Testimony of Verified Voting
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Georgia House of Representatives
House Science and Technology Committee
Re: Voting System Technology- A Comparison
November 30, 2017

Thank you Chairman Setlzer and members of the committee for the opportunity to testify on voting system technology.

Verified Voting is a national non-partisan, not for profit research and advocacy organization committed to safeguarding democracy in the digital age. Founded by computer scientists, Verified Voting's mission is to advocate for the responsible use of emerging technologies to ensure that Americans can be confident their votes will be cast as intended and counted as cast. We promote policies that provide for auditable, accessible and resilient voting for all eligible citizens. We commend the Committee for its attention to this critical issue.

Georgia's voting machines need an update. The lifespan of voting machines has been estimated at 10-15 years.[1] Purchased in 2002 Georgia's voting machines are at the outside of that estimate. As voting systems age they are more susceptible to error, malfunction or security threats potentially losing or miscounting votes.

Georgia is one of only a handful of States that is still casting votes on entirely electronic voting systems, known as Direct Record Electronics (DREs). These machines record votes only in digital form; if the digital records are corrupted, either by benign error or malicious attack, there are no backup records and no way to know whether votes have been corrupted. When Georgia purchased these machines in 2002, the national trend was toward paperless touchscreen voting machines. Since then, however, most states moved away from paperless voting systems, driven by mounting research establishing these machines' security flaws and some high profile and costly machine failures.[2] Most of the nation has adopted voting systems that rely on a voter-marked paper ballot, an election safeguard recognized as essential by election officials and computer security experts alike.

A paper ballot provides a durable, physical record that is out of reach of a cyber attack and cannot be lost by a digital malfunction or programming error. Paper ballots can be used in a recount or to perform a post-election audit or check on the election results to help ensure the election outcome is correct. Today roughly 70% of voters in our nation mark a paper ballot which is counted by an electronic scanner.

[1] Norden, Lawrence, Famighetti, Christopher, "America's Voting Machines at Risk," The Brennan Center for Justice, Sept. 15, 2015
[2] In 2004 a voting system failure in North Carolina caused the loss of more than 4,500 votes. Because a state-wide contest had a margin less than 4,500 votes, the election had to be run again. "More than 4,500 North Carolina votes lost because of mistake in voting machine capacity," *Associated Press,* Nov. 4, 2004

Public statements by the Georgia's Secretary of State indicate an interest to move Georgia to adopt voting systems that provide a voter-verified paper ballot.

In November Rockdale County tried out a system from ES&S called "ExpressVote." In the trial all voters used the ExpressVote computer, a touchscreen device, to record their votes. The device then printed a summary of the voters' choices on a piece of paper. The paper was then scanned by an electronic scanner.

The trial in Rockdale was unusual in that no jurisdiction in the U.S. currently employs an electronic touchscreen device for all voters. As stated above 70% of the nation votes on paper ballots which are counted by electronic scanners, but all of those jurisdictions offer only one computerized ballot marking device to provide accessibility for disabled voters. Voters who do not require assistance simply mark their ballots with a pen or pencil.

Simple voter-marked paper ballots and ballot scanners is the most widely used voting system in the country. The system works like this: – once the voter is authenticated and checked in, he or she is given a printed paper ballot. The ballot is similar to the absentee ballot you would receive in the mail if you needed to vote absentee. The ballot lists the candidates and ballot questions and beside each one is a small circle, bubble or other space to fill in. The voter is given a ballot and a "privacy sleeve" (this is essentially a folder to protect ballot secrecy after the ballot is marked). The voter takes the ballot to a table or desk that affords a private place to mark the ballot and the voter then marks his/her choices by filling in the bubbles with a pen. The voter brings the ballot, in the privacy sleeve, to a scanner which is fitted on top of a secure ballot box. The voter feeds the ballot into the scanner. If the voter over-voted (votes for too many candidates for a particular contest) the scanner will kick the ballot back out to the voter so a poll-worker can spoil the ballot and the voter can correct the over-vote on a new ballot. The scanner can also be set to alert voters if they under-vote (fail to vote for any choices for a particular contest). After the ballot is accepted by the scanner it drops into a secure ballot box. The scanner tabulates the votes and saves a digital ballot image and an electronic representation of the votes on a thumb drive or card (similar to those used in cameras).

For voters with disabilities, an accessible ballot marking device is provided at each polling location. This is a computerized device, like ExpressVote, that is compliant with the Americans' with Disabilities Act and the Help America Vote Act of 2002. It typically has a touchscreen as well as sip/puff, audio and joy stick accessories for voters with disabilities. The devices records and marks the voters' choices on a paper ballot which can then be scanned by the same scanner as the manually marked ballots.

With this system most polling locations need only purchase one ballot scanner and one accessible ballot marking device.

In contrast, the system trialed in Rockdale, (which requires all voters to use a computerized device to mark their ballots) requires purchasing multiple ballot marking devices for each polling location, escalating the cost considerably. It has been estimated that new voting machines for the entire state based on the Rockdale model would cost over $100 million. Additionally, these systems would also require programming, servicing and software licensing fees. **They are also susceptible to breakdown and hacking**

If Georgia were to adopt a voter-marked paper ballot and ballot scanning system, like those used in most of the country, it would cost considerably less. Based on a projection of 3,000 polling

locations in Georgia, we estimate new equipment for the state would cost around the $ 30,000,000 mark. This is based on prices quoted to the state of Michigan[3] which recently purchased new ballot scan tabulators.

The cost for the scanners quoted from the three major vendors ranged from $ 4200 to $5600 per device. The cost for the accessible devices ranged from $2700 to $4500 per device. Additionally counties would need to license software to aggregate the vote totals. If Georgia continues to program all machines at the state-level the cost will be less, but we can estimate it would be approximately 13%-17% of the total.

This excludes the cost of electronic poll books or ballot printing but is still significantly less than the cost projection of over $100 million that has been estimated for the touchscreens trialed in Rockdale.

In addition to the considerable cost savings, there are several other advantages to adopting voter-marked paper ballots and scanners. By requiring voters to use a touchscreen device to mark their ballots, the number of voters that can vote at any given time will be limited to the number of devices. With voter-marked paper ballots and scanners voters need only a pen and a place to mark their ballot, making it easy to scale-up during busy voting periods and decreasing lines and wait times.

Under current practice Georgia counties print absentee/emergency/provisional/challenge ballots for each election. If Georgia opts for the ExpressVote model counties will still need to pay to print absentee/emergency/provisional/challenge ballots in case the touchscreen ballot marking systems fail on Election Day, incurring printing costs for ballots that will probably not be used in additional to costs for the ballot marking device.

Opponents of voter-marked paper ballots may claim that the voters' marks vary introducing inconsistencies in vote counting by the scanners. While this may have been a problem fifteen years ago, today's sophisticated scanners are able to discern voter marks carefully and flag questionable ballots for adjudication.

With the advanced age of Georgia's voting machines we encourage the legislature to take action to replace the voting equipment with voter-marked paper ballots and scanners, the most commonly used and cost-effective voting system available. Verified Voting does not endorse any specific voting system vendor. All major vendors offer similar machines that function essentially the same. Thank you very much for your consideration. We welcome the opportunity to provide any additional information and hope to work with the legislature moving forward.

[3] http://www.michigan.gov/documents/sos/CostComparison_549577_7.pdf