2011 Electronic Voting Technology Workshop/
Workshop on Trustworthy Elections

Keynote Address
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San Francisco, CA
August 8, 2011

Thank you very much for the opportunity to visit with you today. It is kind of a surreal experience for me to be here. My Chief Deputy, who is normally a reasonable person, a few years ago and out of the blue developed a terrible crush on Bono from the rock band U2 mainly because of his lobbying efforts for AIDS medication. Recently, I happened to hear he was in New York, and I teased her – "I bet you wish you could find out where he was having lunch and just "happen" to show up there. Her response was not, "Oh, I'm headed to the airport." It was instead, "No. If we are doing ultimate wishes, it would be that he thought my work and thoughts were interesting enough that he would call and ask me to lunch." So, my being here today is kind of that ultimate wish come true for me. You are my hope, my rock stars. Hovav is my Springstein, David Waggoner my Jagger, Brent Waters my Jay-Z, and Dan Wallach my… well I saw a recent video where he talked about me – so today Dan is my Ozzie Osbourne. Oh, and Greg Miller – Greg you are my Prince, my Jack White.

I was thinking about what I could offer you today, besides being a bullseye. My first thought was, of course, that you wanted to hear my comments on whether or not the Python programming language running inside the CherryPy 3.2.0 application server with a "Lighty" web server provided sufficient structure and a robust enough environment to scale up to run a medium sized internet election in my County. Well, I decided to pass on that – been there, done that. Instead, I am going to focus on giving you my perspective as to why I hope we can change the dysfunctional structure of relationships in the election world – and, to talk about how much this country needs your wisdom and your knowledge of science – especially NOW. As an example of this, I want to tell you where Travis County is on their purchase of a new voting system, and how I need your input. And finally, I would like to tell you briefly about a new project we are trying to put together that may be of interest to you. I've got so much to share with you. I hope you will forgive me if I go rapidly through this.

I am the elected County Clerk in Travis County, Texas, and I provide election services for the County and about 130 local entities including the City of Austin – the capitol of Texas. I am extremely fortunate to have been re-elected 5 times and have had the privilege of serving the great citizens of Travis County in this job since 1987. I believe it is an honor to be in public service, and I strive to never take this immense obligation for granted. The first election I conducted was way WAY back, back when the dinosaurs and the cavemen roamed together on the earth (sorry that's an inside joke in case you've followed the politics of Texas textbooks) – so I've administered elections using paper, punch card, optical scan, and electronic ballots. Currently, we have 575,000 registered voters and 210 precincts. We have an extensive early voting program and, if our request is approved by the Texas Secretary of State, we will be trying out a vote center system where we maintain our regular number of polling locations, but allow anyone to vote in any location throughout the County.

In 2002, we purchased a new voting system because our existing ES&S optical scan system had come to the end of its life. With the help of a citizen's committee, I made the decision to purchase the Hart Intercivic eSlate voting system, and it is what I use today. HAVA implementation occurred shortly after we purchased our system, but we were fortunate to still be able to obtain HAVA funds to apply back toward this purchase. Since we started its use, the Hart system has successfully performed about 33 elections.

Now almost ten years have zoomed by, and our current system is getting near the end of its life. So, I am in the middle of a careful and deliberate process to select its replacement. I knew I wanted the new system to have a paper element to it, and when I went to find out what was new on the market, I was shocked to discover that it looked like they had taken the old optical scan system from the 90's and just given it a new coat of paint.

Ten years ago, when we were looking at moving to electronic voting, discussions then were largely isolated to issues like: How would voters adapt? What kind of training and logistics are needed for election workers? How will we make sure every polling place is up and running at 7:00 a.m.? The thoughts of software attackers, computer viruses, and the world of advanced cryptography seemed more like science fiction than a relevant topic in my world.

So, you would think that as I got ready to go into this process again for the third time, I would find that the terrain had drastically changed - that the lessons learned meant we would be so much smarter and handle this so much better.

Unfortunately, I would argue that this is in many respects not the case. Today, we are facing issues very similar to those in 2000. Thank goodness we aren't talking about hanging chads, pregnant chads, or even sort-of-pregnant chads. But, are we not again talking about the need to fundamentally change the way we vote because there are issues as to whether or not our current system can be trusted? Tens years and what has changed?

