



EAC Election Data Summit 2018  
July 12, 2018  
Captions Transcript

>> We're going to start in about two minutes. In about two minutes, we're going to start.

>> Good morning, everyone. I love the fact that people get quiet when I get up on stage. Good morning. I'm Tom Hicks. I'm chairman of the United States election commission. I should have asked the folks if we're streaming before I get going. So good morning. I'm Tom Hicks, chairman of the United States election commission, or EAC. And I want to take one minute to pledge allegiance to the flag, which is right behind me here.

I pledge allegiance to the flag of the United States of America, and to the republic for which it stands, one nation, under God, indivisible, with Liberty and justice for all.

So with that, I want to ask everyone to silence their phones so that we don't have any mishaps during the summit.

We are honored to be hosting this Election Data Summit, in partnership with the Pennsylvania Department of State. The EAC held its first data summit in 2015, and we're excited to carry the momentum toward this event today. Thank you all who have joined us here today in the audience and those of you who are watching this live streaming from home or in the office. Collecting, analyzing, and sharing election data is a big part of what we do here at the EAC.

In service of our clearinghouse function and all the mandates under the Help America Vote act, which administer the election administration and voting survey, or EAVS, after every federal election. The EAVS survey collects state by state data under jurisdiction of federal elections in all 50 states, the District of

Columbia, and four U.S. territories. The EAVS contains the most comprehensive nationwide data about how elections are run in the United States, data on voter registration, voting by military and overseas citizens, absentee, and provisional ballots, polling operations, election day activities, and voting equipment.

The EAVS provides policy makers and the public with key information about how our democracy functions. We at the EAC take our responsibility as stewards of critical national election data seriously, and we are busy laying the groundwork for the 2018 survey. Building on some important changes for 2016, we're working to improve the survey in three ways. First, we're working to make the survey easier for election officials to complete. Second, we're taking steps to strengthen the data quality and completeness. And, third, we're working to Foster greater use of the data by experts and election officials alike. We know that EAVS data barely scratches the surface of the wide world of election data that's out there. State and local election officials across the country use data every day and are constantly innovating to improve election -- page turn -- processes.

From voter registration processes to post-election review exercises, data driven approaches are helping election officials identify trends, anticipate changes, voters need, predict the impact of proposed policies, and determine how to invest resources. As election officials prepare for the upcoming midterm elections, we are thrilled to be partnering with our friends at the Pennsylvania Department of State to offer this platform for election officials and election data experts to share their experiences and lift up innovation, data driven practices from across the country.

With that, I'm going to talk about a few housekeeping things that are going on.

If you are a social media user, we encourage you to post about this summit using the #electiondata18. Again, that's #electiondata18.

There are a few opportunities throughout the day for our audience to ask questions of our panelists. If you would like to ask questions, we politely ask you to do one of three things. This is about data, three things. Remember this. One, speak into the microphone so that folks who are listening from home can actually hear the question. Two, identify yourself, name and affiliation. And, three, this is most important, actually ask a question.

If you need assistance throughout the day, please find a staff member from the EAC or the Pennsylvania Department of State, because we're all happy to help and assist you.

Thank you again for coming, and thank you for the Community College of Philadelphia for hosting us here today. Let me give a special note of thanks for the

election officials who are here. And if you're an election official and wanting to stand for a quick acknowledgement, please do so. Don't be shy. Don't be shy.

[APPLAUSE]

Most of these folks are here for the NAS and NASED conference, but we're very encouraged they all came for our summit today.

Finally, let me give a sincere appreciation for acting secretary Robert Torres and his team at state for inviting us here today to the commonwealth department for this important initiative. At this time, it's my pleasure to introduce secretary Torres, who will be delivering opening remarks. Thank you once again to the audience in your commitment to secure accurate and improving elections. Thank you.

>> Good morning. Chairman Hicks, it's good to see you. Thank you for being here. On behalf of the Department of State, it's my privilege to welcome you to the city of Philadelphia, the Community College of Philadelphia for today's Election Assistance Commission. Our happy to partner with the election commission on this data summit co-hosted by the state and the EAC. I would like to extend my gratitude and a special thanks to our deputy policy director Jessica Myers for all of her hard work and collaboration with our colleagues at the EAC to help organize and bring you this relevant, educational, and timely summit.

Of course, I also want to thank the EAC team for their hard work and support in putting today's summit together. And by the way, you can't beat the price. So there should be no complaints, at least on that front.

So let me also extend my thanks to all the moderators and the panelists for your time and effort in participating today. And finally, thank you all for your interest and attendance in what I trust will be a worthwhile investment of your time.

Pennsylvania takes the administration of our elections very seriously. We at the department work in partnership with counties to ensure smooth, fair, and secure elections. However, I know that many, if not all of us, want to find more efficient ways of administering elections and managing our limited resources. This is why we have been working to modernize how we manage data and information in Pennsylvania. With regard to voter registration, we implemented online voter registration nearly three years ago and passed the 1 millionth user mark last February. We have also developed web APIs or interfaces to further continue and leverage the progress that we have achieved with online voter registration.

However, the voter registration database that we use needs to be replaced because it is costly and doesn't support the kind of information reporting and analytics that a modern system could provide. Therefore, we are in the process of developing business requirements with strong considerations on how we want the

data and the information derived from that data to work for us and the counties so that we can maximize the benefits of a new system.

On election day, we work with the counties and other state agencies, such as the office of administration, Pennsylvania Emergency Management Agency, office of Homeland Security, and others to monitor events throughout Pennsylvania that could impact voting. The surveillance and use of data in the communications channels we have established, help to maintain situational awareness and help us respond quickly to problems.

Pennsylvania is also pursuing the transition to new voting system within the next two years. We have directed that all new voting systems purchased in the commonwealth must have voter verifiable paper ballot or paper records of votes cast by the voter that will enable us to audit the systems and conduct post-election audits that will help further validate voting results and maintain confidence in the integrity of the electoral process.

ADA and the effective use of data to help manage all aspects of the electoral process is extremely important. However, data alone is not enough. The quality of the data you use always has to be considered. The skill sets of the staff and analysts who use the data that you will rely upon for information has to be considered. How you formulate research questions has to be considered because, if you ask the wrong questions, guess what? The data will be useless to you.

Voter confidence in our elections can be impacted by their experience at the polls and their observations on how elections are handled. As election officials, advocates, and stakeholders, it is incumbent on us to collect and use data effectively to help improve our properties, enhance resource allocations, increase accuracy, and support auditability. All of this should be done to ensure voters and ourselves that the integrity of procedures being used and ultimately our elections can be trusted.

Let me just say this. If you don't remember anything else I say this morning, please remember these words throughout the day. If you cannot measure, you cannot manage. I'll repeat. If you cannot measure, you cannot manage.

Thank you for being here. I wish you a productive and enjoyable day. For those of you who are staying for the NAS or the NASED conference, enjoy your stay and have a great conference experience. Thank you.

[APPLAUSE].

>> Good morning. And welcome to our first panel. My name is Christy McCormick, and I am the vice chair of the U.S. Election Assistance Commission. Since the EAC was reconstituted with commissioners in 2015, we've taken a number of steps to strengthen our data collection efforts at the EAC and to

encourage data driven practices among election officials. In addition to our work to improve the election administration and voting survey, we organized the EAC's first ever Election Data Summit in 2015.

And since I've been in this business, I've realized that election folks are the most OCD people I have ever met, and this just feeds that disorder. Some of the speakers here today were with us at the original summit, Amber McReynolds, Jennifer Morrell, and I'm pleased there are many new voices on the stage and in the room today. We're proud to be furthering this effort with the Election Summit. Thank you for the Pennsylvania Department of State for partnering with us on this important event.

The panels we have arranged for you today follow the phases of the election cycle. We begin the day focused on preregistration activities, such as voter registration, and we'll finish with post-election matters, including audits and after action review processes.

This panel that we're on right now will focus on the topic of voter registration. Voter registration data is the backbone of election data. Not only does this registration data serve as the list of eligible voters used in polling stations on election day, but it is also essential to vote by mail and ballot creation. This data also drives key election administration resource key allocation decisions, such as assigning poll workers and voting equipment to polling places. Statewide voter registration databases are also one of the main tools that election officials have for sharing election data within and among states.

Our panelists here will explore how voter registration data is being used across the country. This will include a discussion of recent efforts to modernize voter registration systems and processes as well as initiatives to increase the sharing of registration data between states to support improved list maintenance and outreach to unregistered voters. Our esteemed panelists currently serve -- or previously served as election officials in Colorado, Florida, Oregon, Pennsylvania, and Virginia. Each of these expert panelists brings a unique perspective of the conversation about data driven approaches and improving voter registration processes.

So I would like to introduce our panelists before we get started. On my far right is Mike Moser, the deputy commissioner of elections in the Pennsylvania Department of State. Welcome, Mike. He joined the department in 2015 and oversees and coordinates elections and voter registration initiatives and federal and state elections with the 67 county board of election in Pennsylvania.

Next to him, to my right again, is Dr. Judd Choate. Judd is the state election director for Colorado and the immediate past president of the national

association of state election directors. Judd has a J.D. from the University of Colorado school of law and both a Ph.D. and M.A. in political science from Purdue University. He was formerly a professor of political science at the University of Nebraska. In a previous life, Judd was a scout for the Kansas City Royals. And as I found out this morning, he also used to deejay for an adult contemporary music station. So we had a nice conversation about Neil Diamond.

Ericka Haas on my left is the systems engineer and technical liaison for the electronic information registration center, also known as ERIC. She manages the data exchange of voter registration and vehicle licensing data for 24 states. Before joining ERIC, Ericka, appropriately named, worked on the Oregon state registration system with the Oregon secretary of state.

And then on my far left is Don Palmer. He's a policy adviser with the U.S. Election Assistance Commission. He's a fellow with the bipartisan democracy project, focused on the recommendations of the presidential commission on election administration of the PCEA. Don previously served as secretary of Virginia's board of elections, and as director of elections in Florida. He's also served as a trial attorney with the voting section in the department of justice's civil rights division, and we actually started on the very same day at the DOJ. So I've known Don for quite some time. And as of yesterday afternoon, he was also nominated by the president to be our next commissioner at the EAC. So congratulations, Don. We'll see how that goes.

[APPLAUSE].

The way this is going to work is each of our panelists will give prepared remarks, and then we'll shift into a question and answer period. I have some questions for them, and then we will open it up to the audience. So, Mike, you're up first. Thank you.

>> Good morning, everybody. It's great to see you. Thank you so much for the opportunity. Fantastic. Thank you.

So I'm here to talk about kind of the recent modernization efforts for voter registration in the Commonwealth of Pennsylvania and kind of how we're trying to synchronize what we call the service channel for voter registration. And reviewing the data and the design of the applications we're using to collect the data to inform decisions and next steps of where we want to take them.

So I'll call a journey that we've been on to modernize here in the Commonwealth, it's been a great experience, and what we're trying to do is take a look at the paper, traditional paper method of registration versus online voter registration and really trying to hook into some other areas in addition to the work

that we've been doing with PennDOT and the motor voter transactions to actually engage more with registration drives and third party entities.

We can kind of summarize it into three broad areas we're trying to focus on when trying to modernize here in the Commonwealth, and that's usability, integrity, and improvement of the forms. And just the cycle in general of how we're making changes. We're really trying to focus on usability, where we're focusing on plain language, we're making sure the applicant is understanding the context of the information that we're trying to convey so they can submit their information on the forms, and also engage into user testing with the entity so we can make adjustments on the form to collect the necessary information to ensure proper registration. That not only helps out with them getting registered to vote, but it also helps out our 67 boards of election so they can process the registration adequately, and the voter ultimately gets the registration card, and they can go vote.

We're also focusing on the integrity of the process. I mean that loosely. That's where we are looking at the different types of data that's coming in. Are the data points complete? Are they accurate? Are they consistent? And then we just kind of apply like the lien process overall. I know that's becoming more of a common terminology among election directors and just government services in general. It's a big initiative here in the Commonwealth of Pennsylvania to engage in a lien or sig sigma, for those who are familiar with it. So we kind of look at the overall process to ensure all the information is there for the applicant.

And then just continuous improvement overall. We have an agile environment here, and that is a 30-day sprint cycle for development here for our online forms, but we also apply it through lien to make sure we're continuously reviewing the changes we're making.

So I just want to give a little background on kind of the major voter registration changes that have occurred in the Commonwealth. In 2003, we've had an electronic exchange through our PennDOT transportation partner with Motor Voter. We've had signatures coming over, and we've made changes, which I'll go over momentarily. In 2005, all counties completed the transition to our current voter registration database, which is what acting secretary Torres was mentioning we're going through a process to modernize the database as a whole.

And then the bulk of what we've been doing, the modernization efforts came, started happening in 2015, where we redesigned our paper application with some usability testing. We launched online voter registration in the state, and as the secretary noted, we went over 1 million applicants, which was a great experience for us.

In 2016 we simplified the language for Motor Voter. We incorporated online signature upload feature into our online voter registration application, and I'll talk more about that soon. And also implemented an application programming interface for third parties to plug into for voter registration.

2017, we built upon that to engage with our state NVRA agencies and adopted our first agency into web API for online voter registration.

Then in 2018, we launched a third party feature for online registration drives to help there with our counties and the applicants because, as election officials are aware, usually registration drive goes out on paper and not all the necessary information or the quality isn't always the same and consistent as would a normal signup. So we want to kind of help out there with the data we were seeing and built an online feature to help make it more consistent for the applicant.

So this is just a quick example. I think on the left for you is the old paper form that we had. The new form is on the right for usability testing. It's a lot more consistent, and we've seen a much better back end with data there with the changes, and then we also have examples of this is what our current online voter registration state looks like, again with testing and review and looking at the different data points. We'll be pushing out a new redesign in the future and really cutting out a lot of the extra space.

The idea I'm trying to drive is that with data collection, it's not just looking at the back end information that's coming in, but you can also push certain types of collection and get better quality data through initiatives of the designs of forms you're putting out there to help with the back end analyses that a lot of the experts will be doing and to build a solid foundation for the future. Design is certainly an aspect that's been very beneficial for us in Pennsylvania.

So something that we noticed right away and we were kind of aware with online voter registration when it was launched, when somebody goes to sign up online, not necessarily versus a paper form, if they didn't match with PennDOT, they didn't have an opportunity to bring their signature over. Here in The Commonwealth, if you match with your PennDOT information, your signature will automatically come over on the record. When OVR was first launched here, that wasn't a feature. So we were tracking the information that was coming through, and what I have here since 2015, '16, and '17, I have the total applications that were coming through for online voter registration. And then the number of missing signature requests that would come through.

Because what you could do is, when you went through the application and you didn't match with PennDOT at first, you could request a mail form come out, and basically the applicant would sign it with key information about them and mail it

back to their county registration office. So that was a process we were really starting to look at where people weren't always returning the form. A lot of applications were sitting out there, and we really wanted to make sure the applicant got registered to vote but also the counties had what they need to process the application. So we kind of looked at it and incorporated a signature upload feature.

This is just a brief screenshot. Apologize for the blurriness a little bit. Essentially, they will be prompted at some point to upload a signature, going through the process and validations, and then you can upload a signature there. It's a little better than a doctor's signature, but that's the gist of it. You take a picture, and you can submit it, and it comes into the application for the county registration office to see it when they're reviewing the information when they're in the database.

Since we launched that feature, we have seen the total number of signature requests come down. Initially in the first year, it was about 20 percent of total of online applications. Since the feature came out, we're now sitting at about 12 or 13 percent. So it's been a very big boost here by changing the design of the form and prompting the applicant along the way, we've been able to really get better information and registrations out of the online process.

Overall with what we're seeing with the online application, we have more approval ratings. Blue is the paper method. Orange is the online method. We have less declinations coming out of the system because we're putting more validations up front for the applicant as they're coming along through the process, their data is being checked with PennDOT up front, and they have the option with signature upload. So we're getting more complete applications coming through, which has been very helpful.

Now, this slide is really where I think has been a big boost to us with looking into web application interfaces and integrating with third party agencies for voter registration. By pushing more and modernizing towards an online platform and making sure that not only do we have a common language across all of our forms and methods of delivery, but we're working with third party entities to make sure they're having similar language on the form so it's a consistent experience. And what we've noticed with the design and the collection is that the online platform and third party entities have been really benefitting us in what we're getting into the system, which is very helpful for any maintenance practices or any matching we need to do to review the information or to look up information on the voter.

We are overall seeing pretty much an almost 90 percent of applications coming in through online voter registration have a driver's license. We're seeing almost 35 percent that always have at least an SSN on there, last four of the social security. And then online platforms overall are really driving the information of the

individual for contact, like an e-mail or a phone number. And a lot of the third party entities are really helping out there, especially on the registration drive, because it's so core to the business to be able to reach out to the individual.

So I guess the point I'm trying to drive there is that by looking into third party sources in a secure manner and a consistent manner and making sure that they're going through and testing it properly and testing the language of the forms, you can really broaden the information and have more complete information coming into the database that's not only helpful to the applicant to get registered, for the counties to process, but it helps with a lot of other initiatives just by focusing on user testing and designing the form in such a way that they can better understand the context.

There are some other realized benefits we're seeing with driving more towards a modern platform with online registration. We're seeing that the application process is becoming more elastic, and I'll talk to that in a second. Overall, applications are more traceable for the end user if they're provided with an application ID where they can kind of go in and type in some information about themselves and look up the status of their application. And then there's better opportunities for us to understand some behaviors of the applicants and when they're using the applications because with a traditional paper method you don't always have the same benefit as it depends on when it's arriving in the office, if it's mailed in, things like that, versus online you're getting that data right away, the time stamps and things, so you can better understand the behaviors of your applicants.

So this is kind of what I was getting at with the elastic process is that this is preliminary. We surveyed all the counties. And on average for every ten paper applications that they are processing, it takes them about 18 minutes in the Commonwealth of Pennsylvania. And then likewise, for an online application, for every ten applications they're processing, it takes about 6 minutes. So we have seen the process come down almost two-thirds, which has been pretty impressive here in the state, and I really have to give credit to the county board of elections for being early adopters and being helpful throughout the process and embracing it. They have done a tremendous job day in and day out executing everything. So thank you to them.

But to drive the point even further, this is kind of the loads of applications that we see coming in, where the green line is the paper applications from 2008, and everyone knows that was a very heavy registration year across the nation. And then in 2012, which is the blue line and 2016 is the black line, we had relatively similar paper applications coming in. And then the yellow or gold is online voter registration itself for 2016. And then the pink line is online voter registration with

paper in 2016, and it is tremendously outsoared the 2008 number. And by having a more modern platform and focusing on the design of the form for both the front user and the end user, the process was able to become more elastic, where a lot of the counties felt they were in a good position in 2016 at registering voters right around the deadlines because they saved a lot of processing time, and they had the information they needed to process those applications.

Both the commissioner and I did a lot of phone calls to talk and make sure everyone's all right, and it just saved a lot of time with processing those applications. It would have been a completely different story if we would have had just more of a traditional method here in 2016.

And this is another chart where we just kind of look at the behavior of the applications coming in and the applicants, whereby hour, since the beginning of January 1st of 2017, we kind of form a behavior of the submissions that are coming in to help us inform maintenance windows or impacts the applicants that we have to change anything. So it's just another way that we're kind of utilizing the data to find some patterns so we minimize impacts to the end users.

And then also, we kind of see it by the day of the week as well. Monday is the most productive day of the week, and we're actually seeing that trend on the applications. Everyone must be thinking about it then. And then around Fridays and Saturdays, things dip down to a more slow period. So we actually not only look at our resources, but we plan our department development windows around this type of information. We usually do releases around the Thursday now because we see things like this.

So I just kind of want to close out because I know we have a short allotted time here to just kind of say -- and I know it's glossing over some items here. Like find me on the side. I'd be happy to give more information or ask some questions during the Q&A period because there's a lot of great things that modernizing a platform can do by engaging your end users. And by focusing on the design of the form, you can really improve the types of information coming into the voter registration database and also inform some needed changes that need to happen to your applications by looking for certain markers like application statuses as they're coming in.

So by using data, it really helps drive initiatives but also at the experience for the end user. So I just want to say thank you so much. Look forward to chatting with you.

>> Thanks, Mike. I appreciate it. Good job.

[APPLAUSE].

>> You can see what I'm talking about, election geeks being OCD. Next geek up is Judd Choate. Judd, take it away.

>> Thanks. I'm Judd Choate from Colorado. Let's see if we -- I have a couple of different topics. What we collect and why we collect them in the realm of voter registration.

The first one, we try to anticipate peaks in voter registration. This kind of dove tails a lot off of what Mike was just saying, but we have tracked a couple of things that I think you might find interesting. We communicate this with our counties.

So the first one is the Facebook effect, which I have two examples of. In 2016 you can see our online voter registrations for about three or four weeks or so, and on one particular day we had over 20,000 updates or new registrations. That was the Facebook voter registration advertisement. This is when they sort of posted on everybody's Facebook page that they should really go update their voter registration or register new if they hadn't. Google also did a similar advertisement or notice on their page, and then there was national Voter Registration Day, which followed the Google day. These were all over the course of five days in September of 2016.

You can see that there was an incredible jump that one day. The only bigger day we had that year was on election day 2016. Colorado is a same day registration state. So we get a lot of activity on election day.

Then we also have the Facebook effect during this 2018 primary. So our 2018 primary was on June 26, which is on the far right of your screen. You can see that more people registered to vote or updated their registration on the Facebook notice day than did on election day. We also had a big bump on the first day of early voting. So that was the day that that the VSPCs, voter polling places, opened on the 15th. So priming them there's a really important day coming can get them primed and understand they need to bring in additional work force or at least prepare themselves for that particular day. So that's one way we use data for voter reg.

We also try to use it to influence legislation which you'll see that's varying levels of success. This is the 2016 presidential election use of our polling places to do updates or new registrations during the early voting period prior to the election. You can see that a lot of our activity occurs on election day or the day prior to election day, so Monday or Tuesday of the election period, and not a lot of activity occurred prior to that. And I break that down by the kinds of activity that was occurring during that time.

So updating existing voter registrations is the yellow line. So you can see that some of that was occurring during that period of time. It was the second most common. We also had new registrations during that time, which was a big chunk of what was happening. The interesting thing about this data, though, is that that is per VSPC during that period. So we were looking at around two or three changes or updates that were occurring in a voter service and polling center during the first week and into the second week prior to the election. So very little activity honestly.

So we used this to talk to legislators and important community activists on elections and describe for them the need to change the way we do our VSPCs to sort of roll back the number and length of time in which we needed to be open because very little activity occurs in those first couple of weeks, or certainly in that first week. We were pretty much wholly unsuccessful in that conversation because people really like the fact that they were open for that period of time regardless of the fact that they weren't actually being used. So we were paying for a lot of judges to be there when, in fact, nothing was actually happening. But when you have conversations about that, they have kind of other concerns which they're maybe interested in, which are more national in perspective, which frankly aren't all that related to the actual data that we were able to produce for them.

Another thing that we wanted to talk about related to voter registration is using data to sort of reduce county mailing expenses. We'll hear from Amber McReynolds later, who's back in the corner. Wave to everybody, Amber. She and the Denver relations team encouraged the use of change of address -- in fact, we passed the bill in 2013 -- which led to the automatic updating of voters' files based on national change of address. So if we received a notice that somebody had changed an address from NCOA, the county could automatically update that information. They didn't have to ask first, which when you ask first, you get a lower response rate, actually a substantially lower response rate. If you just update it and then tell them, hey, we just updated your information. If you don't like that, let us know. You get to do a lot more of that work because you get very few responses when you actually invite.

So you can see, based on that activity, that we've actually seen an extraordinary reduction in the number and percentage of undeliverable ballots. The election that's missing there is 2017. We didn't actually have a statewide election. We had a coordinated election in which counties had issues on the ballot, but there was no statewide issue.

Our NCOA numbers for 2017, most of them are intra counties. So these are people that are moving within a county. And then intercounty, so moving from one county to another county. And then our out of states. But for the law allows us

to automatically update, automatically change the inter-county and the intra-county. So over 75 percent of the notices we get from NCOA, we can make an automatic change to that file.

Here's the NCOA numbers across months. Again, this is useful data for helping counties to better staff up or times in which there's going to be a lot of activity and corresponding vacations and so forth around the times in which there's less activity.

So what has automatic update of NCOA done for us? In 2016, 152,000 in-state NCOA updates were automatically made by county officials. Each of these saved one mailing at least and a reduced number of subsequent failed mailings, the regular mailings and the ballot mailings, which are expensive because of the rate of return. If those hadn't been updated, we probably would have seen less than 10 percent of response to those mailings asking and encouraging people to make that update. So 90 percent of the address changes that we ultimately would have had to make at a VSPC, at a polling place during an election cycle, we could make prior because of the NCOA information.

So savings. We see these as three major areas of savings -- the reduced mailings, the automatic update, which reduces our mailings, and fewer in-person updates. Counties probably saved \$500,000 in 2016, and that was the biggest election year recent ly. Using this data, Denver has some data that suggests that number is probably even double. But that may be more specific to the Denver model or the metro model. Certainly, many counties would see an extraordinary savings or have seen an extraordinary savings using NCOA to automatically update.

So those were my three topics. I'm happy to answer any questions when we get to the question and answer period.

>> Great. Thank you, Judd. We'll pass this over to Ericka. Next up is Ericka from ERIC.

>> Hello. Yes, I have the most appropriate name for any worker ever. So I am Ericka from ERIC. I have a very long title, which basically means I'm the geeky person in our business, and I get to play with data a lot.

So I don't want this to be an ERIC pitch, but I do want it to be a case study of what states can do when they join Together. We're a little unique in that we have quite a few states doing something for the same purpose. We try to make it broad in the sense of hitting angles that appeal to red states, blue states, purple states. We are across the nation. Darn, my new slide didn't get in there. This is 23 states, but we were happy to welcome South Carolina two days ago. So their data isn't in our fold yet, but we have welcomed them into our membership.

Oh, I got the picture, but I didn't update the title. ERIC is a member organization. It was created by the states for the states. I answer to the board of election directors. We have the 24 states, which now with 24 equals about 39 percent of the voting eligible population, according to the 2016 members from the U.S. election project. We were created in 2012, but that was actually a process that started back in 2008 in a conversation and took several years to build because it's a very purposeful, methodical process that was well thought out in the sense of how do we make this work and make it work for our states?

And what we do is we take in voter registration data and DMV data, and we will be taking in other service and agency data. We take in information about voters and DMV, the contact information. So the top, their full name, mailing address, residential address. Their information about their activity because for us it's finding out who has the best data about a person. So activity dates and status. We also take in -- and I'll talk about this a little more later -- we take in data that we purposefully hash. So I'll go into March depth on that, but that means we make the data so it is not -- we never receive clear text of date of births, driver's license, or ID number and SSN. That's a way to protect the data but we use it for matching. We purchase the death file from the social security administration so we're able to process against the deaths across the nation, and that's especially helpful for states when a person has passed away outside of their state.

And then we purposefully exclude protected or confidential data. So that's never in our system. So that can be protected at the source.

So we take in that information from our member states, and from that we produce reports back to our states. So we only communicate with our state elections officials this information. So we take a two-pronged approach. We're doing outreach to do eligible but unregistered mailings. Currently, we have DMV and voter registration data. We do intend to have other service areas. But the idea is to find a DMV record that doesn't have a corresponding voter record, and those are people who are potentially out there that could be registered and states can do outreach to. On the other side of the house is the list maintenance, and that is finding -- by using this big matching engine, which is basically what we are, a big matching engine on steroids. We're able to find instinct moves, and that's actually our largest number even though across state that's what people think of us about. But in-state movers, just as Judd's data suggested, people move closer to home more often, and that's just as detrimental to their voter record as if they moved across the country.

