



the Presidential Commission
on Election Administration



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Public Meeting

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[Music]

>> Can we take our seats please so we can begin the morning, or the balance of the morning program, please?

>> Co-Chair Bauer: Thank you very much for coming this morning. And we're now going to have a conversation about the future of technology but we have some very specific questions and very specific goals. And for a description of that, I'm going to turn it over to my co-chair, Commissioner Ginsberg.

>> Co-Chair Ginsberg: Thank you, Mr. Bauer, or Commissioner Bauer. Welcome everyone. And thank you very much. As we've gone around the country, we have been overwhelmed with the comments from election administrators at all levels about the challenges they face with technology in the future. So we appreciate all of you in the industry coming to join us. And we have some very specific requests to make of you, which is, we really do want to talk about the future of technology. We all know you have wonderful, wonderful, products. We've had the opportunity to see them all. So we're not interested in the specific products you have now. We are interested in looking to the future and answering the questions, what jurisdictions with limited budgets will be able to do with their machines as those machines get increasingly older. And so we would very much appreciate your thoughts about technology in the future because there are many of you, and we do want to have a robust discussion over the course of the day. We would ask you to limit your remarks to five minutes per company. We'll be a little dogmatic about enforcing all of that. But again, we look forward to what each of you has to tell us about the future of the companies. So with that, why don't we dive right in and Professor Gilbert, would you please begin?

>> Juan Gilbert: Okay, I'll begin with saying that I'm not a vendor. We've created a technology called Prime III that brings me here today. So I appreciate you all having me here. With respect to the future of technology and voting, from my perspective, I have basically three areas that I'll comment on briefly. One will be, I do think we will see a shift, and we're starting to see this now, in design of voting technologies towards what I call a universal design, meaning the notion that we previously have seen of having an accessible machine and then a machine for everyone else. I think that is going to go away in the future in voting. That we're moving towards a uniform machine that has accessible features that can be used any time. So that's my first comment. Then the second area, we saw this in the presidential election, and I think it had something to do with you all being here, is the time it takes to vote and voting lines. I think we're going to see an insurgence of technology created to address voting lines and voting times. We've done research in this area. And we know there are certain methods and things you can do to address voting times and voting lines. So I think there'll innovations and new technologies put into this area. And then the last area I think voting technology we're going to see advances in in the future, in innovation, I do think with respect to UOCAVA voters, voters overseas. There's been this issue of security and voting, Internet voting, which I agree with. Meaning that I don't think it's possible to submit a ballot using today's technology securely back in the method that most people think of when you say Internet voting. However, I think you can submit a ballot in a different way and having a physical ballot being created on the other end in real time. So I think there will be advances in Internet voting, but it won't be in the traditional sense of submitting a ballot like I go in and submit something for my checking account. I think it's going to be a more interactive experience. And again, we've done research in this area and prototyping that suggests it can be done securely, meaning you can't change the outcome of an election undetectably or change someone's ballot undetectably. So those are the three areas I think we'll see advancements in with respect to innovations in technology and voting in the future.

>> Sorry. I was late. Thank you for having us here today. I think the work that you're doing is really exciting. As I look through the mission that you have and the problems you're trying to solve, they're the same missions -- it's the same mission and the same problems that everyone counts has been trying to solve for over a decade. And we think we've made a good progress. So I'll share with you a little bit about some of the concepts that we think make the most sense. When you look at improving

election administration, one of the key things obviously is process. But technology is now available and has been in other industries for decades that can help improve those processes and add auditability, security, accessibility and, frankly, simplicity to the processes. Elections, we believe, are one of the most mission-critical and important business processes in the world. And in fact, business process improvement has been done, as I said, for decades in other industries. So we think that one of the key things is to not think about manual and paper processes as stand-alone. To not think about voting systems or poll books or election management systems as one-off products. Purpose-built hardware isn't used in any other industry except maybe airlines. And that's still backed up by software. And it's the software that makes it work. So, what you can get today because of technology really is perpetually state-of-the-art systems. If HAVA were to be funded again, then what everyone would worry about is what do we do in five years, because 13 years after HAVA, or 10 years after HAVA most things purchased have reached their life expectancy, in 10 years. Not just the hardware, but the software. When you build something once and expect to use it again and again and again, it begins to become antiquated, not just because processes get changed, but because technology advances. There are systems in use today, voting registration, election administration, that aren't compatible with today's operating systems. So some election officials can't buy new PCs because their systems aren't compatible on anything more advanced than Windows XP. So this isn't something that we think about just with voting machines. It's something you have to think about across the board. So a software's a service model, whether it's for voting, for registration, whether it's for poll book or auditing and tabulation, is really important. As I was saying, if HAVA were to be funded again, it could buy something that can be perpetually state-of-the-art. So in three years, it isn't going to be broken. So you can use a software-based voting system anywhere, as some of you saw when you came into our room. A voting machine today could be an iPad, an Android tablet or a PC or your mobile device. You don't have to have long lines where people in states that can't vote early have to go in and mark a 20-page ballot while 70 people are standing behind them, or 700 people. Instead, you can use express voting. You can vote on your table, a QR code can let you go into the express voting line, and suddenly your ballot is there and submitted instead of having to wait. So if you think about what could be done today, think about what you are doing every day with all of your other systems and services. And one thing I would also suggest is in thinking through what to make a recommendation on going forward, I think it's important that we actually have the hard but important conversation about what we accept and what we want. Because we can all sit here and have a paper versus electronic debate, but the reality is we all know this can be hacked by anybody. And some good electronic things are harder to be hacked. But we have to decide if we're going to have the conversation that is everything we do now is just fine, or actually it's not. It's just familiar. And it's really important to make the decision in advance if you're going to accept that what we do is good enough or not. If you're not, talk about what could be and what is happening everywhere else. If you are, at least acknowledge, we know it's not good but we're going to pretend it is. Thank you very much.

>> Dan Nolan: Good morning commissioners. Thank you very much for this opportunity. And I want to follow on with those comments is how we think about our history, but how we look to the future. You know, throughout our history there's been a slow but deliberate evolution in who was allowed the franchise and the methods by which they could make their voices heard. As populations become more diverse and dispersed, it became necessary to find ways for voters to cast their ballots remotely. The first absentee voters were Union soldiers during the Civil War who were allowed to vote by proxy through the mail. But absentee voting by mail wasn't generally adopted until about 1963. This is an indication of how slowly technology, voting technology changes, and should. And that remained true until November of 2000 and the presidential election in Florida. That near statistical tie and subsequent difficulty in recounting punch machine ballots led to the passage of HAVA. And that law required the replacement of those punch card machines with new technologies, either direct recording, electronic systems or paper-based systems that scanned the electronic ballot. This required expenditures of millions of dollars across the country. And for the then newly chartered Election Assistance Commission, to establish the standards to certify those voting machines. This has been a very successful process of those

past 13 years. But now we're seeing the end of that and where we need to go. Now, as was just previously discussed, there've been some great advances in the opportunities for things like Internet voting, online voting. But a few scientists have spoken up questioning the security of a voting system that involves a home computer, transmission over the Internet and tabulation by election officials. The claims of insecurity were picked up by the media and the government agencies and used as an example of why online voting cannot be pursued. The International Foundation for Electoral Systems identified the greatest threats to integrity of electoral systems as systemic manipulation, electoral malpractice and fraud. By far, IFES found that the most likely of these was electoral malpractice, just human error in the electoral system. Essentially, human error in any system is most likely the cause of bad outcomes. Fraud is far less likely. In the U.S. between 2002 and 2005 hundreds of millions of votes were cast. In that same period, there were 95 cases of fraud prosecuted, with only five instances of multiple voting resulting in conviction. The human error in that period likely prevented millions from having their voices heard. The fear of the remote possibility of fraud is being used to allow the probability of electoral malpractice to proliferate. There has to be a better way. This commission was chartered to examine and propagate best practices in election administration. This presumes that the current practices are adequate to meet the needs of a dynamic population. And if we could just skim the cream, then all elections administrator's practices would improve. The impetus for this, of course, was the report of long lines at the polling place in election 2012. According to Professor Stewart's survey of Performance for American Elections, the nation's average waiting time on 6 November was only 13 minutes. That being said, when 105 million people waiting 13 minutes each equates to about a half billion dollars in lost productivity to the nation. There has to be a better way. And [inaudible] information indicates that the primary cause of the delays in voting were problems with check in at the polling place, and in some states unusually long ballots. Lengthy ballots are a challenge imposed by legislatures. And they can be the solutions. The proximate cause of check in problems are errors in voter registration databases caused by poor handwriting on paper registration forms, poor transcription of the forms into the database, and a lack of data in the paper-based poll books. The solutions are straightforward. Online voter registration eliminates most of the transcription errors, and electronic poll books allow each polling place to have the full VR database to best direct votes. Still, our practice to conduct elections on a single day for a fixed number of hours. The introduction of mail and absentee ballots in '63 and early voting after the turn of this century, has done much to distribute the volume of voting through these other mechanisms. Today we're seeing nearly 50% or greater electoral exercising a non-election day option. That is that better way. The last version of UOCAVA and the MOVE Act, signed by the President in 2009 authorized UOCAVA voters to receive their ballots electronically. Based on the experience of serving their military and overseas voters, the state of Alaska implemented electronic ballot delivery, on-screen marking, electronic ballot return protocol for all of their voters. The files are converted to paper at the election office upon return, and then tabulated. Long lines in Alaska in November are not just a bad idea, they're potentially fatal. Other states have implemented versions of this for their UOCAVA voters and the expansion to the rest of the population seems forthcoming, just as Maryland has done. Cash-strapped states across the country are facing enormous financial investments in new voting technology and because of a lack of legislation, bureaucratic inertia and purveyors of fear and uncertainty, we're trapped in legacy technologies. In some cases, such as the city of New York, we're taking steps back to lever machines. There is a better way. The state of Alaska has found a way to make ballots available at the speed of light to all voters via a secure system that eliminates residual votes, protects anonymity, and provides a verifiable paper trail to include scannable ballots while reducing congestion at polling places by never leaving the comfort of home and hearth. This is a current best practice, and the better way. Thank you.

>> Good morning. My name is Kathy Rogers. I'm a Senior Vice-President of Government Affairs for Election Systems and Software. I'm joined here today by my colleague Ken Carbullido, who's Senior Vice-President of Innovation. We may share this microphone at some point. Thank you to the members of the commission for the invitation to be here today and for the opportunity that you provided to the vendor community to comment on the future of voting. Following the November 2012 presidential election,

much has been said about the future of voting. Very little, however, has been said as to exactly when is this future that we speak of. While development testing and certification have a defining impact on the availability of new technology, it really is market needs which serve as the ultimate driver. When will the bulk of today's systems require replacements or upgrades? For some, that time is right now. For others, it's post 2016. For those jurisdictions who replaced systems in recent years, their replacement could be 12 years or more away. So in truth, there are really three future scenarios. There's the future today, the future in four years, and the future after the turn of the decade. So how do we as providers of these voting systems address a future that essentially begins today and yet must be adaptable enough to bridge to tomorrow? The first [inaudible] that's flexibility coupled with experience and capability. Not every state, much less any jurisdiction will require the same configuration of voting systems. Unique geographical voting trends across the nation are emerging with greater speed in the last ten years than was experienced in the last three decades. One size of voting technology has never fit all in this country. And it's very doubtful that it will for some time. Providers of future voting systems, whether that future is today, post 2016 or somewhere in the next decade and beyond, must be able to provide end-to-end technology capable of interfacing seamlessly with all facets of voting market trends. Now that we've discussed this future that we speak of, let's focus on what users tell us they'll require when they select that future voting system. Inevitably you will hear customers, manufacturers, academics and many people at this table speak of systems which should be transparent, secure, auditable, interoperable, diverse and sustainable. Well, we believe those aren't really system requirements. Those are actually system necessities. So if all of those requirements are considered baseline necessities, what does the future voting system really look like? That answer is as easy as it is complex. Many jurisdictions will continue to require purpose-built hardware designed to serve the traditional polling location. Others will require central scan solutions designed to count mail-in ballots. Many will require far less hardware in the future and they'll begin to rely more fully on systems which send blank ballots via an electronic means. Some jurisdictions will completely depart from traditional voting and they'll seek systems which allow voters to make their selections at home and then bring those selections to the poll, perhaps via a mobile phone or some other device with bar code capability. In the future, pre-printed ballots may soon be as forgotten as those printed checks that you once carried in your wallet. Regardless of the form of voting, all future technology must be capable of rapid throughput, employ uncomplicated and basic interfaces for voters and provide low maintenance for those jurisdictions who own them. Today's future has already shown us that voting technology will required to utilize multiple channels to meet the needs of any voter in any given place or time. The key to success will be the ability for an elections provider to bring these multiple channels of voting into one seamless operation that's able to cover every voter from your polling place, traditional polling place voter, to the sight-impaired voter, to the voter in the war zone, to the voter who may have been displaced in his or her home due to disaster. Not only must a company be able to provide for every facet of voting, they must have the flexibility to quickly adapt to meet a jurisdiction's needs as they themselves transition from one trend to the next. At Election Systems and Software, all of our systems are developed with multi-channel voting in mind. An election provider can no longer simply be a purveyor of a product. But rather, they must understand the entire ecosystem of voting and provide systems that are flexible enough to bridge to the old channels of voting to the new ways of voting. Just like the voices of consumers that have played a bigger role in the creation and adoption of consumer products over the past 50 years, so too will the voices of election administrators and voters play a much bigger role in the creation and adoption of voting systems in the future. In short, this means that election providers must provide voters and election administrators far more choices than they do today with greater flexibility so that the very same goal that we've always had, accurate and protected tally of votes, can be achieved through a means that are convenient, user-friendly, trusted and secure. Basically this means better elections for everyone. Thank you.

>> [Inaudible].

>> Hi. My name is McDermot Coutts, the Director of Research and Development for Unisyn Voting Solutions. I actually do have a presentation that I was going to pop up here real quick, but in the interest time, there is only one slide. And let's get right to it. This is the responsibilities of a voting system and a voting system vendor. Accessibility, accuracy, auditability, reliability and security. None of these should be new to anybody standing in this room. But what we have to take a very close look at is how does technology apply to each of these items? It's always been a watch word of mine that technology itself does not solve a problem. Technology just applied willy-nilly will just make your problems show up faster. So what you need to do is take a good look at what your processes are and then apply technology to the process in order to make sure that you are improving the experience of both the voter and of the people who are running the election. So what does this mean for the actual future of voting? Well, first of all, one of the key items that we need to look at is certification. The certification provides a very important baseline in each one of these levels. Basically, what are your minimum requirements in order to be a solid voting system? Now after that, you have to start looking at what are the requirements of your different audiences? What are the requirements of a voter? What are the requirements of your election officials? The voter is going to require technology that they use every day. They're only going to be going into the polls one to five times a year. They need something that they're familiar with, something that they can use, something that they are going to understand intuitively. For the audience of the election officials, you're going to need -- they want speed, they want accuracy and they want to be able to audit the system clearly from end to end. So these are the areas that we're really focusing the technology on, but what the specific requirements are, those are still being developed. We're doing things today. We're doing things tomorrow. But this is the past, present and future of election technology. Now, we do have some additional challenges that are somewhat unique to the voting industry. One of them is and these are things that the standards do not keep pace with technology. We're dealing with issues of hardware and with security. These are things that change every day. I can't get the same computer next week that I got last -- I can't get that today that I got last week. So how do we speed up process while still maintaining that solid baseline of requirements and standards that we have in accessibility, accuracy, auditability, reliability and security? Thank you.

>> Good morning. My name is Penelope Chester. I'm the Sales Projects Coordinator for Dominion Voting Systems. And I'm here with my colleague Ed Smith, Vice-President of Certification and Director of Supply Chain Management. And we'll be sharing the microphone this morning. If -- yes, thank you. Okay. So the last -- looking at the last three or four decades, the optical scan tabulator emerges as the longest-lasting, most trusted and effective voting technology. And even though our lives currently are increasingly digital and screen-based, perceived security issues with DRE systems, once thought to be the future of voting technology have supported the further development of optical scanners. Indeed, the VPAT requirement in many states brings us back to this need for a physical audit trail, which the paper ballot is. So in terms of future trends, Dominion believes that the same kinds of expectations which drive innovation in other industries, the demand for greater transparency and openness also applies to the future of our industry. For vendors, this will mean stronger than ever audit mechanisms, greater transparency and openness in the way we operate and in the way our systems work. Another trend which will drive our industry is the increased expectation of convenience through the diversification of voting channels. And in this context, we believe it's important to at least open the door on the Internet voting debate. There is now an entire generation of young people called Digital Natives. And while they may not be voting today, they will be voting soon and their expectations may be different than the current generation of voters. It's, in our view, counterproductive and an abdication of civic duty, actually, to ignore the subject and simply say no. Online ballot delivery, as other colleagues have remarked, has already been identified as the way forward in the context of UOCAVA. In addition, many countries, not all successfully, have begun testing, implementing and supporting the development of online voting. That said, as far as our company is concerned today, and as I mentioned previously, the optical scan tabulator will remain the key technology for the foreseeable future. In addition to the trends previously identified, transparency, openness and convenience, accessibility and designing

systems with accessibility in mind has been a driving force for innovation and research and development in the industry and will remain so. As an example, as many of you have seen this morning, Dominion's Image Cast Evolution is the first all-in-one unit, which combines a tabulator and a ballot marking device allowing all voters to use the same machine and the same ballot regardless of their ability. As our population ages, and as our society seeks to mitigate the impact of all kinds of disabilities, vendors will need to continue to design systems to serve these needs. This means not just people with disabilities, not just people in a wheelchair or with vision problems. This also includes pregnant women, senior citizens, people with limited English language skills or people with limited literacy skills. Dominion believes that as far as accessibility is concerned, the future of voting technology includes the full realization of the HAVA mandate for privacy and independence in the voting process.

>> Good morning. I'd like to expand on some of the previous commenter's remarks and on -- I lost my slides. And on other comments around auditability. Auditability has become an increasing demand. People want to know that that optical scanner really read the ballot in the way that the voter intended. And indeed we see discrepancies when they're recounting canvassing situations. So we're seeing more of a movement to the digital scanners with their ability to take a full picture of the ballot and make those ballot images open to all candidates, campaigns, interested citizens as we've seen for instance in Humboldt County, California. That better trans -- excuse me -- better transparency. It's more open. Citizens can be more sure that the people who actually were declared the winners should indeed have been declared those winners. And furthermore, a related concept is software verification, ensuring that the units have the proper firmware. That nothing's been added, taken away, or modified. Same with the application software in use at election central. That once again, nothing's been added, modified, or taken away. Audit logs underlie the auditability. There's much better logging due to efforts of the EAC in recent years to enhance what we see in the 2005 [inaudible] and certainly what you saw from the 2002 FESS. What we do see as a future trend is a consolidation merging worked through the common data format. There's some folks here associated with that effort, to bring audit logs to a common data standard so that interested citizens, candidates, campaigns, can better access those logs and make use of them. So in conclusion, we've heard a lot about technology. We've heard a lot about process as well. You on the commission especially, and those need to be married up and both areas need improvements. Vendors have responded to market needs in the past, and we're going to continue. I'm not going to belabor that. My colleagues have already spoken to those in detail. We do see some needs for the common data format work to continue and go forward to aid the technology. And we're just going to see nothing but more increased scrutiny of the systems. And so they have to be more transparent. We see that as a trend as well. And one thing that my colleague Penelope pointed out to me --

>> We are going to run a little short on time, if you want to [inaudible].

