be -- that we were going to receive in the
24 distribution as part of the pilot, we weren't going to get
25 enough equipment to run an election with the City of Atlanta on

1 there.

2 Before that, we were going to have ten municipalities.
3 And we were -- for that -- for that election, we were going to
4 have to either make a choice of doing all early voting with the
5 new equipment and then the -- and then run election day with
6 the old equipment, or we were going to have to isolate it to
7 cities.

8 And so it was going to be difficult for Fulton County
9 unless we could get equipment for all -- for the entire
10 election, for election day and early voting, to be a part of
11 the pilot.

12 So I talked to Chris Harvey and told him that we just
13 weren't going to be able to be a part of it.

14 **Q.** I want you to clarify a little bit. So we have heard that
15 the county and the state already uses paper ballots for
16 provisional and for absentee voting. And so it would be a
17 simple just to switch over to paper ballots.

18 Do you believe that to be accurate?

19 **A.** Well, my office staff processes all of the absentee
20 ballots. So they have been doing it -- they have been doing it
21 for years. The poll workers are unfamiliar with paper. And
22 I'm unsure what type of measures would be put in place.

23 For example, in Texas, they would -- when you -- when you
24 hand out paper to a voter, you put down three upside down.
25 You'll give them a choice of three ballots, and then they pick

1 one of those so that you are not handing them a ballot. You
2 are actually giving them a choice to pick from three ballots of
3 that ballot style.

4 So I'm not -- I don't know what the state would mandate as
5 part of their processes with regard to how we're supposed to
6 execute a paper ballot election. So there would just be a lot
7 of -- I mean, I have done paper ballot elections. So it is
8 just -- there are a lot of procedures that are different. And
9 I think that especially early voting would be somewhat
10 problematic at this point.

11 **Q.** Do you have any concerns about whether or not paper
12 ballots will be able to be ordered for your September
13 election -- ordered in time? I'm sorry.

14 **A.** For the September election, well, I mean, I think if we
15 ordered them right away, we probably could get them.

16 MS. RINGER: I just have one more thing. Just one
17 second.

18 **(There was a brief pause in the proceedings.)**

19 **Q. (BY MS. RINGER)** Are there any other materials that you
20 would need to obtain or procure in order to do a paper ballot
21 election outside of paper ballots and scanners that we've
22 talked about?

23 **A.** Yeah. We would need to get -- you would have to get
24 ballot boxes -- emergency ballot boxes. We would also -- we
25 would need the ballot boxes that the OS scanners are going to

1 go on. We would need to have an emergency ballot box in the
2 precinct, as well, unless there is a slot for that with the OS
3 ballot box.

4 THE COURT: I'm sorry. OS refers to?

5 THE WITNESS: The optical scan. They slide on
6 usually to a rolling ballot box. If those already have an
7 emergency ballot box -- but we always used to have also the
8 metal -- an emergency metal ballot box in the precinct.

9 **Q. (BY MS. RINGER)** Let me stop you. What would the
10 emergency ballot box be used for?

11 **A.** Well, if for some reason we have to run out because of a
12 fire or if the poll workers need to exit the building because
13 of a fire, they can at least still -- I mean, you would expect
14 that if the building is on fire they can set up a polling place
15 out in the parking lot or wherever it is somewhere. And they
16 aren't going to be able to use that any more. So they are
17 going to have to get the ballots out, transfer them to that
18 box, and then seal it and get out.

19 **Q.** Are there any other materials you would need?

20 **A.** Yes. For early voting, we would need cabinets because you
21 are going to need big cabinets with lots of shelves in them to
22 file all of the ballot -- paper ballots -- the different ballot
23 styles. Those cabinets would have to be purchased.

24 You would have to get a vendor. The county's -- I'm not
25 sure how the county's procurement process is going to -- would

1 be to get those. Usually it takes a couple of months to
2 purchase anything through the county's procurement process.

3 So -- but we would definitely need those for early voting
4 if we're going to keep the same level of early voting in
5 November that we would want.

6 **Q.** Would you also need to procure anything regarding curtains
7 or security?

8 **A.** We would need booths. We would have to get lots of voting
9 booths. You can set those up so that they have privacy windows
10 in between. And you can set those up on tables. We would
11 probably have to procure a lot of tables to deliver out to all
12 the polling places.

13 THE COURT: Can you explain that to me? Right now
14 you have voting booths?

15 THE WITNESS: No. We have voting booths for the
16 DREs.

17 THE COURT: Right. You can't use those voting
18 booths?

19 THE WITNESS: No. Those are part of the whole DRE
20 mechanism. It is all one piece.

21 THE COURT: How many voters are you thinking are
22 going to -- are likely anticipated in the District 6 race?

23 THE WITNESS: There are nine candidates. You know,
24 it could be anywhere from probably 10 to 20 percent.

25 THE COURT: That's in the original one but not in the

1 runoff?

2 THE WITNESS: Yeah. The runoff depending on who is
3 in it could end up -- sometimes in those races the runoff
4 turnout ends up being a little bit higher because you are down
5 to two candidates. Sometimes when there's nine candidates,
6 people -- they don't know who to pick.

7 THE COURT: But when you say 20 percent -- I still
8 don't know what that number looks like. What are we talking
9 about? 2,000? 6,000?

10 THE WITNESS: I think there are somewhere right
11 between 125- and 130,000 registered voters in District 6. So
12 we're talking -- and then it is similar -- APS District 2,
13 between those two, if we have a ten percent turnout, you are
14 talking about, you know, somewhere between 16 -- 16,000 and
15 20,000 voters.

16 THE COURT: I was general counsel for the school
17 board at some point. And I never remember seeing an election
18 turn out like that. But that is -- but anyway --

19 MS. RINGER: One last question, Mr. Barron.

20 THE WITNESS: Well, most of that turnout would
21 probably be for Commissioner District 6.

22 THE COURT: Okay. All right.

23 **Q. (BY MS. RINGER)** One last question. When you prepare for
24 an election, can you prepare as though only 20 percent of the
25 electorate will come out to vote?

1 **A.** I mean, we're supposed to assume as though -- we have to
2 prepare as though everyone is going to turn out. I mean -- and
3 the one thing that would affect that is the number of ballots
4 that we would -- that we would order ahead of time.

5 **Q.** Would that also impact the number of poll workers you
6 would need?

7 **A.** It could. But I mean, for municipal elections that have
8 lower turnout, we do use fewer poll workers usually.

9 MS. RINGER: No further questions.

10 THE COURT: Thank you.

11 MR. RUSSO: We don't have any questions, Your Honor.

12 CROSS-EXAMINATION

13 BY MR. MANOSO:

14 **Q.** Afternoon, Mr. Barron. I just want to circle back on a
15 few things from your testimony.

16 I'm right that you testified that the City of Atlanta is
17 not currently holding any elections in November of this year;
18 is that correct?

19 **A.** Correct.

20 **Q.** And I believe you also testified that ten municipalities
21 are having elections in November of this year; is that correct?

22 **A.** Yes.

23 **Q.** So that means that less than 800,000 registered voters are
24 eligible to vote in November of this year; correct?

25 **A.** Correct.

1 Q. You were talking about turnout as well and that it is
2 lower for these type of elections; is that correct?

3 A. Yes.

4 Q. Are you aware that Alpharetta had 3900 votes for the
5 municipal elections held in November of 2017? Does that sound
6 right?

7 A. Sounds right.

8 Q. Earlier you talked about using police escorts to transfer
9 memory cards in the November 2018 election?

10 A. Uh-huh (affirmative).

11 Q. Do you recall that testimony? There were 25 police
12 escorts used by the county for November 2018 to escort the
13 memory cards; is that correct?

14 A. That sounds right.

15 Q. They were split across five collection centers?

16 A. Yes.

17 Q. So that means you had to use 25 police officers to drive
18 the police car; correct?

19 A. Yes.

20 Q. You had to pay those police officers overtime; is that
21 right?

22 A. Yes.

23 Q. And each police officer also had a poll worker with them
24 as well; is that right?

25 A. Yes.

1 Q. And it is true that you implemented this in response to a
2 request from the state?

3 A. Correct.

4 Q. You actually thought the use of police escorts was
5 unnecessary; correct?

6 A. To do -- to do that duty? No.

7 Q. Well, let's be clear. You said that it made no difference
8 in terms of the security that they were using police escorts
9 instead of the use of modems; is that correct?

10 A. Well, I think what we wanted to do was conform with the
11 rest of the state.

12 Q. Right. And that is not my question.

13 My question is that you said at the time that I think it
14 makes no difference. I think there's more risk driving them.
15 That is what you said; correct?

16 A. There's more risk driving them? Oh, well, in terms of
17 whether there would be accidents and that sort of thing or, you
18 know, if you run into traffic or any of that sort of thing or
19 an accident or if the police have to stop because there is an
20 emergency somewhere --

21 Q. Again, to be clear, my question is that you said that it
22 makes no difference in terms of whether they were transferred
23 by the modems that they had been or the use of police cars.
24 That is what you said; correct?

25 We can pull it out if you would like.

1 **A.** No. If I said that, then I said that.

2 **Q.** Mr. Barron, there was a runoff election in December of
3 2018; is that correct?

4 **A.** Uh-huh (affirmative).

5 **Q.** And at least the Life Center Ministries polling station
6 had to use provisional ballots for a portion of that runoff
7 election; is that correct?

8 **A.** I don't remember.

9 MR. MANOSO: If I may approach, Your Honor, I will
10 hand the witness Exhibit 14.

11 **Q.** (BY MR. MANOSO) Are you with me, Mr. Barron?

12 **A.** Yes.

13 **Q.** You see that this is a news article from December 4, 2018?

14 **A.** Uh-huh (affirmative).

15 **Q.** And this is about two Fulton precincts remaining open
16 later due to early morning issues.

17 **A.** Yes.

18 **Q.** As it says, the Life Center Ministries polling place
19 stayed open an hour later because a polling manager lost a
20 stack of voter access cards?

21 **A.** Yes. That is what this says, yes.

22 **Q.** Do you recall that that occurred in the 2018 runoff
23 election?

24 **A.** Yeah. Vaguely, yes.

25 **Q.** You have no reason to believe that that didn't occur, do

1 you?

2 **A.** No.

3 **Q.** As a result of lost voter access cards, there was no
4 voting for approximately one hour; is that correct?

5 **A.** Well, they would have started voting provisionally.

6 **Q.** And if those ran out, there would have been no voting;
7 correct?

8 **A.** Correct.

9 **Q.** I'm glad you mentioned the provisional ballots because it
10 is true that once the voter access cards were lost provisional
11 ballots is what were used until those cards could be replaced;
12 correct?

13 **A.** Yes.

14 **Q.** And as this indicates, your office had to print more
15 ballots to be used?

16 **A.** Correct.

17 **Q.** Those hand-marked ballots were -- they were collected?
18 Voters were able to use them; correct?

19 **A.** Yeah. They had to go through the provisional process to
20 vote. But yes.

21 **Q.** But those hand-marked ballots were counted; correct?

22 **A.** Yes.

23 MS. RINGER: Objection, Your Honor. This is outside
24 the scope of direct examination.

25 THE COURT: Overruled.

1 **Q.** (BY MR. MANOSO) Your office did what was necessary to
2 make sure that people could cast their vote; is that fair to
3 say?

4 **A.** Yes.

5 **Q.** If the Court ordered you to use hand-marked paper ballots
6 to allow voters to cast their vote in November, you would
7 follow that order; correct?

8 **A.** Yes.

9 THE COURT: So when people turned in provisional
10 ballots, was it the poll workers themselves who worked with the
11 provisional ballots?

12 THE WITNESS: Yes. Yeah. They have to fill out the
13 envelopes and the provisional paperwork for each voter. So it
14 does take longer to process them that way.

15 **Q.** (BY MR. MANOSO) Mr. Barron, just quickly, how much does
16 Fulton County receive to run the ten municipal elections that
17 they will be running this November?

18 **A.** Well, we are going to -- the budget is currently around
19 1.1 million.

20 **Q.** Just to make sure I'm straight, that is 1.1 million that
21 Fulton County receives from the municipalities to run the
22 elections?

23 **A.** Yes.

24 **Q.** Thank you. Going back to November 2018, do you recall
25 that you testified in the hearing last year that Fulton County

1 would probably have 400 to 450 ballot styles for November 2018
2 elections? Do you recall that testimony?

3 **A.** Probably.

4 **Q.** We can pull it up.

5 **A.** I don't recall it. But if you say I did --

6 **Q.** That sounds like what you would have testified that you
7 were expecting 400 to 450 ballots; correct?

8 **A.** It could be, yes.

9 **Q.** We can make this easy. In fact, Fulton County only used
10 115 ballot styles in the actual November election; correct?

11 **A.** Okay.

12 **Q.** Did you not testify in January of 2019 under oath that
13 Fulton County had 115 ballot styles in November 2018 elections?

14 **A.** Did I testify under oath?

15 **Q.** Did you testify in a state court proceeding in
16 January 2019?

17 **A.** Yes.

18 **Q.** You testified there were only 115 ballot styles used;
19 correct?

20 **A.** Yes.

21 **Q.** Staying with the November 2018 election, there were
22 complaints about a shortage of DRE machines available during
23 the election made to your office; correct?

24 **A.** Uh-huh (affirmative).

25 **Q.** You said that the reason for the availability of few spare

1 machines was because of Judge Totenberg's sequestration order;
2 is that correct?

3 **A.** Well, I think what I've since learned is that the
4 litigation hold was -- I think it is the result of the Attorney
5 General. And so I had 694 machines that I had no access to.
6 And the only way they could be lifted was either if the
7 plaintiffs' side agreed to lift it or if there was a judicial
8 order to lift it.

9 **Q.** Mr. Barron, let's listen to my question. My question was:
10 At the time of the November 2018 elections, you said that the
11 reason for the lack of spare machines was because of Judge
12 Totenberg's sequestration order? That is what you said?

13 **A.** Well, I think that is semantics at this point because I
14 had 694 machines that were outside of my access.

15 **Q.** You also stated that Fulton County had asked Judge
16 Totenberg to release those machines but that she refused. Do
17 you recall that?

18 **A.** That was my understanding at the time.

19 **Q.** Mr. Barron, you still have confidence --

20 THE COURT: That is not your understanding now; is
21 that right?

22 THE WITNESS: Right.

23 **Q.** **(BY MR. MANOSO)** Mr. Barron, you still have confidence in
24 the voting system currently in place?

25 **A.** Yes.

1 Q. In fact, after the hearing last year, you stated that
2 Georgia voters should still be confident in the voting system
3 that we have? That is what you said before; right?

4 A. Yes.

5 Q. And that is still your belief today?

6 A. Yes.

7 Q. And you said that warnings about election security do not
8 reflect real world scenarios? That is what you have said as
9 well; correct?

10 A. Correct.

11 MR. MANOSO: Nothing further, Your Honor.

12 CROSS-EXAMINATION

13 BY MR. BROWN:

14 Q. Mr. Barron, I'm Bruce Brown. I want to ask you some
15 questions on the turnout in the anticipated four -- and to
16 distinguish between the October race and the November race.

17 What is your expected outcome in the race -- the September
18 race?

19 A. For the September election, it could be anywhere from 10
20 to 20 percent. I'm not really a prognosticator when it comes
21 to turnout.

22 Q. And that is against -- what is the base? What do you take
23 ten percent of? The 800,000 or some subset of that?

24 A. It would be a subset of that because we have got the APS
25 District 2 and we have got the Commissioner District --

1 Commissioner District 6.

2 **Q.** 6. And I think you estimated --

3 **A.** So I mean, you know, I think optimistically we're going to
4 see somewhere between -- it could be anywhere from 16- to
5 20,000 if it is in that ten percent range. It just -- it is
6 going to depend on how many people that candidates can get out
7 to vote.

8 **Q.** And then for the runoff, it might be more; is that right?

9 **A.** Once it narrows down to two candidates, you may see a
10 higher turnout.

11 **Q.** And then do you -- have you made any estimations for the
12 turnout in the November elections?

13 **A.** No. I think it is going to be less than, for example, in
14 November of 2017. Because usually the City of Atlanta has a
15 much higher turnout than other municipalities.

16 **Q.** Do you have a ball park? Well, what was it in November of
17 2017?

18 **A.** I think the city was close to 30 percent and some of the
19 other municipalities were probably as low as 6 to 9.

20 **Q.** Could you give me an estimate -- just a ball park estimate
21 of the number of anticipated voters in November? Not as a
22 percentage but as a sum.

23 **A.** It is going to vary from city to city. So I would say
24 somewhere in that probably 5 to 12 percent range.

25 **Q.** So about the same as October or a little bit more or a

1 little bit less?

2 **A.** Your guess is as good as mine.

3 **Q.** Well, how many hand-marked paper ballots did you scan in
4 the 2018 election?

5 **A.** I haven't looked at that number in a while. But it is
6 probably somewhere between 18- and 22,000.

7 **Q.** Okay. So all of this activity that you have been
8 describing in this misery of moving to hand-marked paper
9 ballots, what you are describing is a move from about 18- to
10 20,000 ballots being scanned to about 18- to 20,000 ballots
11 being scanned; fair enough?

12 **A.** Uh-huh (affirmative).

13 **Q.** So it is about the same as what you have been doing;
14 right?

15 **A.** Yes.

16 **Q.** Okay. And -- but if you are using hand-marked paper
17 ballots -- well, you are very careful with those -- all those
18 DRE machines; right? When you set them up, when you tear them
19 down and test them and everything else; right?

20 **A.** (Witness nods head affirmatively.)

21 **Q.** You need to say yes.

22 **A.** Yes.

23 **Q.** And they all -- do each of them go through logic and
24 accuracy testing?

25 **A.** No.

1 Q. And how long does logic and accuracy take?

2 A. For a major election, probably four to five weeks.

3 Q. And how many full-time -- how many employees or
4 contractors do you have doing that?

5 A. Usually there's about 15 people that are working on that.

6 Q. For how long a period of time?

7 A. Several weeks.

8 Q. And if you moved to hand-marked paper ballots, you
9 wouldn't be spending that money; right?

10 A. We would have to then -- we are going to have to do logic
11 and accuracy on all the OS machines. So if we were able to
12 procure 130, say, then we're going to have to do logic and
13 accuracy testing on all of those units.

14 Q. Well, the 130 was -- the 130 scanners -- 130 scanners for
15 20,000 ballots?

16 A. Well, we would have to -- that depends on the number of
17 polling places that we have, and also it depends on the number
18 of early voting sites.

19 For the November election, we would need far greater than
20 100 -- 130.

21 Q. Well, that is two per polling place and 20 for early
22 voting; right? It is about 130.

23 A. Yeah. We have -- for the November election, it is well
24 over 100 precincts for November. I was speaking about the
25 September election.

1 Q. Okay. So for the November election, you have well over
2 100 precincts; right?

3 A. Yes.

4 Q. And those would be well over 100 precincts that you would
5 have to furnish with DRE machines; correct?

6 A. Yes.

7 Q. And, instead, what you are doing is you're furnishing them
8 with more scanners; correct?

9 A. Correct.

10 Q. And do each of those precincts have scanners already?

11 A. No.

12 Q. They don't even have one?

13 A. No.

14 Q. But each of them have people who are trained on handling
15 paper ballots; correct?

16 A. Yes. They process the provisional voters, yes.

17 Q. So the way you --

18 A. It is usually only the poll manager that processes
19 provisional voters.

20 Q. So the way that you would sort of net out your cost would
21 be to figure you're scanning about the same number of pages but
22 since you are going to put that all in the precincts you're
23 going to have to buy more scanners; right?

24 A. We would have to buy scanners, yes.

25 Q. But if you got into a budgetary fix, you could go to

1 central count; correct?

2 **A.** Yes.

3 **Q.** And in any event, whether central count or precinct count,
4 you would be saving a lot of the cost of all of those people
5 that you are hiring to do the logic and accuracy test on the
6 DRE machines, although not on the scanners; right?

7 **A.** Yes.

8 **Q.** Now, Mr. Barron, let me show you what has been marked as
9 Plaintiffs' Exhibit 15.

10 MR. BROWN: And for the record, the handwriting on
11 the second page does not appear on the original. But it does
12 appear in the copy that I'm handing to you. This also appears
13 in the record at 258-1, Page 102.

14 **Q.** **(BY MR. BROWN)** You're a county election official;
15 correct?

16 **A.** Yes.

17 **Q.** Do you recall receiving this from Chris Harvey?

18 **A.** Yeah, I believe so.

19 **Q.** Let me direct your attention to the bottom of the second
20 page. Do you see the last paragraph there?

21 **A.** Yes.

22 **Q.** And could you just read that into the record.

23 **A.** There is a provision of Georgia law that allows the state
24 to move to paper ballots in the event that the machines are
25 inoperable or unsafe. If we ever reach a point where our

1 office feels that these machines cannot be trusted to
2 accurately deliver election results, we will invoke this
3 statutory provision. To this day there is no credible evidence
4 that our election process is anything except secure and
5 accurate.

6 **Q.** Was it your understanding that the state would make that
7 decision to move to paper ballots depending upon whether it was
8 more trouble for you or less trouble for you to do it that way?

9 **A.** No.

10 **Q.** It was simply binary; right? If it is unsafe, you have
11 got to move to paper ballots; is that right?

12 **A.** Correct.

13 **Q.** And if Mr. Harvey as opposed to a federal court gave you
14 the order, you would also follow it and move to paper ballots;
15 correct?

16 **A.** Yeah. If the state told us we had to, then we would do
17 that.

18 THE COURT: Are you offering this as an exhibit?

19 MR. BROWN: I move that into evidence, Your Honor.

20 Thank you.

21 THE COURT: What is the number?

22 MR. BROWN: It is Defendants' 15.

23 THE COURT: Plaintiffs' 15.

24 MR. BROWN: Plaintiffs' 15. I'm sorry.

25 **Q.** **(BY MR. BROWN)** Mr. Barron, very quickly, has Fulton

1 County taken any action to assess or remediate the impact the
2 KSU server exposure to the internet had upon your system?

3 **A.** No.

4 **Q.** Now, you're not a great fan of e-pollbooks, are you?

5 **A.** They -- well, I think in less than countywide elections,
6 they are -- I had an issue with them.

7 **Q.** And your office -- you've had problems with them; right?

8 **A.** Yeah. We did in one particular election.

9 **Q.** I mean -- what particular election was that?

10 **A.** April 2017.

11 **Q.** And what happened?

12 **A.** We had -- if you have less than a countywide election,
13 there is -- we had to have three -- we had to use three
14 databases for that election, one for the city of Johns Creek,
15 one for a runoff for the City of South Fulton and Roswell, and
16 then we also had the Congressional District 6 and I think it
17 was the Senate District 32 election.