So in-state is when the DMV has more information about where the person moved. Cross-state has another record that's more recent, so it would make

it appear the person moved out of your state. As I mentioned, the social security death master, so matching those records. We do matching. That's what we do. But also because we have so much information coming in -- and that's the basis for our matching engine. It's a product from IBM and our product company sensing. So when you have something new comes in, you can find the person. The social security death master is really interesting because many election folks, many voter registration systems, you take either the driver's license or the SSM. So in many cases, there's only about 20 percent of the records that have a social security, last four digits on them. So if that local agency was able to purchase the social security death master on their own and match it to their system, there's 80 percent of the records that don't have a last four SSN they can even look at. So you only get name, date of birth out of that. So it's harder to match to.

One of the things we like to point out is that we approach security from the ground up. So when we were building our system, when we were conceiving it, we talked about security and how we protect this information in our care. We approach it from a standards based management practice. We look at the ISO standards and kind of develop our standards around that. We do risk assessments yearly, and we're thoughtful and methodical about how we approach security. We also take an approach of continuous improvement. And I think you'll probably hear this in a theme throughout the conference if you're at NAS. We're never done with security. We're never like, okay, we got this. We're ready. Because there's always the next new thing. So we're always improving. We're always looking at what's out there, how we're changing, and how we need to change with that.

We approach with both internal and external reviews. We'll head into a security audit along with financial audits. Those are important things for us. And I have the picture of the onion here because that's really the most important thing for us about how we approach security. There is no single piece that is infallible. When you were a technology, security person, and cyber security especially, there's no piece that has no vulnerabilities, even if it might be infinitesimal. So we have a different layer around the onion that protects the weak spots of one with the strong spots of another. So that's an important concept for us.

I mentioned that we protect the three specific pieces of data -- the date of birth, the last four SSN, and the driver's license number -- but we use a cryptographic one-way hash, and that's just a big mouthful that basically says the information goes through a process of hashing, which makes it into an output here that has a jumble of letters and numbers which aren't helpful to a person who just wanted to look at the data. So I can't tell a person's date of birth in any piece of data in my system, but I can tell does this date of birth match another date of birth?

The same jumble of numbers comes out of this hashing function, but it's only useful for matching. So that hopefully, again, one layer of the onion is this makes the data uninteresting for someone who might have a nefarious purpose.

And what's important about this being one-way is we never intend to decrypt that information. We never intend to have it in clear text. So it's a one-way hash.

So some of the things that are interesting to me at least, as a data geek, because I get a different view on this data. I get to see lots of data come through my hands. It is me at the moment. I am the person at the keyboard looking at this information. When we're onboarding, I am a new set of eyes on the data out in the state, and sometimes they find that interesting, and sometimes they don't because we're looking at very specific data points. So things like activity date, which is trying to find out when a person had an interaction with your agency, both voter and DMV, that was meaningful and from that person. So we find things like how county practices may differ across the state. I get to see things like list maintenance, the activity over time. I take information monthly or every two months and compare it to the last. So if I suddenly have a large number of records that are different, generally -- either there's an election, which is easy to find out. If not, I reach out, and generally there's a list maintenance activity that's happened, and I can kind of see that unfold in the data.

As these data points mentioned about elections, the other thing, I went looking to see, well, can I kind of tell how people move? And is there more of a constant rate? You really see it articulated how voter registration, we have this big swell, and then it kind of falls off as the people move and the registration, you know, it's harder to get that information updated. Versus DMV is such a steady rate. So seeing that comparison is kind of a fun thing in the way I get to see data.

How addresses are entered differently across different states. But mostly I get to see the comparison of DMV versus elections, and things like how you might deal with a person who is homeless will be very different or people who are continuous travelers who are now living in their RVs as they retire and are exploring the country.

Also, it's been very interesting to see how DMV practices differ in different states. Things like in one state it's very common for a person to have a license and an ID card. So there's always two pieces of information versus other states where you only have one and one ID throughout the lifetime of your interactions with the DMV. So I get to see those kinds of things.

This is just kind of an interesting way I look at data. I thought maybe you guys would find it interesting as well. I went looking for someone who moved

around. You can see this progression of they were in Wisconsin in 2011, in D.C. in 2015 to '13, Minnesota, Maryland, Virginia. And this is -- while it's generic information, this was a real person's kind of progression through. And what I find interesting, and part of what's core to our system is you'll see the mailing address from Wisconsin to D.C. It was their mailing address in Wisconsin. It became their residential address in D.C. They're using their phone number across multiple states. That's really common, so phone number has become much more useful for matching. And also e-mail. People are keeping the e-mail addresses longer and longer. That's a way to find someone and to reach them. I just find this interesting. Maybe you do too. I'll pass that on to Don.

>> Thanks, Ericka. Don, you're up.

>> Thank you.

So thank you. It was a privilege to work with ERIC in Virginia bringing that to the Commonwealth. I think that's very valuable too, particularly as a statewide official. One of the things that we, I sort of looked at, is what power tools are available to election officials because, as we'll see, our challenge is keeping pace with the voters to maintain the voter rolls, and the expectations are they sort of anticipate that we will be able to follow them, but they don't necessarily notify election officials. So we have to find technology and new ways to identify their moves and then take appropriate actions.

The goal is to be smart in how we do that and accurate and focused on those group of folks. Obviously, I think, from my perspective, the notification to the election officials is key. If we can get that information with some confirmation, either through DMV or other sources, that helps the process move along.

The challenge is upgrading our processes to the latest technologies and available data, and that's sort of what we've heard. So there are current technologies and data that's available. There's a tool for everything. That's what I learned growing up. The major sources of data that I saw and have worked with that have been very effective across the country and what election officials rely on is the department of Motor Vehicles. It's a database that's great. It can either confirm what you think you know. It can be an investigatory database, and I saw that in Virginia and Florida, where you can confirm perhaps a potential registration or a discrepancy or move. But if you have access to the DMV on a macro or individual level, it helps resolve tough issues in investigations.

Social security administration and department of health and vital statistics in each state, that's been a very valuable data on deceased. And the state voter registration system and election officials, when someone moves inside of state or

outside of state, the local election official will receive notification, or the state will do the same.

And the courts have been a source of data. But what we'll find is that their -- as we'll mention in a moment, NCOA is a very valuable tool, but only about 50 percent or 60 percent of individuals notify the post office. Therefore, there's a whole swath of individuals we have to work with to try to find what their new address is.

And that's where the power technology is. I was always taught there's always -- power can solve any issue. You move from the basic tools to the power tools, and, yeah, it will get solved, right? We've been relying on return to sender and post office information, and it's become a very valuable thing. The vendors have done a lot with the information. The post office service has done much, and I'll talk a little bit about that and dealing with the vendors and the post office information under NCOA.

There's other information that these vendors can provide that can be very helpful to identify those who haven't notified the post office. And also there's been some events with EVVE, electronic verification of vital events, where some of their information is very, very valuable to local election officials or state officials who either want to investigate ones that are tough to verify, the deceased status, and then there's the third party credible data providers. These are companies that they work with other agencies, federal, state, and major companies in the United States, and more and more with election officials to provide that little extra you might need to resolve the problem.

So, obviously, most of you know what NCOA is. We've talked about it already. Obviously, it's a national database of 160 million records of individuals that voluntarily confirm to the post office that they've moved, very valuable information. What I found interesting, though, and I felt it would be good to share, is that more and more this information is available. And those that don't provide the post office, these vendors are able to provide you that address where that individual is now residing. It allows election officials some flexibility.

What I found interesting is a lot of services provide realtime access to a user. Could be local or state. I know a lot of officials who use that, where if there's an individual that you're investigating or a batch that you want to do, that you want to process, you can do that in realtime, and that can be very valuable to a local office. Again, I just wanted to highlight that, when movers fail to notify the election office, you're able to get that address, and then you can send a mailing.

What I also found with NCOA, just going a little bit in depth and receiving some reports from the vendors, is they can do a lot of audit features. They can actually audit your mailing list and provide you some issues that are very useful to

you in cleansing your rolls. And then they can also provide some analytics. Obviously, everything costs a little money, but the fact these are offerings can really help an office.

Think about EVVE. It's a national nonprofit, and they basically are a consortium of states' vital records departments, the thing that's interesting is they receive the data directly from the state death databases. Again, I was very intrigued by the fact you can have large volume requests and single queries. A lot are using social security administration death master file, as discussed, but this is becoming a more inclusive record as we'll find out in a moment. Again, you'll get an electronic response. If you have certain individuals you're not sure of their status and believe they're deceased, you can actually do an electronic search and find this out.

As you can see, more and more jurisdictions are participating, and they claim that they actually do have more records than the Death Master File because there have been major changes with social security and the Death Master File. A lot of information is no longer available to election official, and they're actually making it a little more difficult for vendors to provide that data to the states and to localities. So I thought it would be interesting to bring up EVVE because they don't have some of these same issues.

So I thought it was very interesting because they are -- they have more records than the Death Master File because many of these are not being released to the public anymore because of protected status.

EVVE has a growing number of clients, both at the state and federal level, including department of motor vehicles and the secretary of state offices. So it's become a valuable tool.

Credible third party data, public records. You know, some of the players in this are LEXIS. Many of you have dealt with LEXIS or Experian. These are multibillion dollar companies with tens of thousands of employees, and they provide all types of information to folks that they have a financial interest in making sure the address is correct and the identity is correct. So they have an interest -- the information is fairly accurate. So what they do is they do provide these services for states and locals to do person address locators for that last mile, trying to identify those that haven't identified their move to the post office. Their engines, they have all types of military locators, voter registration records they actually collect from the states, and you can see all the records they have, and they use this as part of their services.

They can provide address cleansing to your list. And really the goal is to actually reduce the amount, as Dr. Choate mentioned, bad addresses. It helps

cleanse your -- it saves on undeliverable mail. And you can see all the records they use to provide that service to their customers.

Neal Kelley did a study back in 2012, and he's continued this. To talk about, he wanted to do a study of how this credible third party data would work for his office, you know, a major county obviously in California. As an initial test, what he wanted to do is a nationwide service. He sent out a thousand names of individuals that they had no activity and they believed that move, but they had no notification from any source -- the NCOA, DMV, election office. They had no other source of data. So they did this test and sent it out to 1,000 individuals, and over 500 came back with an accurate address.

So they tested this in -- what's interesting is that 280 of them had moved at least five times. It shows you the mobility of voters and that sometimes these are the hardest voters to try to keep up with. So then they went to a larger study, and they analyzed 250,000 voters, and they were able to update addresses for 122,000 of them. They were able to send addresses to these individuals, informed them they should register in their new state or jurisdiction if they had not already done so, but also give them the opportunity to update their address with his county. Over 18,800 responded to the postcard, and he found just with this one mailing, he almost was able to find savings that matched the expense.

What's remarkable, though, is it only took two or three elections, and obviously the investment paid off. He's told me that he's done this -- and he'll be here later today, and you can talk to him. He's actually done this three or four times since 2012, and it continues to be a practice in his office. It's major savings on postage.

>> Great. Thank you so much. So we'll move to some -- thank you to our panelists.

[APPLAUSE]

I'm going to move to some of my own questions, and then you can be thinking of your questions. I think this is kind of a general question for all of you, so we can kind of go down the row. HAVA provided funds to support the establishment of computerized statewide voter registration databases, and some of the new HAVA funds are being used to update those databases, to strengthen them, especially when it comes to cyber security.

I want to ask you all, what is the state of these databases? Are they healthy? What are the kinds of things we can do to improve them? Including, you know, of course the cyber security. Let's start with you, Mike, and hear what your thoughts are about the state of our databases.

>> I think the state of the database, specifically in Pennsylvania, it is in good shape. We do a lot of testing of the database. We have some very dedicated teams in close collaboration. I think some of the challenges that we're seeing is more of the reporting capabilities and more of the flexibility of the database and getting more information that would be easier to take out of the systems. Always with the benefit of hindsight you see it differently when the database was first implemented back in 2005, 2004, you can easily say these are the things I wish I had, looking back at it. And I think a lot of it has informed us to get better metrics along the way of how applications are being processed and the way election results are captured, things of that nature.

But overall, I think that we have pretty robust cyber security layers in place. We work actively with our office administration and other entities in the state, like FEMA, and forging a closer relationship with the national guard. Certainly, the U.S. Department of Homeland Security, we've done a lot of work with them to make sure the security layers we have in place are good and make sure the system is secure. We're really focused on making sure we can leverage newer technologies to really get better insights on how everything is being processed within the system to make sure we can continue to go down the path of making more data driven decisions to meet people where they need the services.

>> Judd, what are your thoughts?

>> In Colorado, we have the old system from Sabre. Sabre is a company that hasn't been in business for ten years now, so you can tell it's kind of an older system. But I think we've made pretty good decisions about it. Most notably, we hired several of the programmers and developers of that original system and brought them on staff, and that's allowed us to keep that to be a dynamic database where we can always evolve with new code to make it more useful going forward.

We do have a current project right now, which we'll support through the new HAVA funds, to roll out basically a web version of our score system, and that web version we can enact a lot more security measures and make it a much more user friendly database. Right now we're linked to a Citrix internal network to make it work, and our future we'll be expanding behind that to what we call score 3, which is sort of the third version of it, which will allow us to be much more sort of user friendly and dynamic.

So that's the future, but we are in a pretty advantageous position because we have code writers on staff that know the system. And so they can literally make that old system function like a new system.

We do foresee the use of HAVA money for a number of different security upgrades, including firewalls and tracking more -- in a more minute or a microlevel

the actual activity that occurs in our database. So it's easily retrievable. So if we see something, we can jump on it immediately instead of perhaps hours or a day going by before we realize that something's going on. So we're using that new HAVA money for tracking and improved security with firewalls.

>> You've got an interesting viewpoint, seeing that you can see a lot of different databases from a lot of different states. What are your thoughts on the state of our databases and what we can do to improve them?

>> Well, I think it's definitely, as you mentioned, hindsight is always 20/20, but we've learned a lot, and I think that's probably the biggest important thing for what I see is our elections officials take this seriously. I think we all know this in the room. But getting to learn about their own data and what's out there, that we're more interconnected than ever. Things like ERIC, where we have 24 states that come together regularly, they talk about stuff, and they see each other's practices.

Like I just got to help Oregon and Minnesota have a little demo where they're checking out processes on how they handle some records and get to learn from each other on those things. So I think that's encouraging, and I think that's happening more and more. And I think that helps improve the security across the nation and the state of the registration databases.

As I onboard states, I get so many more interesting questions now, and I've gotten to see the progression of states, our original states, and the data, how it's progressed, Judd could speak to how they got to compare to their DMV data and find it lacking, and also changes in how they handle addresses and more consistency. More states that have been our bottom up, where the counties still have individual pieces. When they use something like ERIC, they get to see a global picture of their own state and how they might be using processes and using their systems. Even some of them in their top down, how the counties actually use their systems. I think there's more tools and more opportunities, and our elections officials are taking them and taking advantage of them so they can improve. So I'm encouraged.

>> Don, do you have something to add?

>> I would just add that the statewide voter registration systems is really a service from the state to the localities. In this business, there's not an option. You have to be accurate. You have to provide those services. And what happens on election day in early voting can matter, obviously, to voter confidence. And so if you have a 10-year-old system, how confident are you telling, oh, everything's going to be good. Fear is not an option. It takes a lot of work, and it's always good to have a continuing upgrade of your voter registration system because you want to make sure going into early voting election day, you want to fulfill those services, to election

officials and to the voters, and it's obviously an evolving process. But I think there's areas where we can upgrade our systems.

>> Privacy is a big concern for voters when it comes to registration data. And I just want to hear from you all what's being done to address the privacy concerns. Are we doing enough? I get this question a lot from voters who are very concerned about the privacy of their voters. Let's start with you, Judd.

>> Well, obviously, privacy is a huge concern, and that's a lot of what you're doing when you're protecting your database. One of the big things that we try to identify is various ways in which somebody could penetrate our system. We've done the risk and vulnerability assessment with the DHS, where they've come in and basically lived in our office for a couple of weeks and tried every various way to try to get into our databases, both those that are elections related. But also we have business filings and charitable filings and many other services that we provide on the business side of our office. So DHS has really been effective in that.

But all of those are about protecting our voters and our constituents' information because, if we don't protect it and it gets out and is available either on the web or on the dark web, it's a violation of all that we are trying to do to protect it.

>> Mike, do you have something to add?

>> Yeah, I'd like to echo Judd's comments. We are very much concerned, and that's one of the first things we're thinking about when we're putting a new build out or getting information from the voters, we want to maintain the privacy of all sensitive information as best we can.

And that's why we really focus on the routine scans that are out there. We also have physical testing that takes place as well in the office to see if there are any exposed ports. And we have really renewed the interests of seeing what the practices are for not only data in transit with our business, but also data at rest to make sure that we are meeting a lot of the federal standards and our Commonwealth standards on data encryption and protection. So we really do try to put as many layers as possible with firewalls on the database and logging of networks and the things of that nature to make sure that nothing is getting out there that shouldn't be getting out there and that voters can be confident that their data is safe in the database.

>> Ericka, you talked about hashing the data. That was interesting. What are your thoughts on continuing to make voters' information private?

>> Well, I think again -- and the questions that I now get as we have new and prospective states, I think the awareness is so much higher. That's kind of on the front of our elections officials' minds, and I think they're becoming more and more educated. They ask us pointed questions about how we protect data, and I

think that's of critical importance to us. We're more and more aware of the tools that are available. Again, that interconnectedness of us talking to each other makes us stronger as a whole sector, and I think that's happening.

So I think that's where we continue to grow through. Things like our tools of how we hash data. I joked that we're trying to be purposefully uninteresting. We want to be boring and not looked to as a source of data they can use. I think the awareness out there for others is, as our election administrators, they're more educated and more aware than ever.

>> Don, I remember when you were in Virginia, you had some litigation over this issue, right?

>> Well, we did. And part of it is I think part of the initial attitude is that we're here to protect the data of our voters. There are -- I mean, there are legal mechanisms for the release of data, not only FOIA, but the legislature has -- the legislature and the political parties usually receive a list of registered voters. So their mechanisms in the state where the data may be released. And the courts have basically said also that certain information is eligible to be released for persons that request it.

So it's weighing the balance between open ness of our process versus the privacy of voters. It's balance. So we face that in Virginia, yeah.

>> I think you said earlier the judge had provided an order with a lot more open data than you expected.

>> Well, it was interesting. We had a case where the order initially basically was going to release voter registration records, and then there was sort of a modification because they would have released social security numbers and other data. So the judge modified the order to protect certain data from release to the public just generally.

>> So I'll just do one more question before we get to the audience. I just want to ask about the recent Supreme Court decision in Husted versus Philip Randolph Institute. And the action in Kentucky has brought attention to the list of voter registration list maintenance. How do you see list maintenance practices changing in light of these developments? Don, why don't you go ahead with that? We'll kind of go down the line.

>> Sure. I think that -- and it's one of the reasons I focused on the area. I think there is data out there that allows us to focus our resources. So it can supplement and sort of refine sort of our mailing processes for NVRA. Obviously, you can submit mailings to all registered voters. The court opinion was directed at can you focus a mailing on those who haven't voted in two, four years, and then start the NVRA process?

I think that part of my presentation was to talk about the tools that are out there to make -- to refine our mailings to those that we absolutely know have some indication, some notification that they've moved. So you can do smart list maintenance with mailings and with targeted information data that's available.

>> I feel like I'll end up like a broken record a bit. What we find, because we're all about list maintenance and outreach, but list maintenance happens more regularly across the year, is our states are comparing notes and finding what works for each other and taking that information back once they've talked to us. I think that's a really important thing. So they're finding out what works, and then we see it play out in the data, and that, again, having data that you can look back to and actually taking the time to find out what worked and what didn't and how you can modify it is super important.

The other thing for us is we try to be very focused on actionable data because there's so many limited resources. So making sure that you have what's in front of you, things you can act on succinctly and not have to sort through a lot. So that's important from our standpoint.

>> Great. Judd, we saw each other on the day of that argument. It's the day of our 2018 summit, and you went to the argument. What are your thoughts on the Husted case?

>> I was very fortunate to be there. It was the first time I had seen a U.S. supreme court argument. It was a very interesting case. I think the ruling is basically an earthquake in list maintenance under the NVRA. But ironically, probably won't have all that much in the way of long-term consequences because it is a complete shift in the way that we see the NVRA and the way we see how you can change your record. I think it was a pretty widely held belief that you couldn't really do anything with somebody for their failure to vote, even if you sort of padded it with additional protections like doing a follow-up mailing, and that was a widely held belief in the elections community.

But the Supreme Court, in the 5-4 decision, decided that was not the case. However, it was really only a handful of states that were doing the kind of Ohio related practice, and even Ohio really doesn't do it anymore. They have joined ERIC since then, and a lot of their list maintenance activity is happening through the use of ERIC data. So this isn't -- this is a practice that likely won't grab hold in the elections community because I think we're all looking at better information than this because this really was sort of a machete that states were using when now we have scalpels. So it's not really -- it likely won't have that kind of long-term consequence.

>> Obviously, the NVRA was passed in 1993 before we have a lot of the tools we have now. Mike, do you have any thoughts about that?

>> I agree with all the general thoughts up here. Specific to Pennsylvania, I don't think we see a direct impact to what we're doing. We're looking to continue to leverage the robust reports coming out of the ERIC program. It's been a great program, and the actionable data has been very helpful. We don't see a direct impact to what we're doing today because we kind of go through a normal five-year vetting process as it is and have plenty of time for that to play out.

>> So let's go to the audience. Do we have roaming Mikes. We have one there, one over here. Got a question here. Remember Tom's three things -- speak into the Mike, tell me who you are and where you're from, and ask a question.

>> Hi. My name is Athen from Bucks County, Pennsylvania. I have a question for Mr. Moser. In the presentation for the online voter registrations, you had reference the third party API. Can you talk a little bit more about that. Who can access that? How does it work?

>> Great. Thanks for the question. Essentially, the way the process works is it's an entity is interested in conducting a registration drive and would like to build their own online application, they can essentially go through an approval process with the department, and they'll sign up for an account, and they need to go through a terms of use and agree to terms of use that's publicly available on our website and need to go through a series of application testing to make sure they're adhering to our standards and that they have a lot of the pertinent information there for registration, and they're certainly meeting all of the legal requirements for voter registration to make sure that information is there.

So we engage through a testing process, and then they essentially are assigned a unique key on the back end to add security layers to it and to help us track the information that's coming into the online interface so we can continue to monitor metrics with the entities that are submitting application for not only compliance, but to make sure we're not running into any other issues.

It's been helpful to track the registration drive process, and I think we've been seeing benefits in the short time that it's been up for over the year, year naphtha we've been able to reach out to entities and kind of coach them along with best practices as we're seeing information coming through, but they've done a really good job adhering to the testing requirements and the security requirements and making sure they're following the registration guidelines.

>> Colorado has an API as well. We've got one over here. Microphone is making its way.

>> Hi. My name is Sheila Laney. I live in Montgomery County, Willett Grove. My question is regarding that supreme court decision. I think it has to do with intent. Like when I listened to your panel, I'm really hearing like somebody

mentioned the geekiest part of elections and the processes. But when your intention is to not allow people to vote, then that changes the whole mix. The question I have is a couple years ago there was a purge, and I think it was Bucks County, of 14,000 voters. So I'm listening to the processes that it takes to maintain a valid list, and the money that Orange County did to go through that whole process, what here in Pennsylvania are we doing so that we don't have to purge people because they're either not voting, we can't find them, the addresses are not connecting?

The second part, as a community person, that online voter registration form, is that available now? The updated version? And also, is the paper version updated? Is that available now?

>> So Mike?

>> So I'll start with the last part, and thanks for the questions. So the updated paper form is out there available today. It's listed on the votes PA website. We also have a few forms in several languages there in the same format.

The online voter registration application is available, and we have the third party option for registration drives. That's out there today as well. So both of those are accessible. And I'd be happy to talk to you on the side and can give you direct links for that information.

The other information, I'll say up front, I'm not familiar with that specific instance, but what I can talk to more globally is that, one, we don't ever purge voters here. There is a process that, through the list maintenance practices, that they'll be getting notices to try to get accurate information of where their location is or inactivity, and we go through a pretty extensive vetting process is time for a response. The individual still has the capability to show up to the polling place to go through an affidavit process to bring them back up into active status.

But we're really trying to focus on that area. It was a really good question to bring up is where we really want to not only take advantage of more actionable data for current records, but part of the reason why we're putting a lot of focus on modernizing the voter registration process, and what is going into that is clarifying a lot of the language that's out there and conjoining that with the information that's actionable on where someone might RESIDE to make sure they understand with the noticing that are coming out and by collecting information through the online forms, designing them in such a way to get more information, like an e-mail address or a phone number, is we really want to start building a more solid foundation to have a more interactive process with that, to make sure the individual is aware that we're looking for clarification on, say, like a change of address or something so they can respond to the local county authority to mitigate potential issues like that.

>> Judd, do you have any thoughts about maybe cleaning lists and the maintenance of it?

>> As an elected official, I hate the word purge. I hate to use it. The only time Colorado does a, quote, unquote, purge would be after a federal general. These are people who two cycles ago got a mailing, got a confirmation mailing that bounced. It was undeliverable. So we know that they don't live where they were registered. So then they don't vote in the next election, next federal general election, and then they don't vote in the next federal general election. So typically, that's a four-year window. It could even be more.

When you have that assurance they don't live there and they haven't voted in any election, they haven't had any activity whatsoever, and they didn't vote in the two major elections, one of which had to be a presidential election, at that point, under the NVRA, you can cancel somebody, and that's the voter purge that happens in January, February, and March typically. That's the window after a presidential or after a -- either presidential or congressional election. So we'll have one in January, February, and March of 2019.

But that's really the only time you should be doing that kind of level of list maintenance where you're cancelling people in buckets. Otherwise, you're just using information about somebody who's died or has notified you they've moved to another state or in the larger case, where you've had data upon data upon data that they don't live there, and now you've gone through a two cycle process.

>> Any thoughts, Ericka?

>> List maintenance is so imperative to what we do. For us, it's all about trying to get information in the hands of our elections officials that can fix it. So for us, the DMV is such a great source because people, when they move, they go to the DMV. And many of them think that it automatically flows through. In some cases, it does. There's so much more interaction with the DMVs than it was even five years ago. That's part of why we exist is to try and make sure that elections officials have the information to update the records and get it so the folks don't even have to really notice almost. There's mailings and things that go along with the processes we suggest to our states, and each state does it a bit differently. But that's what we're all about.

>> Don, I know that BPC has been doing some line work. This is kind of related, isn't it?

>> Well, it is. I think that the collection of line data, another issue that the country is faced with lines on election day, and BPC, where I'm a fellow at, we have focused on the collection of line data in jurisdictions across the country. It just goes to show that data can actually inform us on the allocation of voting machines,

electronic poll books, a number of stations. It can help identify us to the local election official, who's really the person that's going to be managing that process. So I thought I'd mention at the data summit that BPC is doing a lot of that data. And it just shows you how data can be used to sort of improve the process we're undergoing.

>> Clean data is important to make sure we don't have long lines, correct?

>> Clean data is very important because, you know, inaccurate voter rolls or snafus can cause long lines or long lines and provisional ballots. It can cause congestion at the polling place, confusion, headlines. We can go on and on about where that goes. It's never good when you have inaccuracies in the process. And so it's better to just make sure we get to a point where our list can be as accurate as possible when we go to the polls. So there's less confusion about am I in the right polling place? Am I in the voter rolls? And those sort of issues that, when they do occur, can cause problems in a polling place. Election officials and poll workers have plans, plan Bs in place, that these things do happen, and presidentials. A lot of people are showing up to vote. So they have these contingencies, but it's always good to do as much as you can prior to election data resolve these problems.

>> So we've got improved access for data in elections, better quality for data in elections that continues to improve. I think that's improving our processes as election administrators. I think the next step, and the question is what can we do to share that with the public to build public confidence and share that with policy makers to improve the administration of elections from a policy and a legal perspective with this data kind of as the next step.

