

Written Testimony of
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Chairwoman Lofgren, Ranking Member McCarthy, committee members, thank you for the opportunity to testify today. My name is Pamela Smith. I am President of VerifiedVoting.org and the Verified Voting Foundation, partner organizations that promote reliable and publicly verifiable elections. We believe ensuring that our election systems are reliable and publicly verifiable enfranchises voters and increases public confidence and participation in our political process.

My interest in voting issues includes experience as an election observer, locally and internationally. I have testified on verified voting issues in several states, co-authored written testimony on several state voting system Requests for Proposals and legislative recommendations, as well as reports on audit provisions, escrow provisions, election transparency, and accessibility and auditability issues for voting systems.

The focus of my testimony today is Election Audits, a key purpose of which is to convince the losers and their supporters that they've lost. (The winners always believe that they've won.) Audits are one of the most important means for ensuring the accuracy of election outcomes, and for allowing observers to verify that accuracy. There is a strong consensus among those who study election security about what is needed to make audits effective, but implementation has lagged.

Voter-verified paper ballots are essential to ensure that elections can be audited. Nationally, some three quarters of the states now have voter-verified paper records of some kind to audit, but only one quarter have audit requirements, and those are not carried out at all uniformly. Still, successes in some states show that audits can be done effectively and at relatively low cost. Congress can help make our elections more transparent and reliable by passing a federal requirement for voter-verified paper ballots and mandatory random manual audits.

I. Overview of Election Audits

Voting systems are supposed to record and tally the votes that express the will of the voters in electoral contests. Given that no system is perfect, in order to ensure that the will of the voters is *accurately* captured by the voting system and the outcomes are correct, election officials must deploy safety-checks on the entire system. Contest-specific recounts sometimes will clarify the outcome in particularly close races, but the bar to initiating full recounts is high so they are too intermittently applied to serve as an essential spot-check. Instead, officials must conduct random manual audits of a smaller set of ballots.

A random manual audit means that ballots to be audited are selected through a random process and counted manually, and the resulting hand tallies are compared with tallies made by the voting system to check for accuracy. In cases where the tallies differ, additional records may be audited to determine the outcome.¹ Even where an outcome is

¹ Other checks and balances to help ensure accuracy of vote counts include ballot accounting procedures which can and should be carried out for each election, e.g. checking the number of voters who signed in against the number of ballots cast, but the focus of this testimony is on post-election audits carried out after

not changed, discrepancies can provide information about how the system is working. (For this reason, discrepancies should be examined and explained even if they leave an outcome unchanged.)

Election audits must examine enough records, and must do so in a rigorous way. An audit is not effective unless sufficient records are selected,² the selection process is truly random, the timing of the audit occurs after the initial tallies have been made public, the types of ballots to be audited include all types, and the record to be audited is a hard copy representation of voter intent – in other words, the voter had the opportunity to confirm that the record accurately represented his or her intent, e.g. a voter-verified paper ballot.³ And that paper ballot is counted manually—as one state’s law puts it, “hand to eye”.⁴

Another crucial component of an effective audit: the whole process must be publicly observable. Transparent processes increase the public’s confidence in the outcome. Citizen observers should be notified about and invited to watch both the selection process and the actual hand counting of the paper records.

Finally, before the audit begins, procedures should be defined governing what to do if the tallies do not match. Since the voter verified paper ballots are verified by the voter and electronic records are not, the manual tally of the voter-verified paper ballots must be considered the correct record of the vote, except where convincing evidence shows the paper record of voter intent was compromised to the point of being unusable or illegible. If discrepancies occur, an expanded audit and investigation may be needed to clarify the outcome.

If we are not careful, auditing can degrade into meaningless ritual. If the audit is to be a **safety net for voter intent**, those responsible must see this process as one key step in what it takes to get elections right, no different than taking care to program the right names on the ballot every time, or to recruit enough pollworkers for Election Day.

Many officials grasp the concept of doing audits, and doing them right – using the voter-verified paper records for the audit, for example, instead of a meaningless end-of-day printout voters have never seen. Some officials, however, may claim that two or three sets of matching tallies prove the system is accurate. They may conclude incorrectly that there’s no need to do audits every time. That’s like saying that a corporation was audited once and everything was in order, so it’s not necessary to audit them again. It is a dangerous way to think about auditing any system.