18 **Q.** And what happened?

19 **A.** Well, we had -- voters that lived in Johns Creek or that
20 lived in Roswell because we had to use different databases had
21 to check in twice.

22 And if you have less than a countywide election, when
23 you -- when voters go in to vote, if they are ineligible to
24 vote or if they are in the wrong precinct, what it does is if a
25 poll worker doesn't call in to the office to verify that then

1 when they hit the precinct detail tab it pulls the information
2 from the last voter that was there.

3 **Q.** That is a software glitch I take it?

4 **A.** I wouldn't use the word glitch. But it is, I think, the
5 way the software was designed.

6 **Q.** It was defective by design?

7 **A.** I wasn't privy to the design. So all that I know is what
8 happens when you have less than a countywide election. And I
9 think when you have voters that had to check in at two
10 different places for that -- because we were running three
11 different elections on different databases, which had never
12 been done, that it magnified the problem.

13 **Q.** But -- and it happens when there is less than a countywide
14 election; correct?

15 **A.** Yes.

16 **Q.** Which happens all the time; right?

17 **A.** It does.

18 **Q.** Okay. And it is something that should not happen;
19 correct? You didn't call it a glitch. But it is a flaw;
20 correct.

21 **A.** It was something that when they designed it I think -- I
22 don't think they considered that.

23 **Q.** And they fixed it though; right?

24 **A.** No. It is still there.

25 **Q.** Okay. And do you recall in a meeting, I guess it is, of

1 the -- you go to the board meetings; right?

2 **A.** Yes.

3 **Q.** Because you are the election director; right?

4 **A.** Yes.

5 **Q.** Do you recall in a Fulton County Board of Elections
6 meeting in April of 2017 saying, because of -- because the
7 ExpressPolls to me are just the worst thing in the world? Do
8 you recall saying that?

9 **A.** I may have.

10 **Q.** That would not be inconsistent with your belief at least
11 at the time; correct?

12 **A.** That was a frustration.

13 **Q.** And have you reported the flaw to the state?

14 **A.** They are aware of it.

15 **Q.** But no fix has been implemented; is that correct?

16 **A.** I'm unsure if it is possible. We just -- we train the
17 poll workers to call us if it is less than countywide and
18 somebody shows up that is in the wrong precinct or if they are
19 ineligible to vote in that election.

20 **Q.** If you had a hard copy of countywide e-pollbooks --
21 everybody in the county in the e-pollbooks, that would at least
22 partially ameliorate a problem such as that; correct?

23 **A.** Somebody that is familiar with the programming to that
24 needs to answer that.

25 **Q.** Okay. Let me hand you what I'm going to mark as

1 Exhibit 16 just very quickly.

2 THE COURT: Were you wrapping up here?

3 MR. BROWN: I am now.

4 **Q. (BY MR. BROWN)** Let me hand you what has been marked as
5 Exhibit 16. And are these Fulton County's responses to our
6 interrogatories?

7 **A.** Yeah, it looks that way.

8 MR. BROWN: I move to admit, Your Honor. I just
9 point out for the record that in those interrogatory responses
10 the explanation for that glitch is provided in greater detail.

11 THE COURT: Okay.

12 MR. BROWN: Thank you, Your Honor.

13 THE COURT: Are you just referencing this, or are you
14 introducing this?

15 MR. BROWN: I'm introducing it, and I'm finished with
16 it.

17 THE COURT: But you are introducing it as an exhibit?

18 MR. BROWN: Yes, I am. I move to admit, Your Honor.

19 THE COURT: What is the number?

20 COURTROOM DEPUTY CLERK: 16.

21 MR. BROWN: 16.

22 THE COURT: Are there any objections?

23 MS. RINGER: No, Your Honor.

24 COURTROOM DEPUTY CLERK: And 14?

25 MR. RUSSO: No objection.

1 THE COURT: No objection from Fulton County?

2 MS. RINGER: No.

3 THE COURT: Were there any objections to the other
4 one, 15?

5 MS. RINGER: No objection.

6 THE COURT: Any objection?

7 MR. RUSSO: No, ma'am.

8 THE COURT: All right. They are admitted.

9 COURTROOM DEPUTY CLERK: 14 as well.

10 THE COURT: 14? What was 14?

11 MR. MANOSO: That was the AJC article, Your Honor.

12 THE COURT: Do you really need it? It is sort of
13 like -- I mean, you questioned him about it.

14 MR. MANOSO: It is up to you, Your Honor.

15 THE COURT: Of course, it is up to me. Well, you
16 know, I didn't allow them to have their article that they
17 wanted in. I just sort of think it is not necessary.

18 MR. MANOSO: Yes, Your Honor.

19 THE COURT: You have offered it. I don't think it is
20 necessary because he discussed it in the testimony. So it is
21 not admitted.

22 All right. May this witness be excused, or do you
23 have more?

24 MS. RINGER: No further questions, Your Honor.

25 THE COURT: All right. Thank you very much.

1 MR. MILLER: Your Honor, we're going to call Russell
2 Bridges from Chatham County in the interest of him getting back
3 to Savannah at a reasonable hour.

4 THE COURT: Is somebody going to get him, or is he
5 here?

6 MR. MILLER: Yes. He is in the witness room
7 sequestered.

8 MR. TYSON: While we're waiting, would it be
9 appropriate for us to check on time?

10 THE COURT: How much time are you going to need? I
11 mean, you haven't had any witnesses. So I just want to find
12 out what you --

13 MR. TYSON: We have three witnesses, Your Honor. So
14 yes. So Mr. Bridges and then Ms. Ledford and then Ms. Doran.

15 MR. RUSSO: And Dr. Shamos.

16 MR. TYSON: And Dr. Shamos' video -- the clips from
17 the video deposition.

18 THE COURT: All right. And how long do you think
19 each -- how much -- I can't remember how much you allocated for
20 each of these individuals.

21 Regardless of what you allocated, what do you think
22 at this juncture?

23 MR. TYSON: Probably 20 minutes apiece.

24 MR. RUSSO: For our side.

25 MR. TYSON: For our side only. And then I believe

1 the video of Dr. Shamos is right at 20 minutes as well. Maybe
2 17 minutes.

3 THE COURT: I don't know what we're going to do.
4 Let's see how we do with this witness. And, you know, I'm
5 prepared to go to 7:00. But if we had to spin over to Monday,
6 I would do that too. It really depends on whether we become
7 dysfunctional here.

8 MR. MILLER: I don't intend to start that trend, Your
9 Honor.

10 THE COURT: That is so wonderful.

11 COURTROOM DEPUTY CLERK: Please stand and raise your
12 right hand.

13 **(Witness sworn)**

14 COURTROOM DEPUTY CLERK: Please have a seat. Loudly
15 and clearly state your full name, and spell your last name for
16 the record.

17 THE WITNESS: My name is Russell Bridges. My last
18 name is spelled B-R-I-D-G-E-S.

19 Whereupon,

20 RUSSELL BRIDGES,

21 after having been first duly sworn, testified as follows:

22 DIRECT EXAMINATION

23 BY MR. MILLER:

24 Q. Good afternoon, Mr. Bridges. Thank you for hanging around
25 a little bit. I know you are anxious to get home. I apologize

1 for that.

2 Mr. Bridges, did you prepare a declaration in this case?

3 **A.** I did.

4 **Q.** And in that declaration, did you speak to your general
5 background and experience in Chatham County?

6 **A.** Yes, sir, I did.

7 MR. MILLER: May I approach, Your Honor?

8 THE COURT: Yes.

9 MR. MILLER: I'm handing the witness what is already
10 in the record as Document 472-6, the declaration. I don't
11 intend to tender it at this point.

12 **Q.** **(BY MR. MILLER)** Mr. Bridges, could you describe for the
13 Court your background and the current position you hold.

14 **A.** I'm currently the supervisor of elections for Chatham
15 County. I have been with the county now for 15 years.

16 **Q.** And where did you grow up?

17 **A.** I am actually a Savannah native. I haven't grown up yet
18 though.

19 **Q.** And what do your responsibilities entail as the elections
20 supervisor?

21 **A.** Well, as the supervisor, I'm charged with -- first, I
22 report to a board. But my job is to oversee the day-to-day
23 operation of the elections office and the staff and all of the
24 various people that we employ to conduct an election.

25 **Q.** And I understand that Chatham County has a board of

1 registrars as well; is that correct?

2 **A.** Yes. We're separate from the board of registrars.

3 **Q.** Could you describe the difference in the duties between
4 the two and how they interact, if at all?

5 **A.** Well, the duties of the two are distinctively different in
6 that the registrar is in charge of registering voters. They
7 conduct the absentee functions within a county and -- which
8 includes early voting.

9 And our office, we actually are sort of the architect of
10 the election. We are the one that qualifies candidates. We
11 put together the ballot. We get polling places. We recruit
12 poll workers. We conduct training. We do the nuts and bolts
13 of putting an election together. And we support the registrar
14 in their functions for early voting and absentee also.

15 **Q.** And when you describe support, what do you mean by that?

16 **A.** Well, in absentee, of course, they use the paper ballots.
17 And we generate those for them. We currently use a machine to
18 produce those as they need them to contain cost. And the other
19 is for early voting they use the same equipment we use for
20 election day, which is the DRE systems.

21 And we prepare all of that equipment for them well ahead
22 of the election because early voting starts 21 days ahead of
23 the election. And if we are conducting a federal or state,
24 they have 45 days for absentee.

25 **Q.** What is the size of the voting population in Chatham

1 County?

2 **A.** We currently have 207,000 registered voters.

3 THE COURT: 207 or 270?

4 THE WITNESS: 207, ma'am.

5 **Q.** (BY MR. MILLER) Is that active registered voters?

6 **A.** That is the active. I believe there are about 20,000
7 additional inactive voters on top of that. We have had a
8 tremendous growth increase last year in the 2018 election
9 cycle.

10 **Q.** Sure. What kind of election day, early voting, absentee
11 setup do you have in Chatham County? Not just election day
12 specifically -- but elections setup generally do you have to
13 handle these voters?

14 **A.** We have currently 90 voting precincts that we open on
15 election day. We are actually in the process of looking at
16 adding two more for one of our municipalities. They were kind
17 of one of the growth areas in the county last year. So we have
18 those open.

19 The registrar has six early voting locations -- now, they
20 are not open on election day, but they are in advance of it --
21 that they operate. And we have -- we hire about 600 people to
22 work on election day. And we deploy typically about 500, 550
23 voting machines.

24 **Q.** Okay. And in terms of staff, do you have full-time staff
25 and part-time staff in addition to those voters?

1 **A.** I have a staff of four full time, and we employ -- for
2 election preparation, we employ an average of about eight
3 seasonal workers. And most of these are people that we
4 actually use as poll workers, poll managers. But they work for
5 us as part-time employees to do election preparation.

6 **Q.** What is your typical process for preparing to conduct an
7 election in Chatham County?

8 **A.** We basically as an election is approaching -- obviously if
9 there's qualification, we go through the legal process of
10 publishing qualification, having candidates qualify. And then
11 at the close of qualifying when all the candidates are
12 collected, if there are any referendums or whatever, we
13 collaborate with a ballot builder to build a database, which
14 runs the election.

15 And we have to go through an arduous proofing process with
16 ballots, which usually takes about a week's time. And then
17 once that is done, we then actually begin the physical
18 preparation of the equipment. And normally my team takes about
19 two weeks to prepare just the equipment for the election
20 purposes.

21 We have to have those things ready -- we have to have --
22 for example, when early voting is happening, we have to have
23 the equipment for early voting, which is, you know, three weeks
24 ahead of the elections. So we usually have that equipment
25 ready at least, like, you know, five weeks ahead of the

1 election time.

2 **Q.** And I guess to sum it up, how far out would you start this
3 kind of prep work for the election?

4 **A.** In a typical election, the concentrated preparation is
5 about eight weeks of actual -- when our teams are in and
6 preparing the equipment, preparing the ballots, and the other
7 things that we have to do.

8 We have some things that we do in advance of that, such as
9 we have to prepare our training material, we have to hire
10 staff, and all that.

11 So, for example, for this year, my staff has already been
12 working on staffing polls for November.

13 **Q.** And with respect to the training you referred to, do you
14 have responsibilities related to the training of those poll
15 workers or how does that work?

16 **A.** That is a direct responsibility that we have. Every major
17 election, we have to -- we have to train every poll worker.
18 And, you know, the majority of our poll workers are returning
19 workers. But they still have to go through about three hours
20 of training.

21 And if we have new poll workers, we have additional
22 training that we provide them to give them the basic skills
23 before putting them out in the poll.

24 **Q.** Let's talk about 2019. Is the Chatham Board of Elections
25 scheduled to conduct elections this year?

1 **A.** Yes. 2019 is a municipal election cycle year, and we
2 currently have eight cities that we conduct elections for. And
3 this year, we're conducting elections for six of those eight.
4 Two of the smaller cities are not holding elections this year.

5 But we also -- in addition to that, we have a countywide
6 election for two referendums.

7 **Q.** Is that list final? Is it possible there could be more?

8 **A.** Well, there are some potential variances in what we have.
9 One of the cities is expecting to possibly have an additional
10 special election occur because they have a candidate who is
11 currently an elected official who is thinking of qualifying for
12 a different office. Once a person qualifies, that will create
13 a vacancy in their council, and we'll have to turn right around
14 and run a special election for them to fill that vacancy.

15 **Q.** Could there potentially be others?

16 **A.** In this business, you really never know. Somebody could
17 die. You know, somebody could drop -- could resign from
18 office. So something could develop between now and then.

19 **Q.** When you talk about running elections for the cities, does
20 the Chatham Board of Elections or Board of Registrars, to your
21 knowledge, have an intergovernmental agreement with these
22 municipalities?

23 **A.** Surprisingly, we don't have a direct intergovernmental
24 agreement with our cities. Since I've been in the -- prior to
25 my coming on board in 2004, the cities and the counties just

1 pretty much had an agreement that the superintendent, us, would
2 run their elections.

3 But each municipality at the beginning of the year has to
4 pass a resolution requesting our services. In this case, the
5 six that we're doing this year have all done that.

6 **Q.** And given that you don't have an agreement or contractual
7 relationship, how do you work out expenses for those elections?

8 **A.** We bill them for the direct cost that beyond -- we don't
9 charge them, like, for my salary. But we charge them for the
10 salaries for the people who come in and prepare the election,
11 for the ballots that we print, for the transportation cost, the
12 rental cost on the polling places. Anything that we encumber
13 to actually hold that election above our basic operating
14 expense of having an office, we bill that out proportionate to
15 the number of voting precincts that they have.

16 **Q.** But you don't charge for machines; correct?

17 **A.** No. The machines -- since the machines are something that
18 we have, we provide all of that as a direct -- as part of the
19 service we provide. We just charge them for things that we
20 spend money on.

21 **Q.** Is that state law that you can't charge that?

22 **A.** No. I don't know if there is a law that says we can't.
23 But, you know, certainly the state law provides that we can
24 conduct elections on behalf of cities and charge them
25 reasonable expenses --

1 THE COURT: I'm not sure. So you don't charge them
2 the expenses of upkeep, logic and accuracy testing on the DREs,
3 or you do?

4 THE WITNESS: We charge them for the labor -- for the
5 staff that we bring in for the hours that they are working.
6 But actually like on a per unit basis, no, ma'am.

7 **Q. (BY MR. MILLER)** Mr. Bridges, for these 2019 elections,
8 what kind of equipment do you intend to utilize?

9 **A.** Currently we're planning to use the system that we have,
10 which is the DREs for the voting -- for early voting and for
11 in-person voting in the polls. And we will use the optical
12 scan equipment that we have for the absentee by mail and
13 provisional.

14 **Q.** And how many pieces of that equipment do you have?

15 **A.** I have 663 DRE systems. I have eight optical scan units.
16 And I have two ballot-on-demand printers that we use for
17 printing the absentee provisional ballots.

18 **Q.** How do you store that equipment at your location?

19 **A.** Well, we have a warehouse that we're co-located with.
20 We're fortunate we're in an old Air National Guard building,
21 which is an extremely durable building. And within that
22 facility, we have a completely encased and controlled facility
23 that is -- it is a building that is out of a building,
24 so-to-speak.

25 **Q.** Can you describe a little bit that warehouse security,

1 things like that?

2 **A.** What we have is an old maintenance bay from an Air
3 National Guard facility with ten-inch thick concrete solid
4 walls, concrete roof. We have -- because we're weather prone,
5 we have storm-rated windows. We also have a lot of security on
6 the building.

7 **Q.** Can you describe your past experience utilizing DREs for
8 elections?

9 **A.** Well, actually the DRE systems have worked extremely well
10 over the years we have had it. Since I've been with the
11 county, the DRE equipment we have has been used for 52
12 elections and 50 under my tenure. And in all of the elections
13 we've had, we've had the one or two voters who touch something
14 and, you know, had to retouch it.

15 But we have never had a case where a machine malfunctioned
16 and lost any votes or anything at the end of the election where
17 it brought the election into question.

18 We did have an issue one time during a recount, not with
19 the DREs. But actually during a recount, we had a variance of
20 one vote in the recount. And it came from the hand-marked
21 absentee ballots. We lost a vote. Not a ballot. But one of
22 the votes didn't scan the same way the second time.

23 **Q.** You mentioned with respect to your building and facility
24 and things like that. Are you aware of the Department of
25 Homeland Security's offer for assessment to localities?

1 **A.** Yes, sir, I am. We have -- we have actually had a
2 physical site inspection, both on our infrastructure and on our
3 facilities. And they came down twice and inspected our
4 facility and issued a report to us.

5 And we got an extremely favorable report. I think they
6 only identified one item that they would like us to do. And it
7 was exterior to the facility. And that item is under -- it has
8 actually been budgeted for this year.

9 **Q.** I notice you're describing in vague and careful terms
10 item. Is there a reason you are using that kind of
11 terminology?

12 **A.** Well, the Department of Homeland Security has declared
13 that election infrastructure is critical infrastructure. So
14 basically I have the only two copies of the report locked in my
15 safe. No electronic copies. And they basically say you don't
16 share this with anybody except on a need-to-know basis.

17 **MR. KNAPP:** I have an objection. First of all, he is
18 talking about a report that is not attached to his declaration,
19 and so it is not covered in his declaration. So it is a
20 surprise to what he is saying. He is also testifying about a
21 document that is locked away that is not here today.

22 **MR. MILLER:** Your Honor, with respect to the first
23 matter, we're talking about a fact witness as opposed to an
24 expert witness. I think the delineation the plaintiffs were
25 referring to was an expert witness declaration being somewhat

1 akin to an expert's report.

2 Nonetheless, with respect to the second issue,
3 Mr. Bridges is not talking about the contents of that document.
4 He's talking about the existence of a document. If plaintiffs
5 don't want to admit and don't want to ask questions about the
6 security measures in Chatham County, that is perfectly fine.
7 We'll move on.

8 MR. KNAPP: He was testifying as to what the security
9 report said. That is what I object to.

10 THE COURT: Well, I think he can't testify about what
11 it says unless you produce it.

12 MR. MILLER: Frankly, Your Honor, we would be happy
13 to produce it. But the reality is of the classified nature of
14 it. So I will move on.

15 THE COURT: So when was the report though?

16 THE WITNESS: About ten months ago.

17 **Q. (BY MR. MILLER)** Mr. Bridges, are you familiar with the
18 relief plaintiffs in this case are requesting for the 2019
19 elections?

20 **A.** I believe that what they are looking to do is to move to
21 hand-marked paper ballots as the election system or possibly
22 moving to a -- either with current technology or different
23 technology, if I recall.

24 **Q.** And let's talk about the scenario of a different
25 technology, of replacing all of the equipment. What would that

1 require in order for you to conduct the 2019 elections as
2 scheduled?

3 **A.** Well, first off, I would have to determine what type of
4 system to purchase. If it was not predisposed, then I would
5 have to do some investigation to determine what to buy. I
6 would then have to determine the quantity of equipment that
7 would be necessary to conduct the election and seek funding.
8 And I don't believe I have funding that would cover any of this
9 at this point.

10 Then we would have to go through actually placing an order
11 with a vendor and having equipment made and delivered and then
12 learning how to use it and training the staff. And it is not
13 only training us, but we have to train our poll workers who are
14 used to our current voting system at this point.

15 And, secondarily, you have to do voter education on
16 something like this. You can't just throw this out and have
17 the voters walk in the poll.

18 **Q.** And if you were required to implement an entirely new
19 system, are you aware of what kind of procurement would be
20 required for optical scanners and ballot marking devices?

21 **A.** Well, something of this nature, if we were replacing
22 everything we had and we had to do this, I would have to
23 involve our county's purchasing department. They would have to
24 go through a bid process. Because you would be talking about
25 significant expenditure here.

1 Q. And with respect to the procurement process that I think
2 you were referring to and just gathering the equipment, can you
3 speak to any of that?

4 A. Well, if we're talking replacing -- if we're talking
5 acquiring the same kind of equipment we have, it would just be
6 sourcing -- finding it available and then determining the
7 funding.

8 Q. For now for the whole enchilada?

9 A. For the whole enchilada, we're talking the new meal deal.

10 THE COURT: I'm sorry. I'm not sure what is
11 encompassed in the whole enchilada here.

12 MR. MILLER: I apologize, Your Honor. It was my
13 attempt to not lead the witness.

14 THE COURT: That is fine.

15 Q. (BY MR. MILLER) Mr. Bridges, with respect to this
16 scenario, we're talking about replacement of new optical
17 scanners of a different kind.

18 A. Okay.

19 Q. And of new ballot marking devices of one in each precinct.

20 A. Okay.

21 Q. And a new GEMS replacement.

22 A. Well, that would be a fairly significant thing. One, if
23 we were to go with a -- presumably, we would be going with
24 hand-marked paper ballots scanned in polling places. We would
25 have to acquire sufficient scanners -- we would have to

1 determine, first, which ones to get and acquire sufficient
2 scanners and the appropriate security boxes to go with those.
3 Because of privacy, you have to get a privacy station for each
4 voter to stand at in a poll.

5 So today when we project the number of machines we have --
6 for example, each DRE is a privacy station in and of itself.
7 But we would have to provide a place the voter could stand --
8 put their ballot, stand and mark and have room. So it would be
9 essentially equivalent to replacing the DRE with a privacy
10 stand.

11 You would have to have scanners sufficient to handle
12 whatever was in the poll. Since we have 90 polling places, I
13 would have to have a minimum of 90 scanning devices just for
14 the polls.