>> Which panelist are you? I want all of them to take a stab at it.

>> If anybody's got it.

>> Don, you want to go?

>> Sure. One of the things I wanted to express is data provides -- it's agnostic. You can -- believe it or not, both political parties and politicians, when they're faced with data, it often does move the needle. It's hard to believe, but it's true. So collection of line data or how we're doing on voter registration or those sort of things, you can bring that to the decision makers, like a city council or state legislature or the federal government and say this is the data. This is where the trends are. And I think that that serves a valuable purpose in where we're getting -- the community is becoming more -- there's more of an ability to extract the data and provide reports to decision makers, policy makers. So if you're able to do that, we can move in a direction where we continue to improve the process. That's my opinion.

>> Yeah. I mean, data can help take emotion out of some of these decisions, right? It can be misused, but it can also take emotion out of these questions. Do you have something to say, Ericka?

>> For better or worse, we have more of the public's attention right now because more of this is in the news. So it kind of is -- the time is ripe if we can get those things. I don't want to steal anything from Amber, but things like what Amber McReynolds does in Denver County, where she produces really consumable information from the data she collects. I mean, info graphics is a bit of a buzz word, but it does really make it understandable. So where we have these data points -- like I love that Pennsylvania is approaching their next iteration of their voter registration date thinking about what they want, what answers they want to know first.

The things that we can get out in those tweets -- and I hate to even say that, but those little bits where we can get accurate information from reliable sources out while we have the public's attention, the time is right. It would be great to do so. Maybe in somehow connecting with interns or those folks that are in that kind of graphical information sharing to tell our story, I think could be really useful.

>> I'm going to go ahead and take the prerogative to ask one more question. Unfortunately, we could go on for a while, but we have an end point. My question is to Judd and to Mike, since you all answered the last one. State officials across the country have differing levels of authority vis-a-vis local jurisdictions and state and local relations can be tense. In your experience, what approaches can states take to navigate these obstacles and build the necessary trust among local jurisdictions to strengthen your statewide systems for data collection, analysis, and sharing?

>> Well, so a couple of things. Over the last several years we've taken a multitude of approaches. Right now with Secretary Williams, who's in the audience. He can wave to everybody. Secretary Williams, who's my boss and who's been my boss the last four years, we are very much arm in arm with the counties. We work very closely with the counties. Every decision we make, we are involving the counties.

We haven't always been that way, and, in fact, we were even suing the counties on a pretty common basis a while back. That can work. It doesn't always work. If you have a very specific issue that you need to address, sometimes the courtroom is where you can address it. But for the most part, I think working together makes sense. And one of the things that we've done in Colorado is we started collecting data on elections costs, and I think that that's a pretty new phenomenon. We've been doing that for about the last five years, and we've tied it

to something that we have in our law, which is that we reimburse counties for federal or elections where there's a state question for -- we reimburse them either 80 or 90 cents, depending upon the size of their jurisdiction.

And having that, sort of a carrot and stick approach, hey, we're going to give you money, but if you don't give us your data, we're going to have to hit you with a stick. Sometimes that can be kind of an effective way to work together to try to figure out how we can get the kind of data that we need in the timely manner but in a way that doesn't really make the life of the county all that much more difficult, and they get the reimbursement. So there's often ways in which you can work together to create a data sharing and get people on board, which is can have multiple ways, both carrot and stick.

>> Mike, last word on this one. And then we'll wrap up.

>> I would say that we are working on trying to not only maintain, but also build on the coalitions and partnerships we have, specifically with county boards of election. In the past, it has probably changed with administrations, depending on our priorities. But this administration has done a great job, particularly under the acting Secretary Torres, to maintain conversations with counties to have open die logs, to maintain the communication, to talk about what's in the system, what changes are we making to the system, and what are initiative that's are really important to them that we might not be having a top priority at the state, and we'll readjust our priorities because we really want to maintain a line towards modernizing the whole process.

They have done a tremendous job in sharing information, and we have a monthly meeting. We call it the short advisory board. It's a member of six county advisers that we have communication with. We have meetings across the state several times a year with the different associations of the counties and have an annual meeting that we're there. But we're also building new groups out there. Right now there's an election cyber security working group that is extending beyond the county election office to also the IT offices on the county level with state representation.

So we're really trying to build off of past practice and make it more effective and have more conversations about evolving topics and a closer loop, I'll say. And take that information and try to help sway some of those decisions with some of the data that's coming out and what we're seeing to just make improvements that are great from all sides of election administration.

>> So let's give a round of applause to our panelists. Thank you all.

[APPLAUSE]

I appreciate you all being here very much. This was an informative discussion on voter registration. We hope that you'll stick around for the rest of the summit. We now have a break until 11:00 for our next panel, and that will be on election day preparations. Thank you.

[Break ]

>> Good morning. Our panel is just about to start. If we could start to make our way back to the tables. Thank you very much.

>> If we can get everyone to their seats, we'll make our EAC overlords happy, and we'll get going.

Great. I'm Charles Stewart. Welcome everybody back to the second session, both those of you in the room and those of you watching the webcast from the beach, wherever you are. I'm sure that's the primary audience today from afar.

We have an excellent panel today to talk about moving on to talking about election day. Being a professor from MIT -- by the way, I didn't mention where I'm from. I'm Charles Stewart. I'm professor of political science at MIT and director of MIT election data and science lab. Being the guy from MIT, I've been tasked with letting you all know about the WiFi situation. I don't know if they've actually changed the paper on the tables, but if you look for the CCP WLAN as a network, that's the network you're looking for, and there should be no password needed. Again, that's CCP, two Cs, not three, WLAN, and no password should be needed. So there you go.

So let's get going to talk about election day and election day preparation. We have four panelists who will be talking about a number of interesting topics. Just as a way of kind of getting into the topic, election day is the day when there's really no margin of error. If an election official is not prepared, you can't say let's do it tomorrow. If an emergency strikes, if something bad happens, an option isn't to delay things. The show must go on. So election day preparations are really, really important.

My work as a political science following election administration, I got going, got my interest in this area after the 2000 election, which is true of a lot of academics. One of the things that I've learned over the last nearly 20 years of studying elections and studying problems that show up in elections is that actually it looks like on most metrics, on almost every metric, whether it be the quality of the voting machines, quality of registration systems, quality of polling place practices, quality of vote counting, election administration has gotten better undeniably over the last 20 years.

There's a lot of -- there's still a lot of work to be done. There's pockets where work really needs to be done, but it is, I think, true, and I would defend the proposition that things have gotten a lot better.

One of the reasons why I find this kind of amazing is that elections have also gotten a lot more complicated in the process. It's not only that we have new challenges because of security concerns, because of the role of technology, but also because kind of election administration has helped to complexify things itself. In the 2000 election, for instance, 90 percent of all the votes cast in the 2000 election were cast on election day. Now only 60 percent are cast on election day. 40 percent are cast either in early voting or by the mails. And then election day voting itself is complicated by vote centers and other new ways of voting. So things have gotten a lot more complicated, and things are getting better.

So how can you give greater complication and yet improve service overall? One of the ways you can do it is by working smarter. The other -- one of the trends that I've noticed over the last 20 years is an increased professionalization of the field. Bringing people into election administration who have technical backgrounds, who have backgrounds outside, maybe in logistics or statistics, in areas where the job is to get things done and to analyze the situation and to work smartly. That's really, I think, the big theme of this panel is how do -- can election administrators work smartly in an increasingly complex election day environment and more broadly is a more complicated election administration environment.

So we're going to be listening to some folks who have thought about how to work in this environment. I will just very quickly introduce our panelists, and then we'll get going. There are longer biographies in the packets you all have gotten, so I won't read them extensively.

So my far right and to your left, the first is Neal Kelley, who's the registrar of voters in Orange County, Florida. Neal serves the voters of Orange County -- I'm sorry. Orange County, California. I oftentimes give him the wrong name, and that's -- so it's an honest mistake since I grew up in Orange County, Florida. So a 3,000-mile mistake, and we both used to have oranges in our county, but we don't so much anymore because of a mouse who infiltrated both of those counties.

Anyway, Neal is a registrar of elections in Orange County, California, which is the fifth largest voting jurisdiction in the United States. Neal has held a number of offices, both at the state and national levels and has won a number of awards and has been recognized for his Sterling business leadership in elections over the years.

Next to me is Benjamin Uminsky, the project manager, business intelligence competency center of Los Angeles, California. Ben joined the L.A.

County registrar/recorder county clerk's office in 2007, where he worked as an HR analyst for six years. He joined the department's executive office in 2013 to head up the newly created data analytics program, where he had been working on various data science projects involving revenue forecasting, whole worker classification modeling, voter file duplication, et cetera. He has flown the coop. I'm good for L.A. County, for other parts maybe bad for elections. He's recently left the registrar's office to work for the L.A. County Department of Health Services, in their business intelligence unit, doing many of the same things he did for elections.

Immediately to my left is Melissa Frey, the special assistant to the director of the Pennsylvania emergency management agency. Melissa currently serves the Commonwealth of Pennsylvania as the special assistant to the director of the Pennsylvania Emergency Management Agency, PEMA. She joined PEMA in December of 2016, where she's been able to combine her unique background in strategy development, finance, as well as program data and crisis management to lead PEMA's office of policy.

And finally, there's Mark Goins -- I never know if it's goings or go-ins. So you tell us.

>> Either is fine.

>> We'll pin you down one day. He's currently the coordinator of elections for the State of Tennessee, having been appointed by secretary of state Tre Hargett in 2009, and he's also past chair of the EAC's standards board. Before that, he served on the -- before being the coordinator of elections, he served on the state election commission in the aughts from 2005 to 2009. Before that, he was in the Tennessee house of Representatives. I just discovered unfortunately he was gerrymandered out of representing Rocky top, Tennessee, which is my favorite song from the state and one of my favorite places. But when he was in the legislature, he also served on the election subcommittee.

We have an interesting and varied panel. We'll jump into the first presentation from Neal Kelley.

>> Great. Thank you, Charles. And thank you to the EAC and the officials here from Pennsylvania for putting this on. I think this is fantastic. Thank you for the invite.

So I want to focus on the use of data for utilizing logistics on election day and pre-election day, and how we have used data over the last ten years or so to really inform the decisions that we're making leading up to election day and then looking at the metrics post-election day to see if that's actually working.

I'm going to walk you through a couple of things here, just in term of the pre-story and the history of how we got to where we are today. So I took over the

office in 2005, and when I did so, the booths we send out to the field and the polling places -- by the way, in Orange County, we have 1,200 polling places roughly, and we utilize 12,000 pieces of equipment. So it's a large operation, and those would go out in caddies, steel containers. So you have eight booths in steel container, and it was much easier to ship them that way. That's the way it was being done when I got there, and I let a cycle go through of that, and I thought, this is strange. Why are we doing it this way?

It really hit home because in 2006, I had a senate election, very contested election, where we had very high turnout we didn't predict, and we had lots of lines in 2006 because we didn't have enough booths in the polling places. So I wanted to relook at that, and that's kind of the precursor to where we started using data in a different way.

So because of those lines, we started to look at historical turnout at the precinct level and started trying to do some forecasting at the precinct level and then changing the way that we shipped the booths themselves. I have to give some props to the brilliant mind of Professor Stewart because we're utilizing his tool now from MIT, and I'll get into that a little bit later, and it's actually been fantastic for us.

So the booths, and you can see one on the screen, are configured to be shipped in a variety of different ways. We were doing it eight at a time in these steel caddies. In reality, we could shift two at a time all the way up to 16 at a time, depending on what's needed in the polling place. That's what we wanted to start doing, sending them to polling places with high turnout, a big booth, where we might have 16 booths total.

Some of you may know this as well, when you send two booths to a poll worker that's been there for a long time, they freak out because they're used to seeing eight booths, and it's a big change for them.

District boundaries are also changing the complexity of how we're sending out booths. This is really happening now with the district-palooza, I like to call it. We're going from at large districts to district-based elections in Orange County. We're working on 15 jurisdictions that are changing between now and November, and we have 400 ballot styles in Orange County that really change the dynamics of the number of booths that are sent out. Some of you in the room may send multiple ballot styles to a single polling place. I won't do that. So if it has a ballot style, it's going to have one ballot style within that polling place.

And you can see there just on that map we have 400 different ballot styles on average throughout the county.

The data preparation itself, what is the data we're looking at to make these logistic al decisions? And that's what I want to jump into. Projected turnout.

So we wanted to start forecasting turnout by precinct so that we could have a better handle on what we might expect to show up on election day and what we might have in terms of the equipment that we would need on election day. So we first started looking at registration trends. This is a heat map of Orange County. I want to just orient you here for a second. That's Surf City, USA, Huntington Beach, the coast is to the left of that. And I put the happiest place on earth, which some might argue is this room today, but this is the Disneyland on the West Coast, Anaheim. So that kind of gives you an idea of the location.

But when I start to put in -- this is like a building thunderstorm. The density of the voters in Orange County really are concentrated in the north central part of the county, and those really hot red orange areas mean there are 5,000 voters per square mile in Orange County in those particular areas. Just to give you some perspective, we have 1,000 square miles in Orange County compared to San Bernardino County, which I think has 8,000 or 9,000 square miles. But we have 3.2 million people packed into that 1,000 square miles. We have much better weather than Los Angeles County and less traffic. So if you're ever out that way, come down to Orange County.

So anyway, when you look at the density there, this starts to give us the layer we use to start forecasting what the turnout is going to be. In data forecasting, I think, is very interesting. I like to use the weather analogy because, if you get the next day weather forecast, it's usually pretty accurate, 85 percent of the time it's accurate. If you go ten days out, it's about 17 percent accurate because you don't have as much data inputs coming in. It's the same thing with what we're dealing with. The more data inputs we can get, the more forecast we can provide.

On that historical turnout, when we took the density of those voters and started looking at ten years worth of data, going back ten years per precinct, we were able to start predicting some forecast going from 25 percent turnout all the way to a 75 percent turnout. I want to point out two things to you on this map in particular. If you drew a circle around Orange County, along the coast and up around the borders of Los Angeles County, we were predicting very high turnout in those areas. The density of voters not as high along the coast, but the engagement of voters is much higher in most areas. So that was one thing.

The other is right in the middle of that hotspot, you see a lot of blue there. That's the city of Santa Ana, very dense voter population but not a lot of engagement in terms of turnout generally, and that's going to change here in just a second.

Then we brought in time studies because this is one of the things we need to be able to use the optimization calculator that Charles has provided election

officials. So we started using every ballot style, or an average of ballot styles in every election to conduct time tests because that's really important. A couple of things about time tests on the ballots. The first is that you need it for that optimization calculator, and the second is how many votes can be stored on a VVPAT roll. I don't know if you use a paper trail here in Pennsylvania. But in California we use them. On a California ballot, you can typically get about 120 votes on a roll of paper. That's really important to know on election day in terms of being prepared for that.

When you look at the times -- and I just want to give you a quick sample here of these random time studies. This is from 2016. The sweet spot right there it is that average, 8.25 minutes to vote that ballot. That's what we use for that calculator. Now we go to the inputs. I'm getting the hook here. I'm going to go as quick as I can.

So using these data inputs, we used the queueing calculation, and by the way, this is basic queueing theory. Charles has distilled it for elections officials, which is fantastic, but you can use -- if you don't use that, you can use other queueing calculators. It works well.

So I want to use an example from Irvine, California. Irvine is one of our largest cities in Orange County. It's right there in the middle. And you can just see that hotspot of dense voters in one particular area of Irvine. So that's where most of our polling places are located. But the example I want to use is a small polling place in a very large precinct, serves a lot of voters but not a lot of density in terms of the voters. So it was a good example to give you.

So what we did in the calculation, we had 390 voters that turned out in the 2012 election. We forecast for 2016 an 80 percent increase. That may sound significant -- it is -- but we're not taking into account the history of voters that are new voters, that are registered voters since 2012. We don't have their information. So we don't know the turnout necessarily. We backed a lot of that out. But at any rate we ended up with 702 predicted turnout for that particular area. We then used an eight-hour span for calculating 84 voters per hour. Why not 13? Because that's the length of our election day. You don't have busy times on certain points of the day. We're averaging it out to an eight-hour day. So 84 votes per hour for the arrival time.

And based on that, we plugged in 8.25 minutes for the time to vote. We established a 15-minute wait time with a 90 percent service level, meaning 90 percent of the time people are not waiting more than 15 minutes. And that gave us a booth count of 13. If I go over 12 in my jurisdiction, I have to add a second setup.

So we backed out one booth and sent them 12. They used to get 8. How did it work? I just want to show you real quickly how it worked.

What we did is we then took this data in all the 2,700 precincts I've got in Orange County, and we did the exact same process that I just showed you in that Irvine example, and that gave us calculations from 4 booths all the way to 16 booths we would be shipping throughout the county. And measuring the outcomes obviously is important for all of us. A couple of things to consider, the number of booths that you have. That may change how you're doing it? The facility size. If you send them 16 booths, obviously, sometimes they can't handle 16 booths. We get that. The number of votes for the paper trail. That's important. The bottlenecks for the check-in stations. This is obviously not breaking news for all of you, but that certainly is where the choke point is. If you can add more check-in stations, that really helps.

In that cube, the sweet spot is in the middle in those colors. If we go to the variations on the outside, we missed our forecast. So when you look at the map, this is 2016. Overall, we did pretty well. When you draw that circle around the map, our forecast was pretty much on the money. We were able to send the right amount of booths to the right number of polling places based on data, not on gut feeling, based on actual data. The thing that killed me, though, was right there in the middle of Santa Ana. Remember I told you at the beginning we were forecasting a low turnout, we actually had a very high turnout because they were energized, irregardless of what side you're on in the Trump campaign, they were energized with that election, and they turned out in very large numbers. Caught us a little bit off guard, but we still were able to handle it. As a result, we had reports of 17 polling places with long lines, out of 1,200 polling places. So it does work.

One last pitch, and I'm going to turn it back over. Because this is a data summit, I encourage you to visit our website. We put every amount of data that is publicly available on the website, and this is what you can see in these data rich tabs that you can click through. We're now doing it in realtime for data visualizations as well, OCvote.com. Thanks very much.

>> Thanks, Neal. You got to Lord it over the L.A. County people.

>> All right. Before I jump into my presentation, I'd like for most of you to start thinking about I'm going to be presenting an interesting data analytic that use what's we call machine learning. Some of you are more familiar perhaps with some of the more hype terms in this field, like artificial intelligence. I'm not going to use that term. But there is an inherent danger in the analytic that we've created, and so I'd like, as I jump into my actual presentation, you'll see a number of different slides. Start thinking about what would be the inherent danger to this approach? And we'll

talk about it a little bit later as well because I think it's important to realize that, while data can be very, very powerful and a very useful tool, if use the inappropriately or unwittingly, it could ultimately replicate patterns that you don't want to replicate.

Okay. So let me go ahead and jump into this. So I guess I'll have to point. So ultimately, all of us have to find enough poll workers to work on election day. Ultimately, we need to find enough folks to staff close to 4,600 precincts on election day. That usually amounts to trying to find close to 26,000, upwards of 30,000 to 33,000 per large election number of people that would be willing to show up and spend about 13 hours of their time for a very small stipend that we give them.

So the inherent problems with this, as we recruit people, folks cancel last minute. The worst situation for us is when they no show, no call, no anything. It's particularly problematic, and I guess for those of you at that administer elections, you know how problematic it is if it's the inspector that doesn't show up on election day with materials and supplies. So if that happens where too many folks don't show up, we might end up with some long lines, and we might have folks grumbling about these types of issues, which, of course, leads to other issues such as low voter turnout, so on and so forth. So these are all terrible outcomes that we're all trying to avoid, of course.

So let me just be clear. I have received some criticisms about this slide. What I mean by optimal selection is optimal for us is a physical human being that is showing up on election day and wants to work, right? Irrespective of any demographic, political leaning, anything to that effect.

>> Tacky sweater.

>> Right. All that notwithstanding. So we really do want to find the folks that are excited to be there providing wonderful service on election day to our voters.

So the question for us is how do we find these people? Without having to call 35,000, 40,000 different folks. So I started with looking at a lot of historical data, and I think it's a similar process to what Neal was looking at with historical outcomes of who's showing up and who's not showing up. Ultimately, we ended up using, I think, data going as far back as 2000 to train the algorithm we had created, and we used the 2014 election as our test data. And I'll explain a little bit more about that. Ultimately, what we were finding is without using any fancy algorithm, just simply our recruiters' intuition, we were winding up with a 67 percent success rate for recruitment, meaning of all the people we called to try to recruit them, 67 percent were indeed sticking to their commitment or not telling us politely or impolitely no thank you or whatever else they tell us.

And then that was for the November. Then for June, we were at 78 percent. So clearly, there's a lot of room for improvement in terms of having better recruitment success rates for our poll workers.

So for us, when we were starting on this data analytic project, we were asking ourselves key questions. One of the core questions being how do we really differentiate between those that are committed and those that are not committed? In many cases, our poll workers are looking at a list of folks that had worked previously. The natural intuition is, oh, they worked last time. They're going to work this time. That can be true. It could also not be true. So the question for us is are there other data elements that lend themselves to predicting the truthiness of that ultimately?

So we really want to know, of the intuitions that our poll workers have developed -- and mind you, you probably all have very talented poll worker recruiters that have gotten to know their poll workers and the folks that come and show up and have a sense as to, oh, if I call this person, they'll show up. Oh, this is the wrong election. I shouldn't call Fred, right? So there's some really good intuition. In terms of data, how do we model those intuitions from the data we've collected on poll worker recruitment?

Importantly, beyond the intuitions our poll workers have developed, are there patterns that could be mathematically derived when applying a machine learning type of algorithm? So ultimately, the goal of this project -- and this is the important thing I would like to leave all of you with, which is which algorithm to use or not use, but when using data, it's important to have a very clear definition of what your business problem is. So what are you trying to solve? And the clearer and more defined that problem is, the better result you're going to get, the less ambiguous the data is going to be, the more accurate whatever it is that you're creating is going to wind up being.

So for us, the question isn't could we find enough people to work? Because ultimately, we were recruiting from a list of about 120,000, right? And then beyond that list, we have about 5.2 million people that could potentially serve as poll workers in L.A. County. So there's a lot of -- there's a huge pool to recruit from. But for us, we wanted to minimize -- so the business problem for us was minimizing the negative outcomes that were occurring on election day, being cancellations, no shows, so on, and so forth.

And the reason why we settled on that was we felt the cost of incorrectly a negative outcome was much greater than the opposite situation where, if we were to miss out on certain poll workers, there's a lot of other folks we could recruit from. But if we were to get it wrong and get the wrong people, then we could wind up with

long lines, we could wind up with poll locations not be open, emergency opening, so on, and so forth.

So the question for us in terms of data and data elements that were available to us is what can we use? So some of the things we know about our poll workers are obviously some demographic data we collect from the voter file. We know gender, and we know age. Do we know anything about civic participation? Because this is an important thing in which we would think would drive participation by a poll worker is are they civic minded? Are they part of that community? We ultimately realized, of all the metrics that are out there or imagined metrics we would love to have data on, the most important was voter participation. Are they an engaged voter? We found that of all the data elements we ended up using, voter participation is probably the best predictor for whether or not they're going to show up and be a poll worker.

Likewise, does previous poll worker history predict future poll worker history? We have all the data. To some extent it does, it's an important predictor, but not the most important predictor. Likewise, is there a question about long distance traveling? Would someone want to travel from the top of L.A. County to the bottom of L.A. County? Is it's a very large county. Probably not. Likewise, we also have the specific data that tells us what was the outcome? We call it response data.

At the end of all this, of all the patterns that existed, we realized there wasn't just one pattern. I won't get into how we discovered additional patterns, but for us, we realized there were six different types of poll workers that existed that could all be predicted on. We didn't want to throw everyone into the same mix and predict the end result. We wanted to split things up and get better results, and that ended up working.

So I won't get too data sciency here, but I guess the fair question would be, well, what is the prediction algorithm doing? At the end of all this, the end output is just one data point. That's what it's doing. It's creating a score between 0 and 1. It's likelihood of showing up or not showing up. So in any case of any of these types of classification problems, if it's greater than 50 percent, that's the positive. If it's less than 50 percent, that's the negative.

Now, for us, if you guys remember, that wasn't the business problem we were trying to solve. We were trying to minimize our negative outcomes. So 50 percent plus one isn't good enough for us. So as we developed the different thresholds, we realized we wanted to set that 50 percent much higher, closer to maybe 80 percent for certain groups. So not every one of the six groups that we had created have the same threshold. It differed based on the data. But that was

the idea. And by setting the threshold higher, as you can imagine, it means you're being more discriminating with the actual algorithm.

So we ended up using machine learning. I listed two of many that we used. Anyone that wants to geek out afterwards, I'm happy to talk about gradient boosting and random forest. I won't do that right now.

Okay. So what were some of the results? I'm sure you guys were wondering. Before I get to 2016, 2014, obviously, we didn't have the algorithm at the time. We used it as test data. Using the algorithm, we moved from a 67 percent success rate to closer to 86 percent overall outcome. That's only test data, though. It wasn't a real election. It was just simply giving the algorithm new data it had never seen for 2014. And then the general election, we moved from -- sorry. The primary election, we moved from 73 percent or 75 percent, to about 88 percent or 89 percent. So clearly, it's performing the way we intended it to. And the no shows and cancellation rates were also minimized, closer to 1 percent and 2 percent, whereas before, without the algorithm, we were right around 10 to 13 percent no show and cancellation. And we don't want to be there.

So moving on to a real election. This is now the algorithm being used on a live election. For the June 2016 primary, the ultimate success rate that we saw without using the algorithm was 73.6 percent. The no show rate was around 13 percent. And the cancellation rate was around 11.1 percent. Why am I differentiating? Like any new technology, adoption is not 100 percent. We had a few groups that we had to look at, those poll workers that didn't want to use the algorithm and those that did. In this case, the overall success rate without the algorithm is what you see. With the algorithm, we went from low 70 percent to 85 percent. For those poll workers that were actually using the algorithm, they were seeing a much higher benefit to their success rates. Lower no show rates of those folks that they recruited, lower cancellation rates as well.

Next. Similar data for November 2016. I won't go ahead and explain all the As, Bs, and Cs. Those are just status that we use. What matters, though, is for the 2016 without the algorithm, we were at a success rate of 71.7 percent. No show rates around 6.4 percent. Cancellation rates around 6.2. With the algorithm, 83 percent, only 1.9 percent no show rate, 4.9 percent cancellation rate. So in all cases across multiple elections, the algorithm outperforms -- I don't want to use the term outperforms the human because I'm not suggesting we move to robots. But using the tool versus not using the tool, those recruiters using the tool are experiencing greater successes in staffing those precincts, and that's the whole point of what we were trying to do with this algorithm.

As, I think, Charles had noted, I no longer work for the registrar/recorder doing this wonderful work. I still work at L.A. County. I'm doing health services. I wanted to provide contact info for the data scientist I worked with and trained and is still there doing the same work. She has wonderful ideas. She knows these algorithms as well as I do. For those who have immediate concerns or immediate questions I'm not able to answer today about this type of use, that is her contact information as well.

>> Thanks. Melissa? So we have a question up here about which clicker is the one that's suppose to be working? This one? Not yours. Well, here, let's try this one.

>> Let's see what happens.

First, before I get started, I would just like to say, now that I'm at PEMA, this is like coming home. I used to work at Pennsylvania Department of State, and it's great to see so many faces here. I'd like to thank the EAC team and the Department of State team that worked so hard to pull all this together and for you to be here for valuing exactly what we're trying to figure out to do to help everything kind of improve.

I'm going to be talking today about emergency preparedness in elections. I'd like to thank Neal actually for helping open the doorway to my presentation with all the talk of forecasting.

So when PEMA operates within an emergency management structure, we have five phases we work in. It's our prevent, prepare, respond, recover, and mitigation. The Department of State actually works in very similar ways in preparing for executing and then following up with after actions after an election. So it only makes sense for all of us to work together.