>> I'm on my last sentence. Thank you sir. -- is that many industries are affected by game changers that came completely out of the blue from unrelated industries and technologies. What does that look like for elections, for election administration, the technology and the processes? Thank you.

>> Good morning. My name is Eddie Perez. I want to thank Mr. Bauer and Mr. Ginsberg and the full commission for the invitation to be here today. And as my slide presentation is coming up, I'll just -- my disclaimer is my comments this morning are really going to be particularly on the demand side of what we see as far as expectations in future technologies. So what I talk about might sound a little more abstract, but I'm going to run through this quickly. So those of you that have heard talk before, we are trying to take a very disciplined human-centered design approach to our new voting system. We have identified and we're very serious about focusing on three specific values, which are usability, and adaptability and transparency as far as what we think future technology demands. Today what I want to do, though, is I actually want to advance that discussion. Because another really, really critical part of thinking about human-centered design is the fact that it's going to change. If there's one thing that we can say about human beings it's that they are restless,

they are creative, they are demanding and they're always inventing new things. And some of them are truly revolutionary. So the first thing I want to say as far as the approach is that when we think about the proper approach to future technology, human-centered design is not only focusing on these three core values of: Is it easy? Will it last a long time? And is my system working correctly and how do I know? But again, we need to assume that humans are going to be fickle and they're going to be creative. And that's part of our challenge to try to get ready for. So let's turn, then, if that's the approach, to the solutions. The picture that I want to paint here is one of going from a kind of point to point more static way of thinking about voting and the election experience to something much more robust. It's a little bit like going from the model of a brick and mortar retail store versus the dynamism of a connected Worldwide Web. Up on the screen, this is the way a lot of people think of voting today. I go to the library. I'm going to pick a paper ballot or I'm going to vote on an electronic machine. I cast my ballot. The end. And what I posit that in the future, more and more people are going to think about the overall election experience in a way that looks something like this, which I call a kind of many-to-many, what's been so revolutionary about the Internet. The telephone was a point-to-point form of communication. Mass communication, radio and television is a one-to-many. Well, with the Internet, we suddenly have this proliferation of inputs, access points, incredible opportunities for participation. That's what's revolutionary. But what's even more revolutionary is this idea that emerged back in 1999 of this idea of an Internet of things. And what I mean by that, and I don't want to take it too literally, don't get hung up on the idea of Internet, it's that the many-to-many connections and the way that people expect it today, it's not just computer-computer. It's to-device-to-device. It's people with their Smart phones talking to their cars and getting online to get their voter service information and so forth. So this is the vision of this idea of an Internet of things, any time, anywhere by anything. Today, so much of the industry and the way we think about voting looks something like this. But it seems to me when you crowd source and you ask people what do they want in elections and in voting in the future, it looks a lot more like this. When they think about public services, they're thinking about a level of connectivity and access points that's far beyond anything we've done. So this is the idea of many-to-many. This is more participation on more devices with more modalities. That's what I mean about restlessness and creativity. When you have forward-thinking places like the International Foundation -- the Information Technology and Innovation Foundation or Los Angeles County doing open idea searches. If you just ask for the demand from people, what do you expect in elections? They're not talking about the brick and mortar place. They're talking about online voting. They're talking about the things my colleagues have mentioned, downloading a ballot from the comfort of your home. Using familiar, accessible technology. They're talking about mobile [inaudible] and so forth. This is the idea of many-to-many. And I think an important way to translate it, I started with the values of usability, adaptability and transparency. Those words in another way, usability is access; adaptability is innovation; and transparency is openness. Those three values, I think, is fundamentally the direction in which our solutions need to be going. And those are complementary with everything you hear about government 2.0. So if that's the approach and that's the solution, what are the obstacles? And then I'm just about done. As my colleague from Unisyn pointed out, one of the biggest challenges is that our standards and our institutions are not keeping up with the pace of change. So the first thing we're going to need to do is to get the standards in line with the innovation. This diversity of choices and this demand for more devices and so forth is sometimes in conflict with a flattening thrust of the standards. The fact of the matter is having more requirements that are more complex that are more costly and that take a long time, that drives in a direction of fewer configurations, not many. The second issue is, we need to get our laws in line with the innovation. Laws across the country in these 50 states, it's up to those legislators to decide the extent to which they're going to support, restrict or complicate these questions. It has to do with changing outdated, unusable ballot designs. Questions about voter access, registration, who gets an absentee ballot and so forth. And finally, right-sizing the technology is going to continue to be a challenge for us as manufacturers. One of the hardest things to commercialize a system is the tradeoff among all the values, access, convenience, security, cost. You name it. So in conclusion, we have four specific recommendations. As a manufacturer,

they not surprisingly speak to the standards. I want to acknowledge. There's a lot of really good work going on in this area today. There are ways that people are trying -

[Silence]

>> Thank you very much. We'll begin. I apologize for the delay with the afternoon session here. We have some very distinguished election officials and others who will be providing testimony over the course of the afternoon. But, I think we'll begin now and I think probably the order we'll follow here just essentially because it appears as such on the agenda is to begin with Matt Masterson.

>> Thank you Chairman Bauer, Chairman Ginsberg and commissioners. I appreciate the opportunity and let me, I know I'm about five hours late, but welcome to the great state of Ohio. And thank you for coming.

>> Thank you.

>> We're just a sleepy little Midwestern state that no one really hears about in the elections world so.

>> That never came up once in my experience with the Obama campaign.

>> I didn't think it would, yea. So, I appreciate--

>> Try.

[Laughter]

>> I appreciate the opportunity to talk here today and I appreciate the fact that you all would come out to my hometown of Cincinnati, Ohio. I encourage everyone to get some Cincinnati style chili while you're there. It's wonderful. I want to take this brief moment just to talk about sort of the state of certification voting systems and impact on election officials. As it stands now, to try to tee up both what Kenneth and Dana are going to talk about as far as why they're moving the direction they're moving. Because I think if you understand the state of where we are now and the challenges for election officials now it kind of speaks directly to why Kenneth and Dana are looking to do what they're going to do. And the first is the voting systems. As we heard this morning our voting systems are a challenge right now. These are complex IT systems that are being asked to stretch much further than most IT systems would ever be asked to stretch. The systems have when well-maintained held up well, performed well. But, the reality is they're getting old and maintaining and sustaining them is becoming increasingly more expensive and challenging for election officials. The reality is, is that the cost of sustaining these systems both for big and especially for small jurisdictions is becoming untenable and they're being forced to look at new systems. Part of the frustration for many election officials right now is it's tough to find where those new systems are. We heard from the vendors this morning. It was encouraging to hear about the development, but the reality is you know the future is now. Election officials are inherently planners and desire the need to plan ahead particularly when talking about huge outlays of money and technology and changing the way that they do things. And the challenge now is it's impossible to plan for something that we haven't seen yet. We know about the concepts. We've seen some of the concepts and seen some of the systems that are proposed, but they're not through certification. Ohio is a state that requires DAC certification, which I'll touch on in just a minute, but they're not through certification and there's no availability. And so, as I get calls from counties about how to move forward the question becomes well, what are you looking to do and what's available? And right now it's very limited as to what they're looking at. And so, the question becomes how much longer can I stretch out the system? How much longer can I sustain this system? And in Ohio that's in the face of challenges with counties and budget and county commissioners. The reality is when looking at a county budget it's very tempting for county commissioners to want to cut things like system maintenance and system support on a voting system because to those county commissioners this is something that's used once or twice a year and then stored back you know somewhere

else taking up storage money, storage time. You know space for the county. And the question becomes what do we do with these voting systems and how do we keep them running. Election officials desire the state of the art, but in many cases can't acquire the state of the art and frankly don't know how to support the state of the art. And I think that's an important concept to talk about. We heard a lot of buzz words this morning that I think are really important, nimble, integration, multi-interfaced systems and those are all important concepts to us as election officials. But, the question is at what cost do those systems come about? Not only cost in dollars, but cost in procedures and process. And that's where I think we really need to challenge ourselves. This morning it was mentioned, Commissioner Thomas mentioned the fact that election officials now want to take ownership of their voting system and not just in the very real ownership sense, but ownership of the programming, ownership of the support, ownership of maintaining that system. And that means that election officials must be challenged to think of themselves as IT managers. And so, that begs the question, if an election official is an IT manager, what are the core competencies that that election official must have in order to support those systems? Because even with the voting systems we have today, which are complex systems as well, there's a simplicity to the fact that we talk about the voting system, the voter registration system. You know these peripherals that come about. If we're talking about integrating all of those things we're talking about integrating all of the data that goes into those things, all of the systems that go into those things. We have now created a level of complexity that's far beyond what we're working with now. And election officials in owning the process, in owning the systems need to begin and challenge themselves to think as IT managers and what exactly those competencies look like. And I think you know as far as the evolving landscape of elections and election officials that to me is the real changing dynamic because we can't, as election officials especially in a state like Ohio, do anything but own the issues with the systems, own the challenges with the systems and how to move forward. You can't get up there and say well, the vendor, the vendor. That's not an option. That's not okay or acceptable anymore and it shouldn't be.

[Silence]

[Turning pages]

Certification, as I mentioned Ohio requires certification. We had some conversation this morning, I think it's important to say that as a state that requires DAC certification our systems are better systems because of the AC certification. There are challenges with certification. There are issues with timing that I'll talk about in just a minute. But, it's extremely important that you hear that the certification process in whatever you know form it takes is a vital part of what Ohio does in running voting systems. It has improved the systems in the state of Ohio. With that said, it's important to understand the challenges with certification. The reality is the timeframes to deploy improvements to systems, so modifications to systems, are incredibly tight. If you start from Election Day in November, which doesn't even take into account the other election days throughout the course of the year and begin to work your way backwards to look at the time that it takes to certify the modification at DAC, the time that it takes to get the vendor in and certify the system here in Ohio and then deploy the system to whatever counties. In reality you're talking about a one maybe two month window in any given non-federal election year in a state like Ohio. That's the kind of window you're looking at for a modification for the state of Ohio. That's incredibly tight in attempting to sync up modifications or changes to our system with the DAC process is challenging because DAC has to deal with 50 different timeframes that people would like to sync up. And so, while it's frustrating and hard for us to deal with the reality is, is that election officials need to begin to take ownership of the certification process as well and begin to dictate timelines to the certifiers to make clear what our expectations are in order to get modifications fielded and systems improved. So, that's really what I have today. Hopefully it sets up what Kenneth and Dana are going to talk about, about the challenges they face and why they're headed that direction. I appreciate again the opportunity to speak to you.

>> Thank you very much, Mr. Bennett.

>> Thank you Commissioner Bauer and Commissioner Ginsberg. On behalf of Dean Logan, the Registrar of L.A. County for having us back here again to give testimony. I know Dean gave testimony in the Denver hearing. And in his testimony one of things he really focused on was improving the voter experience using an innovative voter center approach to designing and validating that experience. And so, I really wanted to come today to talk to you about that, about that process. One of the points that was made earlier, I'm going to try to touch on some of the things that I heard in the first session. One of the ones that really struck me though was Merle's comment about you know how-- you know other industries they crystalize what they do in terms of technology standards and implementation around a single goal. And it kind of occurred to me that what I was going to present today really jived well with that and that is, the single thing that everything that we do should be crystalized around is the voter. And if you think about the voter as the one element that gives confidence to what we do that legitimizes the election of new administrations, legitimizes the governments that govern us, then really it all comes down to that. There's a lot of discussion around the technology debate. We heard earlier there's a lot of discussion around the standards debate and you know how can we make this all work. But, what we realized early on back in 2008-2009 when our, we realized our system was at the end of the life and we needed, implemented a new system. But, what we saw was that first of all there was nothing out there in the marketplace that was really going to work for our county, Los Angeles County with its size and its complexity and its diversity. We saw that the regulatory environment was dysfunctional. We saw that trust and confidence in the voting systems were eroding. We saw that elections administration was becoming very politicized and polarized. And in this environment we realized that this wasn't just about implementing a voting system that met certain standards, that went through a certification process, that it was really about much more than that in that it was about the voter. And if the voter is as confident in the processes that we administer then fundamentally we're doing our job. So, at the beginning of the project rather than start off with requirements and try to figure out how we're going to you know get a system that works for our needs, we started out by just talking to the voters. We first held a symposium of voters in 2009. We conducted surveys of voters and poll workers. We held focus groups with many different demographic targeted groups of voters to get their understanding of what they felt about flexibility and accessibility and integrity and those values that we talk about. And then we started an innovative design process with IDEO. It's a global consultancy that focuses on design and innovation. And what we wanted to do was we really wanted to make the implementation process of a new voting system not about systems or about standards or about operations. What we wanted to do was understand what the voter needed. And in, so when we started off with IDEO one of the, well, let me back up here and just say that the process that IDEO uses is called empathetic design. And in that empathetic design they conduct interviews with voters and try to understand how they feel about processes or a product and try to really from that process glean insights and touch points about how the voter thinks about a product or a process. And they do this iteratively and from that they come up with ideas that will sort of lead to new concepts. And they go back to the voter and, or to the user, the intended audience and iterate through that and try to get closer and closer to something that really meets their needs. One of the things that came out that process was that far too much we focus on elections as kind of a linear journey that's disconnected. Where we bring voters into the process at a certain point before the election, try to give them as much information as they can and then they vote and then they disappear. One of the things that from the, our work with IDEO was really trying to see voting as a cyclical process, as a journey that's always happening. The voters always engaged and how can we, as election administrators think about, how do we keep the voter engaged in the democratic process especially in a world, and I think this was mentioned earlier by some of the vendors and the great work that they're doing, is that that landscape is changing. The voters have many different expectations now about what technology's going to be able to do for many different things. And they also have concerns about technology can do wrong. And so, we want to try to be able to engage the voter, understand the voter and provide tools and services for them that will continually reinforce their trust in the voting, excuse me, the elections administration process. So, one of the other findings of our work with IDEO was that the field research with the voters identified three different

types of what they call voter archetypes. One is community voters are voters who view the voting experience as a community building activity or as an opportunity to interact or bond with family members, friends and neighbors. There's impact voters who are motivated by a desire to have an impact on society and to know that their vote counts and their participation in the democratic process is meaningful. And there's convenience voters, voters who due to their work of their life so their personal needs seek convenience and flexibility in when and where and how they vote. And I think what we heard earlier today about the future of technology from the vendors, we heard a lot of these same kinds of needs echoed in some of the work in the findings that they do. But, so looking at the concept of a cyclical journey and the voter archetypes our work with IDEO came up with a blueprint for how to move forward with the implementation of a system that focused not just on the voting device, but also on tools and services that could be used to keep the voter engaged leading up to it, the preparatory types of services and also the tools and services to stay connected afterwards. So, we have findings that you know there might be tools and services for voters that might cluster along a preparatory spectrum of the voting experience such as voting early, voting anywhere, pre-marking a ballot on some type of a device that'll allow you to come in and just scan it. On the staying connected side there are tools and services that might help the impact voter such as providing audit reports online or being able to track your ballot all the way through the process, an anonymous ballot, but be able to track it and know where it is. The same way you track a package in a delivery. And then also for community voters ideas around Election Day and enabling voters to say, at least to let people know when and where they voted to share that experience that I voted experience on social media and then especially just rethinking the layout and the flow of the voter experience within the poll. So, this-- we are at a stage in the process where we're doing this type of work and coming up with designs for a system and we are working with a VSAP advisory committee, which is a body of community leaders and getting their input. These designs are going back out to the voter for validation and they will do that repeatedly. And we also are engaging with a very esteemed group of academics and technical people for our technical advisory committee, some of who are here today, to also validate some of the more technical aspects of the project. But, I guess what I'm trying to get at in a not so direct way is that the VSAP is a participatory project. It's a-- we feel that the only way to get through, get past or solve or resolve a lot of these issues that we face in terms of you know what is the right amount of standards. You know what is the right technology? You know what-- how do we handle the accessibility portion? How do we handle the paper versus electronic debate? I mean we can talk about that all day here. We're all professionals in this field and we in a certain way it's a profession for a professions sake if we don't keep the voter involved in that process. So, we feel that, we don't know where the VSAP is going to end up in terms of how we ultimately implement the system. That's a process that's going to happen as we go forward. But, we feel that if we are continually validating what it is that we're trying to do through engagement with voters, through engagement with other stakeholders and having an open transparent participatory process that we will be able to get past many of these issues. And it's not going to be easy. That was mentioned earlier. It's not going to be easy. But, we feel like that's the only way to come out successfully on the other side because in the end as I started out in the beginning. If the voter is confident in how we administer elections and believe me, I say that from the standpoint of someone who is you know on the ground on election night, staying up late dealing with many, many different types of issues that election administrators face. If we can gain the confidence of them then to a certain extent it doesn't really matter what the solution is. If the solution is building the trust and confidence of the voter in our process then that's what's successful. No amount of academic study or, you know, opining on you know from one stakeholder group or another is going to solve that. It really is a collective participatory process. And I would argue lastly in closing that as we're doing that we should be collecting data and letting data driven analysis, understanding what our voters want to really solve those issues. I mean we're not going to solve them around the table here very easily because many people here have particular viewpoints. So, I would say even with standards, things like determining what are valid standards? Maybe that's something that needs to be, to go out to the voters and collecting data on that so we understand really what is going to make the voter confident. I mean if it is-- if it ends up being electronic voting

then maybe that's what it ends up being. But again, I'm not, I'm not prescribing a solution. I'm just saying the process needs to be voter driven. So--

>> Thank you very much.

>> Thanks for your time.

>> Thank you.

>> Thank you. Dana DeBeauvoir.