15 THE COURT: Aren't you going to have scanning devices
16 to accompany the ballot marking devices planned as well?

17 THE WITNESS: Yes, Your Honor. So I mean -- but that
18 is what I'm talking about. We would have to have a scanner
19 just to scan the hand-marked paper ballots. And if we were
20 going with the new, then we would have to have a ballot marking
21 station to provide for the ADA facilities that they offer. So
22 there would be the two of those. The privacy stations that
23 would go with that.

24 We would have to -- early voting would have to be
25 equipped similarly. So the registrar's office is going to

1 operate six early voting sites. We would have to acquire the
2 same type of equipment for each of those.

3 And if it was on par with what we have, we're talking
4 purchasing somewhere north of 600 privacy stations to replace
5 the DREs. And we would be talking somewhere around 120 or 130
6 scanning devices. Then there would be 90 -- the six locations.
7 It would be at least 100 ballot marking devices. So we would
8 have those.

9 We operate -- we have a field force of 11 people that
10 are on the street backing up our election on election day.
11 They carry spare equipment.

12 THE COURT: They what?

13 THE WITNESS: They carry spare equipment. We cannot
14 operate with one device in a polling place on election day, for
15 fear if it fails. If I have one scanner in a poll and it fails
16 and there is nothing to replace it, then I have to have
17 something nearby to put in its place.

18 So most of the equipment we have today, we put no
19 less than two of everything in a polling place. And we have
20 backup equipment out on the street. So we would have to have
21 sufficient spare equipment to back up the equipment. Because
22 if the scanner quits working, the voters can't cast their
23 ballots.

24 THE COURT: But that's also -- if you have a new
25 system with a ballot marking system, you'll have the same

1 issue?

2 THE WITNESS: Yes. So that is what I'm saying.
3 Factoring all that in, we're talking 130, 140 devices we would
4 have to purchase at minimum just to open the door to process
5 those ballots. And it would be at least 100 ballot marking
6 devices, the same thing.

7 We would also have to look at the back office side of
8 this for processing the absentees and provisionals that we do
9 post election. Having central office equipment to use scanners
10 similar to those in the polls -- higher speed scanners to
11 handle that process. And then there would be the tabulation
12 system, which is akin to the GEMS system that we use today.

13 **Q. (BY MR. MILLER)** To the point of Your Honor's question,
14 what is your understanding of who is paying for the new system
15 coming by state law?

16 **A.** The one that is under the proposed system the state is
17 paying for. But if we're done outside of the state system,
18 then we don't know. Obviously we would look to the state. But
19 we might have to look to the county governing authority.

20 **Q.** You came up with some estimates as to the potential cost
21 of the system; is that correct?

22 **A.** Yes, sir.

23 **Q.** And how did you estimate these numbers?

24 **A.** I had been looking at some information from one of the
25 Brennan Center reports on the average cost of the scanning

1 device, ballot marking, and each run in the 5- to 6000-dollar
2 ranges.

3 And projecting the numbers that I was kind of using
4 earlier, we would be looking at probably \$900,000 minimum to
5 implement this kind of system in our county at this point.

6 **Q.** Just rough back-of-the-napkin math?

7 **A.** Yes.

8 **Q.** Could you lower that number by utilizing central scanning?

9 **A.** We could. I think it is a dangerous precedent though.

10 **Q.** And why is that?

11 **A.** Well, we have experience with hand-marked paper ballots
12 today because absentees are hand marked. We experience about a
13 four percent error rate on hand-marked ballots. Voters change
14 their mind. They don't read the instructions on the ballot
15 that says fill in the oval. They make checkmarks. They do Xs.
16 They make a mark. Then they say, you know, that is not what I
17 want. They draw an X through it. They go down and mark the
18 one below. They draw a little arrow and say, use this one.
19 The machines don't read that real well. Sometimes they just
20 mark two circles.

21 So if you are doing scanning in a poll, it is going to be
22 caught in the poll while the voter is standing there because
23 the voter is going to be feeding the ballot to the machine. If
24 you bring that to the central office, then that problem is
25 going to come back to the central office post election. The

1 voter has gone home. They cast their ballot. They are happy.

2 The folks in the central office -- now all of a sudden if
3 you have -- where like last November, we processed 10,000
4 absentee ballots. We had to hand duplicate 400 of those due to
5 mismarkings or whatever. So we also cast 100,000 ballots in
6 the polls last year.

7 So if I had four percent of that, I would have 4000
8 hand-marked paper ballots that we would have to possibly
9 duplicate using that same error rate. And at ten minutes a
10 ballot, that is a lot of time.

11 **Q.** How does that duplication process work?

12 **A.** During the process when we are processing the ballots --
13 I'll use the absentee process because that is where we're
14 currently handling them. We will attempt to -- unless a ballot
15 is, you know, visibly damaged or mismarked or whatever, we will
16 attempt to scan it. And if it scans, we will process it. Of
17 course, that's directly from the voter's intent.

18 If it will not scan, then we have two people review that
19 ballot and determine the intent. Then we have two additional
20 people who actually do the duplication. And then it comes back
21 to a review panel of two.

22 If at any point during that process we have a problem like
23 they really can't tell which mark is which or what the intent
24 is, then we have a committee -- I have an elected board. So we
25 will get one of the Republicans, one of the Democrats, and our

1 chairman. And they will vote a vote review panel and actually
2 look at it and vote to make a choice. And there being three of
3 them, the tie will be broken at that point. Then the staff
4 will take that direction and continue duplicating that ballot.

5 **Q.** Let's talk about the other scenario you were -- we were
6 referring to earlier where you are continuing to use the
7 optical scanners that you currently use for absentee voting.

8 What would that require to implement?

9 **A.** Well, there again, we don't have but eight scanners. So
10 we would have to acquire sufficient scanners again for the 90
11 voting locations. And that we have -- those scanners because
12 they are older technology, they cannot handle -- one scanner
13 can't hold all of the ballots that we have. So in the poll,
14 that is not a problem, you know, because the ballot -- you
15 know, the ballot scanner can handle what is in the poll --

16 THE COURT: Because what?

17 THE WITNESS: The ballot scanners that we have today,
18 Your Honor, are older. They are probably about 25-year-old
19 technology at this point. They can only handle about 15 to 20
20 ballot styles, and the ballot style really is like what
21 jurisdictions fall within a precinct.

22 Since we have 90 precincts and we have enough
23 jurisdictions, we have about 150 variations that can fall. So
24 when we process an absentee, we have to break the ballots down
25 by which precinct they come from into groups.

1 So early voting, for example, if it were to use the
2 current technology, each early voting site would have to have
3 five ballot scanners. Because right now it takes five minutes
4 to process our ballots. So when a voter finished marking it,
5 they would then have to go over and be sent to a certain
6 machine to scan the ballot.

7 So I think when I was projecting, we would have to
8 get about 140 of those.

9 **Q. (BY MR. MILLER)** Just due to the nature of the technology
10 of those?

11 **A.** Yes.

12 THE COURT: Because they are out of date and don't
13 accommodate the sizes?

14 THE WITNESS: They are older than the DREs are. They
15 were actually the first equipment that -- the DRE system we
16 have today, they were -- the ballot scanners were actually the
17 first equipment that company fielded. They followed it later
18 with the DRE.

19 THE COURT: '98, 2000?

20 THE WITNESS: I know that several counties had them
21 in production, service in 1998.

22 **Q. (BY MR. MILLER)** Just to clarify, when you said ballot
23 identification, that would be similar to the ballot
24 combination, the number that brings --

25 **A.** Right. Right. The combination -- the ballot combination

1 makes a ballot unique for a voter.

2 **Q.** And what about the cost of printing? Have you considered
3 that?

4 **A.** Yes. I used to actually preprint the absentee and
5 provisional ballots for the elections. And in great volume, we
6 could print them for about 40 cents a ballot. With the system
7 that we got to save money, it actually costs about 50 cents a
8 ballot to print. But it is not designed for the high volume
9 that would be encountered in this.

10 If we were to -- you know, there is a state statute that
11 says a superintendent will provide sufficient ballots. It just
12 doesn't say what sufficient means. It means if you happen to
13 be one short, you've missed the mark.

14 So we would have to actually project the number of
15 potential votes or potential electors that are going to show up
16 in the election. Preprint and distribute that number of
17 ballots to the polls with the current technology that we have.

18 And, you know, for an election like we have, if we
19 projected 50 percent election, we would have to distribute well
20 over 100,000 ballots to the street. Plus we would have ballots
21 that would be distributed to the early voting.

22 So we would probably have to print somewhere in the
23 neighborhood of 150- to 175,000 ballots at 50 cents apiece. It
24 would be well over \$100,000 expense just to print those
25 ballots. For example, today I only pay \$185,000 to run an

1 election today.

2 **Q.** I'm sorry. I didn't catch that.

3 **A.** An average election right now runs \$185,000.

4 **Q.** Okay. And --

5 THE COURT: Could I just get back to the scanner for
6 a second though.

7 You are saying that they have different page sizes?
8 I'm trying to understand why you have to have five different
9 types of scanners.

10 THE WITNESS: No, Your Honor. Consider like we have
11 eight commission districts, eight school districts, and those
12 things. When all of those things lay together, where each
13 district coincides, it creates a thing called a ballot
14 combination and that makes that ballot unique. So you, for
15 example, will have this house, this senate --

16 THE COURT: I understand the unique ballot.

17 THE WITNESS: So what happens is because of the
18 number of jurisdictions we have and the number of voting
19 precincts, we have 146 variations within that. And the ballot
20 scanners that we have can only handle so many. It can't handle
21 all of those. So one scanner can't handle every ballot we have
22 because they are their precinct ID and they have all the
23 various other things to go with them.

24 **Q.** (BY MR. MILLER) Mr. Bridges --

25 THE COURT: I'm not clear. But maybe you can

1 clarify.

2 MR. MILLER: I think I can help a little bit.

3 **Q. (BY MR. MILLER)** Does that have to do with kind of the
4 memory of the optical scanners what -- how many different
5 ballot combinations one optical scanner can read?

6 **A.** That is correct. Yes.

7 **Q.** So when you have -- I apologize -- 100 -- how many ballot
8 combos?

9 **A.** Last time I looked, it was 146.

10 **Q.** 146 ballot combinations. And your scanners can handle how
11 many different types?

12 **A.** 30 maybe.

13 **Q.** 30. So each of those, you have got to be able to fit into
14 the memory --

15 **A.** -- of that scanner.

16 **Q.** So that reads the ballot. So in other words --

17 MR. MILLER: And I apologize. I'm leading at this
18 point. I'm trying to help clarify.

19 THE COURT: That's all right.

20 **Q. (BY MR. MILLER)** So at that point it is the scanning again
21 so that the scanner will recognize the ballot combination
22 number?

23 **A.** That's correct. I mean, each ballot has a unique
24 signature on the bottom identifying what kind of ballot it is.
25 So we group them by a precinct range. So this scanner takes

1 precincts in this range. The next one takes the next. And
2 then so if you put it in the wrong scanner, the scanner just
3 doesn't recognize it. It rejects it.

4 THE COURT: So it really isn't a scanner as we know a
5 scanner in our current modern era. Because if I put it -- it
6 doesn't matter what I put into a scanner myself. It is going
7 to scan it and be able to produce a copy?

8 THE WITNESS: Well, that would be correct, Your
9 Honor. The newer technology certainly takes -- you know,
10 covers those hurdles.

11 **Q. (BY MR. MILLER)** All this is the memory -- all this is
12 because the scanner is tabulating and counting the ballots
13 inside of it?

14 **A.** That's correct. It is storing the marks that are on the
15 ballot that pass through it as having to identify the various
16 buckets to store those counts in.

17 THE COURT: All right.

18 MR. MILLER: I apologize for --

19 THE COURT: That's all right. Thank you for moving
20 things forward because I would have kept on going.

21 **Q. (BY MR. MILLER)** Mr. Bridges, you looked at cost estimates
22 and what you are expecting. Do you have money in your budget
23 for these?

24 **A.** No, I don't. In fact, my new budget just went into effect
25 July 1st. And my budget this year is \$1,073,000. And I didn't

1 get everything I asked for in this budget. And, you know, if
2 we're looking at like -- for example, if we went with the
3 BMD-type system, it is about \$900,000. Or if we were looking
4 at, you know, acquiring current technology equipment, we are
5 probably looking at half-a-million-dollar expenditures, neither
6 of which I have the money for.

7 **Q.** And let's talk about the timeline for this proposed new
8 system. When does early voting begin?

9 **A.** Early voting I believe starts October 15th this year.

10 **Q.** And, of course, training and all that prior to that?

11 **A.** Our training classes start September 8th.

12 **Q.** Okay. And, presumably, you would need to be prepared in
13 advance of that start date because of your general obligations
14 and your support obligations for the board of registrars?

15 **A.** Well, certainly we need to -- we have to be prepared with
16 the equipment the week prior to early voting starting so the
17 registrar can equip their sites because they have to do
18 their -- the due diligence work they get when they receive the
19 equipment from us.

20 We have to have the ballots printed. And if we were to
21 make a change, we would also need to know what that change is
22 in time to develop any new procedures or processes. And to
23 train our poll workers, which would mean essentially we would
24 have to make decisions in the next three to four weeks and
25 prepare training material for something that we don't even know

1 how to use yet possibly.

2 **Q.** With respect to the totality of those issues and the
3 budget considerations and what you mentioned you have, would
4 you need to consult with your board on this?

5 **A.** I certainly would have to -- these are decisions that I
6 have to deal with. But I do answer to a board, and they are
7 the final authority.

8 **Q.** In your experience, does this transition right now seem
9 doable?

10 **A.** You want my opinion?

11 **Q.** In your past experience.

12 **A.** In my past experience, I actually was in the computer
13 business for a number of years prior to getting into this
14 field. And I dealt with --

15 MR. KNAPP: Your Honor, I believe this is outside the
16 scope of his declaration. He spoke to the cost of the
17 transition. But he did not talk about whether it was possible
18 or not possible. So I object to this line of questioning.

19 THE COURT: Well, I'll allow him to testify based on
20 his experience. But we haven't heard about computer
21 experience. If he wants to testify because I think it is
22 consistent with this about just simply based on your experience
23 as a supervisor -- you know, he is not an expert witness. But
24 he -- it is his lay opinion. That is all right.

25 MR. MILLER: Respectfully, I did not intend to ask

1 for an expert opinion.

2 **Q.** (BY MR. MILLER) You have your declaration with you;
3 correct?

4 **A.** Yes.

5 **Q.** Could you turn to Paragraph 18.

6 **A.** Paragraph 18.

7 **Q.** So I think could you speak to some of the issues you
8 raised in Paragraph 18.

9 **A.** Well, I think in Paragraph 18 I pointed out that basically
10 if we were to make a change right now we have about 40 working
11 days in which to essentially design, determine, get quotes,
12 fund, order, receive, implement, learn how to use it. That is
13 not really a lot of time.

14 You know, these all have to -- for us to properly train
15 our staff, we would have to do all of these things in the next,
16 say, 20 working days just to be able to train our staff.

17 And something that I didn't put in here is when you make
18 these kind of changes it affects your staffing. Most people
19 are aware poll workers are generally more older people. They
20 don't take well to changes. Generally when we make these kind
21 of changes, we lose people. So we would probably have an
22 exodus of some degree.

23 But addressing this, I think -- I don't think there's
24 really adequate time to properly plan something of this
25 magnitude and go through all the necessary steps and implement

1 in time for this election.

2 **Q.** And what about the City of Savannah, as one of our larger
3 cities in the state? Can you talk at all about what they would
4 be looking at if Chatham were not running their election?

5 **A.** They have no experience in conducting an election
6 historically. I don't believe they -- in the years that
7 anybody that is working there or our time, there is nobody
8 that's ever conducted an election. The county has conducted
9 their elections throughout time.

10 So they don't have anybody -- they don't have the
11 knowledge. They don't have the equipment. So if we were to
12 look at a change like this and maybe offer to let them run
13 their own election, they really have nowhere to start. They
14 would have even less time than we would because, you know, the
15 election is coming to them. They are going to qualify in just
16 two weeks.

17 MR. MILLER: That is all the questions I have, Your
18 Honor.

19 CROSS-EXAMINATION

20 BY MR. KNAPP:

21 **Q.** Mr. Bridges, Halsey Knapp. How are you?

22 **A.** I'm fine, sir. How are you doing?

23 **Q.** I'm good. I hope we can get you out of here quickly so
24 you can get back on 16. I know you are looking forward to it.

25 **A.** I'm looking forward to Atlanta's rush hour and four hours

1 beyond it.

2 THE COURT: Don't worry. You are not going to get
3 into the rush hour the way we are going.

4 **Q. (BY MR. KNAPP)** There is always Macon in between.

5 **A.** This is true.

6 **Q.** Okay. Let's talk a little bit about the November 2018
7 election. You used eight scanners to handle 10,000 mail-in
8 absentee ballots; is that correct?

9 **A.** That is correct.

10 **Q.** How many styles did those scanners handle in counting
11 those 10,000 mail-in ballots?

12 **A.** Well, the eight scanners -- we only use five at a time in
13 production because the purpose of the scanners that we have are
14 to process either the mail ballots absentee or the provisional
15 ballots. We use the same scanners for each. We just change
16 out the programming in it to support which ballot style it is.
17 But it takes us five scanners to process the ballots from our
18 90 polling places.

19 **Q.** I understand that. My question is: How many different
20 styles were they processed to handle in the November 2018
21 election?

22 **A.** The same number I said earlier. Each one handles about 30
23 styles. So the ballots are divided up across the machines so
24 that they each get around 30.

25 **Q.** So in the forthcoming November 2019 election, if you use

1 centralized counting of your scanners, they could handle all
2 the ballot styles, couldn't they?

3 **A.** Certainly.

4 **Q.** Okay. Now, are there any elections in September of 2019?

5 **A.** Not currently.

6 **Q.** Okay. So the first elections you have after today are
7 November of 2019?

8 **A.** Yes, sir.

9 **Q.** And what do you expect the turnout to be? I assume it is
10 part of your responsibilities to make some type of
11 prognostication of what the turnout is going to be.

12 **A.** We project the city elections to probably run about
13 50 percent turnout.

14 **Q.** 50 percent turnout. And what would that be in absolute
15 number of votes?

16 **A.** Since we're running -- actually we're running a full
17 county election at this time. So we'll probably be seeing 60-
18 to 70,000 minimum ballots cast in this.

19 **Q.** And, certainly, that is going to be less than the 100,000
20 you saw a year ago?

21 **A.** That is correct.

22 **Q.** Okay. Now, you said you grew up in Savannah?

23 **A.** Yes, sir.

24 **Q.** So you voted in Savannah all your life?

25 **A.** I did.

1 Q. Do you remember the punch card ballots?

2 A. Vaguely.

3 Q. The machines that you had to run the handle down and punch
4 them down?

5 A. I remember the machines. I remember those.

6 Q. Do you recall that in the year 2000 Chatham County elected
7 to use paper ballots?

8 A. I'm aware of that.

9 Q. You are aware that you didn't talk about that in your
10 declaration, did you?

11 A. Well, I wasn't working there at that time.

12 Q. You were voting though, weren't you?

13 A. Yes, sir.

14 Q. Okay. And for the year 2000, Chatham County had to train
15 its staff how to handle hand-marked paper ballots; correct?

16 A. Yes, sir.

17 Q. And they had to train their poll workers to handle them;
18 correct?

19 A. Yes, sir.

20 Q. And they had to educate the public on how to vote on a
21 hand-marked paper ballot; correct?

22 A. Yes, sir.

23 Q. And the Chatham County Board elected to do it a second
24 year in 2001; is that correct?

25 A. Well, again, I wasn't there then. So when they started

1 and when they finished, this is speculation on my part. I do
2 recall voting on the system when I was there.

3 **Q.** You recall voting more than one year on that system?

4 **A.** Yes, sir.

5 MR. MILLER: Objection, Your Honor. I think
6 Mr. Knapp raised the issue of going outside the declaration. I
7 guess he is taking a different stance on it now.

8 THE COURT: Well, he is trying to cross-examine him.
9 And obviously I didn't confine you to the declaration.

10 MR. MILLER: I understand. But in fairness --

11 THE COURT: I did not confine you to the declaration.
12 I respect the difference between that and the expert
13 declaration. I just didn't want him to opine about an area of
14 expertise we hadn't gone into.

15 **Q. (BY MR. KNAPP)** So, again, the Chatham County Board of
16 Elections bipartisan elected to have a second year of paper
17 ballots in 2001, didn't they?

18 **A.** Well, I believe that when they put the system in -- and I
19 don't know exactly which year that was -- they used it for two
20 or three years running.

21 **Q.** Okay.

22 **A.** And I believe the system was replaced by the current DRE
23 system.

24 **Q.** And that is because you understand that the Secretary of
25 State dictated that DRE machines had to be used in statewide

1 elections beginning in the year 2003?

2 **A.** That's current state law.

3 **Q.** Okay. Now, in your -- do you have any recollection of
4 there being any allegations that ballot boxes were thrown in
5 lakes or rivers when these paper ballots were the system used
6 in Chatham County?

7 **A.** I have no idea what you are talking about.

8 **Q.** Okay. Do you have any knowledge that the insiders were
9 intercepting ballots or being intercepted on the way to a
10 centralized tabulation center and therefore altered in some
11 way?

12 **A.** I give you the same answer.

13 **Q.** Were any ballots lost when the hand-marked ballot system
14 was used to your knowledge?

15 **A.** Again, I have no knowledge. I was a voter then. I was
16 not an election official.

17 **Q.** You were paying attention though, weren't you?

18 **A.** Not that close attention.

19 **Q.** You think if a scandal came up where someone took a ballot
20 box and it was found in the river that would have passed you
21 by?

22 **A.** I might have heard that.

23 MR. MILLER: Your Honor, at this point, I'm going to
24 object again as asking about speculation of hypotheticals that,
25 frankly, he hasn't laid any sort of foundation to what his

1 knowledge would be on. He already said --

2 THE COURT: He is a citizen. He is a voter. And I
3 think he has made his point, and we should move on now.

4 **Q. (BY MR. KNAPP)** In the machines that you have, those eight
5 machines, are they legacy machines that remain from the days
6 when paper ballots were being used countywide?

7 **A.** The machines we currently have were actually provided as
8 part of the statewide system. Although they are the same style
9 of machines that the county used prior.

10 **Q.** Are those AccuVote scanners?

11 **A.** AccuVote-OS.

12 **Q.** Now, to this day, you are using scanners to count these
13 mail-in absentee ballots; correct?

14 **A.** That's correct.

15 **Q.** So your staff is trained on how to handle that?

16 **A.** Yes, they are.

17 **Q.** And if there was a training effort that needed to be made,
18 your staff would then train the poll managers on how to handle
19 them; is that correct?