We'll activate our CRCC, which is our Commonwealth Response Coordination Center, and that is basically our EOC in the Commonwealth, and we'll bring in other departments that I'll talk a little about later on, but it allows us to support the mission of Department of State on election day, both primary and general.

Primary threats for the election day and/or in general that PEMA faces when coordinating with the other agencies enterprise-wide are flash flooding, extended closure of limited access or core routes, hazmat, human caused events, power outages or phone outages. Everyone kind of immediately nowadays is currently thinking cyber, but these are the everyday environments that can cause flash flooding, downed power lines. You can have a hazmat event that would make a polling place inaccessible. So these are different environments. Really, I think I'm

the loudest person in the room, and they still have to push the microphone closer to me. Anyhow, thank you.

What we're going to look at data-wise for today really is kind of one of the things that's most important. It's climatology. So if we look at the history of Pennsylvania from the late '50s till present day, we will be able to know that in April and May, which are the months of our primaries and November for our general elections, we have a higher probability of wind, hail, and tornadic activity during those months. So knowing that and going in, we are going to want to be able to coordinate with our emergency management coordinators in the 67 counties, just as there are the 67 election directors and we're in the process of trying to marry those groups together and make sure that they're communicating the way we are at PEMA with Department of State to support that mission on election day.

One of the other things that's very interesting is, if we look at climatology, we can see that, as the atmosphere builds during the day, the primary release tends to really start to happen around 2:00 p.m. and follow through until just after 8:00 p.m.

that's one of the primary voting windows. You're talking about rush hour traffic, trying to get Johnny to soccer practice, and doing all of those things. You add in a weather environment, and that can change a voter's entire day. It can impact the polling place in very unique ways, which we'll look at as we go forward.

There are a few more slides in this presentation that I'm going to kind of go by a little quickly, but I wanted you to have the information for after to be able to look at. Again, you can see here that April and May, we see an uptick in hail reports as well as same time frame in the evening and the same with tornadic activities. And that doesn't necessarily mean a tornado, but it could mean the environment for one to be created. So we also see that it's also the same time of day.

And this is just a slide identifying since 1950 the types of tornadoes that we've had in the Commonwealth and that are primarily EF-1s. So what we're looking at here is actually a slide within a slide. We do a morning briefing at PEMA with the enterprise, with the entire Commonwealth of Pennsylvania and its partner agencies. Our state meteorologist is probably one of the best holes we have in the Commonwealth, not just for election day but in general, and it's really an example for how government works.

Our state meteorologist will put this together and brief everyone. This was the forecast on Monday the 14th, this year, for primary election day on Tuesday, May 15th. If you look at the center slide, the center image, I should say, you see that the storm system is kind of covering a good portion of the Commonwealth, but we all know that weather can change very dramatically. So now what was the

forecast and what did it look like on Tuesday on the morning of the election? The storm system changed dramatically. You can see the time frames of when they were expected to come through was going to change. You can see the coverage area changed as well. This storm system ended up going up into New York State, down through the Maryland line, and crossed from the west to the southeast.

So what does that mean? Let's actually look at what we were able to pull from our raw data and go through GIS and figure out what this means. So these are real case scenarios that happened on May 15th. These are epicenters of all of our major cities with a five to ten-mile radius around them. One of the things they do is work closely with Department of State, and just days prior to the primary or the general election, they send PEMA an updated list of all the polling places within the Commonwealth. That's this image. This is every single polling place within the Commonwealth for the May 15th primary this year.

The next thing I'm going to be adding in is our weather events. So the weather intensified throughout the course of the day and this storm. Basically, it hit Dauphin County and Harrisburg around the 5:30 hour and continued on a southeasterly trajectory from the Commonwealth going from New York to Maryland. You could not avoid this storm. This follows along the climatology information we just talked about.

In Wayne County in the far northeast, we had an EF-1 tornado with 105 mile an hour winds. We also had the same condition with an EF-1 tornado at 105 miles an hour in Cumberland County that came through. There were downpours, outages, and we have to look at and consider what the continuity plans are for the election directors and what's going on in their areas. Do they have generators? What do they need for their voting systems? How do we support that mission both at PEMA, and then how do we work with our 67-county EMCs as well as our 911 coordinators? We reach out to them a week before or a little bit more depending on the weather environment, and we talk to our 911 coordinators and our emergency management coordinators in the counties and advise them of anything that could potentially impact a polling place.

And on election day, primary or general, we have a specific contact in our 24-hour watch within our CRCC, within the building at PEMA, that coordinates and connects directly to the Department of State to let them know what's coming through. We also work with the PUC, the public utility commission, to find out where the power outages are so that we can communicate those as well to Department of State should it impact any polling locations and what does that mean?

So when we talk about PUC and talk about power outages, this is just a snapshot of that day. As I mentioned, the storms intensified as they went through

Dauphin County and then towards the east. You can see red bad, green good. This is PECO and PP&L, and just a sampling of them. The power outages were massive. We had over 16,000 power outages between the 6:00 p.m. and 8:00 p.m. hours. You can look in Wayne county we had 5,300 power outages in that area. We want to be able to communicate that information to Department of State so they can communicate to the county election directors and vice versa with the EMCs and the 911 coordinators in their counties.

So what are we doing next? How are we -- what are we doing next as a Commonwealth, as an entire entity? Because when we activate our EOC, when we activate the CRCC on primary day and election day, there are multiple agencies there. Department of veterans and military affairs are there, Governor's office of homeland security, PUC, public utilities commission, and we communicate all of that information. Right now PEMA, Department of State, and a number of other agencies are currently putting our 2018 November general election plan together.

The next step is going to be trying to figure out a way -- and we've already opened those lines of communication between the 67 county emergency management coordinators and 911 coordinators with the election directors because we want at the county everyone to be talking to make sure they're talking the same way that PEMA is talking with the Department of State to support their mission on election day.

Beyond that, Department of State and PEMA have come together for some regular meetings to talk about how we can improve more in the real world as well as in data sharing through face to face meetings, through an increase in technology, both before, during, and after an election. Some of that is also including the possibility very early discussions of creating a singular dashboard that would allow all of the stakeholders and parties to be involved where we could upload information from PennDOT, the turnpike from 511, so you can look at where there are traffic incidents and infrastructure, and they can see all of that information as well as outages and other information that's coming through.

The next thing is be prepared. What are you doing to be prepared? Do you know where all of your polling location alternate locations are? Think about that. When you do have alternate polling locations, do you have the communication plan to communicate that to voters in the precincts so they realize the voting location has moved. Those are things you want to stop and think about. We're open to having that conversation. Department of State is open to having that conversation. And we look forward to discussing that as you move forward.

>> Mark?

>> Seems like we're having an issue with the clicker again.

>> I thought it was just me.

>> We need to go back. If you can go back to the cover. All right. I am Mark Goins. I am from the great state of Tennessee. There truly is a Rocky top. I grew up 20 minutes away from Rocky Top. In Tennessee, I like to think we have a positive attitude. So I realized during this election season that it can be very stressful. I always relate elections to cracker jacks. You never know what the surprise is going to be that day, but something's coming at you.

I'd just encourage you to choose to have a great day. Every morning wake up and say I'm going to have a great day. And I also encourage you to choose to learn something today. And being from Tennessee, we are very family friendly in that I always start the presentation off with introducing my wife and letting individuals know who my wife is. So there's my wife. I'm Dolly Parton's trophy husband. You always want to know what he looks like, and I'm him.

No, we're very proud of Dolly. I'm not married to her. I have a lovely wife Rebecca. Anyway, Tennessee is certainly known for Dolly Parton and other things.

I got invited to do this panel, essentially I was told the topic would be about tabletop, to go into a tabletop discussion. And part of the reason was we recently did a tabletop with all of our election officials in Tennessee on the county level, essentially 400 individuals, and it's a photo of 400 individuals in the room doing a tabletop exercise. And I was very blessed in that we were able to get a lot of ideas from the Harvard project at DP3. And they gave us some tools to conduct a tabletop.

Now, in all candor, the tabletop that we did didn't have -- it wasn't all data, but I'm going to go through in just a moment on how it could be all data. It certainly had a data component to it. But essentially, if you're not familiar with an election tabletop, the way that ours worked was during phase 1 you would study for an election. You would plan for an election. We literally gave everyone a notebook. They had to put their plans. We'd divide them up into teams of ten, and they to come up with a plan on how to prepare for an election, and then on election day, they had to execute that plan.

And part of that, though, we were going to hit them with various, what we call injects. For example, in our inject, we hit them with a tornado. We wanted to know if they planned beforehand, and if they didn't plan that in phase 1, then in phase 2, they were in trouble. Basically, for the tabletop, that's the worse we could imagine. Anything that could go wrong happened.

What we did incorporate in phase 1, we did give them a budget. Also during that period, we told them turnout is going to be high. So we told them that information. We also told them during that time that 21 states had been scanned by

a foreign actor. We gave them a choice. They could reduce polling locations, early voting sites. I'll go into early voting in Tennessee in just a moment because I realize Pennsylvania is a little different than Tennessee in this aspect. I know there's folks watching across the nation. Anyway, they had a choice. They could save money by introducing voting sites. The problem with that would be later on they're going to have long lines, and they could take that money and put it to cyber security, or they could do just the opposite and not spend any money for cyber security, and guess what? On election day, they're going to have a cyber activity. So data was involved.

But overall, as we go through this -- as we're looking through, and I may do a data tabletop. In doing a data tabletop, some of the relevant things we have to throw at them, we'll all deal with data, and we'll talk about that in just a moment. But I want to make this statement, and maybe this is one thing you learn from our presentation, and I truly believe this. As an election official, if you do not use data, you do not know how to plan an election, and I believe this.

As we go through, what data is important? We throw them a number of relevant data and irrelevant data. You have a finite number of poll books and machines. But in Tennessee, we have an early voting period that starts 20 days before the election, and in general, with very few exceptions, will end 5 days before the election. So sometimes that relevant data at the beginning of the process can change as you go through it.

Let me give you an example. If we were doing a tabletop exercise, polling location number 1, we might say they're having a 60 percent turnout during early voting. You have a finite number of voters, but 60 percent of those are turning out. Polling location number 2, turnout is extremely low. In the planning phase as an election official, now you have that data, but you also need more information. Or at least I would take more information. What I would do is go look and say was there something on that ballot in precinct number 1 that's causing that turnout or a candidate there with a strong get out the vote effort? It may be you're going to run out of voters in precinct number 1 and you can ship resources to precinct number 2. Or it may be you have a weak ballot in precinct number 2, and you need to ship the resources you have, poll officials, whatever the case may be, to polling location number 1.

You also have a finite amount of money. Money is always going to be an issue in an election. There's so many things we can do that would be great, but you also so take that in context with money. Vendors can be an excellent trouble shoot as far as providing data.

For example, we had an issue with poll books, where unfortunately the wrong early voting data had been entered, so on election day it appeared individuals had voted who had not. Now we require vendors to put that data on the opening page of the poll book. If I have a poll book, I know how many of my voters have voted early. I also know from the election commission, they've sent a data showing this is how many people voted early. If those don't match up, we know we have an issue, and we test that before we send it out to the polling locations.

With the ballot, sometimes you have to create your data. Now, if we were setting up a tabletop, the only thing we would give them would be a very long ballot, and in Tennessee every eight years, that's exactly what we have. Every judicial race is on the ballot. It's a retention type election. And so it's very long. So how do you create that data? Well, we wouldn't tell them, but my hope would be, when they were doing their planning, they would do a mock election. They would take members from across society and figure out exactly how long it's going to take to vote that ballot. In doing so, then that can help you plan.

The next thing is looking at relevant data. Again, we have a U.S. senate seat in Tennessee, six years ago it wasn't contested. It was contested, but pretty much nominal competition in Tennessee for that. We haven't had an open senate seat in a decade. So the tendency is to look at six years ago and see what turnout would be. Frankly, I think that's wrong. I think you've got to look back to 12 years ago, to where we actually had a contested race, money was being spent, and I truly believe that the candidate spending money, there's a correlation with turnout. That helps get the vote out, or at least it does in Tennessee. So I think that's important. It's important to know what happened six years ago, but it's more important to know what happened 12 years ago.

As Neal said, you've also got to -- so now you have that data. You have that information. But you've also got to look at what's the voter registration trends right there? And you've got to adapt that data accordingly. Number of voters, that's obviously how you plan -- we had a new administrator come in several years ago. By way of example, they had ten precincts and 30 machines, and I'm simplifying this. In their mind, they sent three voting machines to each precinct. Well, that's not how it works because some of your precincts are going to have more voters, other precincts are going to have less. Like I say, sometimes that ballot may be a little different in the different jurisdictions that you have.

Age of voters. I have some administrators -- I guarantee this would happen, and it's a great thing that I have this. I'm blessed with this. So we have 95 counties, and some of our administrators analyze everything. So if we were doing a tabletop exercise, we have some communities that are senior living centers or

senior living areas like Fairfield Glade. It's a very popular area in Tennessee. A lot of seniors live there. When I hit 40, I can't read a ballot without glasses. I need something to magnify those. So we saw that was an issue in polling locations. So we sent glasses out to the polling locations. Now, if I have a polling location that's located close to the University of Tennessee, I look at the data. It may only be college students voting there. I don't have to send as many glasses.

But in Fairfield Glade, I'm probably going to need to send more glasses. Now, I'll tell you, if you choose to do that -- and this is serious -- if you choose to do that as a state or if you want to provide those glasses, find the ugliest glasses you can find because those glasses will walk away. We're getting timed up here. I see I need to speed along. But absentee requests can tell you what kind of turnout you're going to have.

Trends are very important. I've learned that people are creatures of habit. I saw this with my family. Are we going to church? We sat on the opposite side. We typically sit on the right, and we sat on the opposite side. My son looked at me and said, hey, we're sitting on the wrong side. Voters, at least in Tennessee, tend to be creatures of habit. If you look at this, the blue line is the presidential preference primary. Normally for early voting, 30 percent. 60 percent is almost dead on. 60 percent four years before that, and four years before that, 60 percent. So we know when planning elections, early voting for a presidential election, we're going to have 60 percent. We need to bulk up early voting sites. For presidential preference primary, look how consistent it is, 30 percent. It's just the opposite. So then you need to bulk up on election day. You don't need to be bulking up during early voting.

Well, I have that data, so I also like to get behind that data. Why is it only 30 percent? Why does that buck the trend? For a presidential preference primary, we're not New Hampshire. We're not Iowa. We're later on in the process. So what happens is candidates start dropping out. We start early voting 20 days before the election. By the time early voting is continued, half the candidates are gone. Voters want their vote to count, so they wait until election day to vote.

Here's where this will catch some individuals, and we've seen it happen in Tennessee. Although I went over this in one of our training exercises, always compare elections to elections. Presidential, don't go two years before because it's different. Go four years before. And we had an individual that looked at the 60 percent as opposed to 30 percent when preparing for a presidential preference primary. They thought, oh, this is 60 percent, but it's really 30 percent. They thought they were going to have a very low turnout. By the time it came to election day, they were caught off guard. You've got to know exactly what data is relevant.

Sir Francis Bacon is quoted with saying knowledge is power. I'm going to give him an amendment. I'm going to give him an assist today. I think that data is knowledge and knowledge is power.

>> Thanks, Mark. So while the audience gets their questions together, I thought what I'd do is I'd go down the row and ask each of the panelists a question that's pegged to their presentation. Actually, I'm going to start, although Mark just presented, I'm going to start with him because I think the question I'll give to Neal, a couple of you all might want to weigh in.

I'll actually preface my question to Mark, with respect to ugly glasses, you must not have a whole lot of hipsters in Tennessee. I would imagine that, in some places, the uglier the glasses, the more likely they would be stolen.

The question I want to ask was just about Mark. So one of the things you learn when you study -- get to know election administrators well is that election administrators are natural emergency planners, and if they're not, they're not election administrators for very long. That's been known for a long, long time. The defending digital democracy program at the Belfer center at Harvard, which you mentioned, has introduced the election administration world to the planning of tabletop exercises. I'm wondering if you could reflect on how the tabletop exercises differ from what you see as traditional emergency planning and what sorts of information or experiences that they give to election administrators that maybe more traditional ways of emergency planning have lacked in the past.

>> I think the difference between the tabletop exercise that's we did is the emergencies happened. So now how do you react? The typical way we were preparing was we'd prepare a plan and didn't execute the plan. During the tabletop exercise, it forces you to put that plan in action. And if you don't have a plan or you didn't think of something in that plan, then you need to go back and adapt that plan.

>> Great. Melissa, I imagine your role is full of tabletop exercises, so you might have some thoughts about that. One of the things I was wondering about as you were talking was thinking about the old Sesame Street game, which of these is not like the others? Or maybe the opposite, which is to what degree is planning around an election, how is that pre-planning for things that might come up? Any other large events in the state that are like that? What are the similar other events that folks can get their heads around. And in your world, how is it different planning for an election more difficult than planning for another large scale event that might be in the public's mind.

>> Just in case. I'll need to tell my father they had to do that. We'll exercise for a number of different things, both in tabletop and then actually by activating the CRCC and having our agency representatives come in. It will be for

power plant exercises and things along those lines. It will also be for weather events. We always do a spring weather and a winter weather exercise just prior to that season.

But really when it comes down to preparing for responding to an election, we do what we do best, which is coordinate. PEMA doesn't save lives, but we coordinate. So we make sure that all the agencies and the resources are talking to one another in that we're kind of a conduit, if you will, for that information to be able to flow.

We've sat down together and worked some smaller scale election scenarios prior to election day, and we're hoping to kind of be able to build onto that, and the next step of that is actually bringing more of the county emergency management coordinators and 911 and election directors to kind of practice that. Does that answer your question?

>> It does. Ben, I'd like you to talk more about a topic that you touched on, and that has to do with one could derisively call the demographic profiling dangers of the sorts of exercise that you're dealing with.

So when you're building a model of a sort that you talked about, how do you ensure that the down side of that sort of modeling doesn't infect the types of decisions that get made?

>> Yeah, there's a wonderful book out there, and I'd highly recommend any election administrator who wants to be data driven to look at it. It's called weapons of math destruction. It's a nice critique of the use of big data and these types of modeling and analytics. What happens -- so just understand these types of analytics aren't creating patterns. They're discovering patterns for you. Ask yourselves a question, who created the patterns? It's your human employees. So in the case of poll workers, it's your recruiters that are using their own -- I use the word intuition. Another word that could be used is bias. It could be explicit. Hopefully not. But it could very likely be implicit bias.

So that individual poll worker are making decisions, human decisions that are trying to yield the best outcomes that they can yield. But over time and aggregated together, there are going to be patterns that exist that could lend themselves to what I think Charles is talking about. So out of curiosity, when you look at your poll worker, anyone look at the age demographic of the likely poll worker? Yeah, older.

Now, the question ultimately is, without passing any judgment, still a question though, is that a good thing or a bad thing? In terms of planning for future elections, well, if all your workers are at the cusp of retirement or already retired, that may not be a good thing. You may not have those -- God forbid, you may not

have a large number of those poll workers for the next election. So for logistic planning, maybe there needs to be some effort spent on recruiting other demographic, right?

But, again, without getting into making the judgment calls, do we go after this demographic or not? And that's probably not that good of an idea to choose a certain demographic, but it's important to use these types of algorithms to uncover whether there's been a pattern in things that have been done before. That's what this algorithm is doing, it's uncovering the patterns. If you could dig into the data using these algorithms, you could start realizing and potentially reversing some of the previous behaviors that your employees have used to recruit certain individuals.

So this addressed that first question I brought up in terms of the inherent danger to this. If these -- if using advanced data analytics is used purely blindly to say, hey, let's just get high performance, then you as an election administrator are at a risk of just reproducing the same patterns but optimized by this algorithm that you may not want. So the way to combat some of those things is to dig into the data and ask yourselves are these the patterns we want to continue? If they're not, great, you just used a tool that uncovered patterns that may have been done unwittingly. And then you could start addressing the way you go about conducting, whether it's poll worker selection precinct selection. Anything you have, if there's patterns and you want to know what the patterns are and make an adjustment as an election administrator, those tools will be available to help you make better decisions in that way.

>> And then Neal, I wanted to ask you about just kind of the resources needed to become the next Neal Kelley. Maybe I'll make a comment and then pose the question another way. I think Orange County really is an exemplar in terms of using data, not just using data, but communicating effectively to the public. And doing so requires a set of skills. And so -- and not everyone is the fifth largest jurisdiction in America. So if you are like the thousandth or the 500th largest jurisdiction in America or the 6,000th largest jurisdiction and you wanted to play in this game, where does one get the types of tools and expertise in order to do the sorts of things that y'all have been able to do maybe at a smaller scale? But nonetheless begin to play in this game.

>> Thank you, Charles. I don't know if that is a slight or a compliment. I'll take it as a compliment. You know, that's a great question, and I get it all the time.

The one thing I always tell people is what we're doing is scaleable. So there's a lot of tools that are available online that can be utilized for the same types of data collection and data analysis we're doing very simply. And I think that smaller jurisdictions that may not have the funding or the resources can do at least half of

what we're doing with online tutorials and online tools. There's a lot of that out there. It's very useful right now.

I also encourage folks to utilize -- and this is a great place to say this, a community college, because there's some great classes on operations management that dive right into this very specific topic and how to handle logistics and data. If you took a weekend course or even a six-month course, that's really helpful because it talks about queueing and line management and logistics, which is very useful.

But I do want to emphasize, Charles, because I'm glad you asked the question, it's not just about money and about resources. For instance, on the social media side, all of that is done probably in a negative way. My family certainly says that, by myself. Because I'm able to send that communication out and I can do that. If I can do it by myself, then do it. We don't have a team like Los Angeles County.

>> I have some other questions I'd like to ask, but I think we'd like to turn it over to the audience. It looks like we have some microphones around, and I will try to call on people as they raise their hands. So what questions do you all have?

>> Hi, I'm Kara Rahn from Chester County, an election official from Pennsylvania. Just the question to California, just so we can understand from a poll worker perspective, what are the laws or rules in California or restrictions you may have on who can and can't be a poll worker? And then also who has the authority to fill those roles?

>> Thank you for the question. In California you don't have to be a U.S. citizen to be a poll worker. You can be a legal permanent resident. In Orange County, this is an example, I support six languages in the county, and that becomes very handy because we can't always find poll workers that are U.S. citizens that are willing to come and do the bilingual support.

So we have the LPR as an alternative. We also have the student poll worker program. You have to be 16 with a 2.5 GPA with the permission of your school and your parents. We use about 2,000 of those in Orange County. Ben touched on it a little. Our population is aging. Our average age was 67. When I first started, it was 72, and that's dropping because we're putting more young folks into the mix. But I find it's a good balance to have the older folks and the younger folks in a polling place as opposed to all young. That's really helpful. Hopefully, that addresses.

>> [No microphone].

>> No, they're not. Let me touch on that quick. Obviously, in some jurisdictions, you have to have a mix between Republicans and Dems. We don't have those restrictions. It's all open recruitment. And we allow our inspectors to

recruit their own individual teams if they want to do that as well. I have to recruit 10,000 poll workers for each county-wide election. Our team has to do that. So it's a very daunting task. So we rely on some of them to help with that recruitment.

>> Just as a followup, I think that's what makes using this type of data so much easier because we don't have those restrictions. We can literally go after anyone. For us, the limitation of the algorithm we use is using voting history. So we generally are targeting folks that are L.A. County voters, but we do have plenty of poll workers that are from Orange County that commute because we also have the county poll worker program, which you guys might have as well. And we have Orange County residents that work in L.A. County. So we borrow from L.A. County, other departments to staff the polls.

Ultimately at the end of the day, it's nice not to have any of those types of issues to stop an algorithm from trying to optimize. You keep adding in more restrictions, the question is how much optimization can you really squeeze out from what you're already doing?

>> I'll just make a comment as somebody who's not around here but has done a couple of things around Pennsylvania around elections. It's interesting because ultimately there's the question about do you elect your poll workers? I've taken that to be an issue here in Pennsylvania.

There's a question here far to my right.

>> Yes. Good morning. This is Suzanne Herb from disability rights Pennsylvania. One of the things that I think is important to remember in terms of data that doesn't always come up is voters who have disabilities. In terms of the discussion that has just taken place, what efforts -- can you describe what safeguards are in place to ensure the ability for people with all abilities to vote independently and have a verifiable paper ballot and also have a private vote are in place.

One of the problems that seems to come up very often in terms of polling place accessibility has not just only to do with polling place accessibility itself but also the ability of poll workers to use the machines and set the machines up so that people who have disabilities can cast independent and private ballots. I know that that has been a concern of mine on various occasions when I voted, and that affects not only my vote but also lines. If the machines don't work properly, it affects lines, it affects everything. Could someone please address that point. Thank you.

>> I'm sure we have several of our panelists who would like to hop in. Start with Neal. Then I'm going to call Mark.

>> Thank you for your question. I'm glad to hear that disability rights Pennsylvania is here. I do a lot of work with disability rights California in Orange

County, very close work. One of the things that I have struggled with and that I would like to be able to get my hands on is data on the number of voters with disabilities, and that's a very difficult data point to try and capture. We've had a lot of discussions with disability rights California regarding that. One of the things that we do, though, to ensure that voters with disabilities can cast that -- their ballot privately and independently with a paper trail is we offer all of those things in Orange County so that each polling place is set up with a disabled access unit or more depending on the voter density that allows voters with disabilities to cast their ballot with all of the tools available on that unit with a paper backup trail that they can verify.

We also provide ballot calls so that, if a voter cannot exit a vehicle or they're outside, they can push a doorbell, and we will bring the voting booth to them so they can vote in their vehicle. Again, I want to go back to the data because this being a data summit, if you have information or ways to capture that data, I would love to talk with you because I think that's really important for us to be able to focus more resources in that area.

>> Mark, if you have thoughts about that.

>> Yeah, Neal is correct. Each polling location -- so we're a little different system in Tennessee where we still primarily rely on DREs. We haven't truly gone to the paper ballots, but a few counties have. Even the paper ballot counties, we make sure there's an accessible unit that's there. One thing that's a challenge is to figure out which numbers are utilizing those systems. One of the challenges is we self-create. We don't want just one person using that machine. So we will -- even though it's a machine that is typically for those that need that accommodation, we try to get other voters to go there as well because we're always concerned about protecting how that individual voted. If you have one unit and only one voter is voting on that, that could create problems of it itself, plus we don't want to single anyone out. We have a very good relationship with two organization that's focus on disabilities, someone typically at our state election commission meetings there. We also have bell calls and also do our best to supply the precincts with various things.

One thing we did do. We worked with them and created some training in a handbook or poll officials. We did that with them working from their point of view.

>> A check of my previous bosses in L.A. County, the VSAP project, which is the voting systems for all people. I know that at its core, in terms of working with disability rights groups, much of the work that is done in actually designing the machines and designing the experience was very much tailored to addressing many of those concerns that those community advocates had in being able to provide that type of good experience at the polls. Obviously, it's a different

problem when we're talking about vote by mail, and there are different necessary solutions to think about that. But for the data as well, we have looked at different data sets, and it's imperfect out there. One can look at census bureau data, even down to the census tract, even group block level, try to massage that up against the citizen voting age population data and try to get a better understanding of your voters in these areas, which ones have the greatest need.

So there's possibility for that, but it's, again, very imperfect. Census bureau data is not presented to the public or even to election administrators at the individual level. So we can't know all those things we'd like to know about our voters. But there are things that are out there that you can use to join data together and get some approximation. So those are things we've begun doing as well.

>> Just want to add I'm actually a little ashamed to admit this. We had not been doing this before 2018 and to bring in disability rights of California and other groups into our poll worker training to have them speak to the poll workers. It's actually the poll workers doing the poll training, to talk about sensitivities and how to work with voters with disabilities. It's actually been great. I'm just ashamed we haven't been doing it for years before.