I'd like to share my flashback to the 2000's with you. There are some unpleasant things here – and if some of these sound oversimplified and like one-sided views from just an Election Administrator's perspective, that's because they are. Remember this is my flash back. In the 2000's, the "aughts":

- Elections Administrators (EAs) were the main force in developing safety protocols for electronic voting systems - even though they had not participated in their design - and we had little or no say in the requirements used for their certification. We turned to physical security methods, testing procedures, and auditing practices because we had no effective mechanism for demanding any software improvements or standards. Although by 2007, we had Voluntary Voting Systems Guidelines (VVSG) very late in the game.

- EAs had minimal assistance from vendors in getting product improvements and few options since only a handful of vendors serve all of the election entities in the United States. Vendors told us and the public "Trust Me" while at the same time withholding their software code as proprietary. We saw few if any upgrades to our systems because even the smallest change to solve a problem required an exhaustive and costly recertification process.

- EAs had to hunt down, sort, and analyze a myriad of information - from anecdotal evidence to actual research that appeared from widely scattered sources. Academic papers and Internet rumors were often given equal weight in the public discourse. No relevant information seemed to get a formal review to determine accuracy or applicability by the certification authorities who, under a screen of confidentiality, reviewed software and certified the systems. As a result, all accusations against the election systems, whether valid or invented, continued to stand uncontested by any independent authority.

- EAs were vilified by electronic voting critics who made broad, sweeping statements that condemned all electronic voting systems and the people who administered them.

- EAs often ended up working alone to find ways to make voting safer and answering voters' concerns because the vendors, certifying agencies, academicians, and other critics spent most of their energy either attacking or defending electronic voting without providing any advice to us about intermediate, practical analyses and solutions.

As I said, this is oversimplified. I am not trying to say that election administrators should be pitied or are not as culpable in all this mess. I know you have a similar list of issues and felt a lot of frustration toward my colleagues and me. Through no fault of your own, you did not have the opportunity to sufficiently contribute your comments until far too late in the process - after certifications were completed and systems purchased and delivered. For you, I can imagine it felt like hollering into a well or that EAs, vendors, and regulatory agencies just stood there and looked at you blankly while you explained what seemed so obvious.

I can also somewhat appreciate the dilemma faced by the vendors. They felt hamstrung by the certification process and found themselves stuck in a low-profit business riddled with endless red tape, where new standards were passed after equipment had been certified and sold. They became the easy go-to targets and scapegoats of anyone and everyone with an agenda.

Community activists felt worn out, their concerns seemingly brushed aside under a carpet of secrecy, left wondering whether this democracy that boasts of being a government of the people could be trusted to count the people's votes.

As an election administrator, I know with certainty that we were not perfect. In the face of accusations we felt were false, some of us may have become defensive. Perhaps we could have done more sooner, but we would have to create a new paradigm to make these changes – and what would that look like?

The point I am trying to make is that there is no one group to blame, rather the roles we were all playing were out of sync and the whole system flawed from the start. So, what would be the proper roles for all of us? Here is a very abbreviated list of some of my suggestions from a paper I did titled "Doing Things Differently."

The role of Election Administrators should be:

- Focusing on taking care of voters and competently conducting elections so that communities can trust the democratic process.
- Actively working with academicians and certifying authorities to develop requirements that tell vendors what to build and encourages vendors to be innovative in how they build it.
- Considering election academicians one of our best resources and encouraging opportunities for these researchers to have access to the whole election process in real-life situations.

The **Role of Vendors should be:**

- Soliciting more input from all parties during every stage of product development, especially early on.
- Proving in a public setting that their systems have high levels of security and performance, perhaps using open peer reviews.
- Establishing a code of high ethical standards that includes the promise that the corporation and its top executives will not make political contributions to individuals or political action committees.

Meanwhile, the Role for Academicians and Computer Security Experts should be:

- Improving communication and working relationships with vendors and certifying or monitoring agencies, perhaps by participating in open peer reviews of software early in development.
- Encouraging the idea that the finding of a problem also comes with the obligation of helping to find a solution and working in close partnership with election administrators to identify those problems and solutions.
- Working with election administrator organizations to offer sessions that bring new and varied points of view. At EA conferences, perform workshops that teach the basic technical aspects of computer security.