[Inaudible background conversation]

>> Good afternoon Dana DeBeauvoir, Travis County and that's Austin, Texas. Commissioner Bauer, Commissioner Ginsberg thank you very much for the invitation to be here. I am honored to be among this august body. Let me just try to further some of the comments that my colleague Kenneth Bennett has offered you because I so agree. In fact, Dean Logan and I agree a lot on the circumstances that we both find ourselves in. So, I don't want to repeat what Kenneth has so eloquently pointed out. We do agree that the whole point, the whole point of us trying to develop a voting system that's better than what we have right now is for the benefit of the voter. What my ultimate hope for this group and for what your work might mean, especially sooner rather than later, is that we end up on the same path that I am on. And that perhaps a lot of people in this room who are conducting elections might end up on is that you are going, we are going to end up at the same intersection in your work. Your work to try to find ways to shorten lines and to speed up voter processing on Election Day, the various election days is exactly the same path I am on in trying to provide a better voting system for my community. Because the things that in a very complicated list of solution, the things that will make it easier and faster for voters to vote are the kinds of convenience issues, electronic solutions, device based solutions that you have been hearing about over the last several meetings. All are still, are also tied to the electronic solutions that are going to make that possible. The paper solutions that we seem to be reverting to right now that have come about because of the lack of progress in electronic voting partly because of standards, partly because of voter lack of confidence have caused us to go back to paper. But, that's going to be a temporary, even boomerang type of effect because the voter group is going to push us as you've heard from many other people today toward the kinds of programs and the kinds of delivery to our voters that's going to force electronic voting. You can't have a paper based system in any community of any size and offer vote centers and electronic-- and early voting and certainly not remote voting in a paper based system. Therefore, we are ultimately headed down the path if we want faster lines and better service to voting, to voters that offers some form of electronic voting. And if we're talking about electronic voting for the future we must be talking about something that voters can trust better. The minute we are all thrown into the environment where we're buying new voting systems the criticisms, the awful, terrible, rock throwing criticisms that many of us went through 10 years ago will resurface in a heartbeat. And I just don't want us, any of us to have to ever go through that again. There, when we very first were placed in the environment where we all adopted electronic voting there were a lot of us that were ill prepared, not experienced, not trained for how to handle electronic voting. So, there was a lot of fallout. There were a lot of us who had to rely on our vendors to provide that kind of support. There was a lot of, there were a lot of experts and officials who conduct elections who did not survive that criticism during that time period. They were left by the side of the road. Those of us who are left though and those of us who are still in this business are a lot smarter than we were back in 2006 or just a few years before that. And I think we can handle new and improved electronic voting systems in ways that our voters can come to trust. I think we will have to go through a whole new period of gaining their trust and proving that these systems work. So, which is why I think it's so important that the work that some of the academics are doing like Phillip Starke [assumed spelling] and like Josh Benilow [assumed spelling] in proving up in doing postelection audits and in comparing one on one the electronic vote to some kind of paper receipt or paper record is so very important. To get ya'll down the road to where you can say these are the kinds of things that would speed up

voting for voters is exactly the kind of thing that's going to be preparing us for the future when we take on more and more electronic voting. I also think that the improvements that we make in electronic voting now as we begin to rethink the kinds of proof that we need are going to put us into our next generation that's going to take us over into what we're going to need for internet voting. We can't use this internet for internet voting for the future. But, electronic voting that does answer these questions about security is the next step to take us there. So, ironically or in a good way our intersection where we need to provide ways for stronger proven elections to our electorate and better ways to treat them, while at the same time you're trying to find better ways to deal with lines and better ways to treat them. We are going to be hitting at exactly the same time and your problems in trying to answer that question are exactly my problems. I am so thrilled that we're having the opportunity to have this conversation. Now, in summary what I'd like to just say that it is extremely difficult to be a county, even granted the capital of the state of Texas and in a large urban area it is difficult to be on your own, a local jurisdiction trying to redesign, Atlas trying to hold up the world. And yet, like a lot of counties the only difference between me and maybe most elections administrators is I have a louder mouth with, as many people already know. We, I cannot wait around until you know God delivers me the answer. My jurisdiction will kick me out of office and who knows what would happen to us if I just sit around and wait for the answer to come. I have, I feel that it is my obligation as an elected official charged with taking care of these voters to push this to give them what they are asking for. And what they are asking for is convenience and faith and something a whole lot better than just trust. They need verified electronic voting. They want all the things that you want and that perhaps we should have delivered in electronic voting 10 years ago. We, you know, we know lessons learned. We now know. To get past the point where perhaps Travis County is going to be successful at going out and beating a whole new plow share election system so that we can have a whole new pathway that other people can follow. You know maybe we'll be successful at that. I really hope so. It's a scary path to walk. I'm going to continue to walk it no matter how many times my knees knock together because, not because it's fun. Not because of anything else, but because I have no choice. My jurisdiction is demanding differently from Dean's jurisdiction. Dean's jurisdiction is, Dean Logan, L.A. County, is demanding a process by which they can all feel like they can develop a new system for the future that they like. My jurisdiction is saying to me, we know what we want. We want electronic voting that has an auditable receipt that can prove up the electronic tally and we want it now. My goal is or my job is to deliver a system. Dean's is to include everybody in a process that will ultimately deliver a system. I have to put it on the table a whole lot faster. So, what I would suggest to you is I'm going to be looking very closely at what you come up with because I need help. I need support. I need guidance. I need for all of the elections administrators to also be talking about the fact that I'm not alone. Travis County is not the only jurisdiction that's running problems with a decaying or an aging system. I don't mean decaying heart, sorry, sorry, sorry wrong word, an aging system. There's nothing wrong with it. An aging system that ultimately is going to need to be replaced and a jurisdiction that is impatient, tapping their foot and wanting it to be done right now. I cannot quit and our demand for additional security is, I think, entirely appropriate. And I'm just so incredibly grateful for the broad, I mean you have some excellent people on this committee who do know what they're talking about. And I appreciate the opportunity for input and please not only wish me luck, but I would welcome your help and advice.

>> Well, we offer, at a minimum we offer you luck and--

>> Thank you.

>> We'll try to be helpful too. Co-Chair Ginsberg would you like to open this up?

>> I would be happy to. If I could, let me ask a somewhat direct and difficult question for our edification especially mine and Bob's as non-election administrators. We heard from the vendors this morning. Mr. Bennett you said you heard many common themes from what you're trying to achieve and what the vendors talked about. Yet, both of your jurisdictions found the current market lacking in

terms of what you could find. And Mr. Masterson, you advise many jurisdictions on how to proceed in this process. So, just to start if you would describe for us in sort of laymen's detail what you find lacking in the current offers on the market, the current systems on the market to help us sort of build up to where we would like to get in terms of talking about the future. Who wants to jump in first?

>> I'll attempt to answer that. Well, I mean on just, you know one of the simple answers to that is that Los Angeles County is a very large jurisdiction. We have a large number of polling places. And the deployment process that we have to undergo and our custody control process that we have to manage really requires a system that is not one, does not involve a lot of heavy equipment, a lot of you know a lot of large equipment, difficult to handle. Also from the standpoint of process control, I don't know how to explain it, but you know when you have 100 precincts that you're managing on election night you have a lot more flexibility in what kind of products you can roll out. But, when you have 5000 precincts and every one of those has to be a vote, excuse me, a tally center it becomes very difficult because there's certain process controls you have to have in place to make sure that every vote gets, every ballot gets scanned. And you know that the poll workers are setting up the equipment correctly. And it's simple to use. And you know we have really, really big challenges with training. And it's, again it has more to do with the scale of our operation and not so much that we conceptually do anything different than anybody else. So, on the tally side we, you know and I think Dean throws these numbers out a lot so they're not new. But, you know in the 2008 election on election night we counted 2.5 million ballots in the span of five hours. And that was really, that span was really driven by, a lot by the time it takes for the ballots to get back to us. I mean we, so whatever voting system goes, that's deployed out in the polling place has to be integrated with a tally system that enables us to tally that quickly. I mean we have a huge volume that we have to tally. And so, we know that one of the values that we have in our county for process control and making sure that we do elections right, we do them accurately and correctly, we value a central tally system. So, whatever system is deployed out there has to also be compatible with that. And so, and the other issues that we have to face are with you know just the, what is the ballot? You know what, I mean again, for 100 precincts and you have a full face ballot with all the names of the candidates and contests on there. And even if it's multipage it's something that you can deal with. But, when you're dealing with, 2008 it was four million ballots. You know right now we have a ballot that's very, it's the old, its optical scan but it's basically the old punch card ballot. It's a 312, IBM 312 format ballot. It's small, easy to handle, very compact. When we talk about going to a new voting system, well how do we handle that? There's so many sort of technical questions that, I know that the vendors are out there exploring. And I'm not, so it's not say that you know the vendors can't do it. That's not what we're saying. What we're saying is that right now it's not there. But, in our turning to the voters to really understand what it is that we want to do, what it is that we value, it tells us that what's there is not, it's not going to be sufficient to meet the principles that we have established in the, in our voting system assessment project. So, I don't know if that makes sense, but.

>> Sure.

>> Any other commissioners should certainly indicate any follow up questions they have. But, can you be and specifically sort of match up by voter expectation and by deficit in what's available? Can you be very concrete about that? If you were to sort of create a hierarchy of the expectations that matter most and the ways in which the current technological alternatives fall short of meeting those expectations could you state that with some specificity?

>> Well, I'll try. I mean you know I would say it just, I would say accessibility is the big issue.

>> Pardon me.

>> Accessibility is one of the key drivers, especially that last mile of getting, of you know sort of hands free casting a paper ballot. How do you do that? I think is

one of the key ones that poses a challenge. And I think it poses the challenges to what the vendors are doing right now. I know that Dominion has one that we looked at today, for example, that was, it looked really neat. But, in my mind when I look at that device and I try to imagine that device being in, you know deployed to 5000 polling places it's a little, even for us and we're used to it, it's a little bit mind boggling. So, but so it's really, it's kind of what we've been talking about already, this how do you merge accessibility requirements with the security requirements, which right now are telling us that we have to have a paper ballot, a verifiable paper ballot. And so, those two things combined with you know how that manifests itself in systems and is that system deployable in the county of Los Angeles? The basic answer is we don't think so right now. We're not saying it's not possible and we believe through the sort of innovative design approach that we're taking we think we're going to be able to arrive at concepts that will do that. I mean, you know the, I think it was Juan who said earlier, this is a challenge that we're willing to sort of step up to. I believe that technology will get there. It's just that, you know right now it's having some difficulty with issues of portability and modularity and how do we implement it in an environment like Los Angeles. It's, the county of Los Angeles is just, you know I know that's not probably as specific as you want it to be, but--

>> No, that--

>> That's helpful. And perhaps Miss DeBeauvoir and Mr. Masterson could add from their perspective their comments.

>> Yea and I'll try to be quick.

>> Go ahead.

>> But, I think the answer from talking to election officials and to be clear the systems now have done what we've asked them to do. And so, it's now, you know technology's moved forward and there's different expectations, right. And people walk in now and they say to themselves, why am I filling out a Scantron sheet, right. That was, you know I did that for the SAT. And so, there's challenges there. I think the answer specifically for you is integration and scalability. Right now the systems we have now right, wrong or indifferent if you buy a VR system and a voting system from the same vendor it's likely they won't communicate with each other, right. And that is the type of integration that at the time didn't, you know was what it was, but now it wouldn't be acceptable. We want our systems to be able to talk and share data with each other and integrate with other so that we have flexibility to then be scalable. So, what works for Cuyahoga County as far as size, scalability, what the voters expect, Morgan County where we have you know two part time director and deputy directors it's not the same system. It's just not fundamentally the same system. But, under you know HAVA and the purchases and the way certification and everything came about and how quickly the money flooded the market, they own the same system. They don't own as many of them, but they own the same system. And that lack of ability to scale the systems to what's necessary and useable for those jurisdictions in a state like Ohio is a big challenge. Having to deploy the systems in small counties that are used in the big counties isn't a reasonable expectation at times. There's got to be another more affordable, more easy to use way to do that and that's the kind of scalability and interoperability that I think needs to be out there.

[Silence]

>> Dana DeBeauvoir, Travis County Clerk. I am not a technical person. I've had to learn to put on that hat and wear it as best I can over the years. But, let me try to give you from just a layperson's perspective a, one answer that you can put in your notes and say this is one thing that is different today that we should be asking for today that we didn't have in the past, lesson learned. For example, one of the things that's going to be called for in Travis County's RFP to ask for better electronic voting. The things that we should have in the future is a new development called homomorphic encryption. Homomorphic encryption is a mathematical tool that allows you to prove up that, I'm going to do my best here, that what comes out of this system in

a ones and zeros mathematical way can be proven up. That what comes out of this system and then runs through another scanner and is produced over here then turns around and it gets matched up back later is, in fact, the same ones and zeros. Was that not too, bad?

>> It was a good start.

>> That's a good start. Listen, I get a C minus from Ravest. I'm completely thrilled, okay. Alright, if you could just take that little bit and let me compare that, homomorphic encryption little bit that you maybe got ahold of right there, with what was required in the past, we had nothing when electronic voting came out. The way you did security when you had electronic voting in the past was you reacted yourself with a procedure. In other words, the electronic voting systems that were given to us had, didn't have clear and clean code written. It was bit of a jumble. Some companies did better than others. Some were truly terrible and some were not too bad. But, nobody had beautiful clean code, nobody. You, for example, if you wanted to make sure that, one of things that you would hear about was that, oh well something could happen. That was heard a lot. Something could happen and it would flip all the votes. Some buried you know flip switch thing would change all the votes halfway through or it would change every 10th vote halfway through in the middle of the election and you wouldn't be able to catch it. And so, the answer to that to reassure your voters that that was not going to happen and in fact, everybody could sleep calmly because you knew that was not going to happen, was that you did what was called parallel monitoring. Well, parallel monitoring is a test that the election administrator does that tricks the system into thinking that it's in a real live polling place environment, when in fact, it is in a test environment. And you are watching and filming it. And you know if it messes up one ballot at the moment it occurs. Now, that's not the best in the world because you're still catching it after the fact. But, it is a powerful procedure for catching it at least at the time. How many people in the elections community had the wherewithal and the resources to conduct parallel monitoring, not very many. I did it. I did it. How many people even took seriously logic and accuracy testing? You know, those were all, those were the ways that you did with, that you dealt with security for your electronic voting system. We should have had security built into the systems in the first place, examples like homomorphic encryption, alright. Now, let me give you another. This abil, this 360 degree trying to defend against is unsustainable and not even really doable for an election administrator. Even when you try to do it there's always some other, you know bad guy's always going to think of some new trick for you and you're going to be turning around to 361st degree and trying to defend against that. It is a never ending losing battle. So, you know we have to give up on that approach and let the system have its own security built in. One of the best ways to do that is to say okay, VVPAT isn't really what we were looking for, but there is a way to have a piece of paper in there that verifies against that electronic ballot, especially if you include homomorphic encryption on top of it because the public isn't going to understand homomorphic encryption. I'm still working on it. But, they're going to understand that there is a receipt or some of kind of piece of paper. The difference that we're looking for here in the new systems is that it isn't batch to batch. It isn't grand total election sums to grand total paper sums. It is one ballot to one electronic ballot matched up in a way that's easy to find, which is what Phillip Stark's contribution to the field is, one on one ability to pull it out, okay. Big, big difference in security, alright. And then finally we failed to perhaps sell the best or make it clear about the best and the worst of electronic voting. With electronic voting the public relations or the public education part of it should have said, this is the very best thing for accuracy, for privacy, absolutely for accessibility, no doubt about it, and for speed of results. But, when it comes to dealing with transparency or dealing with recounts, not so good. We didn't make it clear that those, that that was the environment that we were in. Perhaps if we had done that voters would have gotten the idea that they're getting a whole lot of good stuff and they're sacrificing a couple of things over here and we need to deal with a couple of things over here. Not throw it all out in favor of something that's going to cut convenience for the future. Okay, that's good enough. Thank you.

>> Questions? Okay.

>> On a completely different note sort of, but not really I guess. We talk a lot about usability from the voters' perspective, which I think is of course, critical. But, you mentioned training. So, my question is we have to have systems that are useable for our poll workers, for our election officials that are in the smaller jurisdictions where they do this. It's one tenth of their job. So, twofold, one is for those of you who are creating your own system and you're talking about the usability are you taking into consideration the usability of how to set up the system, the interface with the actual workers? And how are you doing that? And what are the key elements that you're looking for so that it doesn't, as Professor Gilder said, get set up in the corner and left there because he will have difficulty setting it up or afraid of it. So, you know that's one aspect of it. And then, for Mr. Masterson because you're not creating your own system at this particular moment, at least that we are aware of. I know you're plotting to rule the world. But, when you look to purchase a system or recommend a system for the state is that an element that you take into consideration?

>> Okay, maybe I could start with this one. How do we know that our newly designed systems are going to be common sense and easy for our election judges in the polling places and in early voting be able to deal with it? Well, I think the number one thing you do is you count number of pieces. How many pieces of whatever you're using are going to go into a polling place? Once you start getting over two or three you've, you know you've maxed out what people can do. With the design, with STAR-Vote right now we're a little heavy on numbers of pieces. I'd like to see it shrunk down. The other thing is how much does it weigh and what are you going to put it in to carry it around? Real basic stuff and colors, color coded. The pink box plugs into the blue box.

>> Uh huh.

>> Very, you know and it sounds even condescending. It is not. It's about being error free when we know, what was it Juan told us, that or no I'm sorry. It was probably Kathy that told us that error is the-- personal error, human error is the number one problem even in international elections. The other thing too is that I, you know I think when you're looking at a final design it should be, there should be an elegant flow to the way voters you know go through a polling place. It, you know there shouldn't be any stumbles or backflows or anything if you can avoid it. And yet, every single procedure that we do has a backflow in every single thing. You're always going back to a reader or going back to a something or allowing a spoiled ballot. So, you know you're trying to design an elegant stream through everything and yet you have to allow for the backup. So, those are some of the things to consider, very, very simple and yet difficult to implement.

>> Yea. I mean we, you know the part, there is one of the principles that we developed early on in the project in working with our VSAP advisory committee. And some of the research that we did was the need for portability, the simplicity of setup. Also other things related to that sort of the boot up of the system. I mean there's certain things about systems that will throw a poll worker because it's, their expecting because they, when they turn on their phone it comes up in a matter of seconds. But, when they turn on the voting system and you know the voting device in the polling place and it's sitting there doing its thing and you know and then they call in and say this thing's broken. And actually it's not. It's just or the screen's been turned off. So, there's other you know sort of aspects to it that can really throw the voters. But, I mean I would just echo what Dana said. You know its simplicity, the simplicity of the setup, the portability, the compactness. In L.A. County we use a distribution model, which is called the inspector supply pick up where rather than have to manage you know truck routing throughout the county, which is really complex. And you know it's just hard to do. Ask anybody from FedEx. It's hard to do that kind of stuff, USPS. So, we abandoned that model quite a while ago and found that by paying a stipend to the poll worker if they came and picked it up that was much more effective in getting the materials out there. But, the problem was we were relying on them to come and pick it up. So, now you have a situation where you don't know what they're going to come with. They may come with a tiny little

compact or a little smart car and you go wow, how do they get all that equipment in there. I mean you know that's kind of extreme. But, those are the kinds of considerations that we have to take into account as well.

>> Thank you, Commissioner McGeehan and then Commissioner Grayson.

>> Matt may have a response.

>> Oh, I'm sorry Matt. I apologize.

>> No problem.

>> I was just going to say yes and then just no. Absolutely the answer's yes. And it's interesting as technology and society has become more mobile dependent the expectation for that portability has become even more expected, right. And so, your poll workers, your election officials you know they expect this. They expect the ease of use. I think there's an important kind of caveat to that in that, and I'm sorry I have a three year old and a six month old at home so now this is how I think. But, I love my stroller because all I have to do is pull it out and it un-flaps, right. It just pops right up, right. And that is an awesome thing for me as a parent. I can do it with one hand. And so, you know as nice as setting up an iPad and a printer and a this or a that and that may work for some jurisdictions, there is something very nice about just having the voting system that you can put there, roll it out, whatever and you're on your way. And there's an attractive kind of feature to that kind of hardware setup as well. And I think that's dependent on what the sophistication and knowledge of what the election official needs. And so, my recommendation Tammy is not one way or the other, but instead to push back on the election official that's looking at systems to say, what is your setup? What are your resources? What's your typical poll worker like, because we do have sophisticated counties that can do a variety of things right. And so, that's kind of the balance. That's why it isn't one size fits all as we all know. I mean that's how it goes.