20 **A.** I don't think your question is really -- is really a fair
21 question because they are not parallel. We do not -- my office
22 does not process a voter. My office handles the ballots that
23 come in from the mail, which are processed by the registrar's
24 office. We receive those. We balance those to the registrar.
25 We process those.

1 I have a staff that is capable of opening those, going
2 through those, scanning those. But as far as like the process
3 and procedure within a poll, we don't have anybody who has
4 experience with that right now.

5 **Q.** Okay. Now, how -- again, how are the mail-in ballots
6 handled?

7 **A.** The registrar is responsible for issuing and receiving
8 absentee by mail ballots.

9 **Q.** And how do they handle them?

10 **A.** You might have to address that question to them. I don't
11 do -- I don't do their operation.

12 **Q.** You don't know how the registrar handles and tabulates the
13 mail-in ballots?

14 **MR. MILLER:** Objection, Your Honor. We covered this
15 on direct. Savannah has separate Board of Elections and Board
16 of Registrars. The Board of Registrars handles absentee
17 mail-in ballots. Mr. Bridges does not have that personal
18 knowledge as to the absentee mail-in ballots. And he has also
19 answered this same question.

20 **MR. KNAPP:** He can answer it one way or the other.

21 **THE COURT:** Well -- all right. Is that -- your
22 counsel summarized what he believed your testimony was, which
23 may or may not be so. But I might have missed something.

24 Was that a correct summary what you just heard from
25 this corner of the room from Mr. Miller, or have I missed

1 something?

2 THE WITNESS: Well, I was going to try to answer his
3 question.

4 THE COURT: Go ahead.

5 THE WITNESS: We tabulate the ballots. That is the
6 function. The board of elections as an election superintendent
7 is responsible for counting the votes. We tabulate the
8 election. That is done after 7:00 P.M. on election day.

9 The registrar -- you're a voter. You contact your
10 registrar. You say, I need an absentee ballot. They go
11 through a process internally. It is a very well-defined
12 process that they go through. They issue you a ballot. They
13 mail it to you. You fill it out. You mark it. You put it in
14 an envelope, and you mail it back. They go through a process
15 to receive a count that it has been returned.

16 On election day, they then transfer all of those to
17 us with a list saying these ballots are here. We then have a
18 team of people who count envelopes. We have got to make sure
19 we have got the right number of envelopes. We don't open them
20 up until we know we have the right number.

21 Then we remove the contents. At each stage, we
22 rebalance what we have until we get to the actual ballot
23 itself. And then once we get to the actual ballot, we then
24 segregate the ballots into the various groups they have to go
25 through for scanning purposes.

1 And if at any point a ballot falls out of that
2 process, then it goes through the adjudication team, which is
3 where duplication and those processes are done. We tabulate
4 those. We don't issue. We don't receive. We don't -- we do
5 not have people who are trained to in the polls at this stage
6 of the game or on my staff people who have worked with the
7 actual in the poll handing out the paper ballots.

8 **Q. (BY MR. KNAPP)** I was speaking about the tabulation of the
9 votes on the evening of the election.

10 **A.** That is our responsibility.

11 **Q.** That is your responsibility, isn't it?

12 **A.** I just --

13 **Q.** It is handled by your staff; is that correct?

14 **A.** Correct.

15 **Q.** That is what I was trying to get at. So they are trained
16 in actual tabulation of paper ballots; correct?

17 **A.** That's correct.

18 **Q.** Okay. Now, you talked a little bit about the four percent
19 error rate that you have with people filling out paper ballots.

20 Is that a subject that can be addressed with voter
21 education?

22 **A.** Well, certainly. But, you know, you have instructions on
23 the ballot, the ballot that is handed to you as a voter. It
24 says fill in the oval. But people still do checkmarks and Xs
25 and circles and other things.

1 It says, you know, vote for the candidates. If you have a
2 write-in, write the name. We have had people actually write
3 every candidates' name on the write-in line on a ballot.
4 People do -- I don't care how well you have advised them. They
5 do different things.

6 **Q.** Of course, on a mail-in ballot, you are not there when
7 they are filling out the ballot; correct?

8 **A.** Correct.

9 **Q.** So maybe the error rate you refer to might be different if
10 they are filling that out in a polling place; is that correct?

11 MR. MILLER: Objection. Calls for speculation. He
12 just testified that he hasn't done this before at a typical
13 time. He doesn't know the difference.

14 MR. KNAPP: They did it in 2000 to 2002.

15 MR. MILLER: When he was not elections director.

16 THE COURT: All right. Sustained.

17 MR. KNAPP: I'm sorry. What was the ruling, Your
18 Honor?

19 THE COURT: Sustained. I sustained the objection.

20 MR. KNAPP: Thank you. I'll move on.

21 **Q. (BY MR. KNAPP)** Now, have you actually gone out into the
22 marketplace to look at what it would cost to purchase 120 or
23 130 scanners?

24 **A.** No, not yet I have not. I mean, I have -- I'm aware of
25 what the market costs are having seen it in the Brennan report.

1 And, you know, I'm aware of some of the equipment offerings
2 that we have had the privilege to see.

3 **Q.** Do you know Ms. Duran at the Morgan County Board of
4 Elections?

5 **A.** I believe I have met her.

6 **Q.** Okay. She testified that you could purchase scanners --
7 AccuVote optical scanners and a secure ballot box for roughly
8 \$1300 apiece.

9 Are you aware that there's locations that you can get
10 those scanners for \$1300 and a ballot box?

11 **A.** No. But how much time do you want me to take looking for
12 these little pockets of equipment?

13 **Q.** Well, the difference between -- you used an estimate of
14 \$5000 a scanning unit; correct?

15 **A.** Right.

16 **Q.** So the difference between 1300 and 5000 is \$370 {sic} or
17 approximately 60 percent difference in your estimate and cost;
18 correct?

19 **A.** 1300 versus 5000 is about three to one.

20 **Q.** Yeah. Three to one. If, in fact, it is true that the
21 purchase price of an AccuVote optical scanner and ballot box is
22 \$1300, you have overstated by two-thirds the cost of
23 implementing a paper ballot system in terms of the scanners;
24 correct?

25 **A.** Based on what you just asked me, yes.

1 Q. Now, in your calculation, did you take into account that
2 if you are using paper ballots that you won't have someone to
3 prepare the DRE machines because DRE machines won't be being
4 used? You didn't make an offset for that savings, did you?

5 A. No, sir. But there is a cost for preparing those also.

6 MR. KNAPP: That's all I have, Your Honor.

7 CROSS-EXAMINATION

8 BY MR. POWERS:

9 Q. Good afternoon, Mr. Bridges. John Powers representing the
10 Coalition plaintiffs.

11 A. Good afternoon, Mr. Powers.

12 Q. I would like to make sure I had a couple of things
13 straight from your testimony earlier. First, let's talk about
14 the optical scanner.

15 In your declaration, you state that the scanner that you
16 use is the AccuVote-OS 1.94W?

17 A. Well, I actually didn't use the 1.94W. We do have the
18 AccuVote-OS, and I believe that is the correct revision.

19 Q. And is it your testimony today that the maximum number of
20 ballot styles that the OS 1.94W can handle is somewhere between
21 15 and 20?

22 A. I think it is somewhere between 15 and 30. I don't know
23 the exact complexity. But, you know, it varies within that
24 range.

25 Q. And, Mr. Bridges, you testified earlier that you

1 anticipate turnout in November might be about 50 percent?

2 **A.** Well, we project 50 percent because if you underproject,
3 especially if you're preprinting ballots, then you are
4 underprepared. And if you don't have enough ballots, then you
5 have a real problem.

6 **Q.** Mr. Bridges, was turnout in the November 2015 election
7 approximately 35 percent in Chatham County?

8 **A.** I would have to take your guess. I didn't look at the
9 number before I came here.

10 **Q.** Do you know if the turnout in Chatham County November 2017
11 election was 25 percent?

12 **A.** Again, I didn't -- I haven't looked at that today. I
13 mean, I -- I may have provided that information to somebody at
14 your group the other day. But, you know, I don't remember
15 numbers off the top of my head.

16 **Q.** And in coming up with the 50 percent figure, did you look
17 at --

18 **A.** I looked at the election results. The information I
19 provided to your personnel today was from looking at election
20 result reports.

21 I do need to point out 2017 was the smallest election year
22 we have. It is the two smaller cities. Savannah is not part
23 of that. Typically it is not a very big turnout election.

24 **Q.** Mr. Bridges, are there -- you mentioned there are 90
25 precincts?

1 **A.** Yes.

2 **Q.** And is it your testimony that you don't think every single
3 polling place needs a backup optical scanner, do you?

4 **A.** A backup scanner? If I were to deploy the AccuVote-OS, I
5 would probably want a backup scanner because they are not as
6 reliable as is new technology.

7 **Q.** Mr. Bridges, you didn't say that in your declaration, did
8 you?

9 **A.** No, I did not.

10 **Q.** Mr. Bridges, could you have a secure container or
11 emergency ballot box available in the event that an optical
12 scanner had some kind of problem on election day?

13 **A.** The boxes that the scanners sit on that are secure
14 containers are pretty large. The scanner is more of the
15 concern you would have.

16 I did project -- in the numbers that I put in my
17 declaration, I projected one scanner per. I also projected the
18 number of scanners necessary to run the six early voting sites
19 that would be open. And I did cover a certain number for our
20 team that is on the street.

21 **Q.** So one optical scanner per polling place?

22 **A.** That is what I projected, yes.

23 **Q.** And --

24 **A.** But some of this was developed in a very short time frame
25 when these questions were presented. I mean, generally, when

1 you look at doing something of this nature and scope, you take
2 a little bit more time.

3 Because an election is a very serious thing. And we don't
4 really -- we don't jump into anything and doing anything
5 quickly. We make sure that we look at all aspects of it
6 because the person we affect is the voter. And the voter
7 expects a positive experience on election day. So we don't
8 like to take risks without having things.

9 And the more experience you have, the better you can plan.
10 Here, you know, we're talking about something that we don't
11 have any experience doing. And, you know, some of these are
12 rough estimates.

13 **Q.** Mr. Bridges, I would appreciate it if you would respond to
14 my question. So you said you rushed when you were coming up
15 with these calculations.

16 Do you need an opportunity to revisit?

17 **A.** No, I don't need an opportunity to revisit.

18 **Q.** And you already have a process in place to ensure the
19 secure transfer of paper provisional ballots from polling
20 places to a centralized location; correct?

21 **A.** Right. But they go in something the size of a small
22 briefcase.

23 **Q.** Couldn't you just have more containers?

24 **A.** Sure. Sure.

25 **Q.** And, Mr. Bridges, would you agree that you could also

1 employ a central count in which ballots are scanned at the
2 Board of Elections?

3 THE WITNESS: I'm getting dry. Could I get water?

4 THE COURT: It is right next to you.

5 THE WITNESS: Sorry about the squeak.

6 **A.** We could. We could.

7 Let me ask you a question. Are you talking about with the
8 current OS system, or are you talking about with new system?

9 **Q.** (BY MR. POWERS) Mr. Bridges, right now I'm talking about
10 the current OS system.

11 **A.** Okay.

12 **Q.** And just to make sure I have your testimony correct,
13 you're testifying that Chatham County could employ a central
14 count of counting paper ballots at the county boards of
15 election office? That is what you said?

16 **A.** With the current OS system, if we were to central count
17 scan, I really don't even know how to project how many scanning
18 devices we would need to have. These scanners are not fast.
19 So -- and you have to -- again, you have to segregate them
20 according to -- when we are processing 10,000 ballots, it takes
21 us probably, you know, 14 hours of processing to handle that.

22 If you magnify that -- let's say that we went to 50,000.
23 You know, it is five times that. So the equipment we have
24 would not be -- the equipment style that we currently use by
25 itself with what we have would not be adequate for central

1 count scanning.

2 And there is nothing in the current system we have that
3 would be construed as being a central count scanner -- high
4 speed scanner that can handle all styles. That would be the
5 type of thing you would want to employ if you did central count
6 scanning. You need something fast. Something that can scan
7 ballots. These are hand-fed a single ballot at a time.

8 **Q.** Mr. Bridges, is it fair to say that you would need far
9 fewer optical scanners if Chatham County employed a central
10 count?

11 **A.** I don't know if it is fair to say that. The answer I'm
12 trying to give you is I really don't have any experience with
13 trying to do central count scanning on that scale. And I don't
14 believe the equipment we have would be adequate.

15 We would have to project -- we would have to project
16 additional equipment. So we would have to have equipment for
17 that.

18 Now, I guess to answer your question it would be probably
19 less than if we had to have one in every voting precinct --

20 **Q.** Mr. Bridges, you have testified that --

21 **THE COURT:** All right. I think you can move on from
22 this. I understand your point. I understand his point.

23 **Q. (BY MR. POWERS)** Mr. Bridges, you agree that every
24 registered voter in Chatham County has the right to have their
25 vote counted correctly, even if that costs the county more

1 money?

2 THE COURT: All right. That's rhetorical. Let's
3 move on.

4 What do you need to get from him? I'm sure the
5 witness is going to say yes.

6 **Q. (BY MR. POWERS)** Mr. Bridges, is it your testimony that
7 you can conduct a reliable audit of the existing DRE machines?

8 MR. MILLER: Your Honor, objection. This is entirely
9 outside the scope of direct and outside the scope of his
10 declaration. There was no discussion about audits.

11 THE COURT: All right. Sustained.

12 MR. POWERS: No further questions.

13 EXAMINATION

14 BY THE COURT:

15 **Q.** So what was the last -- in the last election in Savannah,
16 if it was comparable, what was the turnout?

17 **A.** The election parallel to the one that we're talking about
18 for this year, it would have been four years ago. It would
19 have been the same election, and I believe the gentleman that
20 was just questioning me --

21 **Q.** Tell me the number again.

22 **A.** About like 35 percent I'm thinking.

23 **Q.** I'm just trying to understand the number of people
24 voting -- what 35 percent -- I don't know what Savannah's
25 population was offhand.

1 **A.** Savannah has probably about 105-, 110,000 registered
2 voters.

3 **Q.** About --

4 **A.** 105-, 110,000. So if they had a 35 percent turnout, there
5 would be like 35,000 voters.

6 Your Honor, the one point to bring here that really was
7 not in this declaration or testimony is we have had a
8 significant increase in population in the last four years. And
9 last year we had an amazing increase in turnout over the same
10 election four years earlier. 50 percent increase in turnout in
11 2018 versus the same election four years earlier.

12 If we experience anything like that this year, we're going
13 to have more turnout than we would anticipate. So in this
14 business, you have to project high --

15 **Q.** I'm really not trying to quibble about the -- what the
16 rate will be.

17 I mean, of course, people do turn out you would agree for
18 a statewide or a presidential election more than for a city
19 election? Isn't that your experience?

20 **A.** Yes, Your Honor. We all kind of have a rule of thumb.
21 After doing it for several election cycles, you develop a rule
22 of thumb.

23 **Q.** All right. What is the next largest city having an
24 election other than Savannah in Chatham?

25 **A.** In this year, that would be Pooler.

1 Q. It would be --

2 A. Pooler, Georgia.

3 Q. Okay. What is their population?

4 A. Pooler currently has about 28,000 people. About 18 -- I
5 think about 18,000 registered voters.

6 Q. That is P-O-O-L-E-R, right, for the reporter?

7 A. Yes, Your Honor.

8 Q. How many precincts are there in Savannah? And how many
9 precincts are there in Pooler?

10 A. I believe when I looked at that number for somebody the
11 other day Savannah has, I think, 54 voting precincts. Pooler
12 currently has three. But we're negotiating with Pooler about
13 adding two more. Likely they won't come until after this
14 election though.

15 Q. I know that there is going to be ten locations that were
16 supposed to be picked for a trial run on the new equipment that
17 the state is going to be using this fall. At least I thought
18 there were going to be.

19 Are you -- and maybe that is not -- that was my
20 understanding. Were you asked to participate in that trial?

21 A. We were not asked. And at this late date, I would be --
22 this short time frame with that magnitude, I would be worried
23 about making the transition.

24 Had they told us earlier in the year and we started
25 planning accordingly, then, you know, I would feel more

1 comfortable. But I don't know -- there are ten counties that
2 were specified. I don't know which ten they are. But I think
3 they were intended to be smaller so it is something you could
4 get your arms around a little bit easier.

5 **Q.** And what if you were to do some type of trial run in one
6 of your cities with a modified voting process?

7 **A.** The only difficulty that we would encounter is that we are
8 running two countywide referendums, which would mean we would
9 have to split the election between two different -- completely
10 different systems.

11 And, you know, at this juncture, I have never really
12 considered that. So I really can't speak to what it would take
13 to do it. I would be a little afraid of anything like that
14 that could cause problems.

15 If we weren't running a countywide election, then I think
16 it would be feasible to take one of the smaller cities and do
17 that in one of the smaller cities. But since we are running a
18 county election and we run the whole election as a county
19 election, we bring the municipalities under that umbrella for
20 this.

21 **Q.** If you received any extra assistance from the state, would
22 that make a difference?

23 **A.** I don't think we could do it if we didn't have a lot of
24 extra assistance. I mean, it would -- because, again, we would
25 be getting a system we don't know anything about at this point.

1 And we would have to be trained on it. We would have to train
2 our support staff on it. We would have to train our poll staff
3 on it.

4 And we are aware the state's going to a new system. So we
5 are already planning to do voter outreach on top of what the
6 state is going to do because the voters are not going to walk
7 in to a different system and just adapt to it. If you put it
8 out, there is going to be confusion. And when there is voter
9 confusion, if you have staff inexperienced on top of it, then
10 you have slower throughput in your polls and you have lines and
11 people are just not happy if they have to stand in line.

12 We had some lines last year. We really don't want to have
13 them again this year.

14 THE COURT: Anything else from this witness?

15 MR. MILLER: No, Your Honor.

16 MR. KNAPP: No, Your Honor.

17 THE COURT: May this witness drive home?

18 MR. KNAPP: Yes, Your Honor.

19 MR. MILLER: As long as y'all are good, yes.

20 THE COURT: All right. You are excused. Thank you
21 very much.

22 THE WITNESS: Thank you, Your Honor.

23 MR. CROSS: Your Honor, on timing, we have us at
24 about 20 minutes over. They have about two minutes to go on
25 their clock. So I'm not sure how you want to --

1 THE COURT: Well, you're all obviously barreling
2 towards being over time. I mean, they spent 40 minutes --
3 deduct -- on this witness, which was -- who was estimated at 20
4 minutes, taking my time off of it.

5 So I don't know if that is what the time frame that
6 Ms. Cole agrees or that they agree is about there. But they
7 are going to have to finish their case just like you had to
8 finish.

9 MR. CROSS: We're going to do the two more witnesses?

10 THE COURT: Well, I guess the question is where are
11 the witnesses -- the witnesses are -- were you still planning
12 to call Ms. Doran?

13 MR. TYSON: Ms. Doran and Ms. Ledford are the two.

14 THE COURT: Where are they from?

15 MR. TYSON: Ms. Ledford is from Gwinnett County, and
16 Ms. Doran is from Morgan County.

17 THE COURT: How far is Morgan?

18 MR. TYSON: Madison, Georgia.

19 MS. ANDERSON: She's about an hour away.

20 MR. CROSS: It is worth noting, Your Honor, they have
21 both been deposed. Your Honor has testimony from each.

22 THE COURT: I understand.

23 MR. CROSS: Okay.

24 THE COURT: But they are entitled to put on their
25 case.

1 MR. CROSS: Thank you, Your Honor.

2 THE COURT: I don't know whether it is going to be
3 very different. And they can consider whether they want to
4 rely on the depositions at all. But --

5 MR. TYSON: There are some different things we want
6 to bring out with Ms. Ledford and Ms. Doran.

7 THE COURT: Let me talk about Dr. Shamos for a
8 second. I didn't see anything that was -- just a second --
9 that was some -- a big new issue. Obviously the state brought
10 up the Senate report. But I don't know that that is -- I think
11 that was almost more, you know, trying to make a point on
12 cross-examination. And you have introduced it.

13 But I don't know -- it doesn't seem like -- I mean,
14 that is not their bringing up something. That was your
15 bringing up the report.

16 Is there something that you think either -- that you
17 believe that was a new issue that was raised -- a new factual
18 territory that was raised or expert opinion that was raised?

19 MR. RUSSO: Your Honor, at this juncture, he had a
20 hard stop by 6:00. We asked him to kind of hang around by the
21 phone just in case. And we've got his video prepared. So
22 unless this rolls into Monday for some reason, we would be
23 relying on that.

24 THE COURT: All right. So we have these two. And do
25 you want to be able to show the video in open court? I mean, I

1 could watch it.

2 MR. RUSSO: Yes, ma'am. We can show the video in
3 open court. We have got it prepared.

4 THE COURT: I understand that. Do you want to do
5 that, or would you like to just go with your witnesses and then
6 obviously --

7 MR. RUSSO: We would like to just go with the
8 witnesses for now.

9 THE COURT: I can always see the video.

10 MR. RUSSO: Sure.

11 THE COURT: Play the video and accept -- and as would
12 then get the transcript. But I would watch the video. He is
13 an interesting witness as it is.

14 MR. RUSSO: It is 17 minutes. You know, at the end
15 if --

16 THE COURT: That is fine.

17 MR. RUSSO: -- we can play it, then that is fine.

18 THE COURT: So it is those two witnesses.

19 Do you have any update -- not that I'm expecting it
20 at this moment -- on the bond issue, whether you're going to be
21 able to get that to me?

22 MR. BELINFANTE: I have got a document that I think
23 is appropriate. I'm waiting to confirm that with the state.
24 That is what I have not heard back from yet. I do have a call
25 in to them as of earlier this afternoon.

1 THE COURT: All right. And I'm sorry to be a little
2 scattered here. But did you give me the contracts and I just
3 have misplaced them?

4 MR. TYSON: No, Your Honor. I have them ready for
5 you.

6 THE COURT: Make sure you give them to somebody other
7 than me at the moment. This is the standard recordkeeping in
8 my office. Somebody else needs to hold it. All right.

9 If the Court believes it would be appropriate to put
10 it in to the record or any of the parties, you are welcome to
11 then do it after the fact. It is hard when no one has read it
12 other than you.

13 MR. TYSON: Yes, Your Honor. I was just going to
14 describe the documents for the record if that is clear.

15 THE COURT: That is fine.

16 MR. TYSON: There is a May 1st, 2019, letter from
17 Secretary of State's office to PCC Technology notifying PCC
18 that they are terminating Amendments 4 and 5 to the contract,
19 which related to the hosting services provided by PCC. Those
20 Amendments 4 and 5 follow the letter. And following that is a
21 master customer agreement related to hosting that will allow
22 the Secretary of State's office to host the eNet system on its
23 own controlled system.

