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**Southern Tier Independence Center, Inc.**

# Comments for the National Institute of Standards and Technology:
# Promoting Access to Voting
**July 2021**

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**About Us**

Southern Tier Independence Center (STIC) is a New York State-funded Center for Independent Living in Binghamton, New York. The majority of members of our governing board of directors, and many of our top management staff, are people with disabilities. We provide a broad array of services to enable people with all kinds of disabilities of all ages to live fully integrated and productive lives in over a dozen counties of south-central New York State and northeastern Pennsylvania. We serve between 4000 and 5000 people per year.

We have been involved in voting accessibility issues since our founding in 1983, and we have conducted accessibility surveys of polling places in our region, and have participated in various workgroups and organizations involved in voting issues.

Our Executive Director is totally blind and she has personally experienced many of the frustrating issues with voting that we discuss here.

Our CIO/CISO is quite conversant with cyber security issues and their application to assistive technology for people with disabilities.

**Introduction**

We are pleased to see the National Institute of Standards and Technology (NIST) undertake this effort to develop standards for accessible voting.

The issues involve both cyber security and assistive technology. In our view the cyber security issues must not be compromised, and 100% unassisted access to voting for 100% of people with disabilities is not an achievable goal. However, there is much that needs to be, and can be, done to maximize the accessibility of various voting methodologies for people with disabilities.

**We Oppose Internet and Paperless Voting**

A variety of esteemed experts on information technology and cybersecurity has reached consensus that there is no form of electronic voter registration or voting that involves transmission of personally identifiable information (PII) or voting choices over the internet that can be fully and reliably secured against tampering, and that permanent paper ballots must always be created as part of the voting process and securely stored for reference purposes during recounts or when voting results are otherwise challenged. (Sources are provided at the end of this document; see "The Experts on Internet and Paperless Voting", below.)

There are two major reasons for this:

1. The voting systems in use in the United States are a very high-value target for advanced persistent threat actors (APTAs) seeking to sow discord and destabilize democracy, including adversary nations and foreign and domestic terrorists. The value to be gained by eroding the

confidence of American citizens in the fairness of their elections is so great that APTAs will likely spare no expense or effort to exploit any vulnerabilities that are found in our voting systems, as soon as they are found.

2. Any effort to secure electronic internet voting against sophisticated attacks of the types likely to be mounted by these adversaries would require every link in the chain of transmission of data, beginning with end-user devices and ending with government repositories for that data, and every piece of software, equipment or network interface between those two points, to be quickly and frequently patched as soon as vulnerabilities are discovered. End users will likely not only need to patch computers or phones, but also home routers and switches, and they may have to purchase replacement equipment for devices that cannot be patched. Ordinary end users, and especially people with disabilities, who tend to have very low incomes, simply are not going to do this with any regularity. Government agencies also have repeatedly failed to patch systems quickly enough to prevent exploitation of vulnerabilities, sometimes on a massive scale. This may seem shocking; surely government would get this done right, yes? But it's less a matter of neglect than a result of the immense and constantly growing complexity of the problem of keeping track of increasingly interconnected systems and their requirements.

(Note: we also object to the use of "electronic poll books" that involve transmission of voter registration data across the internet, and are not federally regulated, on the same cyber security grounds, but since that issue is not related to voting accessibility, we won't discuss it here.)

As a Center for Independent Living that advocates for maximum accessibility in all aspects of life for people with all kinds of disabilities, we certainly support access improvements for voting. But we must emphasize that we wholeheartedly agree with the experts who say that internet-based voting, or transmission of voter registration data, cannot now be adequately secured, and may not ever be securable, and that permanently stored paper ballots must always be a feature of the system.

We urge NIST in the strongest possible terms to disregard the demands coming from some in the disability community that we allow any trade-offs of election system integrity and security in order to improve accessibility. While voting accessibility in the United States is not as good as it should and could be, it is absolutely not necessary to employ internet voting, or do away with paper forms and ballots, to achieve adequate levels of accessibility.

Some voting accessibility advocates will insist that voting will only be acceptably accessible if every aspect of the voting process can be accomplished privately by people with all kinds of disabilities, entirely without human assistance. Some of these advocates are even demanding that paper be completely removed from voting systems to achieve this goal. However, the concept of "unassisted access" is not universally endorsed or desired by all people with disabilities. Indeed, millions of Americans with disabilities rely on family members or personal assistants to help them with a variety of essential tasks, some of them involving the most intimate bodily functions or financial or legal transactions, and in most cases they do not regard the involvement of those helpers to be an unacceptable invasion of privacy. There is no reason why such trusted helpers cannot also be trusted to help people vote, when necessary.