Such a perspective fails to comprehend the nature of voting system security—and ignores Murphy’s Law as well. **Audits really are part of the solution**, not the problem. Problems *will* occur in every election; properly conducted audits using voter-verified paper ballots enable most such problems to be resolved.

II. State Audit Requirements

the initial canvass and before the election results are certified.

² Significant discussion by a number of experts on what constitutes a sufficient quantity or percentage to audit is ongoing. Better ideas are still emerging. For this reason, proposed legislation such as HR811, the Voter Confidence and Increased Accessibility Act and HR1381, the Count Every Vote Act, appropriately establish not only one tiered scheme for audits but also a provision for alternative auditing schemes, provided those schemes are demonstrated to be at least as effective as the tiered scheme.

³ The Help America Vote Act (HAVA) seemed to provide for auditable paper records, but it failed to connect the crucial dots between a voter’s verification of the paper ballot, and the use of that voter-verified paper ballot in any audit. Proposed amendments to HAVA such as HR811 can remedy that problem.

⁴ North Carolina, <http://www.ncleg.net/Sessions/2005/Bills/House/HTML/H1024v7.html>

While many states now have voter-verified paper records to audit, only about one-quarter of the states actually require audits. There is much to be learned from the experiences of those few. Some states have proved that auditing can work, but a federal requirement is needed.

A federal requirement could serve to supplement some existing state laws (at least as they apply to federal elections), as well as putting audits in place (and the voter-verified paper ballots needed to carry out those audits) where those requirements do not currently exist.

Sixteen states⁵ have enacted requirements for mandatory manual audits.⁶ At least two states *without* voter-verified paper record requirements (Kentucky, Pennsylvania) also have audit requirements. These were written into statute decades ago, apparently prior to widespread adoption of (paperless) direct recording electronic (DRE) voting systems. It is unclear whether -- or how -- these states are carrying out their statutory audit requirement, whether partially (e.g. in the few paper ballot counties) or not at all. Other states are considering audit provisions, including Florida and Oregon.

Audit selection must apply to all counties, not just some. In Arizona, the law allows party chairs to have a say in whether an audit will be conducted or not. As a result, not all counties performed an audit after November's election. A federal requirement would mandate that all counties will include at least one precinct to be audited.

Audit laws must apply to all voting systems in a state, not just some. Yet some state voter-verified paper record laws were written with a particular type of voting system in mind, so the audit requirements that were included in those laws pertain just to that type of voting system. This has resulted in an ambiguous requirement for counties which may not have ended up using that type of voting system. Washington and Connecticut have laws which reference voter-verified paper audit trails (VVPATs) with DREs, and which require audits of the VVPAT. But both Washington and Connecticut subsequently adopted paper optical scan ballot systems.

Connecticut did the right thing in November by auditing their new optical scan systems even in the absence of an update to their audit law. And they seem poised to update their statutory language in this session, as the Secretary of State has proposed a 20% audit rule, the highest percentage in the country. A bill to modify the Washington audit language to include audits of optical scan systems did not move in its legislature last session, however. Pending federal legislation would mandate manual audits that apply to *any* voter-verified paper ballot voting system, not just one type.

Most existing audit provisions specify that a percentage of precincts be audited, though some specify a percentage or fixed number of machines. The percentages range from 1% in California to 10% in Hawaii, with most around 3% to 5%. Minnesota bases its sliding percentage on population density. North Carolina's provision is unique in that it does not pre-determine a percentage of precincts, but uses a statistician to determine the appropriate quantity for each election.

⁵ AK, AZ, CA, CO, CT, HI, IL, KY, MN, MO, NM, NY, NC, PA, WA, WV. Requirements and citations of relevant legislative text <http://www.verifiedvoting.org/downloads/StateManualAuditProvisions-03-07.pdf>

⁶ Nevada has conducted manual audits of the voter-verified paper audit trails produced by its DREs from 2% of the machines in less populous counties and 3% in more populous counties since putting VVPAT in place in 2004, but the Nevada Secretary of State's office said (in a telephone conversation) that these audits are not statutorily required. Other states, such as Vermont, have statutory language providing for discretion to conduct an audit, but where audits are not explicitly required, we did not include those states in the "StateManualAuditProvisions" document (cited above).

Although when viewed as percentages these provisions span a wide range, workload must also be considered. There is a significant difference in workload between reviewing the entire ballot, versus reviewing just a few races. Not all states' audits require review of the entire ballot. Some examine only one contest, while others review several contests per ballot. In California, *all* contests in each county are examined. Its ballots tend to be extremely long. Thus its administrative cost is significantly greater than its counterparts with higher percentages. By contrast, Hawaii's 10% audit reviews each ballot for one contest only.

This range of state audit experiences shows that although election officials are already under significant time pressure in many jurisdictions, requirements for a 3% federal audit are administratively achievable. Audits of that approximate size (or greater) are routinely carried out in several states, and they could be adopted throughout the nation.

III. Why are audits essential?

Audits serve to identify problems such as machine malfunctions which might otherwise be overlooked. Even if, in a particular election, a problem might not affect the outcome of a race, knowing that the problem exists allows officials to correct it before any future elections can be affected.

Audits serve to confirm the accuracy of the vote count, which in turn gives voters more confidence in the integrity of the outcome, as many election officials attest:

In North Carolina, Moore County Election Director Glenda Clendenin described the audit as simple, saying it was "*no more than a clerical exercise*" and that the purpose of the hand count was "*to get voter confidence back and make sure it's right.*"⁷ A Boone County paper described the hand-to-eye count as a "*test of accuracy of the machines.*"⁸

In California's San Mateo County, Registrar of Voters Warren Slocum proactively sought input and advice from technical experts to improve the audit process, including voluntarily adding absentee ballots to the audit process even before a new requirement took effect. His aim was "*to get a head start on that process because San Mateo County is aiming for the gold standard in the Manual Recount Process... establishing practices that will assure voters and election officials of the integrity of the vote.*"⁹

In Minnesota, just before implementation of the State's new audit requirement, former Secretary of State Mary Kiffmeyer said "*Audits just build confidence.*"¹⁰ Afterward, Washington County's election director said "*When the post-election*

⁷ <http://www.thepilot.com/news/050306voters.html>

⁸ <http://www.wataugademocrat.com/2006/0515web/primaryelectionfinalized.php3>

⁹ San Mateo County officials worked with VerifiedVoting.org founder David Dill, PhD, and with his ACCURATE colleague Joseph Hall and others to develop improved methods for random selection of the precincts and more secure timing and procedures. <http://www.shapethefuture.org/press/2006/111706.asp>

¹⁰ Time Magazine, "Can This Machine Be Trusted?" <http://www.time.com/time/magazine/article/0,9171,1552054,00.html>

*audit [requirement] was passed in Minnesota, I frankly was not a big proponent. Any local election official understands the enormous amount of work that is done by county auditors, county election staff, city and township staff and election judges. The idea of adding more duties was not appealing." [...] "I was surprised at how quickly the audit went. I was not surprised by the quality performance of the equipment and our election judges... if this is what is needed to provide some assurance to those who do not have as much confidence in the system then I have no problem continuing to do the audits," he stated.*¹¹

Starting in 2004, former Secretary of State Dean Heller of Nevada required election officials in all 17 counties to carry out audits of voter-verified paper records. Heller said he wanted to assure voters the results were *"the most accurate, most secure and most valid in the nation."*¹²

Connecticut Secretary of State Susan Bysiewicz recently proposed a plan to mandate random audits in 20 percent of all precincts statewide, starting in 2008, saying, *"This is very important to ensure the integrity of the voting process going forward. Voters should feel confident that we have a fair and transparent election process."*¹³

Audits are cost-effective. Election directors who are not already conducting audits may be concerned about the cost that carrying out an additional task of this sort will add to their budget. The principal cost of conducting audits is for time to plan, and to examine each of the selected ballots after the election, and the rate of pay for the persons required to complete the tasks.

But the cost of auditing is far from prohibitive, and in some cases is very low indeed. In a recent survey conducted by the National Association of Secretaries of State (NASS) regarding audits, one state responded that the cost --"if any"-- is borne by the counties.¹⁴ In North Carolina's first audit after passage of their new law, when a single race was examined on ballots in 260 precincts, the average cost was \$65 per precinct.¹⁵ In November 2006, Minnesota examined three contests on ballots in 202 of its precincts, at an average cost of \$135 per precinct.¹⁶ In Nevada, an experienced election official estimated the cost of auditing 2% of all votes at about 3 cents per vote.¹⁷ Arizona's Pima County carried out their first mandatory random manual audit since passage of their State's audit law and examined four contests each on polling place ballots from nine precincts, plus additional provisional ballots, for a little over \$0.13/ballot.¹⁸

¹¹ Kevin Corbid, from electionline.org, *Case Study: Auditing the Vote* (March 2007) page 8, at <http://www.electionline.org/Portals/1/Publications/EB17.pdf>

¹² <http://www.krnv.com/global/story.asp?s=2353009&ClientType=Printable>

¹³ http://www.journalinquirer.com/site/news.cfm?newsid=17902613&BRD=985&PAG=461&dept_id=161556&rfti=6

¹⁴ <http://www.nass.org/Surveys/Print%20Version%20-%20Post%20Election%20Audit%20Procedures%20by%20State.pdf>

¹⁵ http://www.ncvoter.net/downloads/NCSBOE_Primary_Sample_audit_count_short.xls

¹⁶ Correspondence with Mark Halvorson, Director and Co-Founder, Citizens for Election Integrity, MN

¹⁷ Testimony of Michael Waldman before the Senate Committee on Rules and Administration, Feb. 7, 2007, http://www.brennancenter.org/dynamic/subpages/download_file_47870.pdf

¹⁸ http://www.azsos.gov/election/2006/general/handcount/Hand_Count_06_General_Pima.pdf

Labor cost is a significant variable. The rates paid to counters vary considerably due to such factors as geographic differences in pay scale. Even within the State of California, for example, one county was paying \$8.00 per hour to counters and another county \$18.00 per hour.¹⁹ In Minnesota, the pay scale ranges from minimum wage to \$12.00 per hour, with an average rate of about \$8.00 per hour. In Arizona, a flat rate of \$75.00 was paid to each counter for a process that was done within 1.5 days.²⁰

Supervisory costs may be a factor, both for planning, administering and overseeing the audit process and the teams of counters and recorders. However, with few exceptions supervision is carried out by regular staff of the local elections office and during regular office hours. And except in the largest counties where dozens of contests are manually counted during the audit, the process can be completed in as little as a day or two.

An important variable to consider is the type of ballots being examined. In reviewing the time and resources devoted to North Carolina's audit process following their 2006 primary election,²¹ it becomes apparent that auditing paper records printed out on thermal paper rolls from the DRE printer used there takes considerably longer than auditing paper optical scan ballots. Overall it was at least two times faster to count paper ballots than to count the thermal paper printout. In some cases as many as 8+ paper ballots could be counted per minute, versus only one or two records per minute for the paper trail printouts.

In some audit states, such as California, every contest is examined. Although the required percentage in California is 1% of precincts, the counties typically select additional precincts in order to include every contest in their jurisdiction. As an example, San Luis Obispo County (164 total precincts) randomly selected 2 precincts, but added 16 more in order to achieve the full contest range in their last audit.²² The ballots are examined for every contest for the first two precincts, while subsequent precincts are examined only for the missing contests.

Audits called for in pending federal legislation such as HR811 would require manually counting just the federal races, in a minimum of 3% of the precincts. Especially when compared to the extensive ballot examinations a state like California has conducted as a matter of course for every election over four decades, an audit of only two or three contests presents a relatively simple investment that is well worth the effort for the resulting increase in voter confidence. The investment may also result in major savings if problems are caught in auditing and corrected before they cause a meltdown in a close election.

Audits are non-partisan; recounts may not be. Recounts can provide redress of a perceived or actual problem, while audits check to ensure the voting system is working – whether there's an obvious problem or not. Recounts are usually candidate or party-specific, geared toward "who won in this specific case", while audits are geared toward making sure the tally is correct, without regard for party or candidate. Recounts may be automatically triggered by a close margin, but if there is no legal requirement for a

¹⁹ Correspondence with Registrars of Voters from San Luis Obispo and San Mateo Counties, CA

²⁰ Audit observation report from Pima County, Arizona; Tom Ryan, AZ Citizens for Fair Elections

²¹ http://www.ncvoter.net/downloads/NCSBOE_Primary_Sample_audit_count_short.xls

²² Correspondence with Assistant Clerk Recorder of San Luis Obispo County March 2007.

recount, no checking of vote totals will occur. Recounts may be requested if concerns exist (though the requestor may have to pay for the recount, which is sometimes a barrier). Mandatory audits do not have to be requested. Recounts may be initiated by candidates (in 39 states), by voters (in 18 states), and in the case of close elections (16 states). Two states (HI, MS) have no provision in state law for recounts.²³

Despite the reasons given for the importance of doing audits, and the positive experiences of states that regularly carry out this safety-check, some may continue to perceive them as burdensome, time-consuming and unnecessary. They may see no need, if there is no immediately evident problem. Similar arguments could be made against any quality control or quality assurance (Q/A) process, yet most critical business or governmental processes have some form of Q/A, and for an obvious reason: Q/A can help prevent future problems – problems that may prove very serious and costly to rectify. Hence the adage, "an ounce of prevention is worth a pound of cure."

IV. Recommendations

1. Ensure the audit is readily observable and understandable by the public.

VerifiedVoting.org's partner organization, the Verified Voting Foundation, in 2006 launched the first phase of a multi-year Election Transparency Project, to encourage public observation of electoral processes, including the audit process in those states where audits are conducted. In some states, audits were readily observable, while in others, observing proved impossible.

In one state, observers calling to learn the schedule of the audit were told it was done "on election night" – a plan which scarcely allows for the inclusion of observers, much less truly random selection or even pre-publication of results for comparison's sake. In another, observers were allowed but public notice was not provided – typically only party officials are notified in advance, making it nearly impossible for a non-partisan observer to participate.

By contrast, some jurisdictions went the extra mile to notify the public through press releases, posting of notice on the county website, and inviting citizen groups to participate in observing the process. HR811 appropriately requires that audits "*shall be conducted in a manner that allows public observation of the entire process,*" including the random selection process.

2. Deploy verifiably random selection of records to be audited. To ensure an equal chance at detection of problems throughout the voting jurisdiction, precincts must be selected at random. No pre-selecting, no weeding out, no setting aside, no picking the smallest ones to make for less work... Existing audit laws often fail to address the procedure for obtaining the random sample, yet to ensure confidence in the election, no

²³ For details, see <http://electionline.org/Portals/1/Publications/ERIPBrief12.SB370updated.pdf>

one should be able to bias or predict the selection in any way. Further, observers should be able to verify for themselves the selection was random and not influenced or biased.

A motivating example of the need for verifiable randomness in the selection process was illustrated recently in Cuyahoga County, OH where election officials received felony convictions for secretly pre-selecting ballots they knew would not cause discrepancies when recounted by hand. Their goal was to avoid a lengthier, more expensive hand recount of all votes.²⁴

Several California counties adopted a methodology proposed by members of the National Science Foundation's ACCURATE project which involved the public rolling of 10-sided dice to randomly generate the precinct numbers.²⁵ HR811 clarifies randomness with the language "*all precincts in the state have an equal chance of being selected*" with a minimum of one per county so that no county is excluded.

3. Time the selection to occur after all votes are counted and results are made public, so that results can't be "fudged" to match audit counts or vice versa. In other words, finish the ballot counting before you start deciding which ballots to check. HR811 calls for the selection to be timed *within 24 hours after the announcement* of the unofficial vote count in the state's precincts. That window, while narrow, ensures the process moves forward in an timely way.

4. The audit must be completed prior to certification of the final results, because the outcome can be affected if discrepancies are uncovered. In states with a narrow window for certification of the final election canvass, effective planning will be crucial. [One such state is currently considering legislation that would time the audit after the certification; unless the results of the hand audit can overturn certification of an inconsistent machine tally, this renders the audit pointless.] HR811 properly requires that in case of inconsistent results between machine tallies and hand tallies of the paper ballots, *the individual permanent paper ballots shall be the true and correct record of the votes cast*.

5. Minimize the time between the selection process and the actual counting to the extent possible. In states conducting audits after November 7, 2006, most carried out the selection process at most a day or two before the counting, or in some cases the same day. But in some jurisdictions, there was a delay of as much as a week or more. Such delays should be avoided, as they raise questions about what may be happening with the ballots in the meantime.

6. Include all ballot types in the audit. Several states already tally polling place ballots, absentee ballots and provisional ballots as part of the audit process. In many states,

²⁴ Ohio law states that each county is supposed to randomly recount at least 3 percent of its ballots by hand and by machine. If there are no discrepancies in those counts, the rest of the votes can be recounted by machine. A full hand-count is ordered if two random samples result in differences.
<http://www.ohio.com/mld/beaconjournal/news/state/16536269.htm>

²⁵ See <http://www.cs.berkeley.edu/~daw/papers/dice-wote06.pdf> "The Role of Dice in Election Audits," A. Cordero, D. Wagner, D. Dill, June 16, 2006 for more on random selection methods and practices.

absentee voting is dramatically increasing. In California, where at least a third (and in some counties well over half) of all voters vote absentee, the audit requirement was recently changed to include absentee ballots. One county deploys a sorter to facilitate counting absentee ballots by precinct. Others sort mailed in ballots by hand prior to counting. Some jurisdictions count absentees in numbered batches rather than by precinct. Regardless of the methodology, including more than just polling place ballots in the manual audit is feasible, and very important to the process of checking the entire system for accuracy.²⁶

8. Prepare a plan in advance for how to investigate and handle discrepancies, and publish the plan. States and counties should also publish the results of the audit, including discrepancies noted, and how those discrepancies were addressed and resolved.²⁷

9. Establish a requirement for broader audits if unexplained discrepancies are found during the audit. Doing an audit but ignoring problems that are uncovered defeats one of the primary purposes of the audit, i.e. ensuring the accuracy of the election results. Very few states have rules to trigger wider audits. If problems are uncovered during an audit, the next steps should not simply be left up to the discretion of election officials without written procedures governing those steps. Even a small discrepancy can, if projected to a full audit, potentially alter the outcome of a contest. Identifying the threshold for escalation of the audit to a wider area (e.g. additional precincts, up to and including all precincts if needed) is an essential part of the audit procedure.

VI. Conclusion

Audits are critical to our democratic process. Properly conducted audits offer multiple benefits: increasing election transparency, promoting public confidence, reducing disputes, protecting election officials from unfounded criticism, ensuring accuracy, improving the conduct of future elections, and creating a feedback loop that allows us to assess what is working and what isn't working.

Audits are feasible and cost-effective. They already being done well in some places, but they are just not being done in enough places. We know problems will occur in every election, particularly with new technology in many jurisdictions. Audits allow us to uncover and correct problems as they arise and carry out continuous improvement of the electoral process.

Voter-verified paper ballots are necessary for audits to be meaningful. No voting system should be used for our elections unless it is auditable. Today, the only way to ensure our

²⁶ With the convenience to voters of absentee ballots comes concern about security, including how to track chain of custody of such ballots. A mechanism for tracking ballots the way other mail is tracked could help ensure the ballots reach their destination.

²⁷ The list should include everything, not just discrepancies that officials could not explain. A good example can be found in North Carolina's audit reports.
http://www.ncvoter.net/downloads/NCSBOE_Primary_Sample_audit_count_short.xls

elections are auditable is by using voter-verified paper ballots. Congress can help make our elections more transparent and reliable by passing a federal requirement for voter-verified paper ballots and mandatory random manual audits, taking into account the nine recommendations provided herein. Thank you.