24 I did notice, Your Honor, that there is a reference
25 to some other documents that go with the master customer

1 agreement. I do not have those, but I will try to get those as
2 well.

3 THE COURT: All right. So what did you have them as
4 the time? I'm sorry.

5 LAW CLERK COLE: I show the defendants have 45
6 minutes remaining.

7 THE COURT: And the plaintiffs have exhausted their
8 time?

9 LAW CLERK COLE: The plaintiffs are 23 minutes over
10 time.

11 THE COURT: You had something different? What did
12 you believe it was?

13 MS. CHAPPLE: We did, Your Honor. We thought that
14 the defendants had three minutes left. Does that time include
15 the 40 minutes of the last -- with the last witness?

16 LAW CLERK COLE: 35 minutes because we stopped the
17 clock when she talks.

18 THE COURT: All right. Well, either way we're going
19 to proceed because I'm not going to deprive anyone of -- it is
20 too important of an issue. I think it has still been very
21 useful and everyone understands.

22 Hopefully we can get this witness on and off in
23 closer to the time anticipated. The only thing I have a
24 concern about is whether you are thinking that you might need a
25 rebuttal witness.

1 MR. CROSS: Rebuttal? Not from what we've seen so
2 far.

3 MR. BROWN: We may have some rebuttal evidence on
4 some of the pricing issues. But we could conceivably put that
5 in in writing.

6 THE COURT: All right.

7 I wondered has the state -- has the state done
8 anything with respect to the additional protections that were
9 called for under House Bill 392 as to the voter protection --
10 the voter registration system?

11 MR. RUSSO: Your Honor, we actually submitted as
12 Exhibit 1 yesterday one of the state's rules that lays out some
13 of those protections.

14 THE COURT: A new state rule?

15 MR. RUSSO: Yes, ma'am.

16 THE COURT: Are there any other -- and does that -- I
17 have not looked at that yet. Are there any other rules that
18 have been developed to implement the bill?

19 MR. RUSSO: No, ma'am. That is the rule that is --
20 it is a fairly exhaustive rule though.

21 THE COURT: Okay. Are there any other rules that
22 relate to audits or anything else like that?

23 MR. RUSSO: I'm not aware that they have a rule on
24 audits yet. They may -- there is not a rule that has been
25 published on audits. To the extent they are working on one,

1 that is not something I have spoken with them about.

2 THE COURT: All right. All right. Well, let's get
3 the witness, and I'll come back to you.

4 I think the most hardworking court reporter in the
5 world needs to have -- if you don't have any enchiladas, get
6 some crackers. And others may need something like that too.
7 So let's take a five-minute break before we begin this witness.

8 COURTROOM SECURITY OFFICER: All rise.

9 **(A brief break was taken at 6:18 P.M.)**

10 MR. TYSON: The defense would call Lynn Ledford.

11 COURTROOM DEPUTY CLERK: Please raise your right
12 hand.

13 **(Witness sworn)**

14 COURTROOM DEPUTY CLERK: Please have a seat. Loudly
15 and clearly state your full name, and please spell your last
16 name for the record.

17 THE WITNESS: Lynn Ledford, L-E-D-F-O-R-D.

18 Whereupon,

19 LYNN LEDFORD,

20 after having been first duly sworn, testified as follows:

21 DIRECT EXAMINATION

22 BY MR. TYSON:

23 **Q.** Good afternoon or good evening, Ms. Ledford.

24 What is your current position?

25 **A.** I am the division director over elections in Gwinnett

1 County.

2 **Q.** And how long have you worked in the field of elections?

3 **A.** 32 years in October.

4 **Q.** And what types of election systems have you administered
5 over those 32 years?

6 **A.** Punch card optical scan and DRE.

7 **Q.** Can you explain to the Court what the experience of
8 Gwinnett County was or what your experience was --

9 THE COURT: Just before you get to that, to be a
10 division director -- people have lots of different titles who
11 are running elections. What does it mean to be a division
12 director?

13 THE WITNESS: Well, actually I just got a promotion
14 this year. I had been previously the election supervisor. So
15 I was in charge of the day-to-day operations for the elections.
16 And they created a division director position. And so I am
17 the -- above that working in conjunction with the Elections
18 Board to manage elections in Gwinnett County.

19 THE COURT: So is there anyone you report to other
20 than the Board? Are you the top person now?

21 THE WITNESS: I have a department director.

22 THE COURT: You have a department director?

23 THE WITNESS: Yes.

24 THE COURT: Go ahead.

25 MR. TYSON: Thank you, Your Honor.

1 **Q. (BY MR. TYSON)** Can you explain to the Court what your
2 experience was when Gwinnett County moved from a punch card
3 system to a hand-marked paper ballot system?

4 **A.** Yes. It was a very detailed process. We had to do a lot
5 of evaluation of our polling locations, our polling officials,
6 as well as the voters. And we developed new training. We did
7 a lot of outreach, and we also had to do a lot of staff
8 training as well.

9 **Q.** What about when the county moved to DREs?

10 **A.** Very similar. It was on a much larger scale. The state
11 was much more involved in that because that was when we started
12 having to do statewide voter registration and election systems.
13 And so they did a lot of --

14 THE COURT: Can you just speak a little slower?

15 THE WITNESS: Yes. Sorry.

16 **A.** They had to do a lot of the PSAs for that. The state also
17 did a lot of voter education and outreach in addition to
18 funding the counties to be able to do that as well.

19 **Q. (BY MR. TYSON)** Do you --

20 THE COURT: You were going from what to the DRE?

21 THE WITNESS: From optical scan to the DRE.

22 **Q. (BY MR. TYSON)** Do you remember approximately how long the
23 period of time was to roll out DREs in Gwinnett County from
24 optical scans?

25 **A.** I think it was -- if I remember correctly, it was about

1 six months.

2 **Q.** What has been your experience with educating voters about
3 changes to an election system?

4 **A.** It does get very complicated. People tend to think that
5 voting systems are intuitive, regardless of whether it is
6 optical scan or DRE. And it has been our experience that it is
7 not. So we try to ensure that we get enough voter education
8 outreach and schedule those events so that the voters can come
9 and actually touch the equipment prior to their first day of
10 voting.

11 THE COURT: What do you encompass within optical
12 scan? We just had somebody from Chatham County. And I want to
13 make sure I'm making sure I understand what system you were
14 using when you were using optical scan.

15 THE WITNESS: The ES&S system. It was just the
16 bubbles -- round bubbles that you bubble in.

17 THE COURT: Then putting it through the scanner to
18 count?

19 THE WITNESS: Yes, ma'am.

20 **Q. (BY MR. TYSON)** What has been your experience with
21 educating poll workers about changes in an election system?

22 **A.** Well, that's a little more difficult. There is a lot of
23 training that goes into that. Elections have become -- as we
24 see here today, have become more and more complex. And when
25 you start getting into the laws, the rules, and regulations of

1 what we have to teach them to try and ensure that they are
2 putting forth that positive voting experience, in Gwinnett
3 County we have online training, we have in-person training,
4 then we also have labs where we set up specific scenarios so
5 that the poll officials can see errors made by the voters, how
6 to correct those errors, and how to work with the voters to
7 correct any errors.

8 **Q.** In your experience in the process of moving to the new --
9 well, let me ask you this first: You understand -- is the
10 state moving to a new ballot marking system?

11 **A.** Yes, to my knowledge.

12 **Q.** In your experience once a vendor is selected for that new
13 system, what types of things will Gwinnett County need to do to
14 administer that?

15 **A.** Well, again, we will have to completely redo all of our
16 training. Again, we do online, in-person, and labs. We will
17 have to evaluate all of the polling locations to ensure that
18 they can handle whatever electrical is needed for the new
19 system. We will also have to look at space because I
20 understand that this is more equipment than just the DREs as
21 they stand now. And that is probably the two biggest things.

22 **Q.** What if an intermediate system was put in place where a
23 different system had to be used for that one election while
24 that process was going on?

25 **A.** Well, that would be really difficult because you have poll

1 officials -- a core group of poll officials and voters who are
2 already trained how to use the current system. If you change
3 it and then you turn around and change it again within a few
4 months subsequent to each other, it could be very confusing.

5 It is confusing for the staff who are trying to -- from
6 our end who are trying to administer the election. It is
7 confusing for the poll officials because, you know, you are
8 going from system to system. And then, again, it is confusing
9 to the voters going from so many systems. And my fear would be
10 that you would create some voter apathy with that.

11 **Q.** Have you had experience with paper ballots that could not
12 be read by an optical scanner?

13 **A.** Yes. We have had actually several experiences with those.
14 Prior to ballots being issued for absentee and for provisional,
15 we do test decks. And while our test decks worked, the ballots
16 themselves did not.

17 In 2008, we had to duplicate over 19,000 ballots and it
18 took over 24 hours. In 2016 -- I'm sorry -- 2018, we had a
19 similar situation. And the ballots could not be read. And we
20 had to duplicate --

21 THE COURT: Couldn't be read by what?

22 THE WITNESS: By the optical scan readers.

23 THE COURT: The ones that you have, the AccuVote?

24 THE WITNESS: Yes, ma'am. Yes, ma'am. The current
25 ones that we have.

1 THE COURT: But they are kind of old, aren't they?

2 THE WITNESS: I'm sorry?

3 THE COURT: They are quite old, aren't they?

4 THE WITNESS: They are. We have had those since
5 2002. But it wasn't the equipment that wouldn't read. It was
6 a problem with the ballots themselves. Because while we had
7 tested them -- but by the time they got out into the field, you
8 know, just a printing issue. When they came back, they were
9 unable to be read.

10 And so in order for them to be read, we had to print
11 another set of ballots and duplicate those original ballots the
12 voters submitted onto a second set of ballots.

13 **Q. (BY MR. TYSON)** Can you briefly describe the process of
14 ballot duplication?

15 **A.** You take -- for whatever reason, you have to mark why you
16 are duplicating that ballot. And it takes three people. One
17 person looks at the ballot. One person reads off the
18 information from the ballot. And the third person is watching
19 to ensure that those ballots -- those votes were transferred
20 correctly from the original ballot to the duplicate ballot.

21 In our case, it took a little extra time because we have
22 Spanish in Gwinnett. So we actually have a two-page ballot.

23 **Q.** If a precinct scanner was used and there was an error that
24 printed a paper ballot from being counted, what would happen
25 when the person tried to feed the ballot into the precinct

1 scanner?

2 **A.** Well, it could be one of several issues. The biggest one
3 that we see is what you call shuffling. And when you put the
4 -- I keep wanting to say punch card -- I apologize. When you
5 put the optical scan in, the ballot will literally shuffle and
6 you can't use that machine.

7 If there is a stray ballot mark on a ballot, the machine
8 will not read it. You have to duplicate. If there is a
9 overvote on the ballot, that is another reason that you would
10 have to duplicate. Occasionally --

11 THE COURT: Let me just stop just for the purposes of
12 efficiency. My understanding is that you are talking about
13 completely still the experience you have had with these
14 AccuVote optical scanners? Not with any more modern version
15 like a 2020 or 2018? We haven't gotten to '20. Though I
16 probably I have jumped that far.

17 THE WITNESS: Yes, you are correct. Yes, ma'am.

18 THE COURT: I don't think that's the proposal of any
19 of the plaintiffs here to keep the AccuVote scanners. I think
20 her experience with that might not be as helpful.

21 MR. TYSON: Certainly.

22 MR. BROWN: Your Honor, our injunction does not ask
23 for the replacement of the scanners.

24 THE COURT: All right. So you want to use -- but the
25 scanners here are just used only for counting. And your

1 proposal is for them to scan everything for counting purposes
2 with these old machines?

3 MR. BROWN: Yes. And if they want to -- if the state
4 wants to buy new ones, that's fine. The injunction just calls
5 for the current AccuVote scanners.

6 THE COURT: All right. Just try to -- then it is a
7 little more relevant. But let's just try to move through it.
8 I get the point.

9 MR. TYSON: Yes. Yes. I'm trying to do that here.

10 **Q. (BY MR. TYSON)** Ms. Ledford, do disabled voters in
11 Gwinnett County use paper ballots for any elections?

12 **A.** Yes.

13 **Q.** And what -- what is that process like for disabled voters
14 using paper ballots?

15 **A.** It is usually much easier because that is -- the only
16 paper ballots we do are absentee ballots. So generally they
17 have someone to help them with that.

18 Our experience has been at the polls it can be difficult
19 if they're having to do a provisional ballot due to low vision
20 issues or physical issues that they can't actually bubble in.
21 And that creates a problem from time to time.

22 **Q.** Do you recall hearing of a problem with Jasmine Clark's
23 votes during last year's elections?

24 **A.** Yes, sir.

25 **Q.** What was that?

1 **A.** If I remember correctly, she went to the poll to vote.
2 And when they pulled her up on the ExpressPoll unit, they told
3 her that she was registered in Dekalb or Cobb -- I can't
4 remember -- another county other than Gwinnett County. They
5 called our office.

6 And what we determined was the poll official had went out
7 of what is called -- the ExpressPolls have three levels. You
8 have in county -- I'm sorry -- you have precinct level, in
9 county, and state.

10 The voter prior to her, they had had to look in the
11 in-state option. They did not go back and change it to the
12 in-precinct. So when they pulled up the Jasmine Clarks, there
13 were several registered. The first Jasmine, whatever her
14 middle name was, Clark was the person registered in a different
15 county. The poll workers did not verify her information. So
16 therefore they thought that was who she was. And so they were
17 trying to send her to a different county when, in fact, she was
18 in Gwinnett.

19 Once we got them on the phone, we realized what they had
20 done. They were able to go back into their precinct count and
21 issue her ballot and her vote.

22 **Q.** So was there anything wrong with the voter registration
23 records for Ms. Clark?

24 **A.** No. It was a user error from the poll official side.

25 **Q.** If this court were to order elections to be held on

1 hand-marked paper ballots, what are the steps Gwinnett County
2 could take to implement that order?

3 **A.** Well, the first thing we would have to do is we would have
4 to evaluate the polling locations. Our experience has been
5 that it takes longer to vote a paper ballot than a touchscreen.
6 So you would have to put out more voting booths -- just a plain
7 voting booth.

8 Gwinnett County does not have enough to cover all of our
9 polling locations. So we would have to do that. We would have
10 to go through a procurement process for a ballot printer,
11 possibly other items that would be needed within an optical
12 scan system.

13 **Q.** Would you also have to evaluate your current precinct
14 locations?

15 **A.** We would to determine what locations the voting is taking
16 place and would it hold the number of units that we would
17 anticipate be needed.

18 **Q.** Are there currently funds budgeted for Gwinnett County for
19 that kind of implementation?

20 **A.** No.

21 **Q.** And I know you are not conducting -- well, are you
22 conducting any city elections in November of 2019?

23 **A.** We are not.

24 **Q.** Based on your experience in election administration, do
25 you believe if you were conducting elections in November 2019

1 there would be time to implement a hand-marked paper ballot
2 solution?

3 **A.** I believe it probably could happen. But there would be
4 significant problems with it. Again, you do have to take the
5 time to be able to develop and train your poll officials, train
6 your public, and train your staff on the procedures to use with
7 that.

8 **Q.** Have you sought a Department of Homeland Security security
9 assessment of your facility?

10 **A.** We did. In 2016.

11 **Q.** And have you heard back on that yet?

12 **A.** We have not.

13 **Q.** Can you briefly describe for the Court what takes place
14 between the close of the election and the certification of
15 ballots?

16 **A.** Well, for three days, we are examining provisional ballots
17 making a determination whether those will be counted or not.
18 Oftentimes that three days is spent duplicating those ballots.
19 And oftentimes we are still doing that right up until the time
20 that we certify the election.

21 **Q.** And so certification -- do you have time for other tasks
22 while you are doing the certification process?

23 **A.** No, we do not. That is our goal from election day until
24 that point is that information.

25 **Q.** If you were assigned to do an audit or some other function

1 precertification, would you need more time to complete that?

2 **A.** Yes.

3 MR. TYSON: That's all I have, Your Honor.

4 CROSS-EXAMINATION

5 BY MR. KNAPP:

6 **Q.** Ms. Ledford, just a few short questions. First, Gwinnett
7 County has scheduled no elections for November of 2019?

8 **A.** Correct.

9 **Q.** So whatever happens here, it won't have any effect on
10 Gwinnett County, will it?

11 **A.** No, sir.

12 **Q.** So, second, you have overseen three transitions already?

13 **A.** Yes, sir.

14 **Q.** From punch cards to optical scanners to DREs and preparing
15 at least for a fourth one with whatever the state does;
16 correct?

17 **A.** Correct.

18 **Q.** And you have handled them successfully, haven't you?

19 **A.** Yes, sir.

20 **Q.** And whatever the problems are, big or small, they are not
21 enough to stop whatever system was in place at the time;
22 correct?

23 **A.** I think that is dependent upon the time you have to
24 prepare for it.

25 **Q.** Correct. You're a pro, and you have been doing this for

1 so long you know exactly how to do that, don't you?

2 **A.** Well, I would like to think I do, yes, sir.

3 MR. KNAPP: No further questions.

4 MR. POWERS: No questions from the Coalition
5 plaintiffs.

6 EXAMINATION

7 BY THE COURT:

8 **Q.** I have a list of the locations that are having elections
9 in Gwinnett County, and I just wanted you to clarify for me a
10 few things.

11 Are you -- the county is not conducting any of these
12 elections that are from -- that are occurring; is that right?

13 **A.** Yes, ma'am. Correct.

14 **Q.** So when, for instance, the City of Dacula is using an
15 optical scan paper ballot, they are going to count that
16 themselves; is that right?

17 **A.** Yes.

18 **Q.** And when the City of Duluth is using a DRE, they are going
19 to be running that themselves? Are they getting the DRE
20 machines loaned by the county?

21 **A.** Correct.

22 **Q.** But then are you as the county -- your office going to
23 count -- run those, or they are going to --

24 **A.** No. They conduct their own elections.

25 **Q.** All right. And then there are a few places that are doing

1 it on paper hand count, City of Buford and City of Berkeley
2 Lake and City of Grayson, as well as Loganville.

3 Do you know how they are doing that?

4 **A.** Yes. They will -- like, literally, just an
5 eight-and-a-half-by-eleven sheet of paper. It has the
6 candidates' names printed on it. And the voters will mark an X
7 for whomever they wanted to vote for. And then they will hand
8 count those at the end of the night.

9 **Q.** What is the biggest one of those places?

10 **A.** I apologize. Can you read them back off to me?

11 **Q.** The biggest -- I'm sorry. Sure. Loganville, Berkeley
12 Lake, Buford, and Grayson.

13 **A.** Buford.

14 **Q.** What is its population?

15 **A.** I really don't know. But I just know of those four that
16 is the biggest one.

17 **Q.** Have you ever had any complaints from those -- from
18 citizens of those cities as to the paper hand --

19 **A.** We have not. But because we don't conduct their
20 elections, they would not contact us.

21 **Q.** So those places like the City of Sugar Hill using optical
22 scan paper ballot, they are getting somebody to fill out -- the
23 citizen to fill out a paper ballot and then they will count
24 them using your AccuVote scanners?

25 **A.** Yes, ma'am. That's correct.

1 THE COURT: Thank you.

2 Anything else? Is this witness excused?

3 MR. KNAPP: Nothing more, Your Honor. Thank you.

4 THE COURT: Thank you for your patience.

5 MR. TYSON: Your Honor, while we're changing
6 witnesses, we had previously submitted with the spreadsheet the
7 declarations of Mr. Elliott and Melissa Arnold related to the
8 administration of city elections. I just wanted to bring those
9 to your attention.

10 I have additional copies here if you would like them,
11 or I can reference them by document number for you. But it
12 contains some of the information about how cities conduct
13 elections and timelines that would be relevant for the Court.

14 THE COURT: I have read it recently.

15 But, Ms. Cole, would it be helpful to have an extra
16 copy?

17 LAW CLERK COLE: Sure.

18 THE COURT: Sure.

19 **(There was a brief pause in the proceedings.)**

20 THE COURT: While we're waiting, I just wanted to say
21 to the members of the audience I do appreciate your longevity
22 and your commitment to those of you who are here not because
23 you are part of the legal teams. Legal teams are always
24 appreciated. But I think it is kind of remarkable.

25 And whatever your position on this matter, you are

1 obviously very devoted to the exercise of the franchise and our
2 democracy. And the Court greatly appreciates your interest.
3 And it gives real vitality to the legal process and political
4 process. And I just wanted to thank you as well.

5 Do you want to call the witness?

6 MS. ANDERSON: Oh, sorry. We call Jennifer Doran.

7 COURTROOM DEPUTY CLERK: Please raise your right
8 hand.

9 **(Witness sworn)**

10 COURTROOM DEPUTY CLERK: Please have a seat. Loudly
11 and clearly state your full name, and spell your last name for
12 the record.

13 THE WITNESS: Jennifer Doran, D-O-R-A-N.

14 Whereupon,

15 JENNIFER DORAN,

16 after having been first duly sworn, testified as follows:

17 DIRECT EXAMINATION

18 BY MS. ANDERSON:

19 **Q.** Ms. Doran, where are you from?

20 **A.** Morgan County, Georgia.

21 **Q.** And what do you do?

22 **A.** I'm the elections supervisor for the Morgan County Board
23 of Elections & Registration.

24 **Q.** And how long have you been the election supervisor?

25 **A.** A little over two years.

1 Q. And what are your duties as the election supervisor?

2 A. With being a small county, I pretty much do everything
3 election-related. I qualify the local filing officer. I
4 prepare elections. I do all the preparation from start to
5 finish.

6 Q. And how many staff do you have?

7 A. Two, me and the deputy registrar.

8 Q. And you mentioned Morgan County is a small county. What
9 is the population?

10 A. About 18,000.

11 Q. And do you know how many registered voters you have?

12 A. Just over 14,000.

13 Q. And how many municipalities are in Morgan County?

14 A. Four municipalities.

15 Q. And do you know if they are holding any elections this
16 year?

17 A. Three of them are holding elections.

18 Q. Okay. And what is the typical voter turnout for those
19 elections?

20 A. Truthfully, one municipality has never had an election in
21 the last 20 years because they don't have enough qualified
22 candidates. But they have 120 registered voters.

23 The other municipality is anywhere from 4- to 600. And
24 Madison, depending on who is on the ballot, is anywhere from 5-
25 to 1500.