Certifying or Monitoring Agencies should be:

- Providing a central reporting, monitoring, and research division that investigates and serves as a clearinghouse for antidotal information and reported events. Taking an active role in providing assistance to election administrators regarding the latest recommendations for detecting problems and mitigating risks. Busting apart and rebuilding the certification process so that it can work effectively without being

something that is sluggish and expensive and prevents new ideas and software improvements from being regularly introduced..

- Setting aside time and resources to fully consider new ideas like open source software.
- Absolutely, the Employee Assistance Commission (EAC) should not be disbanded. They may be flawed and fledgling – but they are the only conduit for local voices to the federal level.

I know this isn't pie in the sky thinking. Heck, you invited me here to be a part of your conference. Yes, we can take on more productive roles. I think what you have done today is a pretty good approach.

At home, my community wants us to do things differently. The study group I formed to help me select the next voting system for our community had a couple of primary points. One, they wanted a system that had a paper element with a machine-marked ballot that is electronically counted. And two, they didn't like any of the systems they saw on the market, and they asked me to go out and get them something they would like. Their attitude was ignore the obstacles, screw the rules, go get something better. Did I mention how proud I am to be an Austinite? Our downtown statues aren't of a bunch of Presidents – they are of Stevie Ray Vaughn and Willie Nelson – and we don't brag about having some fancy theme park, not when we've got the Ann Richard's bridge – home of up to 1.5 million bats, the largest bat colony in North America. We're an odd mix of dreamer and realist, and if the establishment says it can't be done, then we want to do it even more.

That leads me to the second part of my presentation to you. I would like to give you the very first draft of what I think our community might want. I am starting from that vantage point. I am not looking at what has been certified, what fits into current Texas law, or is already sitting on some vendor's shelf. My strategy may not work, but I am going for it.

Before I begin – two quick things - One, security is still going to be a relevant issue once we move to a paper system. We will continue to need real world solutions and security protocols based on probability analysis, not possibilities. For example, in our study group, we heard an extensively prepared presentation from activists who said that no counting method using computers is acceptable because it can never be transparent. They condemned the use of precinct ballot counters, showed footage of academicians supporting their claims, and said that the

only answer that would be tolerated was if paper ballots were hand- counted in every polling place. We all have to live in real world democracy.

Two and most importantly, in case you are thinking to yourself, why should we spend our time thinking about a voting system in one little ole county. The answer is timing. We purchased our system prior to HAVA because we had to. Our replacement schedule is hitting now, but in a few years, you are going to see another huge wave of entities buying new systems. Now is the time to put your mark on what the future is going to look like for Travis County and everyone else.

So, for my part I am throwing my first draft out there and am eager for you to tell me how would you make it better. Help me broaden my vision. I want to not only figure out what I should be asking for, but how I should ask for it so that I get the best-designed, most voter-friendly, most accurate, and most secure system possible.

Our draft design is, at its heart, a system that utilizes machine-marked ballots that are scanned and tabulated on a precinct ballot counter. That is because we want a paper element, but we do not want to have any voter intent issues interpreting how someone marks a ballot. We also want to be able to operate early voting and vote centers without having to manually allocate paper ballots. We can't kill enough trees to make that work. Additionally, we feel strongly that everyone has the right to vote on the same system. A person with disabilities should not be sent off to a corner to vote differently than everyone else.

Let me give you a brief overview of what I have in mind and it follows the diagram I handed out. It is a combination of the good parts of various voting systems, different ideas we have heard, and suggestions my staff have made.

Imagine a polling place where the voter begins at the Voter Qualification Station. The Judge locates the voter on the computerized voter registration list and records that a ballot is being cast. This information is transmitted in real time to the central office. Numbers are monitored by election staff throughout the day, and updates regarding lines/wait times are regularly reported on the website, along with periodic reports of precinct turnout.

One label and one receipt are printed for the voter. The voter signs the label that then becomes part of the poll list. The receipt, which has a number or bar code, is given to the voter to take to the voting booth. The number or code only contains information regarding the ballot format.