>> Actually, while we're waiting. The microphone is there. I'm going to prime my panelists. I want them at the end to list very quickly one resource that you would like to turn this group onto that hasn't been mentioned yet but you just think it's great that people have know about.

>> I'm a reporter from republica, and we cover elections and voting. We are undertaking round 2 of election land this year, which is a project that aims to train local reporters on how to report on elections themselves responsibly and accurately during early voting and on election day. One thing that I would really like our reporters to do is sort of establish a relationship with their local election administrators. I'm just wondering if you have any tips for maybe things that reporters miss or things that they can start to do to prepare now to cover elections in your area or across the country better or more responsibly than they usually do on election day.

>> Who wants to bite first? Just go down the line? Let's start with Mark.

>> Could you summarize that question again. I'm sorry. I'm not fully understanding your question.

>> She speaks with a foreign accent.

[Laughter ]

>> What we're trying to do is sort of help reporters understand the resources they have available to them. So that when a voter comes to them and

says I have this really big problem at my polling place, the machine was broken or vote flipping, they know how to respond to that and they don't just report on whatever. They have understood from the voter. So we're wondering if you can give us some tips about can reporters come to your polling place now and take a look at the machines? Can they get better information from you on how -- like what mistakes you expect to see on election day that are pretty normal and your poll workers are trained to deal with so they can give that information back to voters in a responsible way on election day.

>> That is a good point on the way we messed up on our tabletop exercise. After we did our tabletop exercise, a reporter found out about it and said, why didn't you invite us? Actually, I think that would have been a good opportunity on their behalf to instill voter confidence because all they're hearing in the news are negative things about the election process currently.

But in Tennessee, it's a little different maybe than in some other states, or maybe it's the same. For our process, when the voting machines are being tested, anyone can come in and view that. It's an open process for the machines to be tested. So reporters are certainly welcome. Notice is typically given to the local media that that's happening. So that's always something that can happen.

On election night, we always want the reporters to come -- sometimes reporters will reach out to us and say they'd like to come to the state and see what the results look like as they're coming in. For us, it really doesn't help them because we're looking at a computer terminal where someone is entering it in a portal. So it may be better suited to go to the local commission office where you can view those things.

But the main thing is, I guess, from a media standpoint, what can help the election officials, it's amazing what the voter perceives, and sometimes it's driven from what they're hearing, and maybe because it's politically charged what's going on in the election. Before a headline is given or written, it would be awesome if a reporter would reach out to someone in elections to get the know. It may be that election official doesn't instantly know what's going on, so if we could have a little period to research it and come back.

In my experience, that's the things that's kind of hurt us a little bit is the headline would say one thing and it's totally wrong. Sometimes it's because they've called an election official and the media has to get that information out there, and the election official gives an answer, and they haven't researched it on their end.

>> If reporters want to know about covering kind of the emergency preparedness aspect in Pennsylvania and other places, what should they be doing?

>> As far as the emergency preparedness aspect of things, we'd suggest that the 12 million-plus population of Pennsylvania do this on a regular basis anyhow. But social immediate why is so crucial right now, and we want to find something out in what's happening right now. Somebody's tweeting whether or not it's pouring down rain. So you're going to see that. So find your social media resources, follow us at PEMA on Facebook, on Twitter, the PEMA director has a handle as well that you can do that at.

To kind of go back a little towards my days at the Department of State, if I may be so bold to jump in on that one a little bit. Really have as a reporter a comprehension of election 101. Your county election offices, as well as the Department of State, have spent a lot of time with pretty talented people to explain that process, how everything works, allow e-mail, phone calls. You can come in and ask those kinds of questions and find out exactly how it works in the Commonwealth of Pennsylvania and what those things mean, guidances, other things along those lines.

And you can find a lot of that on the county and the state's website. So if I could suggest that, that's a great possibility.

>> Tips to reporters?

>> So I think to echo some of what Mark had said, I would love it if reporters, especially reporting elections, were just much more data savvy. And I say that in the sense of most of the data that we use is public information, and most can have accessibility to it. But sometimes some folks don't understand what data in one table or one source means one thing, but in a different area or a different -- if you're looking at something looking at something else, it means a whole other thing as well. I would imagine, at least with L.A. County, there's always a group looking at this data. If you can make that connection in the event that you have questions about what does this actually mean? I'm looking at this data that's posted on your website. It looks odd. Or turnout doesn't look right. Sometimes there's errors the county elections office can make. And those are all useful things to bring to the attention of the administrator.

But it could be very frustrating, I would imagine, at least from when I look at things, when certain things are being reported and the context is often completely mischaracterized or the data doesn't actually support the conclusions that are being presented, which then lead to misperception by the voters and so on and so forth.

>> I have a very specific example for you. Ask your reporters, the reporters you know to build a relationship with the election official, and then ask them if they can ride along on election day for the emergency response teams. That has been really helpful on our side. David Whiting is an Orange County Register

columnist. He recently did that with me. Just Google that. Or even our regular response teams because they see what we have to deal with on election day, and it provides a new perspective for them.

>> Great. So as a way of wrapping up, the lightning round. One resource really quickly down the table, and then we're standing between these people and lunch. Neal, one resource.

>> Real quick, hoot suite, social media aggregator. Get all of your social media tools in one location. It helps collecting data, what's happening on election day and pre-election day.

>> Datacamp.com. And I say this -- most of us in this room who run an election do not have the budget to go out and hire a data scientist. I think that's for real. But a site like datacamp.com, in the hands of staff that already have interest in doing the type of data analytics that you'd want to do, that will upskill those folks in a very, very fast way. And I make the suggestion to do this because the Democratization of data science is happening very fast. There are lots of citizen data scientists that are out there looking at the public data we all have, and they're looking at the patterns, and if we're not analyzing what's going on in terms of services we're providing, someone else is doing that. It would be better for you to uncover those things than someone else who has a very critical eye to what's being done.

>> I know we're talking data, but I would say people. Make sure one of the things you're finding, you're connecting with folks, both at the state level, PEMA and Department of State, as well as the county level because they can provide you with the information, the statistics, the material, the data to be able to be responsive on election day should an emergency happen within your county. First your people, and then they can provide you with the data to be able to do what you need to do in time of an emergency.

>> Second thing I read every morning is electionline.org. And I think you can go through there and see what's going on in other states, but also like today there was a helpful article about looking at maps and using various things. So electionline.org.

>> Right. Thanks to the panel and thanks to the audience. Well, we should give these guys an applause.

[APPLAUSE]

>> So what now? One hour for lunch. You're on your own. Come back in an hour. It's going to be even better.

[BREAK]

>> Hello, everyone. We're going to start in about two minutes.

All right. We're about to start. I want to thank you all for coming back. Good afternoon. I hope you had a nice lunch and are ready to get back into elections.

I equate this panel similar to -- and I hate saying this because I'm in Philadelphia -- but preparing for the Super Bowl as in during the preseason, you're not thinking, hey, I'm going to be at the Super Bowl. You're thinking how do I prepare for the Super Bowl? So election day is election officials Super Bowl. So this is what I equate this panel to.

So I'm pleased to serve as moderator for our third panel, which is focus on data related to the election day itself. Data savvy election officials across the country are leveraging a number of tools to strengthen specific aspects of voting operations, tools such as mail-in ballot tracking systems, electronic poll books, line management tools are not only improving the voting experiences, but they're also generating invaluable data that can be used to inform decision-making in realtime in voting and post-election period. Civic groups, political parties, and candidates who work to register voters and mobilize them on election day are also constantly innovating and honing their data driven strategies.

The tools used by these election stakeholders rely heavily on voter registration and turnout data generated by election officials. We'll focus these and related topics during our panel today. Three of our expert panelists who today currently serve as local election officials in Colorado, Indiana, and Virginia. We're also pleased to have with us a representative from the data driven civic group here in Pennsylvania. Each of them brings a wealth of knowledge and experience from across the country to our discussion today about how data is used to improve our elections and support voter participation.

On my far right, Amber McReynolds is the director of elections for the city of Denver, Colorado. She has administered elections in Colorado for 12 years and has worked in public policy and administration area for over 16 years. Denver's elections commission has earned a number of recognitions under Amber's leadership, including the ballot trace program, which she will be speaking about today.

Ray Murphy, who I don't know. So hello, nice to meet you. Is a deputy director at Pennsylvania, where he monitors election key security and monitors campaigns and helps the 501c3 civic engagement programs before coming to Pennsylvania vote. He served as the director of grant making at graham rose's community fund.

To my left is Michelle White, the general registrar for Prince County, Virginia. Including 11 years as director at Prince William counties.

And last but not least is Laura Herzog. As the election supervisor for Hendricks County, Indiana, where she has served for 24 years. Laura is also a member of Governor Eric Holcombe's executive council on cyber security chaired by Connie Lawson. Each of the panelists will give prepared remarks, and then we'll shift into question and answer period. And again during the question and answer period for you, we ask that you identify yourself, speak into the Mike, and most importantly what? There we go. There we go. We'll start with Amber.

>> Okay. Well, it's great to be here. I was participated in one of the election assistance commission's data summits a few years ago, and I find these to be extremely valuable to talk about very critical issues facing election officials and really have good discussions and talks about how to best improve that.

So in Denver, this is my 13th year in Denver, seventh as director of elections. I came to this with background actually in data analytics and what have you during my graduate program. So the analysis of data, what it can do in terms of policy making, continuous improvement, process improvement, all of that is something that I had a great understanding of coming to the job. And when I started in Denver, there was very little of anything with regards to data management, innovation, data analytics, in any way. So we've spent a great deal of time building that up, so much so that we use it to improve our processes. We've used it to advocate for significant changes in Colorado's law. In fact, we were sort of the driving county, and I helped write a lot of the legislation that we passed in 2013 that provided for ballot delivery, vote centers, same day registration and sort of all the innovative policy reforms we all have.

So data is powerful, and that I know very, very well from my experience in Denver but also prior to that.

So I put this up electionopoly, and you see on the slide, gerrymander boardwalk, community chest with campaign finance. But the point of it that I always try to illustrate is with elections there's tremendous games that can get played with processes or policies or even just inconsistencies and difficulties that often occur for voters. So we've really tried to make the rules of engagement clear, advocate for policies that make more sense for voters, and that better serve them in a more effective way.

One of the other things, I've got a couple quotes in the slide deck about data. This one I like. It's Jennifer. She is the founder and executive director of Code For America, and our ability to do great things with data will truly make a

difference in our lives and in our world. Sorry, I think some of that is cut off there. It's a little formatting thing.

So given that and kind of changing the world and making things better in this environment, which is the elections world, for me, this started at a young age. There's many things going on in this picture, but the one that sort of makes me laugh and my parents laugh at this picture every time they see it is that I was probably strolling around thinking about doing a couple different things in this photo but then also thinking about whatever I was going to do the next day or whatever I was going to do beyond that and what have you. So that's kind of -- I think it's sort of indicative how I see stuff in elections, trying to always look for improvements, ways to get better, and what have you.

Our approach -- and I'm going to talk about ballot trace and sort of how it supports our ballot delivery model. But the reason we developed ballot trace and why this matters so much is we now in Colorado have a ballot delivery system. We had permanent vote by mail at great, great high numbers, almost 80 percent across the state by 2012, and that was voters opting in to get their ballot by mail. So they were choosing that method. And what we found with a ballot delivery model -- some call it vote by mail, vote at home, any of these reforms, they need systems to support them so that voters know what's going on with their mail ballot. So we developed ballot trace.

What our goals were to enhance customer experience, proactively communicate to voters, create operational efficiencies that would save money, and then increase the transparency and accountability for how mail ballots are delivered through the post office because, if you're an election official, you know that, if you send out a vote by mail ballot and you don't have ballot trace or you don't have a system, you dropped it at the post office, and the next time you see it is back at your door again hopefully by election day, and there's no accountability in there in between. So we've basically solved that problem with ballot trace.

So here's a slide that shows the impact of ballot trace and why it has been so significant for us. So 2008, and this was back when we had polling places, early voting, and vote by mail, and we had permanent vote by mail at the time. We had 1 in 5 voters who participated in that election had to call us to ask us a question about vote by mail, registration, polling places, whatever it was. And it was a huge phone bank. 50-plus people had to answer these calls for weeks prior to the election. Significant number of people had to call us, and that is just ridiculous that anyone would have to reach out to their election official to get this information.

So after that election, we said, all right, let's analyze all of this call volume and data and why people called us. Specifically, what were they asking for? And

what rose to the top -- and it's because we had permanent vote by mail had increased, was most of the calls, our top call driver had to do with mail ballots. Am I on the list? When are you sending it to me? Why didn't I get it yet? Where is it? Did the carrier give it to somebody else? And then all on the back end, did you guys receive it? Because it's election day and I'm worried, and I want to make sure you received it.

So we said, okay, we're going to develop a data system to address this and then proactively push out the information. So we created ballot trace in 2009, pioneered, designed everything in our office, started rolling it out, and then by 2012, 1 in 15 voters called us instead of 1 in 5. So we saw a tremendous improvement just in a 2 1/2-year period from when ballot trace was implemented, and we didn't have many people on the list yet.

So then we implemented our new law, sort of in the middle of this slide. So 2013 is when ballot delivery to all voters came in. We fast forward to 2016, and we served 100,000 more people in 2016 than we did in 2008, and our call volume was down 95 percent. And most of it is this ballot trace system.

Our primary, which was June 26, we're at 1 in 60 voters calling our office to get information. So our call volume now is down probably 96 percent from what it was in 2008. This is the operational efficiency and the cost. We don't even have to hire significant people to -- significant numbers of people to run the phone bank anymore to basically push the information to voters. This is sort of how it grew. In 2014, about 15,000 users on it. Now as of today, we have 45 percent of our voters that are on ballot trace. So almost half of the voters that vote in the city and county of Denver, we push them a text message or an e-mail saying your ballot has been printed. It's gone to the post office. Now it's out for delivery to you. And then all the way back then, they get a confirmation we've accepted the signature and it's been counted.

We also notify them if their ballot is undeliverable. We say, hey, it's undeliverable. Click here and update your address or call us, and we'll advise you where to go. We also use it as a tool to remind them about the election. So a week out, we say, hey, you haven't returned your ballot yet. Don't mail it anymore. Make sure you drop it off. And then we do it five days out. And then we do it the day before election. And then we do it on election morning. Anybody who has not submitted their mail ballot, we send them a reminder via text, and this is all through the system. So this is literally no work by any staff member, but we're doing all of these proactive communications.

So this is 2016, and we're in the process of analyzing this again. But the power of Ballot Trace has an administrative and operational component for us. It

has a customer service benefit to the voters. And we now have determined it is a turnout driver as well. So voters that are on Ballot Trace have a two-point higher rate in turnout than voters who are not, and they have a 7 percent higher rate of their mail ballot being accepted. Why? Because we notify them if they've got a signature issue or undeliverable or any of those things. So voters are having a better experience with voting because of a system that is customer service based but also drives operational efficiencies.

So we've made this part of our strategic marketing. We're constantly encouraging voters to sign up. Even if they get that mail ballot envelope and we've already gotten it out to them, we still want them to sign up so they get the confirmation that their ballot has been counted on the back end. So we continually push that message out.

This is a little hard to see, but I just want to show one of the dashboards in the system. Customer service, communication for voters, turnout driver. Administratively, when we go drop our ballots off at the post office, we know by the next morning, by precinct, by zip code, by ballot style across the city, the success rate of scanning that the post office has processed. So we didn't know any of that prior. It was a black hole. Drop them off, and then we see them later. Now we know literally down to the precinct, probably even routing code for the post office, what the delivery success rate has been. So if we see anything that's lower than what we expect to see this morning, we notify the post office. Hey, where are these things? Why aren't these done yet?

At first the post office didn't like the system so much, but now they do because it's also increased confidence in their services for voters. So this is one of the dashboards, and we have plenty of reports. We do GIS work to kind of analyze delivery rates across the city and all of that as well.

So here's the final quote. MIT scientist -- Charles already gave his own quotes earlier in the panel. So I didn't have to put him in the slide. Did Andrew McAfee up here. The world is one big data problem. I'll insert elections in front of world. The elections world is a big data problem, and I think this is a good example of how we can build systems that better support voters, great operational efficiencies, and just make the overall experience better for all of those that participate in this process.

[APPLAUSE]

>> I'm ray Murphy, and I'm with Pennsylvania voice. One is to let you know how we use the data that you produce through the state voter files that are available to all of us. The second aspect of what I want to deliver on today is the fact this data allows you just as many options as me, who are out on the ground

trying to engage voters, this data offers you just as many opportunities to be targeted and specific in the way that you communicate with voters and hopefully save you time and money in getting out messages that you need to deliver to voters.

Quickly, before I dive into all that, I just want to talk about Pennsylvania Voice for a second. We are a nonpartisan statewide coalition of organizations that's devoted to increasing voter participation, especially from some of the organizations that are the most -- or the least likely right now to participate. So that means we literally coordinate the activities of organizations in the state that run voter registration drives on street corners with paper, and we are now running as much voter registration in Pennsylvania as we can on tablets, thanks to the Department of State and the leadership of many election officials here in Pennsylvania. We have the most sophisticated online voter registration system in the country right now, which allows third party organizations to set up their own accounts that allow them to collect data about registrants but also automatically transmit it to the Department of State.

In addition, our coalition recognizes that all of the work you do registering voters and turning them out to the polls and educating them about the civic engagement process, which we do in about 18 counties across our state, all that work is meaningless if at the end of the day there are difficulties accessing the ballot itself and then also we recognize that, if the way the legislative maps in our state or any given state are drawn don't accurately reflect the kinds of communities people live in, then they're not able to elect people that represent them.

We're part of a network that's the state voices network. And I name that because we have 25 partnerships across the country, and up here is a list of those states for those of you who want to check out where my counterparts are even where you live. Even beyond those states, we offer access to a sophisticated data file which includes information from data voter files which allows folks to use data in a really sophisticated way to reach out to voters.

All of our network shares the goal of fixing fair representation ballot access, civic participation, and we also do work to strengthen the organizations that serve our communities. So one thing that comes up a lot and I hear from our visionary and lovely election directors in Pennsylvania is that a lot of voters don't seem to know the basics of the system, and one of our jobs is to try to educate them so that burden isn't solely on government, but that folks who are being motivated to vote come in with some knowledge of what the rules are and what the process is.

Similarly, we are really in the midst of a multi-year campaign right now to modernize Pennsylvania's election laws. Pennsylvania is one of only nine states in the entire country that doesn't offer any of the basic voting opportunities that have

become standard in so many other states. Not only do we not have no excuse absentee voting, we don't have a form of early voting, preregistration for youth, automatic voter registration. All of the things we've talked about in other states are not available here.

Unfortunately, as we all know in the current climate, conversations about modernization of our election systems are taking a backseat somewhat to security, including real and perceived threats. And so for us, what one of our most critical jobs in the next two years is to work very closely with election directors in the Department of State to secure all of the funding that is needed to build a secure and modern voting systems. So that includes new voting systems but state filed voter databases but also things like poll book which improve the accuracy of operations. So that's where we are in our fight.

But I'm going to talk for a second about what we do in the context of data. So we think of data as a means for more sophisticated communication. It allows trusted messengers to find and talk to exactly the communities with whom they have the most currency, with whom their message is the most listened to. We also use data to identify prospective volunteers and supporters for some of the door-to-door work we do encouraging people to vote. Some of the phone banking that our partners engage in. We also use data to identify areas of different counties where the voter registration need is the highest. Typically, most civic engagement programs do not do door to door programs to register voters. It's typically too inefficient. But what they do do is find public spaces where there is a large -- there's likely to be a large propensity of unregistered voters, or in the case of a state like Pennsylvania, which doesn't have a fast growing population, often the work we're doing is about re-registering voters, especially lower income voters who tend to move a lot and constantly need the registration status to be updated in order to be on the polling book at the polling place closest to them.

We also know from a lot of resource that there's a significant number of voters who just don't vote without a reminder. They just don't vote unless someone asks them to. And our organizations that belong to our partnership are effective at making those kinds of reminders.

For us, data removes some of the guesswork. There was a time, at least in the grass roots organizing world, you just ended up going to every door or stood on every corner or put Flyers through someone's mailbox. Data takes the guessing out of the picture, so you're able to hone in on the people who most need to hear from you.

There is a very specific set of tools that we use and that we offer to partner organizations. So when you're dealing with voter registration campaigns or

other civic engagement communities, these standards and practices are typically the things on those of the partisan side of the line as well. They may be a little bit different. We start with something called the civic engagement file. It starts with the voter file in a given state. Then we take that file and work with a data vendor who enhances it and overlays on top of that data file consumer graphic information that's either publicly available or publicly available for purchase, and it adds things to the file that let you know a little bit more about who the voter is.

It can give you a more up to date address. It can standardize the way that phone numbers and other pieces of data are used. We also overlay on top of those records census data. You're able to identify an individual voter that lives in a particular census tract is likely to have this income or this ethnicity or likely to be a homeowner or not. And then last, data scientists and other mathematicians create models that go even further. They're algorithms essentially that take a whole bunch of data factors that are able to predict a certain inclination that voter is likely to have. That could include likelihood to vote in an upcoming election. For the partners we work in an engagement front, when we do the get out the vote work, we focus on voters who have a 30 percent to 70 percent likelihood to vote. Typically, campaigns work on voters with higher propensity to work. They already know someone is going to vote. Their job is to push a particular candidate. Our job is to find the folks who are unlikely to vote or participate in the process at all and give them the information they need to be able to participate.

These models also predict things like race and ethnicity. We apply our own model to the voter file to predict what we think is dead wood. The state and counties are bound by very clear laws about who can be removed from the rolls for legal processes, and that's important. But for our purposes, we want to make guesses about who's not likely a live voter because they haven't gotten to the point where they've been removed from the lists.

And models also allow us to predict where a particular individual might stand on any set of issues. For our organization, some of which are focused on environmental rights or some might be focused on criminal justice reform or another might be focused on raising the minimum wage or something like that, these models allow our partners to find the people who are most likely to resonate with the work that that organization does. Over time, that allows an organization to build a relationship with a voter, and that relationship, we think, can ultimately be creating more lifelong voters rather than folks who are only intermittently involved.

I think I covered many of these things already, but we typically use this data to either predict individuals who need to be engaged around a particular election, individuals who live in an area where there's a high voter registration need

or advocacy. I go through this level of detail, to some extent, not just to let you know what we're doing on the other side of the work that we're all collectively engaged in, which is making sure that people are able to participate in the democratic process, but some of the things that I'm saying can serve as models for election directors in states and others who want to have a little bit of help being more specific in their outreach.

For instance, when you look, there are a number of issues that come up frequently. There are polling place changes. There are new laws that come down that needs to be communicated to voters. For instance, first time voter ID laws or something like that. There's any variety of things that happen. There's some obligation on the part of a county or an election or a state election department to communicate to voters, but these kinds of data tools allow you to be more specific in your outreach.

What specifically that could look like, we, for instance, actually have contracts with data and software vendors who literally make it their job to provide these kinds of tools. Those kinds of contracts and vendors are open to you all as well. There are also vendors for one-time programmatic use. You can call a data vendor and say I need to do a telephone town hall tonight to everybody in X district to explain the polling place change in this cycle. And you all, many of the states and counties create the data sets we work with. In my experience, at least in Pennsylvania, there's been challenges, actually looking at that data usefully, because there isn't necessarily the software on hand to make it easy to parse that. But you do actually have much of the same information that we then ultimately enhance and use in different ways.

So, again, the purpose of this conversation is just to remind you that there are a lot of options for how one can use data in a variety of ways that really address day-to-day concerns.

I think, with that, if you have questions or want to talk about what options might be available to you in terms of this target ed data, I'll be happy to talk with you.

>> We'll have questions and answers a little bit later. Next, Laura.

>> Okay. Do I have to click anything, or does it just come up?

>> They'll put it up.

>> There it is.

My name is Laura Herzog, and I'm from Hendricks County, Indiana. Our county is one county west of Marion County, which is where Indianapolis is. We have approximately 111,000 registered voters now. We are the second fastest growing county in Indiana right now. So it's critical for us to keep on top of gathering

data to keep things as efficient as possible for our voters. So I feel amongst friends I want to share this with you.

This is my first time in Philadelphia. So I had two goals. One is to get a real Philly cheese -- whatever. Steak and cheese. And the other was to see the Liberty Bell. So I thought when vice chair Christy McCormick earlier talked about election administrators having a touch of OCD, that's true because I did make it to the Liberty Bell, and it still has a big crack in it. And I thought, haven't they all heard of flex seal? Anyway, I'm enjoying my stay here.

I'm here to specifically talk about electronic poll books. I do want to let you know that our county went from precinct based voting to a full vote center transition just this last primary, which was May 8th. Before, we had 104 precinct-based polling sites. We went down to 26 vote centers, reduced our poll worker force from 520 down to, I want to say, a little over 100. So it's hard to talk about electronic poll books without talking about vote centers. They go a little bit hand in hand. Peanut butter and jelly, biscuits and gravy. You're going to go crazy now. Sonny and Cher.

In Indiana, as of April 6, there are 60 of 92 counties that are using electronic poll books. 35 of those are vote center counties like mine. 25 are non-vote center counties. Like I said, our first election using this was just last May.

Currently, we have four e-poll book vendors that are certified in the state of Indiana. If I could talk a little bit about that. Indiana is very aggressive, thankfully, on their e-poll book certification. Each vendor and county must go through a really thorough acceptance training program. The counties and vendors must comply with before using in an election certain specifications are met to ensure correct functionality. We are also fortunate enough to have an organization called VSTOP, which is a voting system technical oversight program. They are out of Ball State University.

A quick background for us. In Indiana we do have a photo ID law. So on our electronic poll book, which are iPads, the voter must show their photo ID. Typically, it's an Indiana issued driver's license, which makes the check-in process extremely quick and efficient. Bar code is on the back of the license, the iPad camera will access the bar code, and an electronic keypad comes up for the voter. They sign it. They're issued a valid ticket, which then goes to the voting machine. It's an extremely quick check-in process, where before with the bulky poll books it would take a long time for the workers to find the right letter of the alphabet.

Then we have the father that signed on the son's line. So all those efficiencies have improved. We can monitor in realtime on election day lines. I'll have a few screenshots for you, functionality of the electronic poll books. Do they

have full connectivity? Are their printers synced? Are they at the proper charge level? Location activity is extremely important and helpful to us. We can communicate directly with the poll workers through the electronic poll books. Certain things like, hey, if you have a little down time, don't forget to sign all of these forms that need signed, that sort of thing. And, of course, we can monitor turnout in realtime.

This is a really cool slide. This is our dashboard. You can see on the left those are all little subtitles that you can open up and expand. This slide in particular kind of gives you a really nice view of what's going on. It shows you obviously that your polling places are 100 percent. You can see how many have voted absentee, how many have checked in, what your percentage is. Ignored 70 critical iPads because this was taken just last week.

Okay. And this slide, this will give you individual vote center activity. It will show the number of e-poll books that are at each location. The number of people that have voted. You can see here at the Amo community center, we had 195 people check in and vote. Below that at the Avon United Methodist church, we had 2,161 voters check in. That data is going to be imperative for us. Just so you know, the Amo Community Center only has three voting machines, where the Methodist Church has 15. So this is going to help us figure out what locations we need to beef up poll workers and machines or maybe in some cases combine smaller ones together.

This is a good slide. This will show you turnout. Our polls are open 6:00 a.m. to 6:00 p.m. and I believe this slide is a repeat of the others, so I apologize. It's still pretty cool to look at. And these are -- this is a report that's hard to see, but it's produced by the electronic poll book. You can generate oodles and dozens of reports that are very beneficial.

And then the fabulous gals in my office, Tammy and Jen, they turn this information into pivot tables. This is, again, more data that we find very useful. We also can tell are the voters voting in their own neighborhood? Or are they voting on their commute to and from work or taking their son or daughter to soccer practice? It's all very interesting to look at. An unexpected benefit from transitioning into poll books, this isn't my storage closet. I borrowed this off the Internet. This looks like what our storage closet would look like before, just paper and paper in bulk.

Before, we would have to with the poll book scan each voter's signature. Now with the electronic poll book, it's done with the push of a button. We went from this to that. That's our entire primary right there. Provisional ballots, very

unexpected. Average for this past election, 125 to 150. We had one. One provisional ballot? Why? Because no one was in the wrong place.

Okay. I want to tell you quickly about our poll worker that you all know her. You all have one. She has seen all of these changes in her life. She wasn't ready for this new contraption called electronic poll book. It's for young people. It will never work. Through some good training and talking, Dimple tells us now it's the best thing since sliced bread. You all know her, don't you? And then Dimple got her friends to come join us. And whoops. So I just want to say that it's efficient. The budgetary savings to the county just in printing costs alone is substantial.

My time is about up. I just want to say that it's very efficient. There's lots of data there. And thank you all for having me.

>> Last but not least, Ms. White.

>> Thank you, Tom. Today I'm going to present a lesson on how to lessen the line on election day. This was experienced from the presidential 2016 election.

So this is a shot from presidential 2012 in one our precincts. Unfortunately, in Prince William county, the 2012 election didn't go well. There were lines three to four hours reported in many places. But I use this photo kind of as proper motivation, if you will, to prepare for 2016.

So next there is a congressional hearing held afterwards to determine what went wrong in the 2012 election. As you can see, the last ballot was recorded at almost 11:00, which was four hours after polls closed. Polls close at 7:00 in Virginia. So next we took some time to figure out what data we should be looking at. We look at the demographics of Prince William County. We study the number of voters who utilize absentee voting and which precincts were the largest.

So we were on a mission to fix this problem. So we looked at some other things. Statewide, forgive me. 2012, we had 255,000 voters. We went up to 274,000 in four years. At that time in 2016 the state had deployed an online voter registration system. So we were seeing more voters register. So we were getting ready to see a huge uptick in September and October of 2016. Now, as of July, there are 279,000 voters in Prince William County, which means we have to rinse and repeat, which means in the election result we have to reproduce the result we had in 2016 for 2020, but with more voters in the picture.

So looking back at the history of absentee voting in Prince William, we were trying to figure out why voters were not taking advantage of absentee voting. As you can see, it dropped in 2012 from 2008 to only 10 percent to 12 percent of voters. So the solution became to inform voters on how to lessen the election day

line by voting absentee. Thus we began a multi message inform voter marketing plan. We were all over the place and very scrappy.

So the goal became 68,000 voters absentee in Prince William, which was to make 25 percent out of the lines on election day. This was a lofty goal, but we had to accomplish it for a better overall experience for voters.

Next we looked at commuters, and we discovered that almost 150,000 folks commute out of Prince William County, and commuting is a -- or having business outside of Prince William County is a qualifying reason for voters to vote absentee. Let me back up and explain for a minute. In Virginia, you must have a reason to vote absentee, meaning you have to be eligible by certain reasons in order to vote absentee or early in Virginia.

So 68,000 voting absentee was about half of the commuting population in Prince William County. So, again, we wanted to shift that to absentee. So we set our goal. Then we realized we had to kind of go into myth busting mode. We realized that voters think they have to qualify or fit a certain criteria to vote absentee, which is a true statement. However, we got the sense that voters didn't know the number of qualifying reasons that would entitle them to vote absentee. So we mailed a voter guide to every household in Prince William County using every door direct mailing with USPS. This is the same method in which you get your Chinese takeout menus. But we got one to every single household, and within that, we included a sample ballot and six things that all voters need to take care of before election day.

Another myth we had to bust was that absentee votes are not counted. We made it clear in every election piece we put out there that by law all absentee votes must be counted. So we had that in every place we could tuck it.

Here's how we focused on getting the message to commuters. We set up electronic boards in all the commuter lots. I think Prince William has about 15 very large commuter lots on 95 and 66, heading into D.C. We placed ads in the commuter train magazine. We placed ads in HOA magazines where folks were centered and where they were living. And the Virginia department of Elections also helped us out by placing signage on buses and additional signage in the commuter lots.

So the photo is not so hot, but this is what the message board looked like. We also set up a very inexpensive texting program. It said text PWCvotes to 94253 to get voting updates and reminders. Wherever we could, we had these places at intersections and public places where we were allowed to do so. So we really went all out to get the message across.

So back to the congressional hearing, some who testified Monday said pregnant women were forced to stand for hours. Again, this is an indicator that education and information about absentee voting was not getting out there. So then we went on a mission to create some trading cards. Here you go. So we had some fun with it. My team is scrappy, and we have a sense of humor as all election officials must have. So we said did you know by law all absentee ballots must be counted.

This is what we did. Too old. Some folks took issue with this, actually that were younger than the set we were trying to get the message to. These cards got returned. The older folks who got it said they also really liked it. The older folks we were trying to message say they loved the card. But folks in that next tier of age were a little offended. Here's the various ways to commute in prince William county. First responders can vote absentee. And we made sure that first responders knew they did not have to be on the schedule for election day as long as they are first responder, they can vote absentee. Active duty military, we also went after. I'm sure you all know the show Quantico. That is in prince William county.

Here's the back of every trading card. So we made it clear, again, what the deadlines were. Last day to vote absentee, how to get a hold of us. So we crammed as much information as we could there.

So next I have -- we did some scrappy little homemade with found items videos, if you will.

[Dog barking ]

[Sirens ]

>> So we put those all over Facebook, and it was an inexpensive and cheap way for us to get the message out. We relied on other voters to get the message out to their buddies and friends.

The next slide, data does not lie, and getting ready for this presentation, I did not realize that VPAP had done a lot of my work for me. So Virginia public Access Project is a nonpartisan group out of Virginia, and they took data across the state and did some visualizations for me, which I will show you here.

So it's hard to see. I believe in the marriage between data analysts and graphic designers, which you've seen plenty of examples today. Here you can see where Prince William County led the state in early voting or absentee voting for 2016. So we're that very first blue bar right there. Very proud of that. Hope we can continue. Next slide, so here's what absentee voting looked like in 2016. If you go back to 2012, the next slide, you see where the dot moves. Okay. So I like to

toggle back and forth, forward, back, see how far we went? Oh, that's 2004. That's good. Thank you for helping me.

So all that being said, I really love playing with this data for Prince William County because you can really see the shift and what we did to make election day work and get folks to vote absentee.

Next slide would be this one. Reasons for early voting in Virginia. Like I said, we studied, and we knew the demographic we needed to target commuters. And apparently, we were successful in doing that because the biggest block that vote absentee were work conflict voters, and we had 16,000 ballots cast based on a work conflict. So I also found this data very interesting.

So we know our messaging worked, and now we know it's quantifiable, which I like. Again, back in August of 2016, the state launched its online secure portal, which meant that we were taking online voter registrations and folks were able to vote -- forgive me. Register to vote through a transaction at the DMV. So we noticed that more and more people were using the portal than to register to vote through the DMV. So we're paying attention to that. Everything that we put out there had the citizen portal information on it. So citizens were able to check their voter record, update their record, confirm their polling place, also apply for an absentee ballot, and see their sample ballot. So we made sure this was published everywhere possible.

With our voter information or education, we wanted to make it clear that voters have some responsibilities to address before election day. So to know that their voter registration is up, to bring photo ID, what will be on the ballot, what your polling place is. Last two that you'll be marking your ballot -- your vote on a paper ballot and then putting it into new scanning equipment. So optical scan was new for Prince William, and we knew we had a lot of cicada voters. Cicada voters are only those that vote in presidential, every four years. So we had a sense a lot of them didn't know they'd be using new voting equipment and marking information on a ballot.

Finally, we wrote again, election day. Avoid the long line by having a ballot mailed to you.

So on election day, shaving seconds. My approach was similar to Neal's from Orange County. I knew that there were things we could tweak to make things better. I also paid very much attention to the elbow of death provided by the BPC and MIT. They were partners in helping me get through presidential 2016. I listened to everything they gave me, so thank you for that. We looked at our line data collection, and we prepared our precincts to be ready for a line at 6:00 a.m. We provided those folks with line chaser tablets. So basically, a line chaser tablet

took our voter registration list, put it on a tablet that was easy to view. It was not a check-in tablet. And we asked the high school pages to make sure the voter ID was out before getting to the check-in table. So those were shaving seconds.

We provided more officers and laptops in larger precincts. And instead of using a voter permit, we gave the ballot directly to the voter. So we got rid of the second line there.

Next slide, we provided a majority of stand up marking booths. This allows the voter to move more quickly instead of having to sit down and mark the ballot. I am considering switching to an official felt tip marking pen instead of a standard ball point. I think that will also shave some seconds off.

In larger precincts, we put in more equipment, very simple. And we also implemented a chief headquarters connected to our emergency operations center, and we used radio communications in every single precinct along with my office. So we did it. No voters in line at 7:00 p.m. in November 2016, and all 91 polling locations closed on time in Prince William County.

This is my crew. I'm very proud of my staff. We are a team. We're scrappy. We get along well. We're just a slightly crazy bunch but in a good way.

And finally, that concludes a lesson on how to lessen the line. Thank you.  
[APPLAUSE]

>> I want to thank the panelists. I think this was an excellent panel. I learned a lot myself today. How much time do we have for questions? Half an hour. So I'm going to take up half an hour of time asking questions. Kidding. Jokes for those folks at home. I just want to make sure people are still awake after lunch. I know that I see some heads nodding.

Reducing wait times at the polls have been a big focus for the election community since 2012. We heard a lot from Michelle about data collection in Virginia and elsewhere to try to tackle this issue. How are these effects playing out in your counties and states?

>> Well, for Colorado -- and I'm going to make a request for the audience. Just especially based on the wonderful presentation from Prince William. But Colorado, we mail out a ballot to every voter proactively before every single election. So there's no question. That's their notice. They get their thing. They don't have to give us an excuse. And I was watching the presentation and I'm thinking, who doesn't qualify for one of the excuses? I'm starting to think, well, clearly, that's one of those points that just confuses people.

And then just the term absentee. I don't know what others think about this, but most don't know what that means to say absentee ballot. I would love to eliminate absentee from terminology all together with this because I think voters

don't necessarily understand it. I think that would be a great thing long term is to strike absentee out of the dictionary.

But for us, because we do mail out ballots, and we also have same day registration and vote centers. We do have in person voting options preserved for a two-week period, and we build up to election day and have a certain number of vote centers across the city on election day, and you can register and vote right on the spot, and there's no deadline, if you will, to register to vote. What that means is our vote centers, especially on election day, and we've collected this data for a long period of time, we get hit very hard with election day in Denver with sort of the lovely people that were too busy for three weeks to come in, and they are there on election day, which is totally fine. We just now have the data to expect that.

So we're building up more systems. We've adjusted our line management strategy. For this upcoming election, we'll have wait times and all of that available online, if there are any. But we're basically 95-plus percent of our voters use the mail ballot we mail to them. And they -- you know, the feedback we get by getting your ballot at home is I had time to research and vote it at home. I spent a few days talking to friends about what they were going to do. I've heard people say they had wine and cheese parties and talked about various issues, and then they'd all go off and vote their mail ballot at home.

But the interesting thing is -- and this is why I call it ballot delivery and sort of voting at home because it isn't really vote by mail. And the real reason is we have 85 percent of our voters that use their mail ballot drop it off in person to one of our Drop boxes, drive up dropoff, vote centers, or any of those locations. They're not actually mailing it back. We're seeing less and less people mailing it back. So vote by mail is also, for me at least, an outdated term. Really we're just delivering the ballot out. The mechanism is the post office. And they're still experiencing this in person voting option by dropping their ballot off. So we've sort of, I think, managed to preserve a really nice experience for the voters that still want that election day experience, but they're maybe using that ballot they gave to us.

>> Sure. Lines at electronic poll books, I personally like to see a little bit of a line because it's showing that people are there. Four hours, no. Anyway, it shows that people are getting out there and voting, and I don't want them to get too spoiled. But with the electronic poll book, the check-in time is so significantly reduced. It's so fast that, if we do get any kind of a clog, it's going to be between the clerks table, where they sign in, and the actual voting machine, which we have practices in place to not let that happen. But also on the dashboard, that we can see realtime on election day, we can tell what places are getting hit. So we know what do we need to do? Do we need to send backup poll workers? Do we need to

send extra workstations, more voting machines? That's how we handle our lines with the electronic poll books.

>> Ray, thank you for your presentation. I think there's a lot of election officials here today who have misconceptions about organizations like yours, gathering data just to sue them basically. But I think that, in listening to your presentation, I thought it was fantastic, you were saying how much you work with Pennsylvania and so forth.

Are there other misconceptions out there that you would like to dispel from election -- you have a roomful of election officials, or partially. The things that you would like to dispel for them.

>> That's an open-ended question.

>> Or commonly misinterpreted things.

>> I can't speak for every other state, but I will say the sector that I work in is probably as complicated and full of as different kinds of personalities as any of your sectors. I think the most common thing that comes up for us -- and I think this is applicable to many states like Colorado and Virginia that are considered more battle ground states, we tend to have a constant influx of outside influencers who come into the state for a short period of time to run an election, do a voter registration drive, do door-to-door campaigning. They do not have the reasons or the incentives that those of us who are based in this state have to maintain relationships, have a long view. The concept of we're thinking about chess and some people are thinking about checkers. They just want to get in and make that quick move.

So I spend half of my time in an election year doing traffic control with those entities and saying things like, it's not a good idea for you to do the program you want to do in the county you want to do it. And your attitude toward people who run elections is really not matching the experience we have on the ground. Like much of life's relationships are important. And those who work in a particular place dig in over the long run, and you get to know people, and you can understand things are the way they are.

I think it's not necessarily a misconception, but I don't know, speaking to the election directors, I saw some heads nodding, and I'm hearing from some of these folks, there are a lot of things we would like to see and do in our state that we are currently not able to do because of our legislature. It is not because of a lack of will or lack of protest from people on the ground, and in order to change that, we have to work together.

I think it's a misconception I would say for people outside of Pennsylvania, explore who your advocacy community is and see if there are more opportunities for collaboration than you might know about.

>> Michelle, I think you did a great presentation. One of the things that we've done at the EAC each year is we've had with our executive director Cleary Awards. Those awards are given in various categories on things that are innovative and moving forward towards making participation better and making things easier for voters and election officials and giving more information out there overall. I would hope that you submit some of these things for those Cleary awards when they pop up coming forward.

And one of the things I wanted to ask you is how can other counties think of ways -- because I'm a Virginia voter, and I'm not too old for part of that, but I have to give an excuse every election cycle. It's basically, you know, the excuse absentee balloting. So are there other things you're thinking about for 2018 and 2020 that folks can use to make sure they're able to cast their ballot and so forth?

>> Well, I'd definitely like to continue voter education although I've decided to rename that voter information. Because there is an implication with voter education that you're doing something else that folks who are funding that may or may not like.

That being said, I'm going to try to put more boots on the ground. One program I thought of is the absentee advocate program, where I would take officers of election or folks in the community, like Erik's program, go out and let them know why to vote absentee. There's like 18 reasons that make folks eligible, but not everyone knows what those are. So I want to continue on the voter information mission. I hope that answers your question.

>> No, it does. Laura, I have one more question for you in terms of the e-poll books. I think those are fantastic in terms of shutting down long lines and so forth because in 2012 that was one of the major issues that we heard about.

In going towards vote centers, and the same with Colorado, have you notice That they're -- if you don't have this, fine. But have you noticed there's been an uptick in participation through data or remains the same or so forth?

>> Well, this was our first election using electronic poll books. So I don't have anything to compare it to really until we move further forward. However, with that said, the feedback from the poll workers and the voters and the people involved has all been nothing but supportive and positive that it can only help improve the lines and the efficiencies. So I think I need a couple more under my belt maybe. Maybe I'll come back in a couple years, let you know.

>> As Amber was saying, she participated in the first data summit we had, and commemorate commissioner McCormick because this was basically her idea to have this happen, and we've continued on. I'm hoping that 2019 we'll have another one and continue on with that. Sorry I interrupted you.

>> No, you didn't. I'm done.

>> See, we have such a polite panel. With that, I've only taken up ten minutes of question and answer period. So if you have questions, we have two folks who have microphones from Pennsylvania who I would say, if you can make it brief so we can get as many questions in as possible, that would be great. We can start right here.

>> Gary from Dauphin County, Pennsylvania. Like Ray was alluding to, we're kind of beholden to what the legislature says thou shalt not do. There's a lot of things we'd like to consider to streamline elections with lines and stuff like that. How do you transition from precinct based to vote centers? Do vote centers still provide you the ability to hold precinct level elections or by ward elections?

So like if I'm pulling in a couple of municipalities into a high school that are all part of let's just say the Middletown area high school and you've got three municipalities, can I still in that vote center can my royal ton first, ward second, Middletown, whatever, as a polling place. Are you able to do those things within the vote center?

>> I got this one. Yes. The beauty of the vote center is the voter can never be in the wrong place. I for the first time in 24 years actually got a vote on election day. I always have to vote early because I'm always working election day, and I can't drive back home. So this past primary because it was a primary and we had delegates and precinct committee, and it was a large ballot, we had several hundred ballot styles that were loaded on each machine that was deployed out to each of the vote centers. So whether you lived in north Salem or the town of plain field out in the country, your ballot was going to be, no matter where you stopped, your ballot was going to be there.

And the beautiful thing that's up and coming for us in the fall is our county, like I mentioned, we're the second fastest growing in the state right now. We have annexations happening constantly, where you have this nice little country county out here, and then the town comes in and wants part of it but not all of it. So now we have a split precinct. Some voters get the town ballot and others don't. It's so hard to manage. With the vote center environment, the ballot ticket will dictate which ballot style they get. And coming up this fall, we are getting encoders on the electronic poll books that will automatically load the information on the card that will

go straight to the voting machine so it will virtually -- I hate to use that word. It will remove poll worker error in setting the wrong ballot.

Also in Indiana, I wanted to mention our early voting is no excuse. We do have by mail, we have certain criteria. So we have very successful early voting. I hope that answered your question.

>> I was going to add to her answer, if I may.

>> Please.

>> Thank you.

>> Such a polite panel.

>> We're doing the same in Prince William County with our absentee vote centers. We have three major absentee vote centers. They've become the same thing, and I wish we could implement that on election day. We have 91 polling places, and I'd rather manage less polling places on election day. But she's exactly right. All the ballot styles are available wherever the voter decides to show up.

One thing we're doing in Prince William is we're using two sets of EPBs so when the voter first shows up -- and this is just absentee vote centers, not election day. Folks are checked in on one set of EPBs, and they're given the application to sign and indicate what reason they need to vote absentee. Then they take that to a second set of EPBs, which has a ballot program into it based on their split. So they have split precincts as well. Some elections we've had easily 43 ballot styles to keep up with. So ballot on demand tied to our EPBs ensures that the right ballot is printed right there on the spot, which also allows us to save money on preprinting ballots. So it's very possible to do what you're trying to do.

>> And I was just going to add, because we've done vote centers in Colorado for a long period of time. In fact, they started there in Larimore county back in 2004 or 2005. So we've done -- and then in Denver we've done vote centers for early voting prior to us having this new ballot delivery system. So it just kept transferring everything basically to vote centers. And vote centers does have an impact on turnout. You're not left out or voting on provisional because you show up at the wrong place. It isn't just the vote center for that turnout increase. For us, same day registration was a big driver of that. If you just look at the top states for turnout, all six of them have same day registration.

So there's definitely a correlation between making registration easier overall combined with vote centers, whether it's ballot delivery or other policies that help with that.

>> Sheila Laney. I live in Montgomery County, Pennsylvania. Two things. One thing about the long lines. It really depends on if you're trying to track

the electorate or trying to expand the electorate. I mean, I know there are processes, but sometimes it has to do with intent.

For Erin, I think it is, my question for you, I know we are all here talking about data and being data driven, but as a community person, it is what's the face to face interaction that is most important about driving people to the polls. Could you talk a little bit about that.

>> You mean Amber?

>> I'm sorry. The gentleman next to you.

>> Ray.

>> I'm sorry. I got your name wrong.

>> Ray Murphy.

>> I'm sorry. Thank you.

>> That's okay. Yeah, I mean, there's substantial research at this point on what are the most effective things to increase voter turnout? There's kind of three ways that I think about it. There's a significant aspect of voter turnout that can be increased by efficiencies in the way that elections themselves are administered. Most of those have to do frankly with the law, the way that the election process is structured. The more that you offer convenient and accessible options to voters, you do see some increase in turnout. It doesn't in any way, though, make up for the huge turnout gaps that we see across the country, and those get into sort of the other aspect, which is that face-to-face interactions between potential voters and trusted messengers are the absolute most effective way to increase turnout. They're also the most costly and difficult to do because a face-to-face interaction is fundamentally more complicated than a phone call or a mail piece or a text.

I think there's a third component, which is, you know, a bigger philosophical question for all of us, which is what would it take for every person in our democracy to feel like participating in an election is something that they should spend time doing? I don't want to get into that philosophical conversation right now, but I think this notion of shaving seconds on election day is a concept that could be applied to the whole enchilada. There are a lot of ways that elections are administered that create unnecessary barriers to participation. Again, though, my experience is there has not been enough political will at a big picture level to make sure those changes can be implemented fairly by the actual election administrators who are on the job.

And often what you see is sort of -- and I think you see that on this panel. There's some people who are really going above and beyond to be excellent, and that's great, but everyone should have the resources in administering elections to do what they can to shave seconds in the bigger picture.

>> I guess on this side. One question per -- I'm teasing.

>> This question is for Mr. Murphy. I'm from Bucks County. From the day your organization decided it would implement the third party API with the Pennsylvania Department of State, how long did that process take for development and implementation? And what were some of the lessons learned as the application was rolled out with actual voters at the grass roots level?

>> This is maybe a process question. I know Mike Moser is talking about the Pennsylvania web API. Did you already talk about it, Mike? So Mike is really a resource as well and the team at the Department of State. But from my memory, it was a relatively quick development process. The Department of State rolled out online voter registration in August of 2015, and development had kind of maybe begun in that spring. It was the advocacy community that initially said, if you're looking for a cost savings from online voter registration and you want the maximum number of participants, most third party voter registration efforts will not use an online portal because it is considered a best practice in third party voter registration to retain the information of the voter to then remind them to vote on election day. That was sort of laid out to the Department of State, and I think their leadership was incredibly visionary in understanding that that was a true statement and the goal was, in fact, to go as paperless as possible.

So creating an online web portal where third parties could push some of that data in directly to the Department of State would really save time. I would defender to DoS, but I would say in the grand scheme of the DoS budget, it was not a significant amount of dollars that was spent on the coding of that system. Some of that has to do with the way that the Pennsylvania shore system is established. So I wouldn't presume to speak about whether other states could as easily modify their online database to accept those data sets.

What has been exciting, as time has gone on, is the concept of connecting a third party database to the voter registration system is not limited to third parties. So there are many state agencies, particularly where it really makes sense to connect these things because you can drive a large volume of voter registration applications for new voters or change through a completely electronic process. From a county perspective, what that means is there's no data entry. It's more or less clicking an approval or a disapproval for an application for all the typical reasons, and it just saves a lot of time, money, and effort on a lot of people's parts.

I hope that more states will replicate what the Pennsylvania Department of State has done because I think it's also worth pointing out, with no offense to anyone involved, but the technology that was implemented is actually quite standard

in most of the rest of the commercial world, and it's been in place for so or 20 years. We're always running a little behind in government in terms of catching up with tech trends, but the idea of sharing this kind of data is quite simple to do and has so many benefits.

>> I'm getting the wrap-up symbol even though my time says 20 to. So question on this side? No? We'll go back to right here.

>> On the idea of early vote centers and things like that, in Pennsylvania, if you vote by absentee, you can then change your mind, go to the polls on election day. They will physically mark void on that ballot. It's not open. It's not counted. And you get to vote your new choice on the polls. In your early vote centers, you're talking about voting on machines and stuff like that. How do you unring that bell if a voter changes their mind before election day?

>> It's my understanding that's a fairly unique process that you have going on in Pennsylvania. You can't pull your ballot back once you've submitted. We start processing three weeks out. Even when we had early voting, early voting is on equipment. So once you're cast, you're done. And the only way you would then be able to go back in is if you voted on a provisional, which then wouldn't be counted. So there's no rolling back once you submit?

>> [No microphone].

>> Yeah, and Colorado is a swing state. Yeah, you've got to know. I think in most states, bringing it back is not something that occurs. So yeah. You've got to pick.

>> We had a lot of them change their mind in '16.

>> I think we have time for one last question. If no one's going to ask. Come on. This is your opportunity to get a question in. If not, I will finish with my question. People are walking out too.

We talked about electronic tracking, electronic poll books, enhanced voter files. None of these tools existed, at least in its current form, when the EAC was formed 16 years ago. What can we at the EAC do to keep encouraging innovation in this space? And what types of data driven practices and tools do you think we'll be talking about in in the near future? If each of you want to answer within a minute or so.

>> I can. Yeah, I'll get it done. So when I talked about the encoders, I know they've been out there a while. I think that's something we're all going to see. And then one misconception that a lot of people, mostly candidates, have about electronic poll books has nothing to do with the question you asked, is that they're going to get results in faster. They just think, oh, we're going to get numbers quicker. No. So just throwing that out there.

>> Anyone else?

>> Yeah, from my perspective, I mean, our entire approach in Denver has been analyzing the data we have, but also continuous improvement. So elections are very much people, process, and then sort of the concept of continuous improvement. And you can only do continuous improvement. You can only continue to get better if you're curious about what is happening currently in your jurisdiction. How to analyze that data and then build systems that better support the voters.

For me, I think doing what's right by way of the voters as sort of the first premise and step is the right approach in elections, regardless of party affiliation, regardless of where they sit. Everyone deserves this fair, equitable process across the board that's consistent. So any of these like inconsistencies that exist -- you know, I mean, the sort of absentee with excuses and all of these sorts of things. Like the confusion that that creates for people that do this once a year, if that, maybe once every four years, is sort of, I guess in my mind, and I would say disrespectful frankly to the voting franchise. This is our world, but it's certainly not something that they do.

So I just -- I'm a big advocate of being curious and creative about solving the greatest challenges we have in elections. That's why everyone up here has provided different examples of improvements. So to me, I think the election assistance Commission continuing to highlight the best practices and the good things and having events like this to facilitate the conversation is really how we all as a collective get better.

>> Thank you. So with that, I want to thank the panelists. I think this was an excellent, excellent panel. We'll now break for about 15 minutes. Just come back at about 3:15 for our last, last panel of the day, which will focus on the post-election period. I want to thank my panelists again today.

[APPLAUSE]

[BREAK]

>> Can everybody please take a seat. Bring the chocolate with you.

Hi, everybody. Our panel decided you guys have had enough data for the day. So we're going to do a bunch of show tunes. Is that okay?

Hi. I'm Kathy Boockvar. I'm senior adviser to Governor Wolf here in Pennsylvania on election. I cover elections with the Department of State and with county election officials across the state as well. I want to thank again the organizers of the event. You did a great job over not only the substance of the panels, but one of the things I really loved was the diversity of the people who were

presenting because it's really -- the data is fantastic. But if you can't translate the data to the poll workers and the people on the ground and the voters, it's not going to go anywhere.

So I really want -- I just want to say thank you and have everybody give a round of applause to everyone who presented today.

[APPLAUSE]

So this panel is about the end of the day, the end of the election, post-election. Most voters typically care about the results of the election, but election officials and other data experts know that we need to use tools that we've gained from throughout the day and afterwards to make each election better. And so this panel is made up of diversity of backgrounds who are going to tell you what they've done in their states and what they've done in their professions. So I'll start with introductions.

So we have Rey Valenzuela, the director of elections in Maricopa County, Arizona. And Rey has been with the Maricopa County elections department for 28 years. So you probably know a thing or two. And has been the election director since April 2017. And Rey is a graduate of the election centers from Auburn University and also Maricopa County management institute graduate, and is also a Secretary of State certified election officer since 1996.

Rey has served for the past 12 years as one of two Arizona representatives on the EAC standards board and in 2018 was elected to serve on the executive board and currently served as secretary.

Next, we have Jennifer Morrell from the election Validation Project the democracy fund. Jennifer is an election professional, and she's partnering as a consultant with the democracy fund to lead this project aimed at increasing trust in elections through rigorous audits, standards, and testing. Previously deputy director of election ins Arapaho County, Colorado, Jennifer was instrumental in Colorado's successful implementation of the first statewide risk limiting audit, and she's going to tell us all about that today. Jennifer is also an election center graduate and holds a Master of Arts in management and leadership and is also on the advisory committee for the center for civic design. Jennifer is also a veteran of the air force. Thank you.

Next to me on my left is Kara Rahn, who's the director of the department of voter services in Chester County, Pennsylvania. Kara has 19 years of organizational communication, operational, and management experience, and has enjoyed success in government, corporate, and not for profit arenas. Kara prior to this was at Axelon's nuclear generating station. I'm interested to here how that transfers into elections.

>> More than you think.

>> She served as the deputy director in Delaware County transportation management association and held several legislative roles for PICO. Kara earned her Bachelors in communications and public relations and earned an MBA from Eastern University.

And last but not least, I have Bridgett King, who Bridgett is an assistant professor in the department of political science and master of public administration program at Auburn University. Bridgett teaches graduate and undergraduate courses in state and local government, American government, the presidency, mitt Cal participation, and public policy. She's also an instructor in the election center, certified elections, registration administrator, the Sierra program at Auburn. Before Auburn, she was a voting rights researcher at the Brennan Center For Justice. While completing her graduate students studies at Kent State University, Bridgett coordinated the McNair scholars program, which aims to boost the number of low income, first generation, and under represented college students who pursue doctorate degrees. That sounds very cool, Bridgett. Please welcome the panel.

[APPLAUSE]

All right. Rey, shall we start with you?

>> Sure. It's always hard to be the last panel right after cookies. So I know we'll still try to keep you up and awake.

Before I start, I just have a question for the audience. I myself appreciate and it's an honor to be here because -- and you'll see me taking notes. It's not for rebuttal but because I'm learning quite a bit myself. I'm very interested in Jennifer and the risk limiting.

Part of it is one of the things we do learn and what we have learned, if anybody in the audience knows what R&D stands for, they're probably wrong. It's not research and development. It's rob and duplicate. In elections, that's exactly how all these notes here, what we're going to take away. I'm going to show you the wonderful things we're doing in Maricopa County as far as provisional balloting and some of what we say, hey, that looks familiar because we probably robbed it from you.

Just so you know, we'll start out here with the photo up there is not me. That is our new recorder. He is that tall, tall as a city building in Arizona. And if you haven't met him yet, I know that he was just up at training, and if you haven't, he'll find you.

Part of the process we're going to talk about is the provisional ballot close post-election. Before we get there, I want to tell you quickly, briefly our story of how we got to provisional ballot tools we're using. Where we were in 2016, I won't reiterate what everybody's already -- some of you have experienced that four-hour

line. That was us in Maricopa County, 2016, our presidential preference. We were in the media. Some of it had to do with bad data. One of the things I will point is we've done data analytics, but you don't update those analytics and say, hey, there's a factor there. We'll call it the Trump factor, if you will. Most of the time in our presidential preference, we're late to the game. It's over by the time it's in Arizona.

So for lack of a better word, it's a dog and pony show. There's already the heir apparent or somebody nominated. We didn't adjust our analytics. The story is where we were, what we were looking for, where we are now, and we'll get to the provisional balloting, the tools we're using.

So we have -- and, again, I'll go through some of these pretty fast. The presentation's on the EAC, if you really want all of the data. Polling places, 724. We have 2.2 million registered voters. We have 1.6 million of those on our permanent early voting list. It's a big, daunting task to manage that kind of volume. We still do preprinted ballots in 2016. We had all of these lines. What we were looking for is we're trying to create a system that increased voter access, engagement, was economical, and scaleable. We weren't just looking for a unicorn, we were looking for a golden unicorn. Those are really rare.

Again, we wanted that. Not to some of the e-poll books. For a county our size, we needed something different. We needed something that would allow us to do this on a realtime basis. We were having, as an example, when we get to the provisionals, we were upwards of 100,000 provisionals in Maricopa County for 2012. 2016, we it better. We had 56,000 provisionals, and those are things that are worked after election and long hours of processing us. Again, doing a better job on the front end to get people to update their practices we're focusing on, but that's something we need to mitigate.

What we did is took an approach saying, we have 15 counties in Arizona, Maricopa is the largest -- the other 14 counties call us the great state of Maricopa because we make up the majority, and we have quite a bit of a robust IT staff. Not that every county has that luxury, but what we've done and we challenge our IT staff to say give us a better process, a better check-in than what we currently have even in our e-poll book environment.

What they did is they created this check-in process that ties directly to similar to what was presented earlier in the ballot on demand environment, but it is robbing and duplicating from an industry. If you flew here today, you probably didn't talk to an agent. You did a precheck. And even some of our mailing of our early ballots, Orange County we stole from them with their rely a vote. Thank you very

much, Orange County. Years ago, we were using a system from pit any bows for a credit card check.

Instead of having one e-poll book and a clerk behind here or two, as we did in the presidential preference, which had long lines, we can set up three to six terminals that are precheck-in. You basically are coming in. The system is set up with a bar code that can scan driver's license. You basically interface. There's privacy screens. This is a model here. Mr. Commissioner hits. I made him about 10, 20 years younger here. So he doesn't get that too old card. I didn't want him to get that. So an example. This is what you would see as a voter. You precheck-in. And we have a gatekeeper for the people -- is anybody from Arizona here? Good, just me.

But nationally, if you're watching, we do have a gatekeeper. We do still require checking IDs at the polling place. It's part of our state law. Commissioner Hicks would come in, is this your name? And 95 percent, our data shows -- and even from our e-poll books. 95 percent of our voters swipe with a driver's license. Those voters walk right in. They swipe. Is this your address? This is how we get to our story about provisionals. For those percentage, 26,000 of our 56,000 provisionals, 2016, were address changes. That's all they were. But they were three-part form, paper form, that -- and excuse me, Ethel. And I use that name lovingly. But Ethel, who's usually 80 years old, is filling this out, and it takes time to spell Valenzuela, and it's usually not right. There's a point of where this is where we eliminate a lot of provisional.

A fillable form basically. With our SiteBook technology, we're not going through a third party vendor. We're not coming through cloud. We're going right into the voter registration database. I will tell you the party is left blank purposely for Commissioner Hicks. It use to say party. And a place to sign. I'm going to go through really fast. I've only got a couple of minutes to get to the provisional part. Basically, the voter checks in. They precheck in. The ballot is automatically set that's correct for him. We have 7,000 styles in our upcoming election primary. It doesn't matter. They can go through here, and they step over here to wait for their name to be called. It's the Starbucks of voting. I was going to put a Starbucks logo but copyright infringement and such.

You place your order, step to the side. And check-ins, just so you can get here, as far as the data from the SiteBooks. We can actually get down to minute by minute check-ins, and it's not going through a cloud, not going through third party. We're getting actual live open and close data, as far as seen on our dashboard. We're even using it for board worker payroll. You can see Benny here worked 15.3 hours. One of our hardest workers. But it's a tool that is not only sped up

check-ins, in our 2017 election, local election, it was a small election, only a million voters eligible for that election. We call it a baby election. It took an average of 31 seconds to check in and only 44 provisionals for that election. Similar type elections, about 3,000. So that's a drastic 98 percent reduction.

2018, we had a congressional district special election. Congressman Franks opted to resign for some reason. We'll leave it at that. And we had to have a special election. So in that, we had actually 531 provisionals. Similar type election would have been about 52,000. Because we're updating registration right on the back. We got all these analytics that allowed us to then look at these provisionals. So we can now grab data specific to provisionals and say even if we get the election and we're at 9,000, 10,000, we're currently looking at the data and saying where are the high attrition rates? Where are more provisionals being cast? We can look at the data big time and say we have areas that are apartments around gateway testing grounds, which they have high transient employees. So those people tend to move a lot. So we know we can focus there with this data.

Last but not least, we can also know then we can increase board workers in that area. We can have options for three, six, or 12 precheck-in. So basically our provisional tools allow us, no matter what with this particular option of where we were, how we got here, to do a lot of things. We'll save a couple things for questions and answers, but the one big thing is on the provisional tool, this SiteBook has given us the ability to do realtime processing, but more importantly to do it on the fly. By that I mean, for those of you that do realtime provisionals, a whole two years ago for us, you had to wait until after election day or election night. We're actually getting that provisional. The minute the voter casts, they say they're not registered. They do an address change, they're fixing it right then and there. But not registered because they said their name is Rey-r-e-y, and we've got him as Reynaldo. We're getting that data, working it, and dispositioning it. We don't have election night provisionals any longer other than the voter that votes at 6:59 provisionally. We've closed our polls. At 7:01 the data is there. 7:05 I think was our latest. And we have our provisionals done by 7:10 p.m. that night.

Again, some good tools to look at. Hopefully, you know, we are looking to program our SiteBook. We actually are -- my recorder is in NACO today receiving an award for that SiteBook, and he's looking to open source that. Not, again, any e-poll book vendors out there, to try to take any business. When we perfect it, know that as a rob and duplicate, as penance for so much we've stolen from other counties, we're willing to give back. So that's going to be an option if and when we work out any and all bugs. That's our provisional tool we're using and data we're capturing so far.

>> We're going to talk about tools a little as well in my presentation. First of all, it's an honor to be here. I want to thank the EAC for inviting me. About ten weeks ago, I took off my hat as an election official and partnered with the democracy fund in what is turning out to be a really exciting project, looking at ways we can increase trust in elections through audits, standards, and testing.

So the focus of my thoughts this afternoon when we think about post-election data, we think about the way we evaluate our elections, the way that we audit our elections, I want to think about it through the lens of increasing trust, and I've included this statement from democracy fund's trust in election project and that our focus should be creating a system that is voter centric and efficient and inspires trust in our electorate.

Let's talk about post-election data for just a minute. We live in this era where data is almost ambient. It's everywhere. We live and breathe and work with data flowing all around us. Nothing -- there's never been, I think, a better time in elections to be in a place where we start to be data centric and data driven. So how do we do that, and how do we capture that? First we start by asking questions.

Some of the things we can think about after an election is who are our voters, and how do they behave? There's some counties that have done an excellent job post-election of capturing this and showing this. I'm not going to talk to all of these. I really just want to illustrate the amount -- the data sources that are out there and the ways we can think about framing questions around that. I will talk about that last one on there. That one has been really interesting. Geo-mapping is something that's growing. I know we'll see more of that as we start to go through the precinct thing, but we used that in Arapaho County as we tried to plan for vote centers to look at geographically where voters were located in contrast with that voting location they chose to use.

Most of the time, it's the closest location to them but not always. That's really hopefully when you're trying to plan. How do your voters behave? How well do you communicate with your voters? There's a plethora of data after an election that you can look at to look at whether the instructions were understood. The instructions for completing a ballot, returning a mail ballot, the information that you put on your website, the calls that come in can be really revealing. Amber talked about that earlier in changing processes to better inform voters.

One of those that's new to me that I think is exciting is states and jurisdiction that's are purchasing new voting equipment. Quite often now there's an electronic adjudication portion, and there's all kinds of data embedded in that. One of those things is ambiguous marks or marginal marks. And we really have the opportunity now to go in and look closer at that and how often they're made and

how they're made and how that ballot was interpreted because of that and maybe come up with better instructions or better design on our ballot. So that's an exciting thing in post-election data.

How will our processes -- how effective are they? How effective is our training? There's a lot of things we can look at when we try to answer that question. I think one of the most effective in the county I just came from was looking at the poll worker hot line or troubleshooting logs. We did a really thorough evaluation after 2016. One of the things that we found was a series of questions that was being called and repeated over and over again. Something that was covered repeatedly in training, but obviously our training wasn't as effective as it should have been and we weren't getting that message through. So we weren't back from square one, and we rebuilt our training based on the calls that were coming in and the troubleshooting logs that we saw.

One of the things that I put on there that I think might be interesting is very low tech. So we're not talking about a lot of data sets or spreadsheets is inventorying of ballots and supplies. In my prior job in Utah, one interesting thing we did after the election was to inventory all the supplies that came back. And for about three or four elections in a row, we noticed on our inventory sheets this listing of pencils. The only thing that was interesting was we didn't send pencils out. So we did a drill down into the root cause, and what we found is we really needed to revamp our election form. Poll workers were concerned about filling out the form correctly, so we were bringing pencils from home so they could do the tallying and then erase the numbers and fill it in in pen.

How effective was your planning and your resource allocation? We've heard a number of individuals today talk about the MIT resource allocation tool, the line management tool, and that's just as effective when you're planning for an election as doing a post-election evaluation or audit. It gives you an opportunity now to plug in real data and see how that compared with what you planned for in terms of how long did voters have to wait. And what your throughput was. I can see I'm running out of time. So I'll skip through that. This is what we want to talk about. How ballots were handled, and were they tabulated correctly?

We have our ballot reconciliation logs, our ballot manifest, cast vote record, adjudication audit logs, and custody reports. I know there are election officials sitting out there, and those that are listening are probably thinking, well, she captured a few of the data elements we might look at to do some sort of audit or test or review, but she hasn't captured all of those, and you're correct. There is a lot of information out there, and because there's so much, you would think that we, as an election body, would be doing that and capture these regular robust audits and

regular reviews, and all the jurisdictions in the nation would have the world's best elections.

I want to just pause for a minute, though, when we think about why and what makes it difficult to adopt those. I want to talk about surgery and the history of surgery. So in 1846 William Morton administered ether for the first time. It's the first time that anesthesia was used in general surgery. I think you can see right away why it was a win for both the patient and the doctor. And it was quickly adopted. Within two months most of the capitals in Europe were doing it, and within six years, it was something we saw done in just about every hospital in the country. Why is that? It was very visible and immediate effect, and folks could recognize that. And we see that, right? In the election community. We see processes or ideas such as vote centers where there's a win for the voter, there's a win for the election administrator. It's very visible in the media, and so we adopt that.

Post-election audits and risk limiting audits and reviews are more like germ theory. So in 1877 Joseph Lister performed surgery and wanted to prove his theory about antiseptic surgery and using carbolic acid to reduce infection, and he did that and reduced it by 85 percent. Mortality rates for those that had the process done went down considerably. But in over a generation, less than half the surgeons were using that. Why do you think that is? It wasn't visible, and it wasn't immediate. Weeks would go by after the surgery, and they'd soon moved on to the other patients, or in our case, other elections, and we didn't need to think about it so much. How do we lessen the pain now and highlight the long-term benefits of robust audits and testing?

I will tell you what the answer is. An election official in a very small jurisdiction where elections is one piece of what you do and the other months out of the year, you're issuing business licenses and you're doing planning and zoning and you might be doing motor vehicle licenses. So I think we need plug and play tools that we can give to officials to better use the data and do so in a way that's efficient for them. What does that look like? We need plain language definitions. We need to clearly outline the necessary steps and deadlines, and we need to calculate the workload or have a calculator to determine the workload so they know up front what it's going to look like. It involves checklists, tools, templates, a way to practice and to collaborate with one another.

So I'm going to walk you very quickly through those of you thought in eight to ten minutes I was going to tell you how to do a successful statewide risk limiting audit, I'm afraid I'm going to disappoint you. I'm going to quickly walk through what such a playbook might look like, what such a checklist might look like, and just let you know there are those collaborating to put some tools like this together.

And a lot of these ideas I borrowed from folks that have been doing audits for a very long time. Those are individuals in the private sector who have been doing financial audits. I won't read through this. Essentially, they're saying the same thing. You've got to create definitions. You've got to create specifications. You've got to have the questions available so that this process becomes very routine.

When we talk about risk limiting audits from the perspective of an election administrator -- so I'm not going to talk about software tools that are necessary. I'm not going to talk about the responsibilities of the state to carry out something like this on a statewide level, but I just want to give you a quick overview of what it might look like for an election official. Most of these things I think you'll recognize you're doing already, and most of these things are things that you're already familiar with.

So it might include a workbook that talks about prescanning, how to organize and track your ballots, creating a documented plan for doing that, for reconciling your ballots. Thinking about ballot batch size and what that means and how that's going to allow you to ensure that you're not going to lose or gain any ballots throughout the process. Ballot storage containers are the most simple but most essential part of the whole audit process.

Think about this. What we're saying is that for an election with 400,000 ballots, we're going to be able to pinpoint to the exact ballot to pull that for audit. So thinking about containers, labelling those, creating unique IDs for those, and thinking about a thoughtful storage plan for those is essential.

The other key element in your preplanning or pre-scanning is your ballot manifest. Some sort of a tool to map where all of those ballots are stored and how.

We might also in such a playbook talk about ballot scanning. That's something you do every day, whether you only scan on election day or scan throughout the early voting process or post-election, there are some really simple steps that you have to go through. The key one is reconciling and verifying the number of ballot scan matches that tracking form you're working with every day. I think you can see where I'm going with this. Organization really is key.

So we talked about risk limiting. We talked about the theory. We talked about the statistics behind it. But as far as an election official is concerned, the key to a successful audit is the organization process.

Let me skip quickly and talk about ballot manifest because I mentioned the need to have very clear definitions. There are a variety of academic definitions on what a ballot manifest is, and I think this is essential for every element within the risk limiting audit process is thinking what's the simplest way that I can define this that's meaningful. For me it means creating a map or a legend with how individual

ballots and batches of ballots are stored. It can be an Excel spreadsheet, a paper log, or an application developed by a software developer. But it has to be independent of the voting system, and it has to be formatted in a way that shows certain fields that are going to be tied to your cast vote

So the device the ballot was scanned on, the unique batch number, the number of ballots that were scanned and the storage container ID.

It might look like this. I've got two examples here from two different counties in Colorado. This is for a statewide audit. If you're doing this countywide, those county names might be the names of your individual precincts. But the elements there are actually really pretty simple. It's the device. It's the batch. You can see they're sequential. The number of ballots scanned into that batch, and then the location. I've seen counties do something as simple for the location as just a box. I just visited a county that had six boxes full of ballots. So it was box 1, 2, 3, 4, 5, and 6.

We talked about ballot storage. I'll skip that one. There's some essential steps there that are critical to a successful audit.

And then reconciling each day. So, again, we have these data sources that are available to us. We have our cast vote record. We have our ballot manifest, and we have the information from our voter database or our poll book so we can assure those totals are matching before we move into the audit process. It's really critical versus waiting until the end of the election to resolve discrepancies that daily those get researched and resolved. And this is what a cast vote record would look like, and I think that's, again, something that may be on its face can look a little bit daunting, but really it's simple. It's going to be unique to each voting system vendor, but a successful audit means understanding what each of those fields are and what they represent and how they're going to tie all of those pieces together when you go to reconcile or audit your ballots.

So you can see here each individual ballot is assigned a unique number and that unique number is then identifies which tabulator or scanner it was scanned on, which batch it contained, so in the example I've blown up there, you can see ballot 44851 was scanned on tabulator 3, and it was the 97th batch scanned on that scanner. And within that 97th batch, it was the 70th ballot. So it's pretty simple actually. And there's some other information there.

The audit itself, at that point, you've done all of the hard work, and now it's just about retrieving the ballots using the system that you've set up in entering the voter markings to do a comparison.

Easy, right? We all are ready to jump in and do that. And I realize that I've left -- like I said, it's a really complex process, and it's not something that we're

going to be able to communicate in eight to ten minutes. But I want you to think about audits, risk limiting audits specifically, but other types of audits in thinking about a path. It's not an immediate destination. Sometimes we think I don't have the resources. I don't have the infrastructure. The laws in my state or jurisdiction are not set in a way that would allow me to do this, but if you break it apart and recognize there are different places along the path, there are a lot of things that are low tech and things that you can do right now to put yourself further along that path that are really fairly simple and easy to fairly out.

I know we talked about definitions, and I was asked to delve into these a little bit more. We're part way there. We were able to come up with complex theory and come up with simple definitions. I've given you three here. Batch-level comparison audits, ballot-level comparison audits, and ballot polling audits, and think about a way to simplify that even more in a way that we can see it and understand it.

So just in conclusion, how do we use post-election data to focus on prevention rather than intervention? Risk limiting audits are a way to focus on intervention and realize you have a problem with your voting equipment and how do we think beyond that? Why not only audit and test our voting equipment? Why not validate other critical components of the election system as well? I'll skip that because of time.

So I am focused right now on creating a collaborative state and local election professionals and subject matter experts to do just that, to think about different points along the system, different data elements that we can look at pre and post-election and provide tools and guidelines and best practices and assistance for jurisdictions to implement those. I think we all need to become audit experts. A lot of times we turn to professionals, advocacy groups or the academics. But as election officials, we need to explain how these terms work, how these processes work so we can be driving that policy in our own communities.

Charles talked earlier about experts. We're starting to see a number of experts. We have legal experts, communication and social media experts, data analysts and IT experts. I think we need auditing and quality control experts. But until then, because I understand the resource limitations, we need to learn to be pit crews and not Cowboys and learn to, as Rey said, steal from one another, collaborate with one another, and that's something that's in the works. I don't have time to talk about it, but a shared customizable tool to help expedite the risk-limiting audit, the actual comparison process.

And I'll just conclude with this, statement on the national commission on election reform. Americans can and should expect their electoral system to be a

source of national pride and a model to all the world. We're at an exceptional time. I think that is happening, and I'm excited to be a part of that.

If you're interested in collaborating or sharing your expertise, you know where to find me.

>> Thanks, Jennifer.

[APPLAUSE]

Next, Kara. Thank you.

>> Thank you for having me. My name is Kara Rahn. I'm the voter services director for Chester County, Pennsylvania. I have learned a lot today, so I hope that we can be invited to participate in these again.

I was first introduced to the idea of collecting data from Charles a few years ago when I participated in a Department of State presentation. I felt, at that time, somewhat out of control of all the things that an election director has to manage.

So what I chose to do in that time and was inspired to start to collect the data so I could be in control of some of the factors that affected my staff. And data is the place that you can find that control and that confidence and that comfort.

So for me, it was a reaction to 2016, which a lot of us during the course of today have fallen on our swords, where we know we can do better or with data could be more efficient. So as an election director, as a county employee, I have a balancing act, like many of us. We have to manage lines, long lines in Chester County are a common conversation with our commissioners and myself. Meeting the expectations of the Pennsylvania Election Code. I asked the question earlier because I think there are so many wonderful ideas here, but a lot of us are trying to tie that back to how Pennsylvania law requires that we do certain things. So there's another piece to balance.

Balancing county resources. We're a government agency. We are lean, and we are obligated to be respectful to the resources we're given to do our job and spend them wisely.

And then overall, we have an obligation towards customer service. The voters on election day and other times throughout the year, of course, are our customers, and they will be grading us, so to speak, on the experience that they have for the 15 minutes that they're in casting their vote. So to keep that in mind, we have a customer service piece to this as well. So they were some of the drivers to me trying to understand the constraints that we were under and also still trying to make those improvements moving forward.

The other thing that just in general, I think, a lot of industries are facing, and certainly elections, are we're at a little bit of a conflict as far as the expectation

for quick service. We talk a lot about everything today is fast with its technology. If you talk to a child, an hour waiting for something is torture. So that is another factor that comes into play with voting where we have rules and regulations set up and equipment and other things that are not quite set up to be as responsive as the expectation of our voters.

I tease that, if you ask a poll worker how did the lines go today? They'll say, oh, pretty good. If you ask a voter, one voter might say, oh, I had to wait 10 minutes. Another voter might say, I had to wait 10 minutes. So every voter that comes in has a different perspective, and we do need to respect those different perspectives as we go through these processes and looking for improvements, but that's hard because those expectations are literally all over the place.

So just a little bit about Chester County. We have about 350,000 registered voters, 228 polling locations. We have some very small locations. We have some larger locations. So the logistics of each of those locations is pretty unique. We are a paper ballot county. We have hand mark paper ballots, and then we also have a DRE machine in each precinct as well.

As most of us know, we have four-year election cycles. So no election matches or mirrors the one just previous to it. So a lot of times the data we collect really has to have some run time in order to have good comparisons, which is a unique hurdle for election directors. We're not at Disney. We're not taking daily data points or hourly data points. We have two days a year to track the information, and sometimes we have to wait a few years to actually compare so.

So if I can make a plug for anyone who hasn't jumped into the data collection game, just start collecting it. You might not know what to do with it yet, but if you miss the opportunity to collect, you're just prolonging that cycle from actually getting started, which I was equally guilty of up until about a year and a half ago.

And then as you know, voter turnout varies. This past election, we had a 16 percent turnout, which is a bummer, but that's what we had. So to compare that turnout to a presidential would be silly as far as resources and efficiencies. But the expectations of the voters are the same, whether they show up every election or only every four years.

And just to share there, we have the equivalent of about 1,200 full-time, full day poll workers. We average about the equivalent of about five full day staff per precinct in order to keep the show going on election day.

So I mentioned we started with the algorithm provided by the Cal tech MIT research and found it extremely easy to use. We joked a little bit about my nuclear background, and I was a process improvement person there. So data was

everything. Again, I went back to what I was comfortable with. With data, you can understand the situation and spend your resources wisely on how to get after that.

The other thing I like to joke is nothing can go wrong in a nuclear power plant, and nothing should go wrong on election day either. The pressure is there. So what we do with the data is we try to deduct where we should be using our resources. We can use our resources most efficiently and make some educated forecast.

So I just have a couple samples here to kind of show from where from a volume perspective it may not be a big deal, but from a customer perspective, it hurts. So in this example, this last November, on the left here, I show total number of voters that showed up that day, and how many lines they were running. We do not have electronic poll books. We have paper poll books in Chester County. So our bottleneck is at the check-in table.

One thing that we did through some anecdotal polling is we realized the number of privacy booths and the like we started providing clipboards even in some of our polling locations that, if someone really needed to get out and were less concerned about having a privacy booth to stand in, we offered a clipboard to let those get out quick letter if they were in a rush, and those that wanted to wait for a privacy booth to open up, we had that option as well. So we just provided simple things like that to get folks moving. Now, I can do that. I have paper ballots in that example. So my line focus is really at that check-in table. And I call my poll worker Sally. I know we have an Ethel and Dimple was another name.

So here is an example in this polling location. We only had a 30 percent turnout. We asked poll workers to track at the top of every hour how many folks are standing in line and what line they're in. Very simple and easy for the poll workers to keep track of. They set a little alarm on their phone, jot the number down. That's all we need. Quickly, I could say, to the judge of election ins this particular precinct, you need to run more lines in the morning. But the rest of the day, you could probably settle down. So if you only have so many resources, where are we going to ask them to double down? It's going to be in the morning.

Now, that particular poll worker, as an example, if you walk in and you go to vote and your last name starts with a "B," you're really annoyed there's no one else in that other line, but you have to stand in a line of ten people waiting to get your ballot checked in. That's something a poll worker might not consider as something they need to worry about because they're busy and doing their job, but from a customer satisfaction perspective, that seems like an easy one to get after. That's something we'd share with that judge of elections that as low as a 30 percent

turnout, we already have a problem. What are we going to do at a 40, 50, 60 percent turnout?

So instead of having a conversation that sounds like the election director is telling the elected poll worker how to do something differently, we're using data to normalize that conversation and then together come up with solutions that we think might work for this particular precinct.

And this goes for any other business where you stand in line and you're annoyed there's 15 closed checkouts and only two people working and you're standing there in line. It's a similar feeling that people have when they walk into a polling location.

This one, not a large turnout, 395 folks all day, 16 percent turnout. They had a small line all day. One more person would have satisfied no one having to wait in line at the day. In a 16 percent turnout, I wouldn't spend a lot of time trying to fix this precinct. But in a presidential or gubernatorial election, I'm going to make sure this judge of elections isn't running the precinct the same way they always do because this is not going to work for a higher turnout. Again, the data allows me to have the conversation in a less threatening way since we all here in Pennsylvania have elected poll workers to try to manage or work with.

Then what we do too, if the poll workers are able to or have the time in our numbered list of voters book, which is another book our poll workers are required to use, to track at the top of each hour, just right next to the person's name, who is in line at that hour so that we actually can then go further to see how many people voted in that particular hour just by taking a quick look at our numbered list of voters book. So that's another way for us to see if the line's consistent all day or if it just so happened to be at the top of that hour there was a line. These are simple things we can ask our poll workers to do on the spot versus putting out the other fires like tornadoes and the like back at the office.

So we do not, I mentioned, have e-poll books. We're looking for something else like that to take us to the next level within the polling location as we look for new equipment. But I think that it's important for us to realize that the volume is likely not going to change coming into the polls. Where the line builds is what's going to change. So we need to consider if we fix kind of that whack-a-mole game, if we fix one, it will likely create an issue or a line somewhere else. So I'm really trying to take the data that I'm using now even to go into what type of new election equipment I'm going to purchase so that I'm really looking at the big picture and not just the lines that are forming at the front desk because that will likely dissipate or hopefully not become an issue at all if we select the technology to help us along there.

So the other thing is that we've talked a little bit about is our poll workers. There's a learning curve. Anything new can be scary sometimes. But what we've decided to do is build in the data collection as part of their poll worker training as if it's just another thing that's expected to be done at the polls that day. What we did in the beginning was we asked for it as an add-on, and we got a very low response rate from our poll workers. The new poll workers are coming in, and we're just kind of making it part of our process, and we're up over 50 percent now on our return rate.

The other thing we're learning is making sure the way that we're training to collect the data is important. Bad data is not going to get us anywhere. We've had some interesting responses to our form that didn't quite match what we were looking for. So we're still working through it. We have absolutely not arrived, but we're trying, and I feel confident already with the data that we do have, the pockets of the polling locations that we maybe need to put some more resources to.

I think bottom line, even with the data collection, in Pennsylvania, our poll workers are still the most critical piece to the puzzle. They need to be educated. They need to be willing and interested, as I am towards this data and towards that customer experience and customer satisfaction. What happens on election day can make or break the reputation of the county, frankly, of someone's experience.

So what we're doing, just to show an example of what we're doing with the data besides just coaching our judges of elections on what we could do better is we're now using the data to look at where the pockets are of where we're having a hard time finding poll workers. To take the show on the road and go to businesses who offer -- maybe they offer days off if you do a United Way community day. Maybe they can add poll workers to the list of opportunities that their employees could have the day off if they're going to go offer some civic support in the polls. It's a nonpartisan effort. It's VVSG their community. Why aren't we looking at VVSG our polling locations like we do other nonprofit opportunities throughout the year?

We go to rotary clubs. We'll talk to college students, high school students. We have some very active honor society groups that will send us student poll workers, and they're amazing, and they're a really nice balance to the generational mix that we have in our polling locations now.

And I think we're also going to need to identify which polling locations this data is requiring us to do more of a hands-on survey or field review versus just collecting the data from the poll workers to get after what they might need specifically. We talk a little bit about the characteristic of each precinct. We have somewhere the nursing home bus loads up and goes to vote at 10:00 a.m. So that particular location has a different set of needs and expectations and different time of

day than a heavy commuter area where the rush is going to build at 7:00 a.m. So to treat everyone the same is, I think, a waste of county resources. We really need to dig in to get the specificity that the data can provide us and also the comfort to know that certain precincts are doing just fine, and we have the data to feel comfort in that and not just the anecdotes that we might hear from our poll workers or from others.

Okay. That's it. Thank you.

[APPLAUSE]

>> Ready?

>> As I'm going to be. So in many ways, it's appropriate that I'm going last because what I hope to do in this presentation is talk about the role of evaluation and leave you with some thoughts about how you might approach that while integrating some of the things people have talked about throughout the day with respect to the way they have used innovation to address the challenges they've experienced in their jurisdictions and also try not to break the clicker. Okay. Oh, look at that.

So evaluation is the systemic investigation of the merit, worth, or significance of any object. So when we think about this as it relates to election administration, evaluation is really an opportunity. It's an opportunity to gather data and demonstrate the ways in which policies or programs that have been enacted in jurisdictions and can enhance the way you do your jobs and perhaps more broadly, the way citizens experience the democratic process. And so while we often think of evaluation in real social scientific terms, it clearly doesn't need to be. It can be -- the nature of evaluation can take on a variety of forms. It can be very descriptive just thinking about gains and reductions or also be statistically rigorous. But regardless of the approach, evaluation should be something that isn't intimidating but something that you view as a resource or a tool that can continually be utilized as we think about ways to improve and enhance the administration of elections.

So why do this? If you haven't been convinced yet, here's some other reasons. So one reason to engage in evaluation is it allows you to step -- am I too close to this? It allows you to establish model programs and best practices by providing feedback about what worked and what didn't work. So if you can think about some of the voter outreach and information approaches people have discussed, poll worker training, also the way in which equipment is delivered to polling sites, all of these things are opportunities to consider places for improvement. If we think about public administration more broadly, evaluation is a tool of good management and quality improvement. It can be used to gain insight into effective strategies on how to improve performance, measure impact, improve implementation and effectiveness, better manage limited resources. One theme

that's consistently been discussed throughout the day is the best way to utilize limited resource that's people who work in elections have.

It's also an opportunity for you to document program accomplishments, to justify current program funding, to perhaps convince the powers that be that you need a little more money. And also, evaluation is an opportunity to satisfy ethical responsibility to the public and demonstrate the positive and negative effects of things you might be doing in your office.

So this is particularly true if we think about the ways in which society is increasingly concerned about accountability and results. Evaluation is the opportunity to demonstrate what you did, why you did it, and how it benefited the public. And beyond that is an opportunity for you to contribute to the body of knowledge that exists in the area of election administration, to share with your peers what it is that you're doing, the successes that you had, and allow them the information so they can think about how they might integrate what works for you in their particular jurisdiction.

And so just like we talked about there being a variety of ways to address challenges, there are also a variety of approaches to think about what sort of solutions are going to be in the best interest for your particular office on the front end. So one approach to doing this is a logic model. And so a logic model is basically just a map. It is a simplified picture of a program initiative or intervention that is responsive to a given situation. It requires you to think about the resources you need to prioritize the problem or challenge you're currently facing, and perhaps -- not most importantly, but also importantly, it requires you to think about the short term, intermediate, and long term outcomes of the intervention you implement, and those things are often measurable, right?

So it allows you to think about what it is that you need to do in order to address your specific issue. And so a situation is simply just a challenge. So if we think about the beginning of the logic model. It's a challenge that you're faced with, whether it be the result of a particular problem you've experienced in a previous election, or if you're just thinking about ways to enhance what voters experience on election day. You would then think about sort of what resources you have to allocate to address to this particular problem, what it is that you're going to do, and then again, like I said earlier, what the outcomes are going to be once you implement whatever policy or practice you've decided to use.

Here is -- oh, see, okay. Here is an election administration specific logic model introduced by two of my colleagues, Dr. Kathleen Hail and Brown. You can see to the far left that the issue discussed in this particular jurisdiction is slow voter turnout. And then below that, you see the resources that are going to be necessary

to address this particular problem. And then immediately to the right of the problem, you see the activity that, in this particular scenario, they decided to focus on, which is a nonpartisan reminder that is sent before the election.

If you consider short-term outcomes, obviously one thing is the voter still shows up to vote. If we think beyond that, you think about the person becoming a consistent voter, so voting regularly in elections, and then more broadly, you can think about increased democratic functioning as we think about participation being an important component of living in a representative democracy.

So in thinking about the types of evaluation, there are many, and here are just four. So the first is the formative or planning phase. This might be where you would introduce a logic model to address a specific issue. But the idea is that you during this phase will think about what is actually feasible, appropriate, or acceptable. So that clearly is going to vary from one jurisdiction to the next because we all face different challenges or opportunities in different environments, whether that be related to our resources, the political environment, et cetera. But the beauty of this particular phase evaluation is that it shows you or should help you understand the extent to which the program is going to be needed or understood. And it's useful for making modifications before you make a major investment into any approach to address a particular problem.

For the next type of evaluation is process evaluation. And so this is the type of evaluation you would engage in once you have begun a program and throughout it. So it's basically monitoring. So if we think about the situation in Colorado or in other states where we look at peaks and valleys and voter turnout and think about the ways in which we might better allocate resources, that's an example of process evaluation. So the beauty of process evaluation is it lets you see over the length of your program how well it's working and can also alert you to any challenges with respect to the protocol that you might need to address to ensure it is as successful as you anticipate it to be to address the challenge that you initially began with.

There's also outcome effectiveness evaluation, which is kind of self-explanatory. But it basically allows you to determine or assess the extent to which you've been effective and allows you to engage in that particular process as well.

And then lastly, you have impact evaluation, which basically is there to just allow you to determine if you are -- if you did, in fact, achieve your ultimate goal, and it's also useful because it will allow you to provide evidence or data to think about whether or not you're going to proceed with the program in the future to allow

you to assess the extent to which what you did was efficient and effective and also allow you to think about if perhaps, when you do it in the future, or if you do it in the future, if you need to increase the scale at which you approach this particular activity because it was just so amazing.

Thank you. So in thinking about the different approaches to evaluation, one might ask themselves which approach is right? And the answer is it depends. This is like being in one of my classes. There are no answers. But there are questions you can ask yourselves to get a sense of what type of evaluation is going to be the most useful given the phase of your project. So one question is to ask yourself about utility. So who is going to need the information from this evaluation, and what is it specifically do they need? You would also ask yourself how feasible is it? How much money, time, or effort could you put into the evaluation? You also need to think about proprietary, who needs to be involved, and the evaluation to be ethical, and then lastly what design leads to accurate information.

So thinking about what you just said earlier, about all data isn't good, you need good data to do good evaluation, to make good decisions. So the idea about evaluation is effectively to be thoughtful and sort of think sooner rather than later about what it is that you're doing and what kind of questions you would like to be able to answer when you're done so that you can identify and think about and collect data that will allow you to complete the kind of evaluation that is most useful and add value to the work that you do. Oh, and thank you.

>> Thank you, Bridgett. Great. Well, thank you to all of the panel. I have a couple questions. Do we still have enough time to ask some questions? Great.

I'll start with Rey. Rey, when we were talking on the phone before -- in planning for this, you described your check-in system as an e-poll book on steroids. And since my first job in this field was as a poll worker, particularly curious about how the poll worker training went both from the start to the finish. Like when you announced you were having this e-poll book on steroids, and what the process was, and how the poll workers handled it.

>> Just to let you know that I took a tour of Philly, and they said that 9 out of 10 times, the answer is Ben Franklin or cheesesteak. But that doesn't answer that.

Truthfully, it was actually a robust -- we have re-implemented what we call deputy registrar program. In Arizona you have to be a deputy registrar 19-aught to register somebody. We actually reinstated it, not because of registration, but to train up folks and give them a certification because it's still in the statute. And part of it was grabbing all of our poll workers and saying we want you to be experts in the

process, so come back 100 at a time on every Saturday -- and I mean this in the tone that I'm saying. Every Saturday I was there prior to our launch.

And we launched this -- we told our IT, just as a point of reference, 2017, April 1st, 2017. They thought it was an April fool's joke we wanted it launched by November of 2017, within a few months. Bill Gates didn't think we could do it. Bill Gates is a councilman in Arizona, not the real Bill Gates. Probably the real Bill Gates thought we couldn't do it as well.

We brought in our poll workers 100 at a time on weekends, Saturdays, Sundays, and what you saw on the screen was our sand box. Was a demo board worker polling place setup. And bringing them in, we wanted them to touch this precheck-in. You're now in the back of that, a man walking, waiting for somebody to raise their hand and say little blinking light, show me your ID. That's basically TSA. You can precheck-in, get your boarding pass. You don't get the ballot until you show your ID. That's all they were doing. Unless they needed assistance, 99 percent of the people.

So we walked them through. One of the key things they loved about us, because it's somewhat technical equipment, we have launched a T-TECH program where we set up the polling places. The board workers, all they need to do is show up with their inspector and a backup inspector that has a badge that launches those SiteBooks, opens up the payroll program, which is the most important thing for them to check in, and they don't do anything on election night other than secure the ballots and bring in the edge cartridge, so to speak, and their touch screen, and they don't even touch those.

Part of the training was have them go through the environment, and kind of like Dimple, who maybe was a little hesitant, the first time thought you can't do this. We walked them through. Actually lined them up outside the corridor, 100 at a time, and said we're going to walk you through and have you vote and print an actual ballot. They looked at us. On our schedule, it said 15 minutes. They said, we know this takes an hour. 15 minutes with that precheck-in process. And one key thing about that precheck-in, it goes so fast, we do get a backlog of people waiting for the ballot to be printed. Even that, the one thing, the feedback we got was they didn't mind that. They don't mind waiting five, six minutes to get their ballot. They've been checked in. They feel served.

It's not that they're -- if it's busy and we've gotten to the point with those 100 people coming in, they still -- they got to comingle with their neighbors, but not outside wondering what's going on. Instead, they know they've been served and they're just waiting for that. So part of it with our training was to this day we have

nothing but 100 percent positive feedback from both Ethel and our step-up teenage program groups that are helpful in this technology.

>> That's great. Thank you. Let's say hypothetically I'm on the phone with a county election official, and I need to explain the difference between an audit and post-election audits. Can you give me an elevator speech?

>> What was that? Seven minutes?

>> He said it was 47 minutes that he was on the phone with me the other night.

>> One of the most important things to think about, when you think about post-election audits, so 25 states nationally do some kind of post-election that's based on a flat formula. We take 3 percent of ballots or 1,000 ballots, and it doesn't matter what the margin is of the races that are being audited. It's a flat rate. What's different about race limiting audits is we're basing the sample size on the margins. The closer, the tighter the margin is makes sense? We want to audit more ballots. And the wider is we're going to decrease. So we gain some efficiencies there.

The other important element of that is that we put, we institute this idea of randomness. So instead of just grabbing the top batch in the box of ballots or the first scanner that happens to be lined up in our warehouse, we're going to go through this process of randomly selecting those all the way to the point of the best practice or the recommendation is to actually start with a random seed. I think a lot of you have seen our dice rolling event in Colorado. The whole point of that, it doesn't have to be dice, is that we eliminate any possibility for somebody to try to manipulate the system. So we create a random seed. We plug that into a pseudo random number generator, and we use that to do a random sampling of our whole poll of ballots based on the margins, based on the diluted margin, meaning the difference between the winner and the loser divided by the total number of ballots that were cast in that race, and then we set a risk limit.

So we may say, for instance, that our risk limit is going to be 5 percent. This is where I stumble a little bit, but what we're saying essentially is there is a 5 percent chance that at the end of this audit we will not have caught any issues or something that will have changed the outcome of the audit. And I think that particular part, defining a risk limit, to me has been the most challenging, and I've been called to task on that a number of times. And every time I get to the end, I get a blank look. So there's got to be a better, easier way to communicate what a risk limit is.

I think the important thing, when we talk about a traditional audit versus a risk limiting audit is that we are basing it on the margin of victory, and we're doing it in a way that is a random sampling process.

And then I guess the third thing is it's not essential. So it's not absolute we do a ballot comparison audit. I talked about that. We're fortunate that states have the advantage to do that. We're going to pinpoint an exact ballot and take a look at that and evaluate the voter markings on that compared with the way the election system tabulated that. But there are opportunities within that risk limiting audit theory to do what is called a batch level comparison audit. So we may be in a precinct count, a voter facing scanner, precinct polling place model, where we may not be able to pinpoint right to that ballot.

Now, that's not most effective. I think there will be a lot of argument to go to a ballot level comparison, but that's another term, we start to throw two terms around, ballot level, batch level, what does that mean? How do we explain that in a way that's easy for voters as well as election officials to understand? I didn't answer that, but that is essentially taking the batch and hand counting the batch and comparing the totals of that to the totals of the equipment on that batch.

How did I do?

>> You said you're working on a real user friendly thing, right?

>> That's the plan.

>> So you'll keep in touch and let us know, and we can circulate it to everybody?

>> Absolutely.

>> Awesome, thank you. Because I know I'm going to get feedback.

Kara, could I ask you, talking about the data that you're doing, as you know in Pennsylvania, we're going to be transitioning across to new systems. Can we learn from the data that you're collecting, where would you start if you're advising? We're going to have line management is going to be changing, right, with different systems. And some counties are going to be going from DRE machines to hand marked paper ballots or some combination. Where would you start if you were advising a county that was going to make a change? What would be the first set of steps they should take to start the line management data collection.

>> The first thing I would share for anyone in Pennsylvania is to share the model that we use. I forgot what R&D stood for. Robbed and duplicated as well. Their voting patterns remain the same. They're caught off guard with the political landscape and changes there. But for the most part, if you can understand voter flow now, you can use that data to then apply it to what efficiencies you might be able to get from that future equipment. Because your voters are still going to be the same. They're still going to show up at 7:00 or at 10:00 or at 7:59 in Pennsylvania. We close at 8:00 p.m.

and we always have folks rushing in at the last minute certainly.

So I would say that just you have to start, and you can start as soon as November, and I'd be happy to share the tools that we're using, and it's very easy for the poll workers to understand, and then also start now getting the buy-in from our poll workers in Pennsylvania that we need their help with this data. So that's the data that only they can collect for us on election day.

So like I had to do, I had to rip the Band-Aid off and jump in and start collecting the data. It's daunting for an election director to worry about all the things we worry about. Once we got the ball rolling, it's very common for us now, and it's a very doable program.

>> Thank you for offering to share your resources because I'm sure it's very appreciated by the other counties.

Can I ask one more question before going on? Bridgett -- unless you don't want me to ask a question.

>> No, no.

>> I was curious with the power of story-telling, if you have an example of a circumstance where the kind of process that you were talking about with evaluation really made a difference from going from a problem to a solution that had -- you know, you talk about short term, medium term, long term. Do you have an example where you can just share -- and I'm sorry. If you don't, we'll go to audience questions.

>> So I have a kind of story.

>> Stories are good. You can make it up.

>> We just talked about good data all day. So it's not so much a story about me watching the process work through to address a specific solution, but I can tell you about conversations I've had about people -- with people who have used it.

So one of the things that I and my colleagues at Auburn do in our work with the Election Center is we spend a lot of time talking to election officials from around the country about challenges they are facing and the ways in which they address them. And so what I have found -- this is like a half answer. So what I have found, though, when through some of the courses we present the logic model to them, the reaction tends to be very positive. So on the one hand, there's a lot of griping about, oh, another activity that I have to sit through and do. But then what I see is, when people actually sit down and think about what it is that they actually need to do and the resources they're going to need to commit and sort of what their actual outcome is, so just beyond the short term, we want people to vote, or beyond we want people to understand what a specific deadline is. But thinking about the

bigger picture of how election administration fits into this thing that we like to call democracy.

I've seen perhaps the biggest impact beyond that end, when people step outside of themselves and their specific circumstance and think about how their decisions impact their communities and states in the country more broadly. My non-answer.

>> That was a great non-answer.

>> Thank you.

>> Thank you again. Do I have time for audience questions? I can't actually see that far. Okay, great. Are there audience questions? No audience questions. Is there still chocolate?

>> One more thing. I just want to let you know in Arizona we don't have tornadoes, but we have rain, and I just wanted you to know, when it rains, that is our natural disaster. I was making notes here, and I said I've got to make sure to ask about tornadoes.

>> Great. We do actually have some audience questions. I'm sorry. Bright lights are a little blinding.

>> Hi, I'm Paris. I'm a consultant, and looking into what all of you are doing is so terrific. I'm a CPA from Wall Street originally. So there's some very interesting subjects going on here.

One of you brought up the question of precinct surveying, and I was wondering have any of you, since some of you in the audience who have already been on the dais have talked about setting up your e-mail structure with your clients and constituency, those of you like in Pennsylvania where you don't have that necessarily, that ability and stuff, how are you, all of you looking at communicating? And so many online tools are made for surveying and getting feedback. Are we looking into that as something that you're going to be rolling out? Are people rolling it out? Have they rolled it out? Are you clear on what I was talking about? I'm talking about, you talked about customer satisfaction. You talked about getting feedback as to what does the voter really need? You're kind of doing it in a paper way, I gathered, at the moment. But obviously an online monkey tool or something like that would be so efficient. Are we looking at that kind of communication for this industry?

>> For America, but we actually did utilize survey monkey. It's a unique name there. And we got positive feedback. We're rolling out something new, and we really wanted that. So we had the ability to know who's checked in. We go back to our voter registration, who has e-mails, who has texts, or given us a cell phone, and we responded in a short, brief five-question, and we're looking future forward

because we can build our psych book, and without having to go, and, again, not to bash third party vendors, but we can tweak this as much as we want without a cost to it. We're going to actually add. We need to slow down our check-in process. It's so fast that backlog. Starbucks, waiting for your caramel macchiato ballot kind of thing. We're going to have the process. Take a two-question, five-star. I know Don Palmer is not here. We're partnering with the bipartisan. We'll be able to do some line studies. Have people wear a badge, drop at the end of the line when you come in and help us service.

But all of that survey stuff, we're already doing now. I actually just got my text. How was my early voting experience? We've already implemented that text -- because I cast before I left. I should tell them how five star the director is. I'm kidding. Anyways, we're already implementing. I've seen this. I heard today on the text and the e-mail, so it's just more involved. At least in Maricopa, we are already looking at that survey structure.

>> In Chester County, we are not there yet frankly, but we are jealous, and we'd like to. We have the energy towards trying to understand those perspectives. In a data driven way, in addition to maybe the anecdotal comments that the general public may provide. I talked a little earlier about everyone's version of ten minutes is very different. So it's hard to chase that. But if we have the data and then maybe the additional anecdotal after that, that would, I think, give us a nice marriage of information. So not yet.

>> Other questions?

>> I'm Sarah Brennan. I'm an attorney with the voting rights project at the ACLU. I just had a general question. I was really interested in Maricopa County. When did you guys adopt the vote centers? And what are the parameters? Can you go anywhere in the whole county to use any vote center? And I also noticed you mentioned on your slide you have realtime ballot printing capacity. This seems like such an efficiency to prevent people going to the wrong location. If you could also speak to how well it actually works. I know sometimes realtime ballot printing can be very time consuming, but, of course, it helps voters a great deal. So I'd be interested to know a little bit about what experience you guys have had with that specifically too.

>> We try not to speak to the ACLU. Actually, we work with Sarah. Sarah has been working with us. But as far as the process itself, all of our -- the vote centers we've been using theoretically for almost a decade with early voting. It's been a vote anywhere. Early voting, we had ballot on demand. The ballot on demand system we had took eight minutes to print a ballot. But it was low turnout. So just literally in January 1 of 2017 when we got a new model of ballot on demand

we could do it in 30 seconds or less. That's what we began saying with that kind of ability, that we can offer this. So we added that to an election day environment for local.

I will say that Arizona still has a statute that doesn't allow for a vote anywhere on election day for a federal election. So in 2018 we are going to be running a hybrid. Are there any Arizona legislators in here? Well, those -- no, I'm just kidding. This is national. I'm sorry. But the fact is it takes a lot of data, data to prove your process. So we have done this through local elections. Some of the numbers you saw were vote anywhere local election November, a million voters, but still it was not a full statewide or federal election.

This election, they have allowed us to run a hybrid, meaning we'll have precinct based consolidated locations that we won't call vote centers. There's two precincts showing up to one location. That's how we're -- not skirting the law. That's not the right way to say that. We don't fix elections. But we're consolidating locations for this 2018 to do a hybrid, and we'll have 40 locations that will be vote anywhere, but we're advertising that, if you go there, they're not precinct based. So we're doing a happy medium.

Right now you're correct. The numbers you saw there why for a vote center for all our locals, and this '18 will be hybrid.

>> Asking as a good model to promote to other states. 30 seconds, that's fabulous. That's such a great efficiency, and I'm actually fascinated. That's great you guys are doing a model so you will get good data to promote perhaps a legislative change.

>> And that's the beauty of this data summit. We're going to draw this data to -- I even talked with Amber about her great infographics she does. We're going to rob her graphics folks, and we need to promote this a better way to our legislature to say this is what the data shows is where we want to go.

>> Is there one more question? Yes, looks like over here.

>> Well, what I wanted to ask, the whole issue of evaluation, can that be used to also verify that a voter voted the way they wanted to vote, that votes can't be changed afterwards? Like is there a process to track that? That's one of my main concerns, with the evaluation process, especially with what was spoken of today, will that help to verify that the election is true and honest?

>> You want to answer that?

>> I'll answer that. That's exactly what the audit does. That's exactly what the risk limiting audit does. Actually, it's looking at two things, right? It's making sure the voting equipment operated the way that it was programmed to operate. So did it tabulate the ballot the way the ballot was marked? The

interesting thing we found throughout the process it didn't just validate the polling equipment, but it also validated our training of poll workers and election judges in adjudicating voter intent. That's really critical, especially to what you were speaking about.

If a voter marks a ballot, and let's assume they don't mark it exactly the way the instructions provide. They make a mistake or they overvote a race or some other situation happens that it would require a set of election judges or poll workers to evaluate that or make a decision. The audit verifies that was done correctly. One thing that's really important, I think, is for states to think about adopting uniform voter intent guidelines. It's really helpful. So that county by county, we're not making different decisions on what is a correctly marked ballot. But, yes, the audit verifies both of those.

>> If I may just add, in front of that, similar to a ballot status or ballot trace, some of that lends credibility to say, yeah, your ballot has been received. It's in process. My next e-mail or text will be your ballot has been verified and counted. Now an audit then says we've done logic and actually had it counted. So you've got a lot of front end for the individuals when we start rolling these out and people start robbing and duplicating some of this text process and e-mail process that soon will be standard, I think, with all of our election folks.

>> Great. Thank you so much. What great questions. And even better answers. So thank you very much to this panel. That will conclude the panel. I'd like to introduce closing remarks will be given by vice-chair Christy McCormick.

>> So thank you all for staying through. Those of you who have stayed are the ones who need the most therapy on your OCD disorder. But let me offer my sincere thanks to the Community College of Philadelphia for hosting us here today. They are very generous with their space. We thank them for that. Acting Secretary Robert Torres and our partners at the Pennsylvania Department of State, especially Jess Meyer and Mike Moser, who dedicated countless hours to making this possible and your microphone folks as well. I want to thank EAC staff, especially David and Natalie and who else is here? Brenda, Brian, so many folks on our team helped put this together, and I just want to thank you for all your hard work on that.

I want to thank all of our moderators and panelists for spending the time they did to put their presentations together. We appreciate their time and commitment and their expertise and contributions to today's discussions.

And all of our audience members, including those of you who followed online today. Thank you so much. Henry and your IT folks back there too. Thank you so much.

Let me also invite you all to check out the EAC's website to learn more about our recent and upcoming research and data initiative, including the 2018 election administration and voting survey. There were hard copies back there. I don't know if there are still any left there. You can find this information on the EAC.gov website under the research and data tab as well as on our blog.

Lastly, I want to invite you all to another event that we have in the works for later this month on Tuesday, July 24th, in Washington, D.C. I think it's at the Newseum. We are hosting the third annual language access for voters summit, which is being organized in partnership with Arizona State University's pastor center and the democracy fund's voice. This will convene election officials and language community representatives to discuss how election officials can meet their language assistance requirements under the voting rights act and better serve their voters with language needs.

So with that, I just want to thank you all for spending your day with us. I hope you found this to be educational and generate some innovative ideas, and we look forward to our next election data summit. Thanks so much.

[APPLAUSE]