1 Q. And what are your budgets for the elections for your
2 fiscal year?

3 A. Our new fiscal year '20 is \$30,000. And that excludes
4 salaries for staff and poll workers.

5 Q. And what is your fiscal year?

6 A. July 1st, '19, through June 30, '20.

7 Q. So this would include the presidential primary and the May
8 general elections?

9 A. Correct.

10 Q. And is this a similar budget to what you've had in a kind
11 of -- well, I guess it is -- is this a similar budget to last
12 year?

13 A. It is.

14 Q. And how much -- how many funds remained from the budget
15 last year?

16 A. None.

17 Q. And does this budget include running the municipal
18 elections in November?

19 A. It does.

20 Q. I guess I should have backed up. I wanted to confirm that
21 Morgan County does run the municipal elections.

22 A. We do. We handle all of the elections.

23 Q. What is included when you run the elections for Morgan
24 County? What does Morgan County have to pay for its cost?

25 A. For municipal elections?

1 Q. Correct, municipal elections.

2 A. We have an IGA with the municipalities that they reimburse
3 us for actual costs. But we do the notices of election -- any
4 notices that have to be done legally, the poll worker training,
5 and setting up the polls -- I'm nervous. Hang on -- and all of
6 the costs that are incurred. And then the municipalities
7 reimburse us.

8 Q. If Morgan County would have to switch to a new system, for
9 example, the paper ballot scanning systems, do you have an
10 understanding of who would pay for those new machines for the
11 municipal elections?

12 A. If we moved to the paper ballot?

13 Q. Yes.

14 A. My understanding is that we would pay for it -- the county
15 would.

16 Q. If you had to pay for the new paper ballot system, would
17 you have enough funds in your budget to cover the costs?

18 A. We operate at a very lean budget, \$30,000. We would have
19 to get optical scanners. If all of the municipalities held
20 elections, we would need about four OS units with ballot boxes,
21 which would be about \$5000, which we have not budgeted for.

22 Q. And you said it would be about \$5000. What is the basis
23 for that calculation?

24 A. Our board had looked at the feasibility of moving to paper
25 ballots back in, I think, August or September of 2018. And at

1 the time, the board had asked me to look at budget numbers.
2 And I contacted ES&S, who is our vendor. And that would be the
3 OS unit and the ballot box -- that was the quote I was given,
4 about \$1300 per unit.

5 **Q.** And would that be -- what type of machine would that be?
6 Would it be similar to the system you have now or something
7 different?

8 **A.** It would be the current system that we use plus a ballot
9 box that -- we don't use ballot boxes right now.

10 **Q.** Do you know how old the current system is that you use?

11 **A.** Pretty old. I don't know exactly when they have been
12 purchased. But --

13 **Q.** What would you have to do to make sure you had enough
14 funds to cover for the fiscal year if you had to go and buy
15 these machines?

16 **A.** I would have to go to the county manager who would have to
17 get approval from the county board of commissioners to amend
18 our budget because \$5000 -- there is -- we don't have a lot of
19 wiggle room. So we would have to go through the commissioners
20 to get a budget amendment.

21 **Q.** Okay. Would the purchase of machines be your only cost if
22 you had to move to the new paper -- to a new paper ballot
23 system?

24 **A.** Well, the cost of the paper ballots. We order -- in
25 municipalities, we don't have a lot of paper ballots for

1 absentee and provisional. If we had to move to paper ballots,
2 the cost would -- you know, it would be a few hundred dollars
3 for the -- for one times however many elections we had.

4 **Q.** Would there be any other costs involved?

5 **A.** Well, we would -- if we were doing paper ballots,
6 depending on how it was set up, we would probably have a little
7 different setup in staff, which would be man hours that we
8 would be paying.

9 **Q.** So the \$5000 would just be the machines, but Morgan County
10 would likely incur additional costs that would come out of your
11 30,000-dollar budget; is that correct?

12 **A.** Yes, it would.

13 **Q.** When would you need to know if you were going to move to a
14 new system in order to be prepared for the November 2019
15 election?

16 **A.** We would have to have everything to our office by early
17 October at the absolute latest. And the turnaround time at the
18 Secretary of State -- we would have to purchase it. And then
19 it goes to the Secretary of State for certification and
20 acceptance testing.

21 The last time we bought equipment was about two months.
22 So to have it late September so that we could do the testing on
23 it to be ready for early voting, it would be early -- really
24 early August.

25 **Q.** You mentioned testing. You would still have to perform

1 testing on the scanners? Not the same testing as a DRE. But
2 you would have to, in fact, perform some type of testing on the
3 optical scanners?

4 **A.** Yes.

5 MS. ANDERSON: Your Honor, I'm just going to kind of
6 jump around just given the time.

7 **Q.** (BY MS. ANDERSON) What is the security surrounding the
8 county's GEMS server?

9 **A.** It is locked in my office with only me and the department
10 head of maintenance having access to it. It has got a dead
11 bolt on it for more security.

12 **Q.** And is it connected to the internet?

13 **A.** It is not.

14 **Q.** Is it connected to a phone line?

15 **A.** It is not.

16 **Q.** And speaking of -- I think you just -- we were talking
17 about security.

18 Has Morgan County done anything recently to evaluate the
19 security -- the physical securities surrounding its election
20 system or its DRE system?

21 **A.** Yes. The Department of Homeland Security had offered a
22 physical assessment, and we took advantage of that offer. They
23 came out and did an assessment for us.

24 **Q.** Okay. And did they -- did the DHS provide any options to
25 you guys about -- regarding security?

1 **A.** They did.

2 **Q.** And have you implemented some of those options?

3 **A.** We have.

4 **Q.** And you do not -- do you feel comfortable sharing those
5 options right now?

6 **A.** The document listing all the options and the detail of the
7 assessment was designated as a critical infrastructure
8 document. So it is not open to public disclosure.

9 **Q.** Moving to, I guess, election night when elections close,
10 how are memory cards transferred -- going back to your current
11 system, the DRE system, how are memory cards transferred from
12 the precinct to the county for tabulation purposes?

13 **A.** We have a poll -- the poll manager and one of the
14 assistant poll managers from each precinct carry it in on
15 election night from the precinct to our office. We have board
16 members that receive it, along with all the other -- or all the
17 other stuff that they bring in.

18 **Q.** And what are those memory cards carried in?

19 **A.** They are carried in a manager's bag.

20 **Q.** And then how do you -- I guess how do you send your
21 official election results back to the Secretary of State after
22 you have tabulated those results?

23 **A.** On election night, which are not the official results, we
24 upload them to --

25 **Q.** I'm sorry. I was talking specifically about the official

1 results. How do you get your official election results to the
2 Secretary of State's office?

3 **A.** Well, we do an upload to ENR as the official. Then as
4 part of our packet that we send back to the Secretary of State,
5 we do a copy of the GEMS database.

6 **Q.** And the GEMS database, how is that transferred back to the
7 Secretary of State's office?

8 **A.** We meet with -- the Georgia State Patrol and the
9 investigator from the State Election Board comes and picks it
10 up.

11 THE COURT: I think I missed something. So you went
12 back to -- you said we do an upload to what?

13 THE WITNESS: The ENR, the Election Night Reporting
14 website.

15 THE COURT: That is what you meant by ENR?

16 THE WITNESS: I'm sorry. Yes.

17 THE COURT: And you do an upload from what?

18 THE WITNESS: From the GEMS server.

19 THE COURT: And is that by internet then?

20 THE WITNESS: The Secretary of State provides us with
21 a lockable USB drive. We insert it into the GEMS server,
22 upload the results, lock it so that it can only transmit out.
23 Then we do hook it up to my computer and send it over through
24 the internet.

25 THE COURT: All right. Is there anything else that

1 you in a similar fashion when you communicate by internet --
2 by -- via the internet like that? Because I know that you have
3 some things that you do by having them hand-delivered. But
4 what else do you do like that that is protocol for you to --
5 even if it is to lock it that you put it -- it is in your
6 computer and then you send it up to the central office?

7 THE WITNESS: We do have an absentee bulk update that
8 is done the Friday night or Saturday morning of -- after early
9 voting has ended. And that comes across over the FTP server.

10 THE COURT: All right.

11 **Q. (BY MS. ANDERSON)** How many optical scanners does Morgan
12 County currently have?

13 **A.** We have two.

14 **Q.** And how many would you need if you were to go to an entire
15 paper ballot system?

16 **A.** We would need the two that we already have. Then we would
17 need seven for the precincts. We have seven county precincts
18 and then one for early voting. And then we would need at least
19 a small handful as backup in case any of them failed.

20 **Q.** I guess I wasn't clear. Would you need this many for --
21 would you need that many scanners for the November 2019
22 election?

23 **A.** I'm sorry. No. We would need an additional four
24 scanners.

25 **Q.** I wanted to back up to something that you said about

1 absentee ballots. Do you -- does the absentee ballots use GEMS
2 at all?

3 **A.** We do L&A testing on the OS -- on the optical scan unit
4 through the GEMS server. We upload the test results to make
5 sure everything is functioning correctly. And then once we run
6 the ballots through that optical scan unit, we hook it up to
7 the GEMS server to upload the results to the GEMS server.

8 **Q.** For the absentee ballots?

9 **A.** Correct.

10 **Q.** Could you borrow any optical scanners from a neighboring
11 county?

12 **A.** For this election, I know that most neighboring counties
13 are having their own elections. So they would be using their
14 own units.

15 **Q.** Would it be feasible for you to engage in a hand count
16 paper ballot for the 2019 elections?

17 **A.** It would increase our staff hours fairly significantly
18 because the OS unit is not fast. But it is certainly much
19 faster than hand counting them. It is feasible. But it would
20 take -- the results would be much slower than if we did it
21 through a unit.

22 **Q.** And are those staff individuals -- are they salaried or
23 hourly?

24 **A.** They are all hourly.

25 **Q.** Would the county have to incur overtime costs for counting

1 if you guys moved to a paper ballot system?

2 **A.** Yes, they would.

3 **Q.** Do you as the election supervisor of Morgan County have
4 any concerns about moving to a paper ballot system for the
5 November 2019 elections?

6 **A.** I guess getting the equipment on time if we had to do
7 that. I had already sent a proposed budget to the
8 municipalities on what the election would cost based on our
9 current system.

10 If we had to purchase more paper ballots to cover their
11 election, their cost would go up. And, you know, we're a very
12 small county. So we're talking about a 4- to 6000-dollar
13 budget. When you add 5- to \$600, that is a fairly significant
14 number. I mean, in the grand scheme, I know it is not. But it
15 is on a local level.

16 **Q.** And is it your understanding -- is it your understanding
17 if you used the paper ballot system for the November 2019
18 election you would use it for the upcoming presidential primary
19 or the May 2020 elections?

20 **A.** My understanding is that the Secretary of State is --
21 we're moving to a new ballot marking device system so that we
22 would not be doing paper ballots.

23 **Q.** And just so I'm clear, so Morgan County -- well, never
24 mind.

25 I wanted to go back to the absentee bulk files you were

1 referencing earlier. Does the absentee bulk update file you
2 receive on the FTP site ever go into the GEMS server?

3 **A.** No. It goes into the ExpressPolls.

4 MS. ANDERSON: That is all I have.

5 CROSS-EXAMINATION

6 BY MR. SPARKS:

7 **Q.** Ms. Doran, good evening. Adam Sparks for the Curling
8 plaintiffs. We met briefly before your deposition. Do you
9 remember?

10 **A.** Yes, I do.

11 **Q.** Good to see you again. And thank you for your patience.

12 **A.** Thank you.

13 **Q.** I have just a few questions for you.

14 **A.** Okay.

15 **Q.** You mentioned that you had conducted a -- I believe the
16 word was investigation or cost analysis of some sort for your
17 board concerning hand-marked paper ballots; is that right?

18 **A.** I did.

19 **Q.** As part of that analysis, you found that paper ballots
20 could be ordered for approximately 40 cents per ballot; is that
21 right?

22 **A.** Yes, sir.

23 **Q.** And if I understand your deposition testimony correctly,
24 you also asked your current vendor if you could get a lower
25 rate if you ordered more ballots at volume? Do you remember

1 that?

2 **A.** I do.

3 **Q.** All right. And he did not refuse that question; correct?

4 **A.** As I recall, he followed up the email with a phone call
5 and discussed that he was capable of doing the number -- the
6 volume. But I don't remember if he ever answered, and I'm
7 pretty sure he did not.

8 **Q.** As part of this cost analysis, you at some point were
9 directed by your board to ask the Secretary of State whether
10 Morgan County could conduct elections using hand-marked paper
11 ballots; correct?

12 **A.** Correct.

13 **Q.** And they told you no; right?

14 **A.** Yes, they did.

15 **Q.** All right. And you understand that to apply to all
16 elections that Morgan County conducts; correct?

17 **A.** Correct.

18 **Q.** You mentioned the DHS physical assessment for --

19 **(There was a brief pause in the proceedings.)**

20 **Q.** **(BY MR. SPARKS)** You mentioned a DHS physical assessment
21 that Morgan County accepted from the federal government;
22 correct?

23 **A.** Correct.

24 **Q.** And that assessment did not include any recommendations or
25 guidance concerning cybersecurity; correct?

1 **A.** No. It was purely a physical assessment.

2 **Q.** Okay. Forgive me. I'm skipping along, as well, given the
3 hour.

4 Are you testifying that you take files from an FTP site
5 that is internet facing and put them into ExpressPoll?

6 **A.** Correct.

7 **Q.** You testified earlier that there is a USB stick that you
8 move back and forth between the county level GEMS server and
9 your internet-facing computer; is that right?

10 **A.** Yes. But it is locked when it is in my work computer.

11 **Q.** Yes. I understand.

12 You have described a number of policies and procedures
13 concerning the administration of elections tonight; correct?

14 **A.** Yes.

15 **Q.** I'm sorry?

16 **A.** Yes.

17 **Q.** And if this Court orders relief in this case concerning
18 how ballots are cast and counted, you will cause Morgan County
19 elections to follow that order; correct?

20 **A.** Yes.

21 MR. SPARKS: No further questions at this time.

22 Thank you.

23 CROSS-EXAMINATION

24 BY MR. BROWN:

25 **Q.** Hi, Ms. Doran. Good to see you again. Bruce Brown.

1 You testified that you considered for the board, I think,
2 switching to paper ballots and looked at both sides of the
3 issue; correct?

4 **A.** Yes, sir.

5 **Q.** And you could see the argument both ways?

6 **A.** I do.

7 **Q.** And you saw the advantage of paper ballots; correct?

8 There were some advantages of paper ballots and some advantages
9 for staying the way it was?

10 **A.** Yes.

11 **Q.** And I believe your conclusion was that on balance you were
12 not in favor of moving to paper ballots for one election and
13 then starting a new voting equipment system the next year or
14 the next quarter; is that fair to say?

15 **A.** Yes, sir.

16 **Q.** And -- but that assessment was based upon your
17 perception -- your belief that the DREs are secure; is that
18 right?

19 **A.** Yes, sir.

20 **Q.** And if your belief or your assessment of the security of
21 the DREs changed, you could very well change your judgment on
22 whether or not hand-marked paper ballots are better to go with
23 right now; right?

24 **A.** Yes, sir.

25 **Q.** Okay. And to get back to the different scanning options

1 for the plaintiff Coalition's proposal -- and just to give you
2 some context for this, the plaintiffs -- the Coalition
3 plaintiffs propose that you keep the GEMS, keep the AccuVote
4 scanners, and the only thing you do is take out the DRE
5 machines and put in hand-marked paper ballots. That is the
6 only change.

7 Are you with me?

8 **A.** Yes, sir.

9 **Q.** And then on the scanners, you could do three -- one of
10 three different things. You could either not have them and do
11 hand count.

12 You follow me?

13 **A.** Yes.

14 **Q.** You could do a precinct scanner, or you could do a central
15 count.

16 Do you follow me?

17 **A.** Yes.

18 **Q.** And your -- your calculation of the cost increased if you
19 went to hand-marked paper ballots obviously wasn't for hand
20 counting them because you didn't calculate the extra labor
21 hours for that; right? You didn't --

22 **A.** Correct.

23 **Q.** You didn't price that out; fair enough?

24 **A.** Correct.

25 **Q.** But yours was the option of having precinct count, one in

1 each precinct; is that right?

2 **A.** Yes, it is.

3 **Q.** But you could -- if there were a budgetary consideration,
4 you could choose to have a central count and you would not need
5 another scanner for the November 2019 elections; is that right?

6 **A.** The procedure right now is when we are doing testing on
7 the OS units, once we have completed testing, we actually lock
8 the memory card in. So that scanner is set just for -- that is
9 why we have two. We have one labeled as absentee and one as
10 provisional.

11 If the procedures changed where we could pull out the
12 memory card and stick it in the next one to do, you know,
13 central counting and absentee on the same one, it is possible
14 we could use what we have now.

15 **Q.** Okay. And many steps in the voting process -- the change
16 that I have described, many steps in the voting process would
17 remain the same; right?

18 **A.** On -- you are talking about election day, the process from
19 the --

20 **Q.** Yes.

21 **A.** I would say about half would stay the same.

22 **Q.** Well, all the ballot building and the ballot preparation
23 would be identical; correct?

24 **A.** Correct.

25 **Q.** And so there would be no change there? It would just be

1 increase in quantity of ballots; right?

2 **A.** Right.

3 **Q.** And then the check-in would be a little bit different?

4 **A.** It would be.

5 **Q.** Okay. You don't get a memory card? You get a ballot?

6 **A.** Right.

7 **Q.** Okay. And if Morgan County switched to paper ballots, I
8 believe you testified that you could operate the election with
9 the same staff that you have now; correct?

10 **A.** Yes.

11 MR. BROWN: Okay. Thank you very much.

12 EXAMINATION

13 BY THE COURT:

14 **Q.** Let me get some clarification. You said earlier that you
15 do L&A testing on the optical scanner unit from the GEMS
16 server; is that right?

17 **A.** Yes.

18 **Q.** And that you upload the test results to make sure
19 everything is functioning correctly?

20 **A.** Yes, ma'am.

21 **Q.** And then once you run the ballots through the optical scan
22 unit, you hook it up to the GEMS server to upload the results
23 to the GEMS server?

24 **A.** Correct.

25 **Q.** And that was in response to a question do you use the

1 absentee ballots -- use a GEMS at all. And that is the way I
2 understood it.

3 But then you also mentioned later on in response to a
4 question of state's counsel, well, that you -- you were talking
5 about it being up to ExpressPoll. So I'm a little confused.

6 Did I get my description of your -- was my description of
7 your testimony correct? That the whole -- that you go through
8 the L&A process and -- I'm sorry.

9 So I asked you once you run the ballots through the
10 optical scan unit you hook it up to the GEMS server to upload
11 the results to the GEMS server and you said correct.

12 **A.** Correct.

13 **Q.** All right. And you upload that through the internet; is
14 that right?

15 **A.** No, ma'am. What you were talking about, the update on the
16 ExpressPoll, at the end of early voting, we have a list of all
17 of our voters. Through Election Net, we update who early
18 voted. That absentee bulk update is what we get through the
19 FTP server on my computer. That is what is updated to -- or
20 uploaded to ExpressPoll.

21 **Q.** So what is uploaded to GEMS that you were talking about
22 when I was speaking with you about it?

23 **A.** Once we do the testing on the OS units and the TS units,
24 we upload the results on there just to confirm that they are --
25 they are programmed and that they are transmitting the results

1 correctly.

2 **Q.** All right. So I'm sorry for my lack of knowledge here.
3 What type of information are you exactly transmitting through
4 the internet at that point to GEMS?

5 **A.** We're not -- nothing is being transmitted from the --
6 there are two different processes. The bulk update that we get
7 through the FTP is not part of the L&A process at all.

8 **Q.** Right.

9 **A.** What we're doing with uploading the memory cards and the
10 OS units to GEMS is making sure that the OS scanners read the
11 test ballots correctly. That is part of our testing as we have
12 test ballots that are marked in different ways so that we make
13 sure that they are being counted correctly. We upload it to
14 GEMS, print out a summary report that shows what the OS unit is
15 saying, we compare it to make sure that that is correct.

16 **Q.** All right.

17 **A.** Once -- the Secretary of State right before an election,
18 they like for us to upload through the lockable USB from the
19 GEMS our L&A GEMS database file, which shows that we've
20 partially voted on the machines just to show that they work.
21 And then that gets uploaded through the ENR website.

22 THE COURT: Okay.

23 REDIRECT EXAMINATION

24 BY MS. ANDERSON:

25 **Q.** I don't know if -- are you still -- I think there is a

1 little bit of confusion about the absentee bulk update and
2 absentee ballots.

3 **A.** Right. The absentee bulk update are basically the early
4 voters and the people who have submitted absentee ballot
5 applications that are marked in our system -- the voter
6 registration system as either -- it is an absentee -- whether
7 you early vote or we've issued you an absentee ballot. That
8 way when you do the bulk update, if someone shows up on
9 election day and we have submitted -- we've sent them a ballot
10 or they early voted, the poll manager or the poll worker sees
11 that the person has already voted by absentee.

12 **Q.** That is on the e-pollbook or the ExpressPoll? I'm sorry.

13 **A.** Yes, it is.

14 **Q.** And the bulk update, just so I'm clear, those are not
15 actual absentee ballots -- that absentee bulk update file?

16 **A.** No. They are -- they are just records saying that this
17 voter has already voted absentee, whether in person or been
18 issued a ballot. It just shows they have -- yes, they have
19 voted or, no, they have not voted.

20 MS. ANDERSON: Thank you.

21 MR. SPARKS: Just one more point of clarification.

22 RE-CROSS-EXAMINATION

23 BY MR. SPARKS:

24 **Q.** You do use a USB stick to copy files from the GEMS server
25 to your office computer; is that correct?

1 **A.** Correct.

2 **Q.** Does your computer have end point protection installed on
3 it?

4 **A.** It does.

5 **Q.** It has an Albert sensor installed on it?

6 **A.** I don't know what that is. I'm sorry. My IT handles all
7 that. I know that he has all of the stuff that we need on
8 there. But --

9 **Q.** But sitting here today, you don't know whether Albert
10 sensors are installed on your office computer?

11 **A.** No.