>> I just had a couple of follow up questions for Dana. Two questions and one compliment. Let me give you the compliment first, so I don't forget. I just wanted to say Dana what a leader you have been in electronic voting. And yes she does bear the battle scars because it really was a very rough place to be in 2006 when all of a sudden we had all this scrutiny. Nobody understood these systems, yet the election officials had to defend it. And Dana you're a real leader to set up the best practices and procedures to try and safeguard that. So, I hear you loud and clear when you don't only want to rely on procedures to guarantee the security of the system. But, I was curious how the, this version of a VVPAT that you'll be creating, is that accessible? Are you going to deal with that a different way? And do you think that now that the DRE's are more improved and maybe the whole community has taken more account of security issues we don't want to overcorrect either. As Merle King was saying earlier what are our goals for a system? I was just curious how you're handling the accessibility.

>> Dana DeBeauvoir, Travis County Clerk. Sometimes I go into my daydream and fairyland and I think when we buy a new voting system that's fully electronic nobody's ever going to worry about the audit or rather the recount part again. Nobody's ever going to say anything again. And those old awful days of being you know death threats and all that awful stuff is never going to happen again. And maybe that's true, but I don't think so. I think that people still, I think there is some comfortableness with peoples' current voting systems. But, I also think that there's some, a little bit of fatigue and crying about the systems that they have. I think voters get it that we bought a system. Okay, we got to live with what we have right now. But, when it comes to buy a new one I think they're all going to say, okay. Then now give us what we've been asking for, for 10 years. I don't think there's going to be this let up that we sort of feel like maybe we're going to get right now because it doesn't feel like there's anybody screaming right now. I don't think that's going to last. I think they're going to come back even more so and say, we've learned even more. Why haven't you put it to use? Now, the accessibility issue about the paper, I want to find a better word for receipt. But, I'm going to use receipt for a little

while because it's just a quick way to get a handle on what we're talking about. The, all of the second chance voting that would have normally occurred with the DRE does occur in STAR-Vote. So, all of the get your second chance to make sure you've got it all correct happens and then it prints out just your choices, just the voters' selections. But, once that paper is printed out what the disability folks would teach me is that then has the right to be, to undergo second chance as well. So, the idea is that this would be a machine readable document that could then be put through either the station's reader that would then be an audio read back or the person's own portable reader that would audio read back the piece of paper. The one thing that we don't want to do and this is so germane to your piece of work is we don't want to have it at the ballot box where they're stopping at the ballot box to listen to it be read to them at the ballot box. We don't want, that'll pile up things at the ballot box. So, it's some separate other station and we also have to be careful that that doesn't run afoul of standards too because there's specific standards that call for that. But, the idea is that there would then be some second chance with the piece of paper and at both opportunities for second chance either electronic or paper receipt you could at either case spoil and start all over. Or, or and this is also important for accessibility and security. At both of those opportunities you would have the opportunity to challenge. Now, a challenge vote is a way to say I don't trust the system. I think it's lying. It's not like a spoiled ballot. It's a way of saying I want this ballot set aside. I don't want it to count as a vote, but I want it double checked later. That is also built into STAR-Vote a way to do a challenge. And it's, it will be, that'll be an extra security measure and really important for security and something that the general public participates in at the polling place on the spot, very powerful security message to the public. So, I hope that answers both your questions, thank you. And thanks for the good word. I appreciate that. You almost made me cry.

>> I've got two hopefully quick questions for Kenneth and Dana. One would be, and I realize you're both early in your process. You haven't issued RRP's, obviously you haven't gotten responses back. But, I'm curious, what's the feedback from the vendor community as to their interest and probably submitting an RRP. And you're, probably you Dana are further along where they probably have a general idea of what you're talking about. So, you may get a, you may have a more precise answer than you would in L.A. And the second would be we've been talking a lot about the delay in certifying patches or how that process doesn't really work. And I'm just curious and again maybe you don't have kind of fully thought of this though, because you're not quite there yet. How do the two systems that you created, or the approach to creating a system, how are you dealing with that? It might be interesting for us to hear that because that may help us answer how to, you know what's some advice to give on a larger redo of the standards or certification process.

>> Okay, let me let somebody else comment on the second part of your question and I'll take the first and third. The first is how are the vendors responding to our unusual position of asking for a system that does not exist and yet trying to stay within the bounds of standards now. At least as best we can.

>> Perfect, yes, yes.

>> It's not, but we're going to try--

>> Yes.

>> To stay as close as we can. It has changed. It has evolved. When we very first started this process two years ago starting with a citizens' panel, a rather large study group within Travis County of a variety of people the vendor community was not particularly warm to this idea just in a nutshell. And didn't particularly respect our effort to go this far. It is evolved from and through a couple of stages where vendors have said to me; oh we got 80 percent of what you want. To now, what I'm getting is more and more from vendors the realization on their part that it may not look like what they have in their inventory. But, that they do have the capability to offer an important contribution to this industry stepping forward and that they probably are looking at a collaboration. And I would say to them or I would say to

you about them is that they've, it's been a slow progress for them to come to that point because let's face it, they're, we're talking about their livelihoods and their income.

>> Right.

>> And them being able to predict and understand a revenue stream in this new world is a hard place for them to get to.

>> Uh huh.

>> And I think part of me pushing for them to get to that place is the recognition that their new revenue stream is coming from serving as integrators and people who can help do modifications for the future. No people who are collecting a software maintenance fee.

>> Yea.

>> So--

>> And that's for your, having it broken up into different modules helps with that I guess?

>> Yes.

>> Yea.

>> Yes it does. Yes it does. And the idea that if you had either open source of a common data format that then that allows it to go into other areas. But, just because they can pick that up either at no cost or virtually no cost doesn't mean you're done. If you're another jurisdiction you wanted to take the STAR-Votes, you know basic software and go use it yourself. You would still need to have a vendor and integrator to come along and customize it for yourself and built up the things that would fit your county and your state law. Well, it's ideal for the election companies who have been in that business for years to do that for you. So, I think they're beginning to see a new world for themselves that was perhaps not obvious to them two years ago. So--

>> That's good.

>> It's, yea, okay.

>> I mean that's a good answer and its good.

>> Yes. Yea, I hope it is because if we don't, because if we don't then I end up losing out on a whole lot, a wealth of experience and knowledge in a place where I'm not qualified to do this alone. I am not a vendor. I'm not a designer of these systems. And I need them to do this. But, I need them to be completely out of their box and out of their comfort zone. They cannot do this like they used to do this. And to the extent that they don't recognize that now they're staying in an old world that's probably dead by the time this system gets implemented in my opinion.

>> I would echo a lot of what Dana said. One of the things that was, that's maybe a little bit different is part of our voter engagement and our stakeholder engagement process. One of the values that came out of it, one of the principles in our general voting systems principles that we developed for the project was that we found that our voters were comforted by the fact that the system that we have is, and I'm talking about our InkaVote Plus System. So, the marking the ballots--

>> Yea.

>> And the tabulation system that it's owned by the county and that if we want to we can open that up for anybody to see. And there's a lot of interesting things that you

can do with your voter community with those out there that are concerned about transparency and integrity and things like you know opening up your source code on a public facing platform and allowing the people to do unit testing. There's a lot of things that you can do when you own it. And so, there was a general value that ownership of the system for a system that you know that manages elections and infers you know power to incoming administrations that was a good thing. So, it kind of changed the equation from, it changes the equation from the very beginning. But, I agree we don't see, I want to make that very clear and I think, I remember Merle and I talked about it briefly at the EAC meeting in January that you know we're not, we don't want to be a vendor. That's not what we want to do. What we want to do is drive the innovation process. We really see that the value that we can bring to it through this belief that through a voter oriented you know iterative design process that we can arrive at concepts that at some point will have to be built. And then when we get to that point there will, I mean there will be RFP processes that have to take place to build components and there will, the vendors will be involved at that point.

>> Uh huh.

>> We're not there yet because we know it's there. And we know that there's licensing issues that we have to deal with. I was talking with Joe Hall earlier about that. There's a lot of things that we'll need to think about. But, we do know that we want, the ownership is a value and you know obviously the innovation, the things that we need. You know we want to be able to drive that. But, it's not a, it's not necessarily us versus them. That's I think what we want to be clear about is that you know we're not in the business of being manufacturers. We're in the business of driving innovation.

>> Sure. And real quick just to jump in because I think your question about upgrading software is an important one. And it speaks to actually the concept of the election official as not only the system developer, but the system maintainer. So, your question was, how are you going to maintain your system? And that, and this is not all a critique on what either Kenneth or Dana are doing. But, that's a very real change for an election official now, right.

>> Yea, right.

>> And that has a lot of implications. And that's coming about not only in this area, but we have election officials creating their own e-poll books. And there's implications to the fact that you're not only designing this e-poll book, you have to maintain that e-poll book and what all goes into that. What's your staff look like? How does that work? And that is a fine approach. But, there are a lot of extra implications with something like that. And so, as election officials embark on this kind of ownership quest that's an important thing to keep in mind because it's not enough that you roll out the shiny new car, but then you got to make the car run for as long as you need it.

>> Thanks.

>> I just wanted to add to that that you know it goes back to that concept of integrator. I mean we're going to have relationships with vendors for support. If we have an integrator that helps us build the system, I would, I could see that person, like you said being there to manage that process. I don't think that would, I mean obviously we'll be involved if we own the system. But, there's a services oriented role now as opposed to a product manufacturing role.

>> Yea. I mean as I heard somebody this morning mention IBM and IBM used to make computers and they may actually still make some stuff, but they don't make computers anymore. But, they make a lot more money for the corporation because they provide that service, the consultant service, the management service and all that.

>>Okay, we'll close out now with a question for Commissioner Patrick.

>> I get the last word. I'm so happy. So, one of the questions that we've been struggling with and that we will need to discuss is how we provide our services to limited English proficiency voters. And so, this is mainly a question for Kenneth, but for Dana as well because the complexity of the ballot is no more complex than it is in Los Angeles County with 11 or 12 languages now, 12, 12 languages. And with the system that you're using currently you have the ability to provide that in a single market ballot in all of the different languages because the ballot itself really has no text on it or very little text. So, my question is, moving forward we've had conversation in some jurisdictions that have provided multilingual ballots, so not just bilingual, but multilingual and the challenges that that creates with an incredibly long, complex ballot. We've heard testimony that it's better for voters to have both English and the covered language side by side or at least on a single document. And we've also heard from some voter groups that they would prefer and many of the current systems you select the language and that's the ballot language of choice that you receive. But, some of them do allow for you to go back and forth between languages. So, as you're grappling with this new system with your situation what path are you taking? And what are your voters telling you that they would prefer if you've gotten to that conversation yet?

>> Well, I mean we haven't gotten into the details of that. I think that from a practical standpoint providing 12 languages on single ballot's obviously not a solution. On a, not on a paper ballot, but, and we have in some cases done, actually in certain elections we've felt compelled to do a true bilingual ballot. But, we don't normally do that. The ballot's usually in English and then we translate it in a sample ballot booklet so that people can see the ballot and all the other materials in a translation. You know what we're, what, and you know our, the designs that have, we've come up with so far, which are, which again they're first stage designs. And there'll be an iterative process and they will probably change. But, the design that we've come up for really focuses on the, an electronic interface. And so, I would say that one of the big benefits of an electronic interface for marking the ballot is precisely that, being able to give voters, all voters in a universal way the ability to select whatever language they want to see the ballot in. As far as paper ballots go, I would think that you know for vote by mail, for example, as long as that continues it's going to be a situation where the voters, we're going to want to innovate in the process by which we allow voters to specify what language they want to vote in. Making that process easier and getting that ballot out to them more quickly. It's again, and we're not going to be able to just produce a ballot with all of the languages on it and just send it to everybody. So, that's what we focus on is, and that's one of the big areas that we are focusing on in our department. And when we talk about innovation we're not just talking about on the voting system. We're trying to innovate everything about the voting experience including all of the pre-voting activities that voters do including being able to easily and intuitively to communicate with our department so that we know what language they want to vote in and being able to deliver the service so.

>> Okay, thank you very much. We'll take a 10 minute break and then return for the last panel and presentation. Thank you.

[Music]

>> Begin with that Brian Hancock from the AAC, Brian.

>> Thank you Co-Chairs Bauer and Ginsberg and commissioners. We certainly appreciate the opportunity the Election Commission has to testify before the Commission today. My testimony this afternoon is not going to focus particularly on the mechanics of conformity, assessment and product certification. But, I thought what I'd do instead is to provide a reminder, I guess, of some of the less well known aspects of our program that I think really add value to our program. We'll talk about that a little bit and I will finish off with a little bit of a discussion on where I see election technology going in the future. Our quality monitoring program is where I want to start. And that quality monitoring aspect of our program provides an important additional layer of control by allowing the EAC to perform manufacturing site reviews, to carry out reviews of fielded voting systems and to gather information on

voting system anomalies from election officials. We feel that these tools help ensure that voting systems continue to meet the requirements of the voting system standards as those systems are manufactured, as they're delivered and as they're used in Federal Elections. As another means of gathering data the EAC collects information from election officials who field EAC certified voting systems. Information on actual voting system field performance is a basic means of assessing the effectiveness of the certification program and of the quality of the manufacturing process. EAC provides mechanisms for election officials to provide real world input on voting system anomalies via, "The Voting Systems Report" collection published at eac.gov and through regular direct contact with Certification Division staff at in person meetings as well as email and telephone contact. The final prong in our quality monitoring program is our process of fielded system review and testing. We have the ability upon invitation of a state or local election authority to conduct reviews of fielded systems that were EAC certified. This review may include the testing of a fielded system if deemed necessary. Any anomalies found during this review and testing are provided to that election jurisdiction, to the manufacturer and to any other jurisdiction using that voting system. We've done one of these reviews fairly recently in Cuyahoga County, Ohio and I'll leave it to the folks in Ohio to determine what they thought of our participation in that process. We've also done a number of efforts to try to streamline our process. We certainly have heard that the process is cumbersome, often takes too long and costs too much. But, since the initiation of the testing and certification program we have practiced incremental improvement in response to these comments and we continue to respond to both real and perceived criticisms of our process. Since 2009 we have initiated a number of specific programmatic changes to address some of these criticisms. We've introduced weekly teleconferences with voting system manufacturers and test labs for each of our major voting system test campaigns. This way communication is there on a constant basis, everybody knows where the system is in the process and where the problems might be. We've adopted standardized response timeframes for EAC staff and technical reviewers to comment on issues that we see in both test plans and test reports. We've expanded the definition of de minimis change to permit the replacement of equivalent laptops, desktops, servers, printers, keyboards and a number of other things. And that certainly, we believe, is a use to election officials and does add some speed to the process. We've also attempted to the extent that we can to push voting system manufacturers to have their systems completely ready for testing before they begin their test campaigns with the EAC VSTL's. In the past I think there have been instances of voting system manufacturers beginning test campaigns with our VSTL's before their systems were ready and this certainly increased, for them, the time and cost. And so, things in that are, I believe, have improved significantly. And just an example of that, the most recent voting system modification certified by the EAC, in fact, finished this week, was completed end to end, start to finish in 50 days. And so, I think for modification that's a fairly reasonable timeframe.

>> Yes.

>> Thanks. We're also considering additional process changes to further reduce time and cost. Some of these changes again, as mentioned earlier, would require a quorum of EAC commissioners. But, one of them that we've discussed with election officials is the potential for introducing the process of manufactured declaration of conformity for specific VVSG requirements. It's a process that has never been used elections before, but is certainly used in many other industries around the world. Certainly voting is not ready for something like that in all areas of the standards, but we do think there are very specific areas where it might be useful. And so, we'd like to explore that if we could and we will do so in the future. About the future voting technology, it certainly would be wonderful if we could discuss future voting technology and point to some radical new technology or new device that would solve all of our voting related problems from long lines to voter identification to anything else you'd want to mention. Unfortunately, I don't see any such radical technological developments in the near future for elections. To my way of thinking this is probably actually a good thing. I'm not sure that we ever want election administration exploring the boundaries of technology. New technology often fails and failure in elections is too high a price to pay for simply experimenting with some new technology. What we're seeing and what I think we will continue to see are

implementations of existing technologies that may be new for the field of election administration. Everything we've talked about today, none of it is new technology. It's-- some of it is actually very old technology, but it is new for election administration and I think we'll continue to see that. And all this is not to say that progress is nonexistent in the voting systems arena. In fact, some really exciting developments are happening and we've certainly heard some of those recently from Ken and Dana. And you've heard from Dean Logan in the past. And from my perspective the really innovative aspect of this work is not the technology itself, but actually the process. The L.A. County project is breaking new ground in the way voting systems are procured. The VSAP as you've heard takes a participatory approach to this process and their advisory committee is made up of numerous local constituencies, more than probably we want to name right now. In addition, their development and procurement process is based on desirable characteristics of a system and not bound by the constraints of the current market products as you've heard. And certainly these characteristics include mobility, security, usability and accessibility, flexibility, maintainability, auditability and cost effectiveness, a very daunting task no doubt. But, certainly all of us in the voting technology area are eagerly awaiting the results of what's happening in L.A. County and I'm happy to say I'm a very small part of that process and looking forward to our next meeting out there Ken. For the first time in my experience we're also seeing real progress in the areas of usability and accessibility. Even though HAVA as we all know required votings to be accessible for individuals with all types of disabilities, the reality has often not met these very allotable goals. Paper handling has always been a major issue. That was brought up earlier today and we're, I think, finally seeing voting systems that are integrating as you heard the ballot marking device and the ballot box to solve this issue. We're also now seeing voting system manufacturers designing systems for usability for both voters and for poll workers. We're seeing an increased use of some of the design for democracy templates for both the design of paper ballots as well as the design of user interfaces for voting devices in election management systems. And finally, I do see some potential for introducing technological developments into elections that have been implemented in other industries. One example of this is tablet devices used in the medical industry. Because of their rigorous security and privacy demands of this industry, tablet implementations have already been introduced with innovations that may have implications for election administration. Some of these include hot swap batteries with up to six and a half hours of battery life. The tablets also contain antitheft, encryption and performance management functions that I think would be very useful in election administration. So, I'm very interested to see if some of these devices will be piloted in configurations that would allow them to be used in election administration. With that I'll move on. We have a very full agenda this afternoon and I'd be happy to take any questions later on. Thank you.

[Inaudible background comments]

[Silence]

>> Thank you very much. I was anticipating speaking later so you didn't give me a chance to get nervous yet.

>> Someone's got to go first.

>> I have some slides and great, thank you. So, going with the-- starting with the second slide. So, NIST has been working in voting activities under HAVA since approximately 2003. And if we could move to the second slide, please. Ah, okay. So, I just wanted to, my purpose here was just to point out what we've been doing and you know what we're doing at present given the situation without commissioners. So, you know we were working primarily with the technical guidelines of element committee and you've heard about that. You know essentially 15 members from different disciplines and directed, chaired by the Director of NIST, oh thank you. And in a, well you know a ridiculously short amount of time mandated by HAVA we updated the existing standards as they were, which was the 2002 voting system standards. We had roughly about four months to do that. And everybody in the process agreed that this was too short of a time and it really didn't permit the sorts of updates that were really

needed. So, we took an additional, well a little bit less than two years to produce a revision of that and even that was not enough time. But, a good thing was that the TGDC process was public and mandated that you know there be a stopping point. So, we did produce those. Those ultimately for a number of reasons did not get approved at the EAC and you know primarily having to do with the auditability requirements that in effect pretty much required paper records for voting systems as an audit trail. And you know we, along in this process performing various research in voting technologies and the other thing that we've been doing since then and continue to do is inspect voting system labs and accredit them. And we essentially say they are accredited, certified to perform voting system testing and then recommend it to the EAC. The EAC can levy additional criteria if they want. Currently I think there are two voting system test labs and one awaiting accedit, one awaiting EAC accreditation, but, I can't get that obviously until commissioners are present. And I just, okay, let's see if I can figure out how to use this next. Okay, we have been, in our voting program, working on a number of other activities as well in generally providing support to the EAC right now. So, we've been working on updating the current VVSG 1.0 with a revision, which we recently finished up some public review, comment reviews on those comments. And again, that is stalled though. You know the EAC can't move forward on that until commissioners are under way. And we've been working in a number of other areas as well, test assertions. What that essentially means is clarifying what the requirements in VVSG 1.1 mean and how specifically they are to be tested, helping in some areas, helping to automate source code analysis by the testing labs. They spend a large amount of their time on source code analysis and a number of opinions indicate that it would be better to spend less time, automate that to the extent possible and put more time into things such as penetration testing and you know other tests more suited. A number of other areas, security related research, which I'll defer to my colleague Josh Franklin, working on a common data format with IEEE, continuing with our test lab accreditation program. And then the common data format project that I'm most closely associated with is kind of an XML based format. The idea has been to have a common import, export format for voting system and in a dream world have the systems be totally interoperable. The idea being that instead of-- if a, if a jurisdiction decides that they need to acquire new vote capture devices, new DRE's, new optical scanners, the idea being that they could pull out their existing ones, look at any that are on the market, pick which one is best and then put that in. And that has a lot of merit and it hopefully will be possible at a particular point. We're working with the IEEE for historical reasons more so than starting afresh with the IEEE. But, it appears to be working out. And in this particular process I think we have a fairly balanced pool of different parties involved, especially manufacturers. There weren't manufacturers involved as you've heard before so much with the TGDC until the last incarnation. And then I think we had Ed Smith who was at the table earlier from Dominion. So, it's working along. I will have to say that it's a standards effort that require, that needs to be driven so NIST is driving it right now. It contrasts in a lot of ways from the TGDC effort. TGDC effort needed someone to drive it as well and that's why NIST was involved. So, just having a different standards organization involved doesn't necessarily make it better. It still requires someone to move it along and drive it and make it better. And the last thing I just wanted to mention is that you know we talked about this already, the fact that the standards are fairly old. So, the VVSG 1.0 is a good standard in a lot of ways, has received a lot of attention from the EAC with various smaller updates and decisions on RFI's. But, it was developed back in 2005 and it inherited a lot of material from previous standards. The 1.1 is stalled. A lot of new devices out looking through previous testimony and items submitted to the commission, a number of states are involved in things such as electronic blank ballot distribution and using systems that are connected to networks. So, there have to be more requirements developed for these sorts of systems. And more, you know most importantly ability to test them, ability to do different types of testing. I mentioned penetration testing already. The current process that we have right now doesn't really permit timely updates. It takes a while and there is a very big public review process associated with it. And given the rate of change and you know new ideas coming up a more flexible arrangement really is needed. And we've all been talking about this for number of years and have a number of ideas. But, it seems imperative to really move, move towards a situation. The problem if we don't do that is if we end up spending a lot of money on newer systems and then we develop

standards later is we effectively subject a lot of people to needless hassle where you know people will not be satisfied with, you know with offerings. People will complain you know because new standards are out there and the older equipment don't meet them and you know a number of situations associated with that. So, the best scenario would be to have new standards that address new technologies and then have the equipment follow along. And with that I thank you very much.

>> Thank you. Josh Franklin from NIST.

>> Testing, check, check, okay, debit, credit. So, thank you very much for the opportunity to discuss NIST's research efforts to improve the election process for military and overseas voters. Our nation's military and citizens living abroad experience significant difficulty in obtaining, marking and returning absentee ballots. NIST recognizes the importance of using technology to make overseas voting more reliable and secure. Over the past five years NIST has worked with election administrators, technologists and other members of the elections community to identify risks, mitigations and best practices on the use of technology in the UACAVA voting process. NIST's first document titled a threat analysis on UACAVA voting systems documented threats to these voting systems using electronic technologies for all aspects of the overseas voting process. NIST's work then became focused on researching specific technologies for disparate election processes and providing mitigating controls whenever possible. And we actually produced three documents in that effort. In 2011, the EAC's technical guidelines and development committee directed its UACAVA working group to compare the current UACAVA voting process to potential electronic absentee voting systems used by military and overseas voters. NIST facilitated the working group in identifying risks and mitigations associated with voter registration, ballot delivery, receipt and tabulation. Since that time NIST has continued the work to both refine and document the group's findings. The results of this risk assessment can be used as a baseline against which to compare future electronic absentee voting systems. For example, electronic technologies introduce new types of risks to the election process, but also provide new and innovative methods for improving the voting process. There are a number of opportunities for voters to make mistakes in the current UACAVA voting process as voters manually complete registration forms and mark their ballots. Illegible handwriting and ambiguous marks may lead to voters being incorrectly registered or having their ballots incorrectly counted. Online ballot marking and online voter registration systems can substantially mitigate risks typically associated with human error. But, they also introduce new risks into the voting process. This report that we are developing is meant to assess the election officials in assessing this whole risk tradeoff. New technology is fundamentally altering the voting experience in our nation creating new opportunities for research. NIST's previous research into UACAVA voting identified several significant challenges for remote voting systems. Most notably voter authentication, auditability and end point security. Our nation currently lacks a public infrastructure that could facilitate secure voter authentication for remote voting systems. And sharing that actually that errors, defects and attacks on elections can be detected through postelection audits has proved very, very difficult with electronic voting systems. Malware and other attacks on voters' personal computers also pose a serious threat. Exciting new research is being performed to address these challenges. Through the national strategy for trusted identities in cyberspace NIST is working with the private sector, civil liberties and public sector to lay down the foundation for interoperable, trusted credentials provided by private companies. Advance cryptographic voting protocols may be able to provide new methods for auditing elections, although, currently they often introduce new usability challenges. Finally, techniques to prevent attacks on personal computers have been implemented in Norway via voting receipts that do not divulge the voters' ballot selections. While progress is being made additional research and pilot projects are actually needed to study the challenges and develop secure, useable and cost effective solutions. Thank you very, very much for the opportunity.

>> Thank you. Before we throw it open to a broader discussion on the certification process there are two other aspects of it we'd like to touch on. And first, if James Long from Wyle Labs would give us your perspective.

>> And Wyle would like to thank the commission for the opportunity to provide a testimony. Wyle Labs as John mentioned earlier is one of two certified voting system test laboratories. You've heard a lot this morning from the vendors to talking about the testing that's performed and I would just like to kind of summarize some of that back to you. Wyle performs what's known as conformity testing and as Ken mentioned this morning that is a very black and white, all standards are equal testing. No standard is weighted higher than the other to achieve a recommendation from our lab for a certification. You have to be tested to and meet all requirements black and white. There's usually no middle ground. And this is really important to bring up because we test to the standard, the current standard that's adopted and the only standard that can be tested to for the AC program is the 2005 VVSG. As John just mentioned, that copy or that release of the standard is not what the community wanted at the time. There wasn't a lot of time to you know make it what it needed to be. That's what brought about the 2007 revision, but it's what we've moved forward with. Commissioner Thomas mentioned or actually posed the question to the manufacturers asking whether or not the standard was impeding innovation. And I, you know from the labs perspective we would-- we've noticed and in our testing process that the, some of the requirements are outdated and have prevented newer practices from entering into the voting system. I'll provide a quick example. In the 1990 standard there is a requirement centered around essentially central count units performance when scanning ballots that they halt upon some type of a multi-feed. So, the technology back then was essentially, some of you guys probably even have this technology still. It's a single feeder. It's a single path. It goes into a single output. So, the standard addressed that. You didn't want to lose track of these ballots, so the system was required to halt. Well, we've moved past that since 1990. By the way, that standard was repeated nearly verbatim in the 2005. So, this system was being tested to the 2005. It has more options, multiple outputs, etc. etc. But, it could handle this process in a different way. But, because the standard did take it that the system halt, it was actually non-conformant. So, we had defined it as such. Now, since then an NRFI has been released by the AC to you know help address this issue. But, they system is still required to halt under the AC program. So, I mean you can kind of see how the standard is restricting a much better process of allowing the system to continue to process votes without pausing because it has the ability to separate any of the ones that it cannot read. I'll also throw another example of where we believe that the standard is a little dated. We're still using the coding standards that were taken from the 1990 standard and applying them to modern code base. So, in 1990, I believe the 1990 standard was taken from a off the shelf coding, you know, book at the time telling you how you should you know organize your code, what should be represented in your code. So, once again we've kind of moved past that. But, because we still have to test to these old coding standards you know the manufacturers invest a lot of time in retraining their own coders to these old coding practices because most of us you know started learning on object oriented languages where these coding standards were, you know right before Java was even popular. So, you know I mentioned most of this to draw to the attention of the Commission that we, as a lab, really need new standards. We only can test to what is approved. And you know, in the absence of a commission we can't receive those new standards. They're there. John mentioned that there's actually two you know revisions that are being worked on. One that's much further forward than the 1.1, which is a revision to the 2005. But, even the incremental revision to the 2005 I think we would see, you know a large increase in you know efficiency and the testing process. In addition there's been some changes recommended in the program manual, which is also available you know on the AC's website to review. That touches on a subject that I heard, I think it was from-- Hart spoke that there are no de minimis software changes. In the current manual that is prohibited. In the new manual it does open it back up for review and that's very important because you could get small incremental changes. You want to change the font size of something. Well, maybe that's a bad example because accessibility implications, but something really small. You want to change something in your source code. Now, you have to come in for a modification and the fastest one like Brian just mentioned is 50 days. I think that we can still beat. And I think that's you know admirable that we got to 50 days. But, you know for a small software improvement it would be great to have de minimis process for it.

[Turning pages]

So, Wyle has been in the testing business since the early 1990's so we have seen and observed both the pre-HAVA and the, you know post-HAVA testing environment. You know in 2002 when HAVA was passed it was a monumental piece of legislation. It was you know the first time that the Federal Government had ever invested or given funding to improving the elections administration process and for improving the technology in which voters vote upon. So, you know that pairs recently with President Obama's Executive Order. And you know we sat down and we reviewed the Executive Order and you know compared it to HAVA. And most aspects of the order are pretty close to what was in HAVA. So, you know our only take away from that is the work's not done yet, you know. We haven't finished the work that we stated in 2002. And I think this Executive Order, which establishes commission only reinforces that point that there's still a lot of work for us to do. And under the legislation of HAVA you know the EAC has instilled the prime position to continue that work. So, to continue down this path you know before the AC it was essentially NSAD, which was not directly funded from you know my understanding of it. I wasn't around. I was too busy enjoying high school at that point. But, from what I understand it was not necessarily directly funded. It was more by volunteer you know group of state election officials and what not that were performing this testing. So, there was inconsistencies. The level of scrutiny that we have now in the laboratories was not to the same level. And you know I don't think that we want to move back to that model. We can state for a fact at Wyle that the systems are better. We're seeing a lot higher quality of system both coming in and of course, leaving our laboratory. So, I just reiterate that you know moving away from this current model, I think, is a little premature or to be suggesting that we move away from this model might be premature. And I feel that you know the EAC gets judged too quickly at some, by some people. You know this agency has been around for 10 years. But, due to you know the small size of this community and the small number of vendors, I think there's five maybe six. I know that there's only like five major ones or four. There haven't been a lot of systems submitted. I think there's close to 10 now full certifications and Brian can correct me, but somewhere in the neighborhood of 12, 13 maybe modifications. And you know people make this comparison to the FAA and all these other federal agencies. They receive more requests than that in a day. So, you know this program still has a long way to go, but it's still very-- in the maturing process. And only with more systems will it continue to get better. And only with commissioners will it be you know allowed to progress. So, on that I think I'll finish, thank you.

>> Thank you very much. Some states have also developed testing programs and if Merle King could describe what you're doing in Georgia.

>> Okay, thank you. I'm Merle King, Executive Director Center for Election Systems at Kennesaw State and we provide services to the state of Georgia. I think as I've listened to the testimony here today, I think about what every election official thinks about after the election, which what are the things that we're going to do the same. And what are the things that we're going to change? And the outcome of that, of course, is if we don't change anything then our expectations of changed outcomes aren't very realistic. So, what I'd like to do is address three areas that we may want to explore stasis and change in and what we might expect if we make changes. The first is the certification process. The second is our myopic obsession with voting systems as opposed to election systems. And the third is core competencies and there I use as an analogy we talk about the innovations and the technology that we produce much like an aircraft manufacturer might talk about innovations in aircraft. But, the aircraft manufacturer also talks about the needed skills of the pilots, the needed skills of the aircraft maintenance, the needed skills of the instructors of the pilots, the needed resources and the air traffic control, etc. In other words, they would never dream of developing innovative technology and pushing it out the door without thinking through the implementation. So, if I can talk about those three areas, certification, election systems versus voting systems and then core competencies. Every jurisdiction has to figure out in fact, what is certification. And at the very lowest meanest level certification is a check box on the RFP. We're required to have certification and in a very elemental way it is also viewed as indemnification. If we have a certified system then somehow we're indemnified against

negative outcomes in the election. And, of course, that is not true. But, if you move beyond that and you begin to look at certification as we do in the EAC context and often in the state of Georgia we look at it as conformance to a set of standards then we begin to get benefit from it. But, ultimately the certification process, not certification as an awarding of status to product, but the process of certification. At its best and highest performing level it is the revelation of the behaviors and the attributes and the limitations of that system. And that's where the benefit in the certification process comes because ultimately everything that we heard from the vendors this morning, what's back behind the innovations and the application of those technologies is always people and procedures and mitigations. And without the revelation that comes through an informed certification process you don't gain the insights into what are the dependencies of the system. So, we've talked, I've probably been on 30 conversations about security voting systems that attempt to validate voter intent to votes cast. And I've only sat in on one discussion that talked about did the voter get the right ballot and that was the discussion that I led. And so, what we emphasize in our certification process is this very narrow view of voting systems when in fact, the outcome of an election is almost certainly more dependent upon the performance of the election systems that surround it, the voter registration system, the online voter application system, the ballot on demand system, the electronic poll systems, the candidate qualifying systems. All of these have dependencies, bidirectional dependencies into the voting systems. So, to only look at the voting system, declare it to be sufficient and then go into an election thinking we've got our arms around this, that's one of those questions we have to say are we going to do it the same or are we going to change. So, the other things that I think are very important to think about in terms of certification, it's a heuristic process. You learn as a part of performing certification tests. It is not a static process. So, the notion of having a static set of standards to go into a certification it seems odd at best, bizarre in reality that as the threat vectors, the things that can disrupt an election begin to manifest itself, your certification strategy has to be able to adapt to that so that you are evaluating the ability of that system to function in real time, in a real environment against known and emerging threats to disrupt that election. So, that's the first thing is do we want to keep doing certification like we've been doing it. And if we do we're going to get the same cost structure basically out of the process probably with improvements, the same time interval and about the same degree of reliance on the outcome of it. The second thing is this notion that voting systems drive the election to the exclusion of everything else. And if you talk to an election official the things they worry about is not the voting system. And the irony is we just keep testing the same thing over and over again. The one part that we know works we just keep testing it. And the other parts where we know the vulnerabilities are in the voter registration systems and the electronic poll books and the myriad of processes that surround the election we put blinders on. We let the vendors test that. We let the vendor declare the sufficiency of those systems and we continue to focus on the voting system. So, one of the things that I think we have to think about as a community do we keep doing that or do we broaden the scope of our inspection of the election process to include election systems, which is that collection of systems that collect, manipulate, store and present data associated with the election and it's a growing list. If you ask the vendors where the innovation is, it is not in the voting systems. The innovations are in the election systems. And because that's where the margin is, that's where the market is and it's very, very poorly understood by the media. It's poorly understood by analysts who attempt to analyze elections. They don't fully understand the dependencies between those systems. The third thing has to do with the core competency of election officials. And one of the things that we talk about, certainly within our state and elsewhere, is the notion that every election official is an IT manager. And that's whether they think they are or whether they want to be, whether they were trained to be. They are managing IT and they're managing complex IT in a complex environment. I can go into the smallest county in Georgia and the election official in that county is managing more IT than the IT manager in that county with often greater consequence. So, this notion that we've, we have this large collection of election workers out there, election officials, poll workers, poll managers for which we have never as a collective defined what are their core competencies? What is it that we expect an election official to know? And if we don't know that then how do we evaluate their performance? How do we recruit them? How do we develop training

programs for them? So, if you live in a jurisdiction where the criteria for being an election official is that you can win a campaign to become an election official then that is the core competency of the election official in that jurisdiction. So, as we look at what are the things as a community that we need to articulate about expectations of competencies in election officials, certainly some ability to manage IT, you know awareness of election law, awareness of project management, all of those things that we know as election officials are a part of that and make sure that that's communicated. So again, I think in assessing where we are, if we come out of this election cycle and we say essentially every election official you know gets to define their own level of competency, every poll manager gets to define their own level of competency then we can't really expect much difference in the change down the road. So, having said all that, there are many, many things that are going right with elections. And I think most of us who have been in it for a while certainly feel that the equipment that we're using today is better. But, we also agree that the environment that we work in is more risk laden and it is more complex than it was years ago. And so, what I would encourage election officials and the commission to look at surely those three areas, the certification process both at the federal, state level, look at the need to expand the emphasis to review the interaction of election systems with the voting system as opposed to a strict focus on voting systems. Then finally, helping to define what are the core competencies. What should we be able to expect of election officials in every jurisdiction in this country. And I think those are the changes that I would like to see. And I thank the Commission for the opportunity to speak.

>> Thank you. What we would like to do now is sort of engage in the roundtable discussion on some of these basic issues starting off with the certification process if we could. Largely because as the Commission has traveled around and talked to all of the groups that we've talked to election officials have told us a lot about the certification process. And it is worth kind of putting all that on the record and telling us how you believe the certification works and how it could be improved. Certainly, Doug Lewis of the Election Center, we have heard a number of things from members of yours and I wonder if you could summarize that and give us your views on it. Kick things off.

>> I'm Doug Lewis, Executive Director of the Election Center in Houston. Clearly I think you all heard, got an earful when your commissioners attended our conference in August. And over the years truthfully the elections community I think was happy to have the Federal Government finally take a role in terms of testing and to actually fund some of that and involve NIST in the process and to build a program in that. And certainly NASED, the National Association of State Election Directors worked with Brian to turn over all of the data that we had over the years. And there has been enormous criticism of the process and the program. I don't think all of it has been justified as relates to the EAC itself. But, certainly some of my members who, some of whom are even sitting behind me don't necessarily agree with what I just said. And so, the problem is, is right now the process doesn't work. It doesn't work very well at all. And it's not that I'm critical of the EAC or any of our elections officials or critical of the EAC in this regard. This has become dysfunctional because Congress itself has made it dysfunctional. We're at the point where the agency can't even get commissioners. If we can't get commissioners we certainly can't build standards. And if we can't do standards we can't make the improvements that NIST is recommending and that Josh would like, I mean James would like to test too and that Brian would like to implement and have something function. The process is broken. It doesn't work. States now are moving to do their own testing and their own standards and higher their own laboratories to do some of this. Dana and Ken are having to go out and design systems. Let me tell you why they are having to design systems. The manufacturers want to manufacture anything they can sell. The truth of the matter is they can't manufacture the systems these two people want unless they can figure out a way to sell more of them later. And the political environment in which the manufacturers have to operate at this point is, is that they cannot buy those new electronic systems or well-designed systems or what the marketplace, what the voters really want. We can't provide the voters what they want. The truth is, is the manufacturers are able to sell what is politically possible for them to sell and us to buy. And as long as that remains the system along with a process that in testing

takes forever and standards development take forever. Unfortunately, as you all have discovered as commissioners on this Federal Commission, I'm going to guess you've discovered that the Federal Government moves at two speeds, glacial and eternal, you know. In order for us to get standards through you're going to have live as long as Methuselah in order to make it all work. That is unacceptable in elections. We are trying as elections administrators all over the country to run safe and secure elections. We're also trying to listen to our customer base and we keep talking that we want these young people to come into the process. Young people are not going to vote on paper. Well, I say that and I would have said to you that by now we would have been maybe out of the paper phase of elections. But, I've lived long enough that AT&T in 1964 went around talking about this wonderful invention of the touchtone telephone that they had and that within two years we were all going to be voting on touchtone telephone. Well, here we are all those years later and we're still not doing it. And we may very well be on paper long after I'm dead and gone. The problem is, is that we hold electronic systems to a standard we don't hold paper to. You still want to manipulate an election, you manipulate it through paper. Not through electronic systems. We have got to get to the point that we can have standards that are meaningful and relevant that manufacturers can actually design systems. They're not like Apple. Apple decides they're going to create a marketplace; they go out and create a marketplace. They create a product that they think the public will buy. They get out there. They sell it. Here, we're not allowed to do that. And so, until we look at this whole process all over again, until we get to the point that we understand absolutes are not necessarily possible. And we can't continue to make tradeoffs that say, but only this one is absolutist enough for us to pay attention to. Unfortunately, as you all know where we are with Congress itself is absolute. You know we, you've either got to absolutely be for our point of view or we're not going to do anything. And this is the environment in which we in elections operate. We can't do this anymore. Nineteen ninety, isn't that what you all are saying is basically we have made some minor revisions over a period of time to 1990. My God, how long is this going to take? It makes no sense. We've got to-- if the strongest recommendation that you folks can recommend is that Congress and leaders stand up to their political supporters to say we're not going to do insane things anymore. We are going to do things that mean we can make this process work for voters and work well for voters. The truth is, is we keep talking about how do we integrate paper with electronics. Look, electronic stuff was going to allow us to redesign the whole process. It meant that instead of forcing voters to come to us we could have gone to voters. We can't do that yet. And that's, of all the things that are out in society that go directly to consumers anymore, but we can't. This is a situation that has to change. What would I recommend for the voting systems testing program? You all need to make a very, very strong recommendation that Congress do one of two things. Either they get up off their duff and get off their political high horse and commit to allowing this Federal agency to exist and do its job with commissioners and with funding or they tell us they're going to eliminate it and we're on our own to figure it out, because we'll figure it out if that's that case. We can't continue to be in limbo, which is what we've been and I'll hush at that point.

>> Thank you, any thoughts from anyone at the table on that subject who may be directly in the field? Mr. Kennedy.

>> Well, maybe a more measured response. You set a high bar.

[Laughter]

[Silence]

I think, you know you have gathered today probably some of the best experts, those people on the cutting edge that you heard from earlier, people who have been in the trenches. And Doug gave you not only a passionate background, but a historical perspective. And I think you know you heard from, in other situations, that there is a problem with the certification process. And it's important to us as election administrators because from our perspective it's exactly what the mission of this commission is. Your tag is support the voter and it really is about the voter. And for us to serve the voters we have to give them a means to participate in the process

that they're confident in. When Merle King said, what is our goal? We have competing goals. It really is, boils down to serving the voter. That's our goal and then we build from that. And that's high talk, more in Doug's line. But, practically speaking we have to get to making the process more efficient. And I realize you're not in a position necessarily to recommend legislation, but you have to identify the problem. And you've heard, very clearly, that we're not serving the voter with the type of equipment that's available. We're not serving the election official with the type of equipment that's available. We need a process that allows us to take advantage of the technologies that exist now and implement them. And you'll hear more from me tomorrow about how we've done some of that. But, you've heard already today great ideas on how to do that. And what I would say is, you build on some of the very valuable comments that came from the people on the ground on this side as well as the people who are working to serve the voter, the election officials.

>> If I could, there are other topics we're going to obviously cover here. But, Kevin could you-- Doug laid out a diagnosis in no uncertain terms. He had a particular view of what was wrong. And by the way Doug in so far as telling off the Congressional leadership Ben's prepared to do it and I'll be right behind him. I'm going to stand right behind him and every step of the way he'll have my encouragement.

>> Talking to Steny Hoyer now.

>> Yea.

>> I'm putting Ben together with a democratic leader. Yea, yea, yea. But, Kevin do you want to comment on the, Doug laid out what he thought was wrong. Are there any areas there where you would, setting aside the question of you know how strongly Doug expressed his view and your view being perhaps somewhat different in tone, agree, disagree, add, subtract?

>> Well, I think you break it down like you heard the election officials do. You look at you know what do we need? We need a set of standards. Doug was very eloquent in this as were the people who are working with the standards in describing the fact that the standards haven't changed in over 20 years. And yet, we have other ways to define those standards. And so, we need to have some kind of a commitment. I mean election officials took this in hand back in 1990 to design standards because we wanted a safe harbor to show to our voters we're not just letting something be manufactured in somebody's garage for you to vote on. We're, I mean I remember getting a phone call from someone saying, I know how to solve the problem of the 2000 election. I used to work for NCR, the cash register company and I've designed a voting system based on a cash register and I thought it was kind of ironic. But, it was the idea that someone would cook up those things and we don't, aren't able to turn to our voters and give them some level of confidence. The reason why states including Wisconsin are stepping outside of the system is because we have to. We don't have any choice anymore. We thought that the federal system would give us a good opportunity to have something we could point to why these voting systems are trusted and reliable. But, it hasn't been flexible. And so, fortunately like in Wisconsin we designed our approval process where we can step outside of that. And we did it for, unfortunately for a backwards step to allow our municipalities to use modems to send unofficial results on election night because the system was so rigid it wasn't going to address that. And very good reasons for that, but we had to step out and test old technology just to satisfy a political need. But, at least we had the flexibility to do that. I would rather be more forward seeking. I would not want to be reliant on analog modems to transmit unofficial election results. I'd rather serve the voter with those election night results in more efficient ways. And the solutions I had didn't involve technology. They involved sending people out to the polling places like the League of Women Voters used to do to call those results in but to bring the technology back to the central count. So, we need to have new standards and we need to have some flexibility to deal with things in the many processes that Merle King talked about that touched on this. So, that's where-- you know that's what I would look at is what exactly are the steps. How can we get new standards in a very efficient way? Does that mean we rely on the EAC or do we rely on some other type of entity to do that. State's are picking up those standards. They're

drawing things with each other but from the value of the things for the taxpayer we have to work together. You know California's got more resources than Wisconsin does. But we watch what California is doing. We watch what Texas is doing and we take those techniques so that we can use them in Wisconsin. And so that's how I would look at this is let's go back and take the process and how can we improve those steps?

>> Thank you.

>> One of the other interesting facets that the Commission's been dealing with has been the subject of voter tech-- of voting technology. And Martha you're doing some innovative work in your field and if you could fill us in.

>> Well along-- along with Dr. David Kimble next to me, I'm Martha Kropf. I'm from the University of North Carolina at Charlotte. We for a number of years have been working on ballot design issues as well as voting technology issues. And, of course, we worked with Dana and Whitney with some graphic design of ballots. And one thing that we find is that the usability of ballots in the past has been really bad. They haven't been friendly to voters. It's less a technological issue than the certification of ballots. But certainly, we have voluntary standards created by the EAC there too. So, but yet they're voluntary. But it was refreshing to see this morning some of the equipment vendors actually using some of the design standards in the creation of their ballots. One thing that I would encourage though, the vendors and the election officials to think about is that we are in a Federal system wherein we occasionally use alternative voting systems like cumulative voting or like instant runoff voting. And there are difficulties in making apparently from what I understand a lot of the systems aren't friendly to alternative voting systems that are used as remedies for Voting Rights Act violations. And so I think I would encourage the Commission to not just consider our straightforward voting for Federal offices, but also the use of some of these alternative voting systems that are being used in programs across the country. But one thing that also occurs to me is it's not just usability of ballots but acceptance of the technology on the part of the voters. And I hear a lot about security of the voting systems and I think we're doing a lot and we're doing some of the right things although it's clear that the certification needs to be updated. But I think that our number one goal needs to be about creating a legitimate election. And so having our ears to the ground on public opinion in terms of how people, how accepting they are of some of these technologies, I think that we may be-- I think that the typical voter is going to be more accepting of voting technologies than we give them credit for, particularly electronic voting technologies. And I don't think that this is something that a lot of state legislatures are hearing. And unfortunately, that's something that the Commission can do very little about because, unless it's encouraging the state legislature's to change their ways. But North Carolina, for example, well some of the new technology coming in is going to go back maybe a step to paper receipts that people can actually hold in their hands rather than the ability of about 50 of the counties are actually using electronic equipment. And I guess the next generation is not going to be so in North Carolina. That's just one example. And then finally, I would just encourage the-- one of the vendors this morning mentioned the use of residual votes as a measure of how well the voting equipment is doing. And I'll just throw that-- I'm sure that Dr. Stewart has addressed that as well, but that we should use that with caution as occasionally residual votes are not just the result of, while I myself have used it as a measure, it's also voluntary occasionally and due to a lot of contextual factors, so.

>> Thank you. David Kimble.

>> Thank you.

>> Thanks. David Kimble. I'm at the University of Missouri, St. Louis. I'll just apologize in advance if Martha and I duck out before the session ends to catch our flights home. Martha covered our research, so I'll just add a couple of comments and one question sort of on the topics today. One, I think some of the technological solutions we saw this morning were geared at reducing long lines at polling places. And some recent studies indicate that the main bottleneck at polling places is in

checking in voters rather than the act of actually casting the ballot. And to be fair, I think some of the solution-- some of the tech stuff demo this morning gets at the voting line issue. But I think more attention might be paid to the process of checking in voters and not just the act of casting a ballot. And even maybe can some like maybe mundane, non-technical solutions might apply, like simply having enough tables, enough poll workers at least at peak voting hours so that the check-in process goes more quickly. That's sort of one comment. The second to pick up on what some of the election officials mentioned earlier and particularly Matt Masterson, I think one hurdle to innovation in voting election technology is the fact that we have a very decentralized administrative structure for running elections in the United States. There's roughly 8000 local jurisdictions that administer Federal elections. I think one reason why that earlier it was mentioned that other countries have kind of moved ahead of us then most other countries. The National Government can simply decree Nationwide we're going to adopt this new technology boom, done. You know that's not feasible and probably not a good idea in the U.S. given our administrative structure. In addition, there's a huge, tremendous disparity in the size of local jurisdictions that-- about 400 local jurisdictions, just five percent of the total serve about 70 percent of the voters in the United States, five percent of the jurisdictions serve 70 percent of the voters. And I think all of the local jurisdictions represented in the room today are very large local jurisdictions. They've got at least 100,000 or more registered voters, which puts them at like the 96 percentile in terms of size. In LA County it's like 99.9 percentile size. So, but that makes sense that much of the demand for innovation is coming from the large local jurisdictions because many of the challenges and problems in running elections, long lines, undeliverable mail, unreturned absentee ballots, difficulties finding and training co-workers, all those challenges are disproportionately concentrated in a small number of urban jurisdictions. But at the other end of the spectrum there's lots of small towns and rural counties that probably don't want to pay the cost of any new voting technology. And the officials serving those smaller jurisdictions can probably argue with justification that they're voters aren't demanding any new technology. So, the suggestion I would make for consideration is this is more for safe governments than the Federal Government. State election laws and regulations might be crafted or modified to allow more flexibility in-- from-- at the local level so that if large jurisdictions want to be buy E-poll books or if they want to adopt mobile apps or if they want to expand early voting, let them do so. But if smaller jurisdictions in the same state don't want to pay the costs of those innovations, then let the small jurisdictions forego those innovations, just for consideration. The question I had and this, you know I don't, this might be a dumb question because I don't understand much about the contracting process, purchasing process, but I'm wondering if it would help or if it's possible for there to be greater transparency in purchasing contracts. So that, for example, Michigan comes up with a new purchasing model so that you're not vendor dependant for the next ten years, is it possible or can other state and local election officials see that contract so that when it comes time for them to buy or release new equipment they get good value for their money. So, I'll leave it at that.

[Silence]

[Inaudible whispering]

>> If commissioners have any questions at this point especially for Martha and David, because they do have to leave--

>> Can I just ask a quick question. This is probably more for the standards folks which is how-- if I'm a new voting machine maker, how much is it going to cost for me to get my system certified? I mean if you give me a ballpark figure what it's going to take, maybe James you're the one to ask.

>> Alright, so I'm going to hedge a lot here. Are any of my customers here? It is very dependant on two things: One, the size of the system and two, how prepared the manufacturer is for testing. The, you know the smaller of A and the greater of B equals a much shorter and much cheaper testing campaign.

>> I let him push you. I heard it's between three and four million dollars. Is that, is that ballpark, what it's costing some of the vendors you're trying to add to add to the space?

>> I don't have the numbers. I know that the most recent ones in which I've participated in they have not exceeded that number. That's anything from let's say at least the previous five systems have not exceeded that number. But that goes back to when I joined Wyle; before that I have no idea.

>> Just from experience I can tell you that the early systems that came in that weren't, I mean weren't ready and if you go and look at the test reports and the number of discrepancies we're talking hundreds and close to thousands of discrepancies and testing. It's probably accurate to say three to four million dollars. That's probably a correct statement. It's my belief knowing the process, knowing the requirements that a system could get through testing in 12 months to 16 months at around a million dollars for a new voting system. Again, it's very dependant on size. If you're talking central scanner, precinct scanners, all that that's going-- but knowing the requirements and if someone is dreading a test, they've evaluated their system internally, that system can get through in my opinion in 12 months right around a million dollars, so.

>> This is Brian Hancock. And just adding on to that a little bit I mentioned the modification that we just did that was done in 50 days. I mean that was a fairly small modification but it does show you that it can be done in a fairly reasonable time. Additionally a lot of the work that's done for certified systems is in the nature of engineering change orders and de minimis changes. Most things go to the lab and the lab looks at the engineering change order and makes its determination as to whether it's reasonable that that be put through and then talks to us and essentially it's a check off. Very easy to do. The de minimis changes can be done literally in a matter of days.

>> Hours.

>> Hours in some instances, you're right. So, again there's-- it's a big question and a lot of dependency is there.

>> Can I ask a quick follow up?

>> I know the old regime was bad, wasn't any good. That's why we got rid of it, the 1990-2002 regime, but like by the order of magnitude how much would it have cost back in the day? You know like the pre-HAVA testing regime. I mean how much--

>> Under Nsat.

>> Under Nsat, yea.

>> In the initial stages it would have been about 300,000 for software and roughly 300-350,000 on the hardware side, but those were in dollars over those days.

>> So, it's not that different given you factor inflation with-- if you're prepared like Matt described.

>> And as we discovered during Nsat days, many of them were not prepared.

>> Yea, yea.

>> You know they were coming in using us as beta testing and I'm guessing that's still going on.

>> From time to time.

>> It hasn't changed a whole heck of a lot. But it's not just the cost of testing at the federal level. I mean you have to look at the cost of testing at the state levels

too. But right now the problem, the problem continues to be for almost everyone and that's the reason they're trying to bail out is that the Federal system is just not where it needs to be. And so we got to figure this out and I think there's clearly attempts to make this work better, but there's not support at all levels here to make it actually function better.

>> Was it, was the timeframe as long? I mean again, the ones who are-- the standards I know that are different, I know but I'm just trying to figure out like the old business model for voting systems versus the current one that doesn't work. Like I'm just trying to understand.

>> Yes.

>> Was the time faster?

>> Yes, it was faster simply because--

>> It was easier to test. They were simple or standard.

>> Well yea, there are a whole lot of factors there. One we didn't have the Federal Government.

>> Yea.

>> God awful structure of you know publishing everything and studying everything and all of the things that they do. So, we could move faster in that regard. We could make decisions internally with our technical advisory committee much faster than the feds are allowed to do. So, there's a you know-- because it was-- it was sort of a state controlled deal, but at the same time let me say to you we weren't doing at the same level like the standard--

>> Right.

>> These folks are--

>> Right, wasn't as thorough.

>> You know.

>> Yea.

>> And the systems were much worse too.

>> Yea, correct, correct. I'm just trying to figure out the timing and the dollar amount.

>> Just a quick anecdote on that when they were testing the VPAT and that was before that standards, all the HAVA stuff was in place and the guy doing the testing just literally turned over to me and he said, "Is that good enough for you?" And I said, "Yea, that works." And that was the standards then.

[Silence]

>> Patrick.

>> I had a question to follow up. Oh, go ahead. No go ahead Wendy.

>> I just you know before anybody moves on certification standards. I'm Wendy Noren. I'm the County Clerk from Boone County, Missouri and I have been around so long that I've been through multiple systems and I have purchased systems when there were no standards. I purchased them when they were the starter standards but no testing. A purchased a system when as Doug had brought, come in and brought a lot more professionalism to it. So, and each of them brought a better one in. I brought a

system that went through the last 2002 standards. I haven't had the advantage yet of buying a system that'll do that. I can't tell you how important it is as an election official. Now I'm the kind of person who actually reads the standards and I read-- and I've been reading the test reports and test scripts of this equipment. So, and I'm unique in that; I know that. But it is absolutely critical that there be some kind of a testing process on a national level, because a lot of states don't do anything. And I came from a state, which the certification process in my state was about what Larry Lomax said, "It was the dog and pony show by the vendor." We did no more than what you all saw this morning on your demos or your rounds and a few questions like that. So, it has been incredibly important to me that there be a testing process that I know, that I can go and see what it's tested for, at least. That I know up front what the equipment is responsible for, what hasn't been tested. I'm responsible for designing a process demanding stats. So, I don't know how to work it out. The problem is you know they talk about the FAA and the FDA, well those are corporations that have huge amounts of money that the drug companies are selling to and doctors. These people are selling it to County Government, which is the poorest unit in the whole world. I mean this is not a big money-making business. And you know, you're just going to overdesign, you can do it. But we've got to have some standards and minimum standards on this. So we know what we're buying. Even if we know it's a piece of junk and I've got to work all of these other procedures to overcome them, Dan was talking about how we had to do things to overcome the lack of decent equipment. And that needs to be clarified, put out, tested, make sure we know what our part is and what the equipment can do.

>> I had one quick follow up if I could, just really briefly. I had a question actually for Brian while we're still talking about certification and it has to do with in your testimony you were talking about how if I understood you correctly. You say that there are some areas that might be ripe for a more targeted certification or a different kind of look at it and I was curious what those areas might be or if you really thought about exactly what areas you might be able to take that and how that would improve the process?

>> Sure. Thanks for that question. I did talk about the manufacturer declaration of conformity process and really what that means in a nutshell is the manufacturer would essentially certify to us under penalty of whatever laws there might be that yay verily they have tested the system to these standards and let's just use some of the hardware standards, for example. They're fairly easy, you know they could go to any hardware lab out there. Those-- some of them are mill spec standards that are fairly well known to get them done anywhere themselves, show them to our process and then we'd say you know that's an accredited lab that passed the test, that's fine. So, those things could improve the process significantly. There are other areas that we haven't explored. You know some potential for source code review may be some for data technical package review. You know again that's something we'd like to explore. With election officials we started that effort this summer and we're going to continue that. So, that's it.

>> Ron Ravest.

>> Thanks. I appreciate this opportunity to speak before the commission. For those of you that don't know me, I'm a teacher at MIT. I teach a class that covers homomorphic encryption among other things and it was on the TGDC. I chaired the Security and Privacy Subcommittee and so on. So, this relates to security in general and certification in particular. So, we're talking about voting systems in particular. As Brian Hancock said earlier, we need to think about what the high level goals are. And one of the-- if you want to get security right you really only need to ask yourself one question and follow through with the answer carefully. The one question is, what I need to show the day after the election to the losers that they lost fairly and squarely. That's the only thing that matters. If you can answer that question clearly and with full detail, you've solve the security problem. How do you convince the losers that they lost fair and square, right. It's not just having a usable experience, a convenient experience. It's not just-- you know you need to get the voters protected from coercion. You need to make sure that they're able to vote when they want to vote. You need to make sure the votes are collected and recorded

accurately and tabulated accurately. But you need to do all that in a way that not only works and that you as a vendor is convinced that it works or you as an election official is convinced that it works. You need to convince a skeptical losing candidate that he lost, right. And you need, and let's just talk about supporting the voter. The voters are not just voters. They are supporters of their candidates and you need to convince the voters that voted for the losing candidate that they lost fairly and squarely. So, supporting the voter means having an election system that produces the evidence that will convince the voters that supported the candidate that lost as well, right. So, this is all-- this is really the top level question for security. Ellen Case had the right point of view; it's worth ten IQ points. That question gives you the ten IQ points you need on security. How do I convince the loser they lost fairly and squarely, right. So, it's a-- you know it's not all about homomorphic encryption or standards of encryption, stuff like this or other things. You know, you start from the top and say how do I convince those-- what's the argument I need to make and then you follow it from there. If you don't do that you're only providing half a loaf on the election system. So, I'm-- you know we talk about paper ballot system, which has got its complexities and its awkwardness, but you can do that. Or, would you rather convince somebody that this 10 million lines of code has no way of screwing up? I'll go with the paper ballots myself as computer science is trying to convince somebody that 10 million lines of code has no possibility of screwing up. I don't know how to do that, right. That's all state of the art. We see it [inaudible] all the time, you know. We've got patch Tuesday for Microsoft. You know they show, you know--

>> Patch Tuesday.

>> Yea, that's what they issue. You know they got patches coming out everyday. So, paper ballots have a simplicity and a simplicity of the argument that you have to make that makes them attractive. I'm not a big lover of paper ballots but I love the simplicity of the argument you can make based on a paper ballot system. And that's what we're talking-- and it's good we have lawyers running the Commission here to appreciate the evidentiary nature of this. And what's the evidence the day after the election the winner really won; that's what you care about and the security of an election and how do you make that argument? Again, looking at internet voting you know it's convenient. I would love to be able to vote over the internet. I would love to be able to sit in my pajamas at home and vote over the internet. I would love to be able to text while I drive. I would love to be able to jump off of tall building safely and I don't do any of those things, right and I think I shouldn't right? I think there's safety issues with these things and I don't know how to produce for an internet voting system the evidence that the loser lost fairly and squarely. The internet system's got a very complicated collection of software components and routers and adversaries trying to come in over the internet to try and make the argument that the internet system you know to make it convincingly to a very skeptical loser who doesn't trust the software that the vendor wrote because they may have been corrupted. They don't trust that the software that they ran is the software that they should have been running that was maybe certified. You know I was trying to make those arguments for an internet voting system is really tough, at least these days. Maybe in the future we can do that. The nice thing about voting systems and internet voting is we don't need to go there, right. For some applications you sort of have to use the internet; you've got to do that. In fact, it's nice with voting. You know we can stick with some of this tried and true technology that we've been using for a while, where the arguments are simpler until and when the internet guys get the things figured out about how to make authentication and proof of, correctness of these kinds of things work. Then they happen in 10 years and we can ride the curve of technology and you know people need these kinds of things for other applications besides voting as well. And we can piggyback on their successes when they have them. But as yet, you know this contains a pile of software that I wouldn't trust to vote on, right. It's just not there yet and I think we need to wait until we solve that problem well and you know it'll be there someday. But it's not going to be there today and it's not going to be there in five years. It may be there in 10. You know, we'll see. So, that's a summary of you know a viewpoint on security that contradicts some of the things that have been said here. I would also like to you know just again to push back a little bit on this comment that the younger generation feels

everything has got to be online. The younger generation is not stupid either. They like their convenience but they see that the NSA is into everything. They see that the Chinese hacked Google. You know they see that Facebook abuses their privacy. They know that complicated electronic systems can be a source of abuse as well as convenience. And so I think if you make a simple argument to them that these systems aren't ready yet, they will accept that. So, I don't think it's a slam dunk argument that we have to have internet voting in order to get the younger generation to vote. So, I'll stop with that.

>> Thank you. On the same subject of security Joe Hall, would you care to add something?

>> Thank you Chairs Bauer and Ginsberg and commissioners for inviting me to speak. My name is Joseph Lorenzo Hall. I'm a Senior Staff Technologist at the Center for Democracy and Technology in Washington, D.C. Our mission at CDT is to keep the internet open, innovative and free with deep engagement in law, technology and policy. And a little bit about myself, I have two Master's degrees in astrophysics and information systems and a PhD in information systems from U.C. Berkley where I focused on policy mechanisms to increase transparency of essentially black box voting technology. You can think of me as half a lawyer, half a computer scientist if you need to cubbyhole me somehow. I got my spot pegged to five minutes so I'll just go. So first funding and assistance to local election officials. The Federal Government should provide regular Federal funding for election administration. Much of the instability in election administration comes from the veritable backwater in election administration in the voting technology market is occupied. Regular Federal Funding of elections with narrow limited strings attached would begin to address this conundrum. [inaudible] Hall have proposed regular funding and return for comprehensive election administration data and reporting and that seems like a good bargain given that we don't know a whole lot about our local election administration. And some of the people in this room like Charles go to great efforts to collect that stuff. And the effort to eliminate the EAC should just stop. The EAC provides valuable voluntary assistance, information and technical evaluation and the long tail of small local election administrators will increasingly need such support as things change, only more rapidly. And we should make it a prior to seek commissioners and ensure the EAC is positioned to best assist local election officials to run high quality elections. Voting system certification, I don't think voting system certification should be entirely jettison. I don't consider that an option much like what Wendy talked about and it just-- it does not sound like a good thing to do. I do think certification in general should provide a floor and it should be designed to establish a reasonable floor that focuses on betting internal vender development and quality development and quality assurance. New models like evidence based elections that were mentioned earlier from David Wagner and Phillip Stark where you can avoid some of the front end of the certification process by proving afterwards that your elections met some auditability criteria and that it was a well run election. We should begin to experiment and overlay those kinds of models on federal and state certification. Of course, one can certainly run a horrific election from a baseline floor, which brings me to my next point. We really need to design for auditability. The science and practice of post-election auditing has exploded in the past seven years or so. The sad fact is that a lot of voting systems do not support more modern notions of what we call risk limiting audits, although we heard-- you know when I asked this morning we heard quite a bit different. They seem-- vendors are doing amazing things these days with this kind of stuff. The laws have moved slowly. The market has moved slowly. This should be a major priority as it holds the promise to change our elections for the better forever. And I do not exaggerate when I say risk-limiting audits are the best public policy innovation in election since the adoption of Australian secret ballot. Usable security, as usability experts in voting technology notably [inaudible] has now said if it's not usable it's not secure. Security mechanisms that require bending over backwards and not just security but mechanisms that require bending over backwards by poll workers, voters and election administrators will just simply not work. Voting systems have to have usability, accessibility, security, auditability incorporated during the white board design stages of development when it's just a thought some engineers had these things cannot be bolted on later. Finally, parallelism in casting and in voter registration check

in. Voting methods and check in methods that occupy an entire machine or a book or something in a serial manner that is one voter after another spending long periods of time either making selections on a casting device or trying to register to vote. Those just simply don't scale. Optical scan voting systems, ballot marking devices, poll books that you can walk through a line. They would require only quick interactions with voters and allow voters to mark ballots and register and check in very quickly and do so in parallel do scale very well. And the final thing I'll talk about, am I over no. We need to wary and this is entirely my own thought here, be wary of the erosion of the secret ballot. The secret ballot is probably the most important feature of democratic elections, working to ensure that election outcomes reflect unbiased voter preferences. No excuse vote by mail voting as much as you don't want me to say this and unsupervised methods of voting like internet voting are real threats to the secret ballot. It would be a tragedy if these convenience methods turn back the clock to the late 19th century, almost done where voter turnout was high because Election Day was a payday. There's a great research from Jac Heckelman at Wake Forest University that shows after the adoption of the Australian secret ballot in the U.S. turnout [inaudible] because vote buyers could no longer be assured of their investments. While I think many technical experts will concede that we need to figure out how to perform critical civic functions over the internet. And it will be a while before authenticated and civic transactions like drivers license issuances, social security card issuance, notary public, I mean that's the whole point of having a notary public and voting can happen in purely remotely forms. Finally, there are some lessons from this past summer of Edward Snowden that I deal with in my other national security role. Our government seems to think it should be able to tap everything but the secret ballot is an existence proof that that world view is just simply wrong. Thank you.

>> Thank you. One other point we want to touch on is voters with disabilities, because many of the cutting edge things that we've heard in the process are driven by that. And so Diane Golden, if you would.

>> Diane Golden with the Association of Assistive Technology Act Programs and I'm sort of sitting here thinking actually what I'm going to start out saying is we haven't been all that successful in driving much in the way of technology and industry and at the risk of beating a paper ballot issue to death today, which actually I'm really, really excited because for the first time I'm not the minority. I don't feel like in this group, which is really cool because usually I'm really getting beat up on over the paper ballot issue. You know, this has been such a polarizing issue and sadly part of it is contextual that I have to make sure you understand. When HAVA passed and there was the promise, a legal promise, of a private and independent vote for people with disabilities, literally it was like another huge civil rights step forward for the community that I have dedicated my life to working for. I can't over estimate the, you know the degree to which this was hailed as something that was going to move the community forward. And it was all conditioned on or premised on the fact that congress wouldn't have passed that mandate if they didn't think election jurisdictions could deliver a private and independent vote for people with disabilities. And they conditioned all of that on the concept that we were all going to be voting electronically and paperless. And it is relatively easy, technologically to deliver a really robust set of access features when you're in an electronic format media. Once you introduce paper into the process you have created really, really challenging accessibility barriers. And it is not any one's fault and it was not as if someone designed this conflict to happen. But, because the law passed we had some jurisdictions and deployed paperless, fully electronic voting and then the tide turned and the security issues. And again, I'm not here to redebate all of those and many, many jurisdictions went back to paper. Literally we had people who had rolled into their precinct the last election and voted completely privately and independently and they rolled in this time and looked around. And rather than them voting on the same machine everybody else was using and being able to vote privately and independently they were back to the special machine in the corner is yours. Everybody is hand-marking an Opscan ballot. Your machine, you're going to have to have a poll worker help you because you can't get the paper in. You can't get the paper out. You've got to do this. I've got to set up for you and you cannot imagine the backlash that those of us in the advocacy community endured. Why aren't you

stopping this? You know and it was just the circumstance. And so when people kind of wonder why there is such angst over the issue of paper ballots within the disability community, you have to understand from a public policy perspective the worst possible thing happened. You gave it to people and then you took it away. Had they never had it, it probably wouldn't have been as big a deal and I will actually touch on that a little later. But this was the worst case scenario from a disability access perspective. So, I am providing that background just to say literally we in the disability community have been patiently waiting for eight years now for a robust solution that is widely deployed and we still don't have it and we are so far from having it. I mean it's going to be probably another decade before we are even close if we remain in a paper ballot environment to where most people with disabilities are able to walk into their polling place and truly vote privately and independently without some sort of assistance or something else having to intervene or just saying okay, I give up. I can't verify my ballot but everybody else can. Oh whatever, kind of thing. So, that's why the issue has such an emotional factor for the disability community. So, having said that and put a wet blanket over the whole thing, I'll go to the potential and promise of remote voting even when it still involves a paper ballot at the end of the process. For many people with disabilities they have always been forced to vote absentee because of transportation problems, because of inaccessible polling places and I know election officials work very hard on that, but things happen. You just, you know you just can't always ensure that it's going to be a fully accessible polling place that you know my transportation that I arranged for actually shows up and gets me there. They don't. The lift's broken on the van that I arranged. I'm stuck again. So, a good number of people with disabilities are on permanent absentee lists or whatever you call them in your state and they vote on a paper ballot and somebody helps them fill out or just fills it out on their behalf kind of thing and they resubmit it. So, the idea of remote voting for those people even if in the end it's producing a paper ballot is actually a step forward, particularly if they are AT savvy. They have their own computer. They have their own computer. They have their own computer access stuff. They probably have a scanner an OCR scanner, etc. If you can deliver them an accessible format you know, in other words something that is in HTML or something accessible so their screen reader will work with it, they can scan it, they can do all of that and even if in the end they print out a ballot, it still has improved the degree to which they are able to vote privately and independently remotely. So, that shows real promise. The activities that our people are doing with free marking a ballot and taking it in and on your cell phone and a code and scanning it there and printing it, same thing. Again, are they going to be able to see what they print out there and make sure that's right? No. But it's a whole lot better than voting absentee and you know just having somebody else market for them. So, there is some-- I mean I think there's some promise in some of the innovations on that front. Also addresses the problems people with disabilities have with wait time. You just can't have somebody with muscular dystrophy trying to stand or sitting around for long periods of time in a polling place. They're just not going to last, period. So, it will definitely help on that front. And the last thing I wanted to bring up is just the research we've been doing, which we've been doing-- we think that people with disabilities are underutilizing accessible equipment that is out there tremendously. I mean we hear over and over and over again, I'm not going to use it. I don't know how to use it, you know, blah, blah, blah kind of stuff. So we decided that we would try to provide demonstration and trainings on accessible voting systems and no value judgment on the system. It can be the best accessible system we've got or it can be really crappy, don't care. It's got access features. All we wanted to do was provide demonstration and training A, to see how long it takes Joe Schmo people with disabilities off the street, not at an AFB convention where all of these blind people are very tech savvy or you know a United Cerebral Palsy convention where all of these people are connected and they've all got their laptops and their switches and everything. Regular old people who probably don't have their own AT. How long does it take them to learn how to use these access features on the systems we have available? We have audio tactile ballots or large visual display whatever. And then how long does it take them to cast a ballot using the access feature. And did that help? You know are they more likely to go to the polling place and use the accessible systems. And very quickly we've done probably 400 or so demo trainings. We'll probably have 500-600 total in by the time we're done. And what we're finding is it takes an inordinately long period of time to

get people comfortable using access features. Like you can get some people familiar and comfortable in a couple of minutes, but there are a large number of people that are going to take 10 minutes, 15 minutes, 20 minutes, 25 minutes. In other words, you can't not expect a poll worker or somebody at a polling place to take Joe Schmo off the street who has never used this access feature and get them up and running and using it on election day in the polling place, not going to happen. So, one thing that we think is really critical is getting equipment out into the community into places where it can be demonstrated so that people can become comfortable and familiar and we have done some pre-post rating scales with folks and they tell us we've moved people on a 10 point Likert scale from a four to an eight. They come in saying level four comfortable using the accessible voting system, level eight going out. And many of them have said it literally, we get close to 10 percent of the people who say I didn't ever go in and use the machine, I'll go in and use it now. And I'll actually be able to tell the poll worker how to turn it on this time you know kind of thing. So, I think there's just a real need. We've got to acknowledge that those machines may seem intuitive to us, but they are not necessarily particularly when you're using the access features. And we've got to do a whole lot better job. You know maybe the younger crowd will kind of solve this problem, but for right now we've got a lot of elders who need to use those access features and they need a lot of help and support before they get to the polling place. So, that's something-- I mean hopefully my network of state Assistive Technology Act Programs, independent living centers, there's a whole network of groups that could help with this, but the hitch is we have a very difficult time getting our hands on the voting equipment to use for demonstration trainings and again, very legitimate reasons. It's proprietary. We only got so many of them. We have to get them in, clean them up for the next election. We can't turn loose. It's very difficult for me as a non-election official to just go to somebody and buy a voting machine. They're not really psyched about selling their voting machine to somebody who's not an election official. So, somehow we've got to deal with that problem if we're going to actually get the equipment out in the community and get to a level of comfort where they will go in and use it. Thank you. Before I forget, we also have developed this handy little guide, which is actually mostly for vendors and election officials that runs through access features and functional limitations of people and tries to make sure folks understand that you know an audio output, speech output might be used by a whole lot of people beyond blind folks. Anyway, and it's written hopefully in a very simple format and it's also available online at wwwataporg.org under a voting tab I think. So, thanks.

>> Thank you. We've gotten an awful lot of helpful information into the Commission. I wonder if there are any windup questions. Commissioner McGheean.

>> Actually I had one question for John Wack with NIST. Was wondering you described how quickly you had to come around and adopt the standards in 2005 and the some of the constraints. If let's say the-- we have a miracle and some of the stagnation, we work through that and you have a certification program and standards to write, what would you do differently? Anywhere, that's really not just for John, but anybody involved with that process.

>> Could I ask you what would I do differently in the standards or in the development of the standards?

>> I guess both, development of the standards. I mean if the Commission is given you know but I mean if there's another way to go about creating standards that would create more flexibility--

>> Flexibility, okay I see what you mean. Well, I have my opinions and I'm sure other learned people would disagree with them or have their own slant. So, some of these are just my own opinions, but you know it's pretty clear that currently things aren't working correctly. One of the things that hasn't been mentioned a whole lot and in fact, I noted down that I think Matt Masterson was getting at earlier was that you know some of the issues with regard to security have to do with kind of a usability for election officials. They'll call it, call it that. That-- what happened was a lot of money was allocated to buy voting systems and then the standards came in later and

mandates for security you know involving paper records came in. And we didn't have voting systems that were really usable for election officials to audit. So, having this usability built in and I was talking to Commissioner Lomax before we started and recalling him describing when he was auditing VBPAD systems and laying out the roles on long you know, long tables. And it was nuts. You know you can't expect election officials to, to use the audit features you know if they are usable. So, a lot more rigor needs to be put into the standards process in my opinion when it comes to evaluating how the systems are being used by election officials. And you know can they be strung together quickly you know to accommodate for longer lines? Can they be audited more easily? Can things work out better in that regard. The other thing is that it shouldn't take in my opinion years to update the standards. Every time you update the standards it shouldn't be an issue. The standards ought to be written in a way that it's a lot easier to provide updates. The way I favor and there are a lot of people who disagree with it, but it's just my own personal bias is to write standards that have requirements that are higher level but have very specific tests and the tests may change over time. We may elect to test things in a certain way for a period of time, until technology allows us to move in different ways. And it shouldn't require an act of the commissioners to involve this. I do think though that there's a lot of value in setting a specific time limit because otherwise people could argue forever. So, I do think having a reasonable amount of time, two to three years, is still a good idea. And having a public process the TGDC process was definitely very public. A lot of participation there, but it also tended to be somewhat slow. The IEEE process I'm involved in I think is working better because we have more election officials involved and we have more manufacturers. There is still a role for anybody else who wants to be involved, but it was eye opening once we started working with more election officials and manufacturers as well. Manufacturers work with all 50 states and you can come up with ideas about how things ought to work and they'll say, but Delaware does it differently. You know it's very educational. And getting back to systems being usable by election officials, you know we have to focus on the voters and make sure the voters are able to vote accurately, but they won't be able to do that if the systems aren't set up well for election officials to use. So, I would emphasize that a lot more and the research and still put a time limit on it and I probably said enough. Thank you.