The voter moves to a Voting Station, enters the code on an electronic tablet, and the correct ballot format appears. The image on the screen is intuitive and needs little or no instruction for use. The graphics on the screen are well-designed for maximum readability. The voter navigates through the ballot and can easily zoom in or out. A bar on the right continuously shows the full list of choices as they are made. A full-screen summary appears at the end, and the voter casts her ballot.

A list of the voter's choices prints out at a printer next to the voter's tablet. This printed list only includes the race headings, the voter's choices, and a number associated with each choice. The ballot is easy for the voter to read and does not contain any symbols or coding that the voter doesn't understand. It does not resemble a traditional ballot and minimizes the use of paper.

This part of the system does not record any votes and stands alone with no connections to the voter registration database or the Precinct Ballot Counter. These are off-the-shelf tablets and printers that are easily upgradeable /replaceable, durable, and competitively priced. The printers are reasonably priced, designed for high-volume use, and use paper that can be easily replenished and identified as official ballot paper. The print is clear, bright, easy to read, and stable enough to maintain high quality for 22 months.

The voter takes the ballot to the Precinct Ballot Counter (PBC). (Note: By voting a machine-marked ballot, the voter has already resolved the ballot before printing so the PBC does not reject the ballot.) This standard piece of equipment contains a scanner, a tabulating unit, two memory card containers, and a ballot box to hold the paper ballots. The system seamlessly handles provisional and limited ballots, when necessary. The voter feeds the ballot into the scanner which then takes an image of the ballot, records the vote, and drops the paper ballot into the secured paper ballot box. The voter sees a message on a small screen stating that the vote was received, and she leaves with a smile on her face. Her thoughts are not about voting security, but about how happy she is that she took a few moments out of her day to participate in her country's democratic process.

When a curbside voter arrives at the polling location, the Voting Station is easily carried to a car by a poll worker for curbside voting. The ballot that is voted curbside is confirmed by the curbside voter and submitted to the

precinct ballot counter with no loss of the voter's privacy. The scanner is compact, geared for high volume and is not prone to calibration issues, even after a rough ride in a delivery vehicle. It is easily replaceable using off-the-shelf equipment.

The Precinct Ballot Counter stores the vote count and ballot images on an internal drive and on two memory cards. Two connector cords are attached to the tabulator system, and are enclosed within the unit so that they cannot be detached in the field without detection. The opposite ends of the connector cords connect to the memory cards. Each memory card is stored in a sturdy plastic container designed to prevent tampering. During initial central office election preparation, a secure connection with the memory card and the system connector can be made. After the box is locked down, however, a break in the connection causes the memory card to fall down into the box making it inaccessible until the sealed container is opened (see diagram). Each container is secured with a seal and a special lock containing a time stamp chip. When this lock is opened, the time is recorded. Both containers also have GPS chips. While the polls are open, the containers fit inside the Precinct Ballot Counter and out of the reach of voters or potential troublemakers. The memory cards are set for read-only after the polls are closed. After one use, they are either discarded or recycled for nonelection use.

When the polls close, the Judge uses a seal and time stamp lock to secure the top of the paper ballot box (which also contains a GPS chip). The Judge then opens one of the memory card containers. The memory card is removed and connected to the computer at the Voter Qualification Station, and the election returns are sent to the central office. When the central office receives this information, an election worker compares the number of voters who were processed at the qualification station to the number of voters who cast a ballot on the tabulation system. That information is then transmitted to the Receiving Substations so they know what to expect. The Substation election workers can ensure that the Judge has adequate documentation to support any differences. The Judge replaces the card into the container, locks it, seals it, and returns it back into the Precinct Ballot Counter. The Judge secures the remaining equipment that is lightweight enough for an average 70-year old person to disassemble and maneuver. The Judge rolls the secured Precinct Ballot Counter to the car and transports it to the Receiving Substation.

An election worker at the substation checks the items in, counts the number of signatures on the paper poll list, and makes certain documentation regarding any differences in numbers (if any) is turned in before the Judge leaves. The second memory card container is removed from the Precinct Ballot Counter and given to a law enforcement officer for delivery to the central office. The paper ballot box and the container with the memory card used by the Judge are safely stored at the substation. These items are delivered to the Central Counting Station after all precincts have reported in.