That being said, there are measures that can and should be taken to enable a greater number of people with disabilities to vote privately, or with minimal assistance from other humans. We'll discuss these next.

**Blank Electronic Forms**

There is no harm in using the internet to distribute blank electronic forms, whether voter registration forms or ballots, as long as the internet is not then used to transmit those forms, after they have been filled out, back to election authorities.

**Accessible Voting from Home**

The COVID-19 pandemic has amplified longstanding concerns about the accessibility of voting by mail. Prior to the pandemic most states only allowed this for people considered to be "shut-ins", but the practice was expanded almost everywhere by the need to conduct the 2020 election at a time when large numbers of people were self-isolated in their homes to protect their health.

A primary concern is in regard to blind people who use screen-reading software on computer devices. In our view, such devices can safely be used to receive blank forms, read them, and fill them out, provided the following procedure is used:

1. The form is created as an editable, but not save-able, PDF file—such as those sometimes distributed by income tax authorities. The form may be emailed to end-users or downloaded from a secure (encrypted) website by them.

2. The user fills out the form and then prints it out on paper.

3. A blind user then scans that paper using a scanner and optical character recognition software to create an electronic version that can be read back to the user by his/her screen reader software, so she can verify the accuracy of the print-out.

4. The user then seals the verified printed form in an envelope and mails it back to the election authority via the US Postal Service, or delivers it to an appropriate location such as a board of elections office or a drop box.

This method is secure because even if the blank PDF form is somehow altered by an intervening malicious process during transmission to the end user, such that it contains code that can deceive the user or even alter what the user enters into the form during editing (since it cannot be saved it can't be modified after being filled out), the printing and scanning verification process will detect any such issues.

Many blind voters will be able to use this system without assistance if they are also given an address and prepaid postage template that they can print on a return envelope—which they should also scan for verification after printing.

Some blind voters, as well as people whose physical disabilities preclude manipulating paper, will still need assistance to complete the process, but this is an acceptable price to pay for election security.

**Better Voting Machines**

We must emphasize that while "electronic voting machines" do face greater security risks than mechanical-lever machines or old-fashioned hand-marked paper ballots stuffed into ballot boxes, these machines can be made secure as long as they only process paper ballots, are never connected to the internet, are securely stored when not in use, and securely monitored when being used.

Properly designed and managed dedicated electronic voting machines offer the best way to

maximize accessible voting for people with disabilities, and therefore are highly desirable.

Such machines can be made to mark, print, and read aloud paper ballots before processing and counting them, in a manner similar to that we described for blind people voting at home. These are known as "ballot marking machines". The ballot marking process, while performed by the same machine, is completely separate from the ballot reading and counting process, and is therefore secure.

Unfortunately, there are no enforced national standards for accessible electronic voting machines that are worthy of the name. As a result, a variety of manufacturers have produced several very different devices, some of which work much better than others. Some of these machines simply do not generate or handle paper ballots; these should be outlawed. Others seem to have been initially designed without consideration for accessibility issues, and accessibility features, including ballot-marking mechanisms and speech output, were added after the fact. Such systems can be very cumbersome and slow to use. For example, machines used in New York State can process a hand-marked ballot in about ten to fifteen seconds, but it takes blind users between 30 and 45 minutes to get through their poorly designed speaking menu systems to mark a ballot and then insert it back into the machine for processing. Further, the accessibility features are not "always on"; a poll volunteer needs to turn them on and configure them for use.

Poll workers are trained to assist disabled voters, but typically don't remember what they were taught, especially if the machines are excessively complicated to use, so most poll workers are entirely unable to provide useful assistance to voters who need the machines' accessibility features on election days. Not only must a blind voter in New York State take 30 to 45 minutes to actually vote, but s/he may need to wait an hour or more for an "expert" to be sent to their polling place from the county board of elections to get the machine set up for accessible voting and provide instructions to the voter before s/he can even begin the voting process. Many disabled voters refuse to spend this amount of time and energy to vote, and they either bring people to help them vote without using the accessibility features, or they don't vote at all. That means that poll workers get very little exposure to voters with disabilities or the accessibility features of the machines, so they don't gain experience in using them, exacerbating the problem. We don't see a viable solution to this problem through better or more frequent training of poll workers. Most human beings simply cannot remember how to do things that they do very infrequently, and we have to point out that this problem is magnified when the poll workers are elderly retirees who are not very familiar with computer technology, as they frequently are. The machines themselves must instead become much easier and more reliable to use.