[Silence]

>> Doug, return question for you if that's okay. You put a great deal of emphasis on the failure of congress, the fact that you know Federal legislative recommendations are not within our mandate. But I want to just clarify something on the record from the standpoint of the analysis that you're pursuing. I think relating the absence of a regular updating of standards to the failure to have a functional EAC fully staffed with commissioners. But the other impression that you get from the testimony is this problem has been going on for a long time, the suggestion that the standards process is slow moving, the updates are irregular and certainly over a period of time when the EAC was fully functional that question together with the question raised by Wendy Noren about do we need a federal presence, Kevin Kennedy's suggestion when will the state see the flexibility to step out of it, I would like to hear your more specific comments on that if you could.

>> The glacial pace initially was learning curve. Learning curve for the EAC in terms of commissioners getting comfortable with what they were going to have to say grace over. The actual process that the Federal Government itself goes through for vetting anything certainly was a learning curve I think for all, even though Brian had been in government for a really long time, nobody at the Federal Government level had done this kind of program that generated so much heat and so much concern and so much thought that it created a whole new series of delays. And so, and then funding issues got to be kind of a problem as we went along and so some of that is explainable. The other parts of this it seems to me is locked into what is the role of the EAC in this-- in the Federal Government in this process is the role to be a super regulator even though that agency has no regulatory authority or is the role to serve a customer base and to have an attitude that its success is really entirely dependent upon whether or not it serves state and local governments well in terms of being able to deliver voting systems in a timely fashion and what have you. And we haven't

resolved that crystal concept at this point and it seems to me that needs to be in the mix. I think the learning curve that we've gone through in terms of being able to do change over processes and so on although with Brian saying today that you know we were able to get something through in 50 days that probably should have gone through in less than a week it's-- I mean this is-- but again, he's strapped with a Federal Government process that NIST never had to worry about. And so those are-- this is part of the process. At the same time we got to kind of redesign the whole thing. It is not functioning well, wasn't then and is not now functioning well, at least to the customer base that we're listening to. At the state level and local government level I got my rear end chewed because I'd been a defender of the process for a very long time. And I got my rear end chewed by both states and local governments that the process was not working. And so it seems to me we need to sit down and think through how do we do this in an open society with regulatory authority with processes that demand that we go out to OMB and ask OMB for their permission to do crap you know that takes forever. I mean it's just-- that's back to where we are. But we can't do it the way we're doing it. It isn't working and if we're doing minor modifications to standards that are at least 12 years old if not 22 years old or whatever it is, 23 years old. Then we're not serving the public. We're not serving the voting systems. We're not serving state and local governments. We're not serving voters. We're not doing any of it and so the ultimate deal is we go to figure this out. I ultimately believe and still feel we're better off as a nation with it in a Federal agency that finally is maybe redesigned to move faster than we are to turn this back to the states and let the states worry about it. Because here's ultimately what the states want to do. If you're going to turn it back to us you fund it at the federal level. Well the Federal Government is not used to just handing out money and staying doing what you want to with it. And so, this is one of those processes that if we're going to do this we have to find the mechanism in which to fund it if we're going to take it back at the state level and that to me means that we've come full circle. We went from states to Federal Government back to the states, but relying on the Federal Government to fund it. That's going to be a tough order it seems to me.

[Inaudible whispering]

>> Thank you Doug. I appreciate that very much.

>> Ron Rivest: I believe that piece of software is doing the right thing. Why do I believe its output is correct? And in the case of paper ballots, you can sort of do statistical sampling and look at the inputs of the software looked at and look at the outputs and say, yea, it did the right thing on a statistical confidence level. You know, I don't know if you're talking about auditing of software or auditing of the particular inputs and outputs. The auditing of the software itself is an unsolved problem. We don't have good techniques in computer science yet for providing assurance that software will do the right thing all the time. You shouldn't expect that of a certification process that looks at the software, the looking at the software that's done in the certification. Now is a good hygiene check. It's not using obsolete encryption. It's, you know, not putting passwords in the clear, or whatever. But it doesn't provide the kind of assurances that you really want if you want to convince the losing candidate that he lost the election fair and square. Software is enormously subtle, enormously complicated. It can, you know, play tricks on itself and overrun stacks and do all kinds of things that just are surprising. There are people who run classes, like Ave Rubin, and sometimes divide the class in two and tell Part A to devise, take this voting system and put a glitch in it that Part B of the class can detect, and they don't. You know, I mean, it's easy to hide in software now where -- and misbehaving things and so on, too. So auditing the software per se is so complicated that we ought to stay away from that whenever possible. If some part of your argument to a losing candidate is "and you lost because this software says so," that's not a good argument, all right?

>> But on the output/input --

>> On the input/output side, if you could statistically check, you could say, well, if you take, you know, at least a sample of 400 ballots out of these 10 million

ballots that were cast, and you do the appropriate test, then you can say yes, the counting was done properly, and the statistics will support that. So you've got an accounting process that's checkable because the input/output relation is checkable by statistically sampling.

>> Yeah, and --

>> So that's a very different kind of check. You don't need to trust the software being correct. And this is the point of the paper that John Wack and I wrote a while ago called "Software Independence." You'd like it to be the case that the outcome of the election cannot be changed by an undetectable error or bug in the software. If you're depending on the software being correct in order to trust the correctness of the election outcome, you're in a very precarious spot because software isn't correct. Commercial software has three bugs or so for every thousand lines. Some of those bugs may be enough to cause the election outcome to be incorrect. Typical software runs for many millions of lines. So software, and all software that's out there is commercial software, has bugs in it. I don't think there's any vendor here that would claim that their software is totally bug free and would turn their company over for you if you found a bug in their software. It just isn't going to happen. All right. I mean, so the software is known to be buggy, and if you're counting on the correctness of the software for the correctness of the election outcome, you're in trouble. But if you can check the correct behavior of the software on a particular election set of inputs by checking a statistical sample of the outputs, you're in great shape because those techniques could be done without sophisticated software. They can be done by people looking at a small number of ballots.

>> And if I can, really quick, just to barely add to what Ron said, not only is it checking a statistical sample to say, yes, the outcome is correct, but what you're basically saying is if you go and count those 9 million minus -- or 10 million minus 400 ballots, if you actually go do the recount, you're going to find the same answers that we found in our tabulation, and that's what's so powerful about risk [inaudible] audits. It's like doing a statistical recount where you can say the law may say you need to do a recount and someone's paying for it, but what you're going to find is the exact same answer we found here, with some level of confidence, you know.

>> I have just one quick little thing to that, please, and what is so powerful about that is it only takes, in this example, 400 of the ballots. So it's powerful to Commissioner's [inaudible] for funding purposes because you don't have to count the 4 million. You only had to count just a tiny percent of it to prove the whole election.

>> Yeah. I would like to make a comment on that, as well. When we developed Prime III, we asked a question: "When was the last time someone certified or tested a pen?" I have never heard that. I mean, for an election, there's never been a case -- and EAC, correct me if I'm wrong -- that you actually required me to use this specific pen with these specs. So what we were getting at was exactly what Ron is saying, that we put the onus on the product. So even if someone could hack our system, which no one to date has, but if someone could hack it, the fact that everyone, independent of your ability or disabilities, vote on the same machine and the product is the same for everyone, that in itself made it not only accessible and useable, but it added a layer of security because the machine couldn't distinguish between a deaf person or a person without arms. So it didn't know what was being produced. So when you did this post-election audit, it didn't matter if the machine was trying to trick you or not because it could not identify who you were to trick you. So the audit case for us was actually on the product, not on our ink pen, which is Prime III, in that case.

[Silence]

>> Questions from Commissioners? If not, we would really like to thank you all of you for your participation in this. It's been tremendously helpful for us as a commission, and we thank you for that. We do have one additional presentation for the commission on coworker training that we will turn to. But we've kept you all a long time, and we thank you again for your participation. Sally?

>> Hi. I'm Sally Williams from Michigan. I promise to be brief. I won't be talking about voting systems today, but will be talking about some of the other technology programs we have going on in Michigan, one in particular are our latest offering, which is a brand-new online training site. My role in Michigan, other than being lucky enough to work for Commissioner Thomas -- I don't get to call him that very often, so -- is the liaison, the conduit, with all of the election officials all over Michigan. And one of the unique things in Michigan that affects just a few states is that we are one of the few that administer elections at the local level, which means that our touch points are really with about 1600 individual jurisdictions -- obviously very challenging in a lot of ways, especially in the way of providing technical support and procedural support and training. We're going to get to some of what we do there in a little bit, but some of the other things we wanted to mention quickly -- we've also taken approach in Michigan on some of our major technology programs to do internal development. We're not going that route with voting systems right now, but we have done so for several years with our qualified voter file, which we first developed back in 1996. We've got a system and a law and a process in place where we have set up an electronic connect between our voter file and our driver file to keep the records in sync, which is, I think, one of the only ones in the nation. We've self-developed an electronic poll book application that really runs from our qualified voter file. Also an electronic precinct list, which is more of a line-chaser type of an application, and we've also developed a major voter resource in Michigan internally, which is our voter information center. And, just quickly, this is a look at our voter information center. It's quite a tool. It's got a very easy URL, Michigan.gov/vote. I don't know how well you can see some of this, but the major functionality allows voters to go in and do a search on their own record, confirm that they are registered, find out their polling place, sample ballot, maps to their polling places. Just last year, we also developed a mobile app for this, as well, which has gotten some very good reviews. It also is a one-stop shop for everything related to voting. So we've got, you know, a lot of information on absentee voting, military overseas, contacting your local election officials. We actually use the system which runs through our qualified voter files, as well, to hook voters up with their local election officials and also use that to generate our electronically transmitted you-oh-kapa [phonetic spelling] ballots, as well, and all generated through our qualified voter file. Next slide is just a sample look at what you see if you do a search on our voter information center, probably not quite big enough but, you know, you'll see a map to the polling place and your upcoming elections and deadlines and sample ballots, which are very interactive, as well. But what I really wanted to hit on today was our latest offering, which is just getting started and will just grow over time, is our online training site. It's -- we call it the Michigan Elections E-learning Center. We launched it in April of this year, and already we've got about 1100 users enrolled. It's a very powerful system. We develop -- and, again, a lot of internal development. It's hosted by an outside agency, but we're doing all the development of the coursework and everything in it internally, as well. We've got online courses. We've got all of our technical and procedure manuals very heavily indexed for great search capabilities out there. We've got collaboration spaces where we can do kind of live, you know, webinars, blogs, discussion groups. We can have, you know, groups by counties. Individuals are tracked. You know, there is a signup, login process by individuals so we can track election officials for the counties that, you know, we do get involved. They can track their county users. We can use it to assign specific coursework. Say a brand-new clerk coming in the door, you know, assigned just a series of courses there. We can put in pre-work and post-work and some other things to supplement a lot of our training, and we do a lot of now online surveying and gathering of data, trying to get rid of paper and data entry and a lot of the gathering of our you-ah-kava [phonetic spelling] statistics from our 1600 different jurisdictions. It's been really enhanced with our online surveying. And one of the other really strong things about this site is that it's available 24/7. We have a lot of very small jurisdictions with election officials that are election officials on the side. They have other jobs, so they can be difficult to reach and train, and the materials are out there for them 24/7 as well, which is nice. It's hosted, again, the outside organization I mentioned is Michigan Virtual University. This is a nonprofit organization in Michigan that really previously is operated with online learning targeted to schools and educators. They were very excited to partner with us. It's their first foray into state government, and they're

now moving on to do so with other state agencies, as well. The E-learning Center really is targeted for -- we've hit on some of this, you know, election administrators, really at all levels. A lot of the different user groups we have out there, we again have, you know, the technical programs of the voter file and the e-poll book. We've got training modules out there and being developed for those that are kind of a nice supplement to, you know, in-person training and dragging everybody to, you know, the state capital, or places that aren't right next door for them, and a lot of just used by our own staff, as well. Some of the offerings -- I'm going to pass, skip through this one and see if we've got time. I've kind of hit on a lot of the offerings, but wanted to just show you this is a shot of our main screen. A lot of the stuff at the top of it is instructional. It really does show up a lot better on your own PC. But we've got several areas where people can access information in different ways. Up in the right-hand corner over here, we've created a lot of just nice tips and quick links to things that we think are easy and helpful, just small things. This is a shot of a couple of those. The top half is an election calendar that we've got out there. It's interactive. We keep it updated for every election. What's highlighted up there is the date for this November's election when precinct inspectors must be appointed. It's got links to the law that, you know, people question, you know, what has to be done and when that, you know, is up there and constantly updated by our staff. People can use this, download it to their own Outlook calendars. They've been very excited about this. The bottom half shows a shot of just -- we have a "what's new" button, whenever we put new content out there, you know, you'll see it under here. And what you'll see is there's a lot of ways to list things by topic and, you know, other ways, and what you'll see is, then you'll see the format for what the item is. It's a little hard to read. But you'll see classroom training. You'll see online training. You'll see documents and things like that. So lots of ways to find what you're looking for. Another main part of the screen are the boxes towards the bottom half that kind of have the red, white, and blue little logos on them. Those are sorted by subject matter. So, for example, if we look at -- there's one on the bottom left that lists courses. You can just go right there, and if you just want to look at courses or if you just want to look at everything we've got on the e-poll book, things like that, you can list things all kinds of different ways and, again, get to these types of listings and see the various types of materials that are out there. One we're highlighting is one of the post-coursework. We have an extensive clerk accreditation class for brand-new clerks when they first come in the door. They're required to pass an exam when they're done. We put this out online that people can take and get their results immediately, get feedback on the information if they've answered anything incorrectly, and, you know, again replaces kind of a somewhat lengthy and clunky paper process that we had. [inaudible aside] One of the other things I wanted to highlight real quick is we've done a series of training videos which incorporate --

>> [overriding voice] Processing voters.

>> And we've got audio, too. We'll just show you a quick segment of this with the software that we've got.

>> [overriding voice] Ask the voter [multiple speakers] polling location. Greet the voter and instruct the voter how to complete the application to vote.

>> There are some really good actors in here, too.

>> [overriding voice] Ask the voter if he or she has photo ID.

>> But you'll see you can tie together all kinds of different types of media into one --

>> [overriding voice] The following types of photo ID qualify as acceptable: driver's license or personal identification card issued by Michigan or another state --

>> And this is the kind of thing, too. It's out online --

>> [overriding voice] -- federal or state government-issued photo identification.

>> [simultaneous speakers] We have a You Tube channel now, as well, where the workers can go out and, you know, look at that after training. The election officials, you know, rather than the age-old kind of textbook training, can cut in to these back and forth, and they're right online for people, as well. I'm just going to show you one little -- [inaudible]

>> [overriding voice] If a voter does not --

>> So this is just an example of what to do when someone has no photo ID, and this poor gentleman has no ID, so.

>> [overriding voice] -- under Michigan law. These voters simply have to sign a separate affidavit attesting to their identity, and their ballots are tabulated normally.

>> [laughter] I know. He never knew he was going to be put on display like this.

>> [overriding voice] -- using the electronic poll book, [simultaneous speakers] swipe the voter's driver's license or type the voter's name into the appropriate field --

>> [multiple speakers] -- we've got out in about 90 percent of our precincts now, and we have some separate modules just on the e-poll book and, you know, some other things to just kind of reiterate some of those key pieces there.

>> [overriding voice] If you have a split precinct, this is the time to --

>> Oh, okay. So that was just a sample. That goes on all the way through the voter experience. Just a couple of other things. Also wanted to just highlight the indexing capability and the search capability. We have had quite an extensive website for years that we've put all of our materials out for election officials, and we have just had a pretty terrible time of trying to do quality searches out there on that. It's all of the State of Michigan materials, and you can look up poll book, and you can get anything from state government. Well, in this system and with the indexing that we do, you can do searches in many different ways and just say "e-poll book" or even, you know, down to a finer line, here's everything that mentions e-poll books. There's classes. There's frequently asked questions. There's manuals, things like that. So we really like the indexing and search capability of this, as well. Moving forward, again, we've just really gotten started here, but, again, the capabilities are very unlimited and powerful. Our focus right now is we had some legislation that went through last year requiring a two-year continuing education, a reaccreditation program, as you will, for clerks, and we are fast and furiously developing a lot more content to go out there that we'll just build on over time and, again, can just assign to officials, you know, automatically track who's taking them, you know, based on experience level. And as we get more and more items out there, we can, you know, continue to refresh that, as well. We're putting out modules, online modules, for some of our major technical programs which, you know, prior to now, we bring people in in real small groups to Lansing, very difficult for some people. But we're putting out a whole series for qualified voter file training, e-poll book training. There's several pieces out there, as well, and we're going to expand on the collaboration centers and the groups. We've set up a user group for the site itself, inviting people in to give us suggestions for other types of materials to put out there. You know, those that use certain types of voting equipment, for example, can have collaboration spaces. They can, you know, share their materials, how they train, things like that, you know. Webinars, we're planning one now. We also have a brand-new post-election audit program that really goes end to end, just from election official responsibilities, you know, on Election Day, pre- and post-, and Election Day items, which we're tracking the results of those to develop additional training courses to focus on. We're putting a webinar out on, you know, the items we're finding in our audits to bring more reminders to people and things like that, you know. And then any sessions that we put out there, even, you know, a lot of training sessions, we can record and place out there for future use. So just very excited,

very -- lots of capabilities here. I'm happy to share any other information, if anybody else is interested, or to answer any questions.

[Silence]

If not --

>> Yeah, just one closing question, Sally, to close. Did Commissioner Thomas complain about the way he was treated at the polling place? [laughter]

>> Not that day. [laughter] Actually, we talked him into being an actor. He didn't know where that was going take him.

>> Well, it was a compelling performance. [laughter]

>> He modestly signed his name "Clark Kent," you know, so --

>> Yes. Somebody mentioned auditing and results of Academy Awards, and we wouldn't have to do that here. In any event, thank you, [laughter] thank you all very much for coming. As Commissioner Ginsberg said, this was a thought, that we had to bring people together in this sort of conversational framework and to try to really initiate a dialogue, and it worked well beyond any reasonable expectation we could have had. So thank you very much for coming.