The central office knows the location of each precinct's memory card container and paper ballot box because they have been "Lo-Jacked" with an inexpensive GPS system. The whereabouts of these important items can be tracked from the time they are initially picked up by the Judge to the time the memory cards complete the loop back to the Central Counting Station. If a Sheriff is sent out because of potential problems on Election Night, exact locations can be given.

The cards are tabulated at the Central Counting Station and the returns are compared to those first sent from the polling locations after the polls closed. When they match, the returns are downloaded onto a read-only CD, transferred to another computer not connected to any system, and published to the Internet along with the early voting and ballot by mail results that are part of the system.

After Election Day and before the canvass, a sample number of precincts are run on an independent auditing system. This system is not connected to the voting tabulation system. It scans and tallies the paper ballots using numbers, not names.

After late mail ballots are received and final official returns are prepared, the images of the ballots are made viewable on the Internet. No hired third party auditors are needed; anyone can view and recount the ballots.

The software through the components of these systems is easy for administrators to use without vendor involvement. The software is well-designed, flexible, able to handle a multitude of voting scenarios, able to recognize and handle provisional ballots, and places great emphasis on security and redundancy. The source code must be open or at least reviewable by independent experts not directly associated with the vendor or the certification process.

On the polling place section of the diagram you will also see something that says ADA innovations. I have highlighted that because I want our voters with disabilities to vote on the same basic system everyone else does – just with enhancements that are cool and cutting edge. The latest conversations on sustainability support this idea that one system is better than having two. We have a situation where for the next ten or twenty years our older population of adults is on the rise. We have more than 200,000 soldiers with traumatic brain injuries they received fighting in the Iraq and Afghanistan wars. I know people are working on ADA innovations. So, why do election systems on the market today have the same thing they did in 2000? What about computer controls guided by eye or eyebrow movements? What about text-to-speech wands? What about screens that fit over the electronic tablets or the paper ballots that deliver their users what they need from Braille to sound? I am not sure what we want here, I just know there has to be something better.

We must also be mindful that in the future we will be dealing with a split in the population of voters. Some will demand paper ballots and a traditional polling place. The rest, having grown up with iPads and iPhones, will roll their eyes and demand voting on personal devices. And, they will look at us as if we are dinosaurs and say, "Why weren't you guys smart enough to figure this out?"

So, that sums up the high points. Please give this some thought and let me know what you think.

There's one more thing. I want to tell you about a project we are working on. I have been very intrigued by the idea of having open source software and open software available for government use. Even if the idea does not get used in its purest form, I think it has the potential to completely alter the way we manage elections. But, I have struggled to visualize how this idea could be tested in our inflexible and unforgiving election world. Enter Greg Miller and OSDV. They responded to our RFP for an Elections Reporting Software package – something that is not connected to our vote tabulation system. They presented a proposal that gives us the opportunity to have a product that fully meets our RFP requirements and a way to try this concept out in a relatively low risk environment. The problem was that our budget was less than their estimated cost. So, we are putting on a full tilt effort to fund the difference. I am confident we can meet that goal. When we do, I invite you to follow our progress. You won't find me inviting you to try and hack the system; in fact, I think that would be counter-productive. We want this experiment to fully succeed so that we can properly analyze this concept

and consider its potential or lack of potential without a bunch of distractions. Your comments and your review, during and after this project, will be invaluable. So cross your fingers that we can get sufficient funding to give this a try.

I know this was a bit dry for a morning speech, but you are the people I need to get my message to, and you are who I need to listen to. You are one of the bright spots of my job. I am serious about wanting your comments. I've included a card with my contact information on it. Your thoughts and ideas are very important and of great interest to me. So please email me, call me, come down and see me – we'll go to lunch.

Thank you for your time and this opportunity, and as you start your conference, I hope you know how much you are appreciated, how much your ideas and reasoning skills are needed, and that RIGHT NOW your contributions are more essential than they have ever been. Thank you, and welcome to the 2011 Electronic Voting Technology Workshop and Workshop on Trustworthy Elections!