Some of these poorly-integrated machines also suffer from software bugs and frequent mechanical problems, so that their accessibility features cease to function and must be repaired before they can be used.

The situation is even worse in New York State, which is the only state that still requires a "full-face ballot": a single large sheet of paper on which all candidates for all races are listed in a grid, with columns for public offices and rows for political parties. (Grids are notoriously difficult for blind computer users to comprehend unless their screen reader software has special features built in to help them keep track of the column and row headers for each cell as they read it.) At least some voting machine developers have blamed this format for deficiencies in the user-friendliness of their accessibility features. It would likely be possible for developers to overcome this problem by expending more money either to apply more effort to their software design, or to license high-quality screen reader software to add to their systems—but why should they do so to meet requirements that are only imposed by one state? Voting rights activists have frequently told NY state legislators that the full-face ballot is a major impediment to accessibility, but this

has been ignored.

A great deal of federal funding was provided to states by the Help America Vote Act to upgrade their voting systems, but unfortunately it was not accompanied by effective mandatory standards to ensure real accessibility. Voting machine purchasing authorities, not well informed about the issues, have been left to the tender mercies of voting machine company salespeople, and have been manipulated into making some very poor choices. As a result, much of that money has been wasted on machines that don't work well.

Issues like this have been a source of great frustration for disabled voters, and understandably so, and they, along with the at-home isolation imposed by the COVID-19 pandemic, are in large part what is now prompting dangerous demands from activists for internet voting and an end to paper ballots. If we are going to succeed in maintaining truly secure voting systems, we must devote adequate attention, and funding, to ensuring that accessible voting machines work better. If we do not, these well-intentioned but severely misguided activists are likely to eventually succeed in degrading the security of our voting systems, leading to destruction of public confidence in our elections and our democracy.

This situation could certainly benefit from the creation of national standards. However, that won't be enough to solve the problem unless Congress can be persuaded to pass legislation to mandate that all states follow such standards, and that legislation needs to contain another round of funding to pay for new standards-compliant machines. It should be quite apparent that anything having to do with federal regulation of state elections is now excessively politicized, and no such legislation is likely to be enacted in the foreseeable future. However, we still welcome NIST's consideration of these issues, and we have a few concrete suggestions.

1. NIST should not under any circumstances endorse or recommend any form of internet or paperless voting, or internet transmission of voter registration data.

2. NIST should issue a very strong statement on the dangers of internet and paperless voting and voter registration that explains clearly why these are very bad ideas, and NIST, as an authority on information security that is recognized and respected world-wide, should seek maximum publicity for this statement.

3. NIST should describe and endorse a system for internet-based transmission of blank forms to voters, and "snail-mail" transmission, or personal delivery, of filled-out forms and ballots by voters to election authorities, that has the characteristics of the system we described at the beginning of this paper, as the preferred approach for enabling disabled voters to vote from their homes.

3.A. We believe that any state or federal law that prohibits a person other than the voter to hand-deliver or mail a registration form or ballot for a person with a disability would violate the Americans with Disabilities Act and Section 504 of the federal Rehabilitation Act. Since transportation to ballot drop locations or even, in some cases, to urban mailboxes, is a problem for many blind people and people who otherwise cannot drive due to their disabilities, and manipulation of mailboxes can be a problem for people with a variety of physical disabilities, such deliveries by personal assistants would be well within those laws' definitions of "alternate" or "reasonable" accommodations that must be provided by public entities. If possible, NIST should make a determination on this point and issue it as part of its standards.

4. To ensure that disabled citizens are able to vote at public polling places, NIST should list some minimum feature requirements and performance metrics for voting machine accessibility

features that can enable disabled voters to vote as reliably, easily, and quickly as nondisabled voters.

4.A. Voting machines should be isolated behind a curtain or partition and reasonably far away from other stations in the polling place, so that people cannot stand nearby and stare at disabled voters as they vote.

4.B. Voting machine accessibility features should be "always on" and immediately useable without special configuration by poll workers, if possible. If configuration must be required, it should be limited to pressing a single button to enable/disable an "accessible mode".

4.C. Voting machines should have a "test mode" that poll workers can be required to use on a daily basis to ensure that the accessibility features are working.

4.D. The machine should have easily differentiated tactile buttons to enable voters to control the process; there must be no touch screens or flat touch surfaces. Buttons should be shaped differently for different functions to assist blind users in identifying them. They should be large and well-separated to improve usability for people with fine-motor limitations. They should have different colors to aid comprehension by voters with intellectual or cognitive disabilities.

4.E. A blind voter using a dedicated voting machine that reads the ballot aloud, enables the voter to make choices, prints the ballot, and then accepts the printed ballot for processing and counting, should, when using the machine for the first time after minimal instruction from a poll worker, require no more than 150% of the time it takes a typical nondisabled voter to vote using the same ballot, without regard to the design or layout of the paper ballot.

4.F. A user who is relying on spoken menus should not be required to re-hear the entire menu of options in order to re-hear the details of one race on the ballot.

4.G. A user who has heard enough to understand what s/he needs to do to vote in one race should not be required to listen to the entire list of candidates for a race before they can cast a vote in that race.

4.H. Users should be able to choose a menu option to vote a party line for all offices in which a member of the party is running, if they wish, rather than being required to listen to each race's details and make individual choices.

4.I. A blind user should be able to speed up or slow down the machine's speech rate, and adjust the speech volume, to suit his/her needs. (Many blind people who are experienced with screen reading software can comprehend machine-generated speech at much faster speeds than normal conversation, and will choose a higher speech rate when available.)

4.J. Headphones must be readily available and attached to the machine for people using the speech output features so they can hear their ballot choices read back to them privately. The headphones must be sanitized by a poll worker after each use.

4.K. Voting machines should be required to be capable of voice activation.

4.L. Voting machines' response to voice activation should be as accurate, and as quick, as typical telephone voice-activated menu systems for menus that are equally as complex as the ballot.

4.M. A "steno mask" microphone should be readily available and attached to the machine to

enable users to speak commands to the machine privately. Such masks must be sanitized appropriately by a poll volunteer after each use.

4.N. Such voice-activated systems should be able to respond accurately to a user's voice command to "Vote for [candidate name] for [public office name]", for all candidates and offices that appear on the ballot, as an alternative to navigating menus and making choices.

4.O. Voice activated systems should be able to respond accurately to a voice command to "Vote [party] for all races".

4.P. Anything that can be done by means of the tactile controls should also be available by voice command.

4.Q. Voice-activated systems must achieve these levels of responsiveness without connecting to the internet to use "back end" server farms to process the voter's speech input. Since the range of required commands will be much more limited than those needed for popular voice control technologies such as "Siri" or "Alexa", this should be feasible, though perhaps rather expensive. It would likely require voting machine manufacturers to license one of those technologies for the purpose, and build the required processing memory and, perhaps, other dedicated chips into the machine.

**Conclusion**

As highly experienced service providers and advocates for people with all types of disabilities who have been involved with voting accessibility issues for nearly 40 years, we want to again emphasize that we do not believe internet or paperless voting are necessary to achieve adequate levels of accessibility for disabled voters, and we are absolutely opposed to any use of such systems because they will destroy the credibility of our elections. Instead, there are many measures that can be taken to substantially improve the accessibility of both from-home and polling-place voting for voters with disabilities, and these should be the sole focus of any NIST standards on the subject.

We thank you for the opportunity to comment on this critical issue.

**The Experts on Internet and Paperless Voting**

The Electronic Frontier Foundation: (https://www.eff.org/issues/e-voting; accessed July 14, 2021)

Bruce Schneier, internationally recognized expert on information security (https://www.schneier.com/essays/archives/2003/08/voting_and_technolog.html; accessed July 14, 2021, and https://www.schneier.com/blog/archives/2020/06/security_analys_7.html; accessed July 14, 2021)

National Association for the Advancement of Science: (https://www.aaas.org/programs/epi-center/internet-online-voting; accessed July 14, 2021)

Common Cause: ( https://www.commoncause.org/page/email-and-internet-voting-the-overlooked-threat-to-election-security/; accessed July 14, 2021)

Digital Diplomacy:
(https://medium.com/digital-diplomacy/security-experts-say-online-voting-is-a-bad-idea-heres-why-1792c9a876b0; accessed July 14, 2021

Ars Technica:
(https://arstechnica.com/tech-policy/2020/09/why-online-voting-is-harder-than-online-banking/; accessed July 14, 2021)

CSO Online:
(https://www.csoonline.com/article/3269297/online-voting-is-impossible-to-secure-so-why-are-some-governments-using-it.html; accessed July 14, 2021)

Finally, here is a scientific research paper explaining the security flaws in the much-ballyhooed Estonian online voting system: https://jhalderm.com/pub/papers/ivoting-ccs14.pdf; accessed July 14, 2021.