12 MR. SPARKS: Thank you.

13 MS. ANDERSON: She doesn't know what it was. But --

14 THE COURT: All right. So is this witness excused?

15 MS. ANDERSON: Yes, Your Honor.

16 THE COURT: Thank you very much for staying so late.

17 And thank you for your work.

18 Are there any other witnesses?

19 MR. RUSSO: No, Your Honor. All we have left is
20 Dr. Shamos. If you would like to end with a short video, we
21 are happy to play it in court or -- it is about 17 minutes. Or
22 we're happy to -- well --

23 MR. TYSON: It is not a lockable USB drive, but I can
24 give you a USB drive.

25 MR. KNAPP: She's not allowed to take it.

1 MR. RUSSO: It has been on an internet-facing
2 computer.

3 MR. CROSS: Fortunately Your Honor won't be plugging
4 anything into the GEMS server. So we should be all right.

5 We can do this all day, Your Honor.

6 THE COURT: Do you have any objection to our seeing
7 it outside -- you have seen it? You know what the 17 minutes
8 are? Do you have the --

9 MR. CROSS: We have not seen it.

10 THE COURT: Have you seen the text?

11 MR. CROSS: No.

12 MR. RUSSO: We were just going to play it and provide
13 everybody with a copy.

14 THE COURT: Do you have a copy of the transcript
15 right now?

16 MR. RUSSO: Yes. Yes, we do.

17 THE COURT: Do you want to see sort of generally what
18 he is pulling up or not, or do you --

19 MR. RUSSO: We were just following kind of how they
20 did it yesterday. We didn't have a transcript or anything of
21 theirs either.

22 THE COURT: I understand. I just want to make sure
23 that no one is going to say I need some other portion. And
24 that is fine. If you do, then you can identify it.

25 MR. CROSS: Your Honor, I don't recall any objections

1 during -- does this include some of your redirect I assume?

2 MR. RUSSO: Yes.

3 MR. CROSS: Other than the objections that we
4 asserted during the deposition itself, because I think there
5 may have been some leading or other questions, I don't have any
6 objection to this. Whatever objection we had I think we
7 asserted at the moment. And Your Honor can give it whatever
8 weight.

9 MR. BROWN: No objection, Your Honor.

10 THE COURT: All right. Is there anything else that
11 you want to provide before you close? I'm going to consider
12 the record to include --

13 MR. RUSSO: We'll give you the video. It is much
14 more interesting than the transcript.

15 THE COURT: Did we give an exhibit number to the
16 other transcript or not?

17 MR. CROSS: Ours was 12. I think ours was
18 Exhibit 12.

19 **(There was a brief pause in the proceedings.)**

20 THE COURT: I think that -- because I've marked some
21 of the exhibits, you are going to end up having to work with
22 Mr. Martin to get a complete set of your exhibits in with
23 actual stickers. I know that the state's provided more. But
24 we just have one copy of many things.

25 MR. KNAPP: We'll get it worked out.

1 THE COURT: I don't know -- I assume that counsel who
2 are not local are returning to Washington and any other place
3 that they are residing this weekend? Maybe they are not.

4 MS. CHAPPLE: We are, Your Honor. We have been
5 moving our flights back. So right now it is at 10:00 P.M.

6 MR. CROSS: We have all the time in the world, Your
7 Honor.

8 MS. CHAPPLE: Yes. It is not a problem.

9 THE COURT: I mean, simply because you are here and I
10 really don't want to get you to have to come again even as
11 exhausted as everyone may be, if there is -- I had said you
12 could speak for 20 minutes if there is something you really
13 want to address now. I can certainly do it by phone as well.
14 But I know that is often not what -- it has its problems.

15 MR. CROSS: Given it has been two days and the scope
16 of evidence, I think brief closings would be useful to hit the
17 highlights for Your Honor, even though we do recognize, as you
18 said, you are the fact queen.

19 THE COURT: That doesn't mean -- this is a highly
20 technical area. And I keep on asking some of the same
21 questions again so obviously -- just because I'm interested in
22 facts doesn't mean that I master them.

23 MR. CROSS: So we are happy to stay as long as Your
24 Honor is willing to stay.

25 THE COURT: Let me talk with my staff and make sure

1 that everyone can manage that.

2 **(There was a brief pause in the proceedings.)**

3 THE COURT: How about you, Mr. Russo?

4 MR. RUSSO: We can stay, Your Honor, as long as you
5 would like. I'm happy to come back on Monday or do it by phone
6 or whatever you want.

7 THE COURT: All right. Well, let's stay for 15
8 minutes and see if we can make any use of this. And if not, if
9 I find it just sort of -- I would really urge you not to go
10 over and over some of the evidence. If there is something that
11 you want to really bring to my attention that you see as a
12 result of the evidence and the law -- but I have read your
13 briefs, and I'm going to obviously have to read everything
14 again.

15 And, in fact, it is sufficiently technical that I'm
16 sort of interested in Ms. Welch not having to do a hearing
17 tomorrow so that she might have a chance -- or Monday so that
18 she might have a chance of actually getting me a transcript.

19 Let's go ahead.

20 MR. RUSSO: Your Honor, one quick question. Do we
21 have a time that we're both doing this in or that we would be
22 held to?

23 MR. BROWN: 10 minutes. 20 minutes for us and 20
24 minutes for them.

25 MR. RUSSO: 10, 10; 15, 5. 20 minutes total. How

1 does that sound? Break it up however you would like.

2 MR. BROWN: Do I have ten or five?

3 MR. CROSS: Five.

4 MR. RUSSO: That means it will be 15, Bruce.

5 MR. CROSS: You were asking me.

6 THE COURT: There is somebody back there who has
7 something to say also.

8 CLOSING ARGUMENT

9 MR. BROWN: Your Honor, Bruce Brown. Thank you for
10 the opportunity to close.

11 Our position is that although there is a lot of
12 technical matters that lie in the weeds is that to decide this
13 case does not require a heavy lift on the facts at all. And
14 the reason for that is in your 2018 opinion you said very
15 clearly that the state could go in one or two directions. It
16 could either build an auditable and reliable system or it was
17 not going to be treated easily by the courts. It can go one
18 way or the other.

19 The one option that they took was not one that was
20 left open to that -- to them. And that was to leave the system
21 exactly the same and, in fact, as we have learned over the last
22 two days, deteriorates substantially from where it was in 2018.

23 The other thing about your order, Your Honor, is that
24 you gave the defendants explicit instructions on what they
25 needed to do. And instead of following those instructions,

1 they did exactly what you didn't tell them. So, for example,
2 Ms. Payton, if you compared what you said the state needed to
3 do, it would define what they carved out of her scope of work.
4 Look at GEMS, look at the printers, look at this, look at this.
5 That was exactly what she was told not to look at.

6 You heard all of the testimony. And still today
7 there is nobody from the state who has done any assessment of
8 the 2016 intrusion. None. Zero evidence of that. And that is
9 why you almost granted the motion last time. And you said it
10 right there. You said -- and you really hit them hard by
11 saying you hadn't back a year ago assessed the impact of it.
12 And they still haven't done it. They still haven't done it.

13 So, you know, we start with the idea that these
14 systems right out of the box are -- I think a strong case could
15 be made that right out of the box they are unconstitutional
16 because there is no backup.

17 Then we have all of the problems that Georgia has had
18 leading up to 2018. And then it has only gotten worse. One of
19 the problems with the way -- and this may be the way that we
20 framed it poorly is that we get into the balancing of the
21 equities obscures what is at stake. And that is voters have an
22 absolute right to vote. And if the state puts a burden on
23 that, then we win.

24 It is not -- it is not if the state puts a burden on
25 that unreasonably, which they clearly have done, we have to

1 prove that their fix is feasible or cost effective or not in
2 some way burdensome. That is not the law. The law is very
3 clear is that the -- we are -- we are entitled to a remedy if
4 we have shown that the burden on the right to vote is
5 unreasonable. And clearly we have done that.

6 We did that a year ago, and our case only got
7 stronger. So having established that the burden on the right
8 to vote is what it is, we get a remedy. Now, is it -- is it
9 \$5000 for Morgan County? Is it more than that for Fulton? We
10 have gone -- if you look at our briefs and with the experts
11 that we brought, we had three experts look at the cost issue,
12 Your Honor. And we really drilled down on that. And our brief
13 is very long and detailed on that because we took the cost
14 issue very seriously. And it is just not there.

15 But even if it were -- even if it were, we would be
16 entitled to relief. Because we can't sacrifice people's right
17 to vote just because Georgia has left the system in place for
18 20 years and it is so far behind. And so what really is, I
19 think, the more difficult decision is whether you grant our
20 motion or you grant the Curling plaintiffs' motion.

21 And on that, I think that we -- our position is much
22 more elegant and much more attainable. On the point about --
23 getting back to the point I just made -- sorry -- about if the
24 DREs are unsafe then we move to paper ballots, that is not my
25 position. That is what Chris Harvey says. That is what

1 Georgia law says. If a voting system like a DRE is
2 impracticable, the way Chris Harvey, the head of -- the head
3 over at SOS, says it is -- if it is, you have got to move. No
4 qualifications. Not if it is convenient. Not if there is a
5 balancing of the equities. You have got to move. And
6 everybody who you ask, whether it is Ms. Doran or anybody else,
7 says yes, if they are unsafe, if they are insecure, of course,
8 we are not going to use them. Are you kidding me? Of course,
9 we are not going to use them. Yeah, we'll go through the
10 hassle. Everybody says that because that is the law.

11 THE COURT: Well, that is -- I understand what you're
12 arguing. But the state isn't saying we're not going to change.
13 They are saying we implement -- we passed legislation -- yes,
14 they could have passed it a month or two earlier. And we think
15 this is -- the state in its very considerable authority in
16 discretion in terms of the management of election matters
17 under -- as recognized under federal law says we are moving
18 towards that. We just -- it is going to take -- we're not
19 going to be able to implement this new system that we have just
20 adopted until the beginning of March basically.

21 And even then, they are not going to be in full
22 implementation necessarily until the election. But it is not
23 that they are saying we're not going to change, which really
24 was the ultimate thing that I was basically opining about in
25 2018 is they can't -- that the state could not continue to have

1 its head in the sand and to say no change is needed, no change
2 is necessary.

3 I'm not saying that it necessarily is all of the
4 change that everyone would like to see. But, you know, there
5 is considerable discretion that the -- the case law basically
6 provides to a state in framing its own system.

7 MR. BROWN: We don't believe their discretion extends
8 to leaving the people in November who are voting just
9 completely without a constitutional option and that our remedy
10 fixes. And it is a very modest remedy. And it is modest in
11 that it is narrowly tailored to the core constitutional defect.
12 And that is, you don't have a paper backup. And that is what
13 we're providing.

14 Curling's is a little bit more complicated. And I
15 think that ours is better for that reason. But, Your Honor, we
16 really are -- in my view the way we are framing this, we are
17 really not following what the law says. Because what the law
18 says -- and the best restatement of this is in *Wesberry vs.*
19 *Sanders* that Emmet Bondurant argued. And that was Hugo Black.
20 And Hugo Black says, no right is more precious in a free
21 country.

22 And why is the word -- why is that word -- and it
23 means a lot to me because precious doesn't mean valuable --
24 just mean valuable. Of course, it means valuable. But it
25 means something that is of great value that is not to be

1 wasted.

2 And Georgia is wasting its citizens' constitutional
3 rights to vote. In everything you have heard, that is what
4 they are doing. And it is careless, and they could have done
5 better. They should have done better. If it costs the state
6 more, then they are going to have to fix it.

7 All these costs that you are hearing about, the
8 scanners, those are state costs. The state bought all those
9 scanners. They have saved millions of dollars by not having to
10 replace these things. It is like driving a car that is as old
11 as mine. I have saved a lot of money by not getting a new car.
12 Yeah, it breaks down. If something happens, it is my
13 responsibility to fix it. It is nobody else's fault. It is
14 the same thing with the state.

15 So there -- and the other thing is that the -- I know
16 that this is not supposed to be punitive. But looking at your
17 order and looking at what they have done, they cannot complain,
18 Your Honor, if they have a little bit of additional expense to
19 be able to cover the million people who are going to be voting
20 in November in 2019.

21 And it is an ideal time to do this change. Because
22 these are -- although a lot of people are eligible to vote, not
23 too many people vote. There is a lot of -- and so all the
24 experts say this is an ideal time.

25 But, Your Honor, this is about the precious right to

1 vote. And it should not be treated carelessly as Georgia is
2 doing.

3 Thank you.

4 THE COURT: Thank you very much.

5 CLOSING ARGUMENT

6 MR. CROSS: Your Honor, last September, we were
7 before this Court with no discovery and Your Honor still found
8 that we had a likelihood of success on the merits. And what we
9 now know is that what we thought about this system was only a
10 small portion of what it really is.

11 The Constitution we submit, Your Honor, requires
12 abandoning the current system and all its components because
13 Dr. Shamos, their own expert, and Ms. Payton have established
14 that the vulnerabilities go way beyond what Your Honor thought
15 before, what any of us thought. They extend not just to the
16 DREs, not just to memory cards, but to GEMS itself. And that
17 has been established in a variety of ways.

18 Ms. Payton herself has said one thing that is for
19 certain is that a U.S. election will be hacked, no doubt about
20 it. And she says paper ballots -- their own expert says paper
21 ballots are the best fraud prevention, Your Honor.

22 I do think it is important to pause on their strategy
23 for a moment. Their defense is to keep saying there is no
24 evidence of a hack. It is disingenuous at best because what
25 Dr. Shamos confirmed again and again in his deposition and what

1 Ms. Payton confirmed is they just haven't looked.

2 And one has to ask given that Ms. Payton and
3 Dr. Shamos have been retained since 2017 -- they both say that
4 they could do this. Why haven't they looked? Either they are
5 terrified of what they are going to find, as we are, or they
6 don't care, or it is something more nefarious. And I'll leave
7 it at that.

8 But it doesn't matter why. All that matters, Your
9 Honor, is we are left in a situation far more egregious than we
10 were in September of last year. And you can't rely on what
11 they tell you.

12 Their defense to say when Ms. Payton comes in and
13 says only three of these serious flaws were remedied by the
14 November election is for Mr. Beaver, the CIO who hired her, to
15 say, well, she is wrong. They are disputing their own
16 evidence.

17 And this is the same person who told you in sworn
18 testimony last year, don't worry. We have a secure system
19 because we do penetration testing, but didn't tell you that
20 penetration testing had failed and then Ms. Payton and her
21 entire team had taken administrative access over the entire
22 domain at the Secretary of State, including what she calls
23 election-related systems.

24 THE COURT: I'm sorry. Who are you saying?
25 Mr. Beaver or --

1 MR. CROSS: Ms. Payton had the access.

2 THE COURT: Right. But who are you saying
3 misrepresented?

4 MR. CROSS: Mr. Beaver. Because in his August
5 declaration he said, don't worry, we do penetration testing.
6 He left out the critical fact that it failed badly.

7 This is also the same person who told you our GEMS
8 databases are unique and confidential. He admitted right from
9 the start that that was misleading, Your Honor.

10 So the only person they brought in this room to
11 defend the system who has actually seen it, because they won't
12 allow anyone else, is someone who has shown himself to be
13 utterly incredible. If he actually didn't know that their
14 system was not unique and that that was truthful at the time,
15 well, frankly, Your Honor, that may be worse than a lie because
16 it shows that the man who is supposed to guard this has no idea
17 how bad the system truly is.

18 Where we ultimately are, Your Honor, with the relief
19 is that they have a new system that's going to get rolled out
20 this year. It includes an EMS that will work with paper
21 ballots. They have said it has to be in place for all counties
22 by December. We're only asking for that EMS to be pushed
23 forward by seven weeks, as Mr. Finley explained. That can be
24 done. That can be scaled. There is no evidence from anyone in
25 this courtroom that that cannot be done.

1 In-precinct scanners, Dr. Shamos himself was emphatic
2 it has got to be in-precinct scanners. It is the only way to
3 have a secure election if you're going to do it. They are
4 going to have in-precinct scanners under the new system. We're
5 just asking that it be moved up and scaled, which our experts
6 have shown it can. Not one of their experts have said that
7 that cannot be done. Not one of their county officials said it
8 cannot be done.

9 THE COURT: But they have said -- and it is
10 intuitive, frankly, particularly in -- one could argue in a
11 system that has had many deficiencies that it would be -- to
12 date that it might be extraordinarily challenging and
13 undermining to have to implement a new system as you've
14 requested immediately now and then in the spring jump again and
15 do what the state legislature has mandated.

16 And, you know, that is obviously a huge challenge and
17 might undermine the functionality of the electoral system. I
18 mean, it is not that these folks have had a system that has
19 worked with a great degree of kind of sophistication as it has
20 gotten older and older and older.

21 MR. CROSS: Two responses, Your Honor. First, the
22 Courts have made clear that administrative inconvenience is not
23 a basis to deny a constitutional right, including the right to
24 vote. They can get it done. If Your Honor orders it, it will
25 get done.

1 The second point is this is why our relief is so
2 simple. It takes what they are already going to do, the EMS
3 that will have to be in place under the new mandate, the
4 in-precinct scanners that will be in place under the new
5 mandate. All it does is to say for now on a preliminary basis
6 don't roll out the BMDs, use hand-marked ballots -- paper
7 ballots for this year. They can then continue to roll out the
8 BMDs next year. And we will deal with that when that comes.

9 But we're the only people in this room that are
10 proposing the simple solution of a single election system
11 across the state. No one else is proposing that. And none of
12 their experts critically, Your Honor, have endorsed their
13 current system. Not Ms. Payton. Not Dr. Shamos.

14 And so what I will say, Your Honor, is they have
15 painted you into a very small and uncomfortable corner with the
16 Constitution painted all around you. The only way you get out
17 and the way they want you to go is to tread all over that
18 because you cannot keep the current system or even GEMS or
19 AccuVote. Because if you do, every single person who knows
20 anything about it has said that it is hopelessly compromised.
21 We have no idea what is inside it, Your Honor.

22 Our relief is feasible. And on the cost point, Your
23 Honor, they have got \$150 million. We're actually -- what
24 we're saying is hand-marked paper ballots cost a lot less than
25 BMDs. The in-precinct scanners, it is already budgeted for.

1 We're just asking to scale that up, Your Honor.

2 Last thing on the delay point. That is their biggest
3 point, and I understand it is the one Your Honor just made.
4 Timing.

5 THE COURT: Well, I realize they are responsible in
6 their own way for their own delay, but that doesn't take away
7 the fact that I've got a reality of an equitable remedy. And
8 it is called an equitable remedy to implement and not do harm.

9 MR. CROSS: But the problem is, Your Honor, if we --
10 you're setting a precedent and you are rewarding bad behavior
11 because it is the same thing. We're here at this stage because
12 they took an appeal to the Eleventh Circuit that the Eleventh
13 Circuit literally said was frivolous. And there is no question
14 in anyone's mind that that was a delay strategy.

15 So what happens is we keep getting to this time
16 crunch where they say now it is too late. But they got us
17 there. So they just keep treading on the constitutional right.
18 It would be someone like just in the days of desegregation just
19 saying, well, we can't do it now. Come back next year. We're
20 going to keep litigating.

21 Constitutional rights cannot get resolved and
22 litigated in that way. It would reward it forever. And the
23 fear we have is they are not going to bring this to a close in
24 the way that it needs to be. They are going to drag their
25 feet.

1 Your Honor is the only one left at this stage. You
2 are the last resort to finally make them do what needs to get
3 done and to tell them you can't just keep delaying and then
4 tell me it is too late.

5 That is what every litigant wants to do on the
6 defense side of a case. It is one thing when it is corporate
7 America. It is another thing when it is the constitutional
8 right to vote.

9 Unless Your Honor has questions --

10 THE COURT: I don't think I have at this moment. Did
11 you reserve any time there?

12 MR. CROSS: I still have three minutes. Yeah, I was
13 going to do rebuttal if that is okay.

14 THE COURT: All right.

15 CLOSING ARGUMENT

16 MS. BURWELL: Thank you, Your Honor.

17 The plaintiffs are seeking a mandatory preliminary
18 injunction. And as this Court knows, those are particularly
19 disfavored because you are not just maintaining the status quo
20 but instead you are requiring action.

21 And in the facts of the current case, we have heard a
22 lot about vulnerabilities in the system. What you haven't
23 heard is that those vulnerabilities in the system have ever
24 been exploited or that as a result of those vulnerabilities
25 there has been any disenfranchisement of a voter.

1 And I would ask the Court to look at the case of
2 *Shelby County Advocates for Valid Elections vs. Tre Hargett*,
3 which is 348 F.Supp.3d 764, which is a 2018 case out of the
4 Western Division of Tennessee. And in that case, the
5 allegations made there are very similar to the allegations made
6 here. In that case, the Court denied injunctive relief. And
7 if the Court -- I would ask the Court to look at that case
8 because I believe that the reasoning in that case is applicable
9 to this case and that for the reasons in this case this Court
10 ought to deny preliminary injunction.

11 The only other thing I want to talk about is
12 specifically with respect to the counties and the cities who
13 actually operate the elections. The people in the trenches
14 that came and testified told the Court about the difficulties
15 with attempting to make a change in the year of 2019. And
16 because you have a situation where there is absolutely no
17 evidence that the vulnerabilities that they have shown in the
18 system have caused any harm to anyone, the Court ought to
19 listen to the people on the ground here in Georgia who operate
20 and who are telling the courts the problems with going forward
21 with the change in 2019.

22 THE COURT: So I should just ignore all of the
23 national findings about the vulnerabilities of the system and
24 the difficulties even that Dr. Shamos says that everyone
25 actually know exactly what is under the hood?

1 MS. BURWELL: Well, vulnerabilities don't make a
2 constitutional infringement.

3 THE COURT: Well, they have done more than that.
4 They have said also that -- in fact, there is a lot of evidence
5 that there was probing, that there is other -- that there has
6 been a lot of Russian probing, that there is more than that,
7 but that we just simply -- basically we're in the position that
8 we are sitting ducks and don't know.

9 Just like, frankly, lots of things happen in other
10 data systems and people say there is no problem until -- as we
11 talked about before, until basically the money is taken. But
12 in the case of voting, there is not anyone with the State of
13 Georgia's system up until we end up having any type of paper
14 confirmation in some way or another -- there is no way for
15 anyone to say yes, this is the vote I cast.

16 So it is all well and good to say there is not really
17 any problem. I accept that it is important to hear from people
18 in the trenches, and I think I have been very respectful of
19 that, and I'm very interested in that.

20 MS. BURWELL: My argument is not that there have not
21 been issues because that is not my issue. That is the state's
22 issue. My issue is on behalf of the counties, the people in
23 the trenches, the people who are actually operating the
24 elections. And if they come to the Court and say, an order for
25 us to have an election in 2019 that is based on paper ballots

1 is problematic, versus the so-called experts that the
2 plaintiffs called who don't have any experience in the State of
3 Georgia who every single one of them, if you look at their
4 declarations, is part of an organization whose goal is to
5 decertify the kinds of machines that are being used in Georgia.
6 And experts aren't supposed to be advocates. They are supposed
7 to be experts. They are not supposed to have an agenda. Yet
8 they came in here with no information on the State of Georgia,
9 our procurement, our election process, and said, of course they
10 can do it in 2019. But not a single one of them had as little
11 time as they are telling the Court you ought to give the
12 counties and cities to respond.

13 Every single one of them in the states where they
14 were, Colorado, New York, California, had a minimum of six
15 months. And that is what we're saying to the Court. We're
16 talking about 2019. Our position is that in 2019 it is too
17 late for this Court to enter a mandatory preliminary
18 injunction, especially under the facts of this case.

19 And yes, they have talked about vulnerabilities. But
20 again, Your Honor, they have talked about things that could
21 happen, not that have happened. And the issue in this case is
22 voter disenfranchisement, not the fact that there are
23 vulnerabilities. Because even Dr. Halderman said there are
24 vulnerabilities with every system of voting that you have,
25 whether it is paper ballots or machines.

1 So the question before the Court as far as the
2 counties and cities are concerned is in the year 2019 will this
3 Court determine that cities and counties have to now move with
4 only a few months' notice to paper ballots. There hasn't been
5 any testimony anywhere that anyone has ever moved, transitioned
6 from machines to paper ballots in less than six months.

7 And so our position is we ask the Court to look at
8 the case and to determine that the balancing of the harm favors
9 an orderly election, not one based on chaos, which is exactly
10 what you would have if you attempted to force counties and
11 cities to move to paper ballots in the year 2019.

12 THE COURT: Thank you.

13 CLOSING ARGUMENT

14 MR. TYSON: Thank you, Your Honor.

15 As Ms. Burwell just said, we are here on a mandatory
16 injunction. The burden on the plaintiffs is high. And what I
17 want to do is just walk through where we were last September
18 and what has happened since then.

19 So at the hearing last September, you had a lot of
20 evidence of DRE vulnerabilities and not a whole lot of evidence
21 on the state's side for what was being done about those
22 vulnerabilities. And I know there was a significant concern by
23 the Court about whether state officials were ignoring the
24 growing threats that we see that we've talked about throughout
25 this case.

1 And since that time, we had an election, we had an
2 inauguration, and within just four months after that we had
3 legislation that has passed and a new voting system that is
4 being put into place.

5 The state went through the process that a
6 deliberative policy-making body would do. They heard from the
7 advocates who favor different kinds of voting systems. They
8 heard from people who had experiences. And the state
9 legislature ultimately concluded to go with a method that is
10 recommended by the very National Academy of Sciences report
11 that the plaintiffs have relied on so heavily for the
12 vulnerabilities in DREs. I don't think there is any
13 disagreement that the state needs to move away from the DRE
14 system. The state policymakers chose to do that and are moving
15 quickly towards that.

16 The state appropriated \$150 million to get that done
17 and to move that process along. There were a wide variety of
18 updates in election statutes in light of the problems that
19 happened in 2018 and the other issues that were raised.

20 The state has added rules about cybersecurity that
21 require malware scans recognizing the threats that are there.
22 As you heard after the Kennesaw State breach, there was a
23 rebuilding of the ballot building server at a different
24 location with new -- with the original software.

25 And I know there is some discussion back and forth

1 about the Fortalice reports. But if anything, it shows the
2 Secretary's office is taking cybersecurity very seriously and
3 is working to mitigate the risks -- identify and mitigate
4 risks. That is what you always want to be doing in the
5 security context. And so the state has taken significant
6 action forward since the point that Your Honor's order came out
7 in September.

8 And I think when we are thinking about the balancing
9 of the equities and the public interests, we have to balance
10 the -- what we heard from election officials about the cost and
11 the difficulties of implementing a new voting system when early
12 voting begins in just 80 days for the November elections, when
13 it begins in 19 days for these elections in Coweta County, and
14 against the evidence of no breach, no evidence of any sort of
15 hack or any sort of manipulation of the election system.

16 Balance that against the burden that is placed on
17 election officials and on the public. And the reality is
18 facing this when we have a new vendor announced -- and it
19 should be just a matter of days as we discussed -- there will
20 be a process that will begin. That process will be to design
21 the very policies and procedures that have to surround an
22 election system to make sure it works. And that will include
23 how we're going to handle the paper ballots that are generated
24 by the ballot marking devices. It is going to include how we
25 design the polling places, how we deal with the electrical

1 problems. All the pieces that are involved in actually
2 administering an election are going to have to be decided.

3 And the questions that are going to be decided
4 through that process are different for a ballot mark device
5 system than for a hand-marked paper ballot system. In a ballot
6 mark device system, you don't have questions about voter
7 intent. You don't have questions about how to process the
8 stray marks and the other things that voters will put on
9 ballots. You have to figure out how to deal with overvotes and
10 the possibilities of human manipulation after a ballot has been
11 cast.

12 Those processes have to be put into place. And as we
13 heard from Ms. Ledford and others, putting another process in
14 the middle of that will be incredibly disruptive and a
15 distraction to implementing the ballot mark device system.

16 The state would have to or this Court would have to
17 design how are we going to handle hand-marked paper ballots for
18 a single set of municipal elections in 2019 while we're in the
19 middle of trying to administer a different set of processes and
20 procedures for ballot marked device paper ballots.

21 THE COURT: Well, let me ask you this. It is one
22 thing to say wait until we get this done and we're going to do
23 it right now. But -- and we're doing exactly what the National
24 Academy recommended. But this whole business of -- and I
25 realize it is a separate claim. But it is still concerning in

1 thinking about an equitable relief.

2 If the state ends up choosing a system or has chosen
3 a system where I can look at the printout but, in fact, the
4 real controlling determination as to what is the selection that
5 is going to be input into the system is something I can't
6 actually verify, which is the bar code, how does that -- how
7 does it resolve that? I know it is an uncomfortable position
8 to ask you. But, you know, it is one thing to say to the
9 Court, listen, this is exactly the same, but, in fact, it might
10 not be the same because I don't think anyone can read a bar
11 code.

12 MR. TYSON: Your Honor, I think there's two points on
13 that. Number 1, I feel like I just need to say obviously we
14 don't believe that is anywhere in the scope of the plaintiffs'
15 complaint --

16 THE COURT: I understand that. But --

17 MR. TYSON: -- or their motions. And I'll set that
18 aside.

19 THE COURT: I understand that, and I'm not asking
20 about it for that purpose. I'm asking about it in terms of the
21 Court's exercise of its equitable discretion saying is this
22 really likely cured or are we, in fact, just going to be into
23 another version of this in the way that Mr. Cross has
24 indicated.

25 MR. TYSON: Yes, Your Honor. I think that the key

1 thing there is the additions in House Bill 316 related to
2 auditing. And when you have a ballot marked device and the
3 voter can check and see what the human readable selections are,
4 it is required in the statute that the system has to have human
5 readable selections.

6 So we can audit what is listed as the -- what the
7 voter has been able to look at as the selections with the
8 results the bar code gets. And so we have an ability because
9 we have a voter-verifiable paper trail to determine if there
10 are issues.

11 The plaintiffs' complaint throughout this whole
12 process has been that DREs are not auditable. The fact that
13 we'll have county level audits starting as soon as possible but
14 no later than November 2020 and that we'll have this beginning
15 process to get Georgia into the kind of cutting edge of the
16 risk-limiting audits -- that is a process that is going to do
17 that and to address that. And any concerns about compromises
18 later can be addressed because we'll be able to determine
19 through an auditing process what is going on. So the claims
20 about the bar codes I see as very different than the claims
21 related to the DREs and the issues there.

22 One other concern that had been raised was about
23 the -- we have runoffs in October as well. And I'm just trying
24 to factor in when we are doing the timing how are we going to
25 handle this different system.

1 So I think for the other piece that I wanted to talk
2 about, Your Honor, is dealing with the question for disabled
3 voters. And the idea that we can -- either ballot marking
4 devices and DREs are so terrible that no one can use them
5 except for disabled voters who are required to have an
6 accessible means of voting. And while the Curling plaintiffs
7 have discussed at length that they could obtain some ballot
8 marking devices in a timely way that would meet their
9 requirements for ballot marking devices, they put forward no
10 evidence that those systems exist, that they can be procured in
11 a sufficient timeline, and place it in a very real danger of if
12 you are trying to procure a non-bar code system -- if that is
13 what they are saying can be done, they haven't put forward any
14 evidence that that is actually feasible or possible in the time
15 line.

16 And the Coalition plaintiffs seem to say, well, we'll
17 just keep using DREs for disabled voters. But if they believe
18 the system is so unconstitutional that it would be adverse for
19 all voters, it doesn't make any sense to require disabled
20 voters to vote on a system that they believe is
21 unconstitutional.

22 And then we're back to the question of cost. The
23 state has appropriated money to take action in light of the
24 security concerns that have been raised, in light of the need
25 to update the call from the National Academies, from the

1 investigations that have happened all around -- to take action.
2 And the fact that we are facing a significant cost, we have
3 heard testimony. Counties and cities will face significant
4 costs trying to put in place an intermediate remedy if we're
5 left with that scenario. And I know that the plaintiffs have
6 made this argument that, well, we will just handle it like we
7 do provisional ballots. But as you heard from the county
8 election officials, there is a different process for
9 provisional ballots. And it is not a matter of just kind of
10 queuing up additional paper ballots to have at the precinct.
11 Because we're still back to the same questions about how we
12 administer that at the county and at the precinct level.

13 So, Your Honor, for the state depending on -- what
14 we're facing is the very real possibility of not only a danger
15 to voters in terms of confusion and problems with getting poll
16 workers and having a system that actually functions correctly,
17 but we're also facing a very real danger of disrupting an
18 ongoing procurement that is designed to address the very
19 concerns that have been raised in this case.

20 Given the nature of what the plaintiffs are asking,
21 the steps the state has taken to comply and to advance the
22 program chosen by the National Academy of Sciences and
23 recommended by them and the complicated nature of the relief in
24 this case, we would say that the facts and the law do not
25 clearly favor the plaintiffs, which is the standard under a

1 mandatory injunction. And the Court should not interrupt the
2 ongoing process of moving the State of Georgia toward ballot
3 marked devices with paper ballots.

4 THE COURT: So this is another relief issue, which is
5 you have a very -- the state itself has a very aggressive
6 schedule. And so the plaintiffs basically implicitly say also,
7 well, they may not really be ready to roll in March so maybe
8 we're being asked to just keep on delaying. You have a --
9 because you're not ready. You have a sample of ten
10 jurisdictions that you are working with for this fall election.

11 And what are those jurisdictions?

12 MR. TYSON: I believe Mr. Russo has those, Your
13 Honor.

14 MR. RUSSO: If I can have a second, yes, Your Honor.
15 The jurisdictions that the state provided to me, I believe,
16 this morning or maybe last night was Bacon, Bartow, Carroll,
17 Catoosa, Charlton, Decatur, Evans, Lowndes, Paulding, Treutlen.

18 THE COURT: Decatur, is that the City of Decatur or
19 Decatur County?

20 MR. TYSON: County of Decatur.

21 MR. RUSSO: County. They are all counties.

22 MR. TYSON: I think the goal, Your Honor, is to find
23 kind of a variety of sizes -- relative sizes of counties to
24 make sure that we can address the varying problems from a
25 smaller county like Morgan County to a larger county like

1 Chatham County.

2 THE COURT: And I realize you are going to say this
3 is sort of like potentially irrelevant. But what if you are
4 not ready and you are -- again come March? Because this is
5 such for your own -- it is an aggressive schedule for the state
6 itself at least having had the legislation adopted late in the
7 legislative session, the procurement taking whatever period it
8 has taken, but a significant amount of time.

9 I mean, what is your fallback arrangement other than
10 simply to continue using the DREs? If we don't -- and did you
11 even consider -- and it is not you personally I realize. But
12 did the state consider conceivably having ten jurisdictions
13 where it would use a ballot -- a hand ballot count arrangement
14 instead? I mean, just basically what I was trying to pursue
15 with the gentleman from Chatham County.

16 MR. TYSON: Yes, Your Honor. I'm not aware of any
17 consideration. I know the legislature considered the various
18 systems. And one of the systems that they received a lot of
19 lobbying and effort was a hand-marked paper ballot system. So
20 that's where the -- any consideration happened.

21 THE COURT: I realize that, but I'm just talking
22 about the fact that you don't have any other fallback. You
23 don't know even how this is going to work and how -- come
24 November. So, you know, all -- you know, I guess I'm -- I have
25 concerns that I'll be in Groundhog Day, you know, forever more.

1 Every election I'm going to be here. And that is the concern.
2 Not because of me personally. But that is not -- that is not
3 fair for the citizens of this state.

4 MR. TYSON: I'll say two things to that, Your Honor.
5 Number 1, as a condition of bidding in the procurement, the
6 vendor is required to certify that they would be able to meet
7 the demands and the timeline that was given. So we have that
8 initial piece. We also have Mr. Finley's testimony here that
9 he thought that the state's goal was very achievable and was
10 doable. That is from the plaintiffs' side.

11 So the fact that there is evidence before you that
12 this is proceeding on that, I understand the concern but I
13 think that is also the reason why, as you know, governments
14 cannot necessarily move as quickly. We have the
15 as-soon-as-possible language in the statute where the goal of
16 the State of Georgia is to as soon as possible get to ballot
17 marked devices -- ballot mark device paper ballots.

18 And if -- and I understand your concern, and I don't
19 believe there is an additional way that we could address that
20 except to continue using the existing system because of the
21 exact concerns that we have raised here. When you interpose an
22 intermediate system, you interrupt the process and slow down
23 the as-soon-as-possible command of the legislature.

24 Thank you, Your Honor.

25 MR. BROWN: Your Honor, I'll just be a minute.

1 THE COURT: Do y'all have an agreement as to how you
2 are --

3 MR. CROSS: No. Well, we had time limits.

4 MR. BROWN: I wasn't done. Was I done?

5 MR. CROSS: Yeah. That was the beeping. Your alarm
6 went off.

7 MR. BROWN: I thought that was my phone. Just one
8 thing, Your Honor, if --

9 THE COURT: One minute. Go ahead.

10 CLOSING ARGUMENT

11 MR. BROWN: Your Honor, there is no evidence of this
12 new system. Here is -- this is the switcheroo. They didn't
13 bring anybody in here to explain the new system. They are
14 getting the bond thing in here sort of over the transom. And I
15 don't know -- so they get the good documents in here but not
16 the other ones. They didn't put on a case about this.

17 And the most -- other than the three people with who
18 do the GEMS in their garages, other than those, that evidence,
19 the most terrifying line in the case was from Merritt Beaver
20 who said, getting this in place in time for the 2020
21 presidential election is tight, if everything goes right.

22 That is terrifying, Your Honor. They have no backup.
23 And the only way to reconcile all of those equities is to say
24 the state has to have a constitutional backup for the
25 presidential election. How can it not? How can it not?

1 And the only way to do that is with hand-marked paper
2 ballots and to enter an order that says do it now -- do it and
3 if you come up with a better alternative, come back, and we'll
4 adjust the remedy, just like it is done all the time in the
5 segregation, in the prison reform cases.

6 Thank you, Your Honor.

7 THE COURT: Mr. Cross, you get your three minutes
8 only because I do appreciate that you are not at war like you
9 were before. So just go ahead.

10 CLOSING ARGUMENT

11 MR. CROSS: I think I have 3:20 left. So I'm going
12 to -- sit over there so I can see you.

13 All right. Briefly, Your Honor, it is surprising and
14 disappointing to hear Ms. Burwell start with the argument that
15 we haven't heard vulnerabilities that have ever been exploited.

16 Again, imagine a trade secret case, Your Honor, where
17 the defense was, well, there is no evidence it was stolen but
18 no one ever bothered to check the computers of the defendants
19 because they didn't look and they didn't allow it. Your Honor
20 would never allow that defense to go forward. It would never
21 survive. And that is literally their defense.

22 As to their own experts. Two experts they have had
23 for years that they shielded from their system. That alone
24 should be dispositive of the system they have. No one would
25 consider that conscionable in the least, much less lawful, Your

1 Honor.

2 If they had even the slightest shred of confidence in
3 their system, you could be rest assured Ms. Payton or
4 Dr. Shamos would have looked at it. They would have done it
5 over the last two years and they would have come into this
6 courtroom and they would have presented the evidence.

7 Remember, Dr. Shamos testified that there was a flaw
8 so severe in 2006 that he had insisted Pennsylvania not go
9 forward with the DREs. They have not remediated that. If they
10 had it, they would have shown you. Dr. Shamos testified if
11 that still is outstanding they cannot go forward with the DREs.

12 And let's be clear, Your Honor. What we have heard
13 from Dr. Shamos and Ms. Payton, the penetration testing, the
14 many flaws -- we are so far beyond DREs. I cannot make that
15 clear enough, Your Honor. We can't end up in a world where we
16 become too focused on that.

17 Because the GEMS is where everything starts, the
18 memory cards. Dr. Shamos agreed. If you get into GEMS,
19 everything is flawed. And he said it takes no more
20 sophistication to swap a memory card than it does to swap paper
21 ballots. And here is the perversity of their defense. Their
22 attack on paper ballots is, well, we can't possibly secure
23 them. They'll disappear. They'll get thrown in a lake.
24 Somebody will do something with them.

25 Pause on that for a moment with what that means. If

1 they can't secure a box of paper ballots, how in the world can
2 they secure 27,000 DREs, tens of thousands of memory cards that
3 float all over the state, 160 GEMS servers, some of which have
4 been connected or apparently all of which were connected to
5 phone lines -- at least 159?

6 They have indicted their own system, as have their
7 own experts. Your Honor, we are done with this current system.
8 And as Your Honor pointed out, they have no -- absolutely no
9 alternative. And to say that our experts don't have experience
10 in the State of Georgia is because they won't allow them.

11 And, remember, we asked to look at the GEMS servers.
12 They represented to Your Honor GEMS is so sensitive that even
13 Dr. Halderman, a renowned expert who has his own lab, couldn't
14 do it. And then what do we learn today? Something that
15 Mr. Barnes didn't disclose in his deposition. That they have
16 contractors who out of their homes build ballots and GEMS
17 databases from their homes on their PCs.

18 And we heard nothing about whether anyone has ever
19 been to their homes and have any idea what the situation is.
20 That's completely at odds with what they represented to this
21 Court time and time again about how GEMS databases are
22 maintained. Their representations are as empty as their
23 defense, Your Honor.

24 On the feasibility, Ms. Burwell said there is no
25 evidence that anybody could do this. Well, let's go back to

1 what Mr. Finley testified to. California in the span of six
2 months swapped out 40,000 DREs for hand-marked paper ballots
3 for 4 million voters in a presidential primary year. In six
4 months.

5 We're asking here to do it for small and local
6 elections that are going to amount to a fraction of that,
7 probably only hundreds of thousands of voters across the
8 elections. In individual elections, you are talking hundreds
9 or maybe thousands of voters often. So it is a tiny fraction
10 in an off year.

11 If California could do what they did, surely they can
12 unless they are just going to tell you that they are less
13 competent. And I don't think we're going to hear that.
14 Virginia did it from September to November.

15 THE COURT: All right. Now you -- wrap it up.

16 MR. CROSS: Your Honor, the last point on audits,
17 just because this has gotten a lot of attention, they have had
18 no evidence on audits. Audits aren't going to exist in the
19 state in any meaningful sense until 2024. Audits are not an
20 answer.

21 Thank you, Your Honor.

22 THE COURT: I know there's a bunch of just clean-up
23 of the record, and I'll leave Mr. Martin to deal with you-all
24 about that in terms of the documents.

25 And do we have the video of Dr. Shamos?

1 COURTROOM DEPUTY CLERK: Yes.

2 THE COURT: I appreciate that everyone has worked a
3 lot of hours and given a lot of thought to this. And I do also
4 appreciate that people have very strong feelings about this and
5 that it is, of course, what makes for a robust democracy that
6 everyone wants to protect in their own way.

7 And these are very difficult issues though. And I'm
8 going to wrestle with them the best as I can. But there are
9 not simple answers. I certainly wish the state had been more
10 forthright with me a year ago. I think -- and I am not
11 pointing to current counsel or prior counsel in that regard
12 either.

13 But the fact is that the state of things was dire
14 enough that it would have saved us time. And I think that
15 Mr. Cross' complaint and argument regarding that we should
16 have -- that Dr. Halderman should have been allowed to under
17 the circumstances presented as evident now been allowed to look
18 at the server is warranted. I don't know that he would have
19 found anything either.

20 And I don't know why the Fortalice firm that was
21 obviously trusted was basically not given other more laser-like
22 tasks. But maybe the first issue, of course, for the state
23 was -- as she said was, were the walls of the kingdom itself
24 functional. And it was much more basic.

25 You know, I understood that. But, of course, the

1 election system in its integrity was front and center here and
2 should always be front and center in any democracy. And we
3 always consider it a mark against a democracy when we can't --
4 when citizens can't have faith in their democracy.

5 Then, on the other hand, there is a true reality, you
6 know, whether people like it or not, that there was a
7 legislative deliberation of great length. And people may
8 disagree with it. But the legislature was presented with a
9 variety of issues and concerns and obviously knew they couldn't
10 stick with the DRE and took a course of action.

11 So it is not something the Court can lightly just
12 say, oh, let's -- I'm going to ignore that. And even as
13 important as all of the voters' interests are in this coming
14 election, I don't also want to run -- run amok of the change
15 that is in process.

16 I share the concern about the audits being perhaps
17 not a reality until 2004 {sic}. It is a system that was
18 allowed to grow way too old and archaic. So climbing out of
19 this is not a simple thing. On the other hand, the Court is
20 just -- the Judge is just a judge. I'm not -- I might try to
21 be the queen of the facts. But I'm not the queen of the
22 reality and policy and administration.

23 So it is a very daunting circumstance to try to face
24 all of that and the very serious issues that all sides have
25 presented. So that is what we'll be trying to figure out in

1 the next few days. But not tomorrow.

2 MR. CROSS: Thank you, Your Honor.

3 MR. RUSSO: Thank you.

4 THE COURT: Thank you very much. Thank you for your
5 seat power too.

6 COURTROOM SECURITY OFFICER: All rise. Court is in
7 recess.

8 **(The proceedings were thereby concluded at 8:22**
9 **P.M.)**

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C E R T I F I C A T E

UNITED STATES OF AMERICA
NORTHERN DISTRICT OF GEORGIA

I, SHANNON R. WELCH, RMR, CRR, Official Court Reporter of the United States District Court, for the Northern District of Georgia, Atlanta Division, do hereby certify that the foregoing 379 pages constitute a true transcript of proceedings had before the said Court, held in the City of Atlanta, Georgia, in the matter therein stated.

In testimony whereof, I hereunto set my hand on this, the 2nd day of August, 2019.

Shannon R. Welch

SHANNON R. WELCH, RMR, CRR
OFFICIAL COURT REPORTER
UNITED STATES DISTRICT COURT