Accessible Voting

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Overview of Talk

• Why do we need to make voting accessible?

• The Help America Vote Act of 2002 (HAVA)

• How does HAVA define “accessibility” and “disability”?

• Accessibility features provided by some voting systems

• How do “paper trail” features impact accessibility?

• Are “accessible” voting systems sufficiently accessible?

• Currently unresolved problems with accessible voting

• What’s ahead:
  • Federal legislation
  • Court cases and legal rulings
  • New solutions for accessibility
Why do we need to make voting accessible?

• "The right to vote is the right upon which all other rights depend", Thomas Paine.

• A significant fraction of the voting age population has one or more disabilities:

U.S VOTING AGE POPULATION WITH DISABILITIES AND LANGUAGE NEEDS

<table>
<thead>
<tr>
<th>People over 18 who:</th>
<th>Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have trouble seeing</td>
<td>19.1</td>
</tr>
<tr>
<td>Have trouble hearing</td>
<td>30.8</td>
</tr>
<tr>
<td>Experience physical difficulty, including trouble grasping small objects</td>
<td>28.3</td>
</tr>
<tr>
<td>Speak English less than “very well”</td>
<td>17.8</td>
</tr>
<tr>
<td>Live in “linguistically isolated households”</td>
<td>9.2</td>
</tr>
</tbody>
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• Voters who are not currently disabled will likely develop a disability later in life

• Most of us are among the “temporarily able-bodied”
Accessibility Concerns Faced by Voters with Disabilities

• Accessibility of the polling place itself (addressed by the ADA)
  • Accessible public transit
  • Accessible parking spaces
  • Accessible paths to the polling place (width, slopes, surfaces, obstructions)
  • Accessible building (door widths, elevators, signage)

• Accessibility of the voting systems used in the polling place (addressed by HAVA)
  • Obstacles posed by paper ballot voting systems:
    • Visually-impaired voters have difficulty seeing or marking the ballot
    • Voters lacking use of their hands can’t hold a pen to mark a ballot
    • Voters with hand tremors can hold a pen but can’t hold it steady

  • Obstacles posed by lever voting machines:
    • Visually-impaired voters have difficulty seeing the labels on the levers
    • Voters lacking use of their hands can’t operate the levers
    • Voters confined to a wheelchair can’t reach the levers
The Denial of Privacy and Independence

• The obstacles posed by inaccessible voting systems:
  • Prevent voters with disabilities from voting independently
  • Require such voters to be assisted by an attendant or by a poll worker
  • The provision of such assistance violates the privacy of the voter’s ballot

• Examples:
  • Blind voters using a paper ballot must:
    • have someone else read them the contents of the ballot
    • dictate their choices to that person who will mark the ballot for them
  
  • Voters confined to a wheelchair and voting on a lever machine must:
    • have someone else read them the labels associated with the levers
    • dictate their choices to that person who will flip the levers for them

• Such voters are forced to trust that the person helping them is accurate and honest
• The “Man Behind the Curtain Analogy”: would you trust your vote to him?
## The Help America Vote Act of 2002 (HAVA)

- The “Florida recount” controversy during the 2000 Presidential Election was the catalyst that prompted passage of HAVA.

- HAVA provided the States with financial incentives to replace punch card and lever machine voting systems with more modern technologies as soon as possible.

- HAVA established the first federal requirements for voting systems; those took effect in 2006.

- HAVA provided funding to States to meet those requirements.

- HAVA requires voting systems to be accessible to disabled voters.
The Accessibility Provisions of HAVA

Title III, Subtitle C, Section 301. VOTING SYSTEMS STANDARDS.

(a) Requirements.--Each voting system used in an election for Federal office shall meet the following requirements:

... 

(3) Accessibility for individuals with disabilities.--The voting system shall--

(A) be accessible for individuals with disabilities, including nonvisual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;

(B) satisfy the requirement of subparagraph (A) through the use of at least one direct recording electronic voting system or other voting system equipped for individuals with disabilities at each polling place;
How Does HAVA Define “Accessibility” and “Disability”

• It provides no *explicit* definition for “accessibility”

• It *implicitly* defines “accessibility” as providing disabled voters with equivalent:
  • opportunity for access and participation
  • privacy
  • independence

• It provides no definition for “privacy” and “independence”

• Several pending lawsuits are attempting to assert various definitions for these terms

• It provides no definition for “disability”

• But it explicitly refers to blindness and visual impairments while failing to mention any other types of disabilities

• It identifies one type of voting system, Direct Recording Electronic (DRE), as being “equipped for individuals with disabilities”, but allows for other types that are.
Accessibility Features Provided by Some Voting Systems

• Assistive visual interfaces:
  • Enlarged fonts
  • Enhanced contrast

• Assistive audio interfaces (audio ballots):
  • Adjustable volume
  • Adjustable tempo

• Assistive input interfaces:
  • Touch screens
  • Control keypads with distinctly shaped keys and/or Braille labels
  • Standard telephone-style keypads
  • Dual-input switches:
    • Foot pedal
    • Jelly switches
    • Sip-and-puff switches

• Tactile ballots and verification devices
Example: Sequoia AVC Edge II DRE Voting Machine

• One of these voting machines is available in each Santa Cruz County polling place

• Touch screen display provides enlarged fonts and enhanced contrast

• Angle of screen can be adjusted for voters confined to wheelchairs

• Audio ballots available for blind and visually-impaired voters

• Audio ballots provide adjustable volume and speed of playback (tempo)

• Control keypad used with audio ballots has distinctly shaped keys

• Sip-and-puff interface supported, but only with audio ballots

• Has voter-verifiable paper audit trail (VVPAT):
  • VVPAT is now required in 28 States, including California
  • Sequoia’s VVPAT is not accessible to visually-impaired voters
Other Examples of Accessible Voting Systems

- Electronic Ballot Marking Devices (e.g., AutoMARK):
  - Provide all the same assistive interfaces as DRE voting machines, plus others
  - Provides synchronized audio and video feedback (cognitive impairments)
  - Enable voters with disabilities to mark a standard optical scan ballot
  - Enable such voters to VERIFY that the ballot has been correctly marked

- Tactile Ballots:
  - A low-tech solution used in several countries and in Rhode Island
  - Standard paper ballot is inserted in a template with tactile markings
  - Instructions are provided to the voter via audio tape or Braille

- Electronic Verification Wand (e.g., VotePAD):
  - Used with a tactile ballot template
  - Enables tactile verification of the marked ballot

- Vote-by-Phone Systems (e.g., IVS-Inspire):
  - Audio ballot transmitted to the voter over the telephone (from a polling place)
  - Voter makes selections using standard telephone touch-tone keypad
How do “paper trail” features impact accessibility?

• Purely electronic (paperless) DRE voting systems have several serious weaknesses:
  • Vulnerability to tampering or “hacking” by intruders or insiders
  • Inadvertent loss of votes due to errors in programming or configuration:
    • 436 votes lost in Wake County, North Carolina election in Nov. 2002
    • 4,500 votes lost in Cateret County, North Carolina election in Nov. 2004
    • 18,000 unexplained undervotes in Sarasota County, Florida in Nov. 2006

• “Voter-verifiable paper audit trails” (VVPAT) help guard against these weaknesses

• 28 States have enacted VVPAT requirements; 7 more use VVPAT (35 total / 70%)
  • Paper trail is verified by the voter but retained within the voting system
  • After polls close, some precincts are randomly-select for audit
  • Paper trails from those precincts are counted by hand
  • Results of those hand counts are compared to electronic totals from machines
  • And if electronic votes are lost due to malfunction, paper trail preserves votes

• Existing DRE paper trail systems are NOT accessible to visually-impaired voters
• Existing ballot marking devices limit “independence” of dexterity-impaired voters
Are “Accessible” Voting Systems Sufficiently Accessible?

• Some voters (e.g., Runyan, Pierce) with disabilities strongly assert that they are not:
  • Problems with audio ballots on some DRE voting machines
    • Most audio ballot designs lacked sufficient consultation with end users
    • Require excessive amount of time to use (lengthy, repetitive instructions)
    • Difficult to navigate ballot (inconsistent use of labels for control keypad)
    • Require special setup by poll workers (increasing wait time for voting)

  • A large fraction of DRE voting machines lack dual-switch inputs (sip-and-puff)
    • Diebold DREs used statewide in Georgia and Maryland lack such inputs
    • Older Sequoia DREs used nationwide lack such inputs
    • Newer Sequoia DREs only support dual-switch inputs with an audio ballot
    • IVS Inspire vote-by-phone system lacks any dual-switch inputs

  • DRE voting systems are not accessible to the deaf-blind (about 30,000 in U.S.)

• Disability rights groups (e.g., AAPD) have filed lawsuits about AutoMARK
  • Existing ballot marking devices require handling of the paper ballot
  • Voters with manual dexterity impairments can’t handle a paper ballot
  • Such voters can’t vote privately and independently as required by HAVA
Currently Unresolved Problems with Accessible Voting

• **No single voting system is accessible for all types of disabilities**
  
  • Existing DRE VVPAT printers are not accessible to the blind and visually-impaired
  
  • Currently, HAVA only requires provision of “at least one”:
    
    “voting system equipped for individuals with disabilities at each polling place”
  
    • If only one type of system is provided, which disabilities are accommodated?
    
    • How large a population must have a disability for it to qualify for accommodation?
    
    • AAPD/PVA lawsuit seeks to require multiple types of systems at each polling place
    
    • If courts require multiple systems in all polling places, how will this be funded?
    
    • Given these uncertainties, how do local officials select which type of system to use?
What’s ahead: Federal Legislation

• Bills to require paper trails nationwide will soon be re-introduced in Congress

• Several different bills will likely be introduced on both sides of the aisle

• Relevant committee chairs in both chambers have announced intent to hold hearings:
  • House Administration Committee Chair Rep. Millender-McDonald (California)
  • Senate Rules Committee Chair Sen. Feinstein (California)

• Current prospects for passage of such legislation this year are quite favorable

• Key questions to be resolved:
  • When will nationwide VVPAT requirement take effect (2008, 2010, 2011)?
  • How will VVPAT accessibility concerns be addressed?
  • How will solutions to those concerns be funded?
What’s next: Court Cases and Legal Rulings

• AAPD/PVA lawsuit: Will the Court determine that:
  • The AutoMark violates the “independence” of dexterity-impaired voters?
  • Existing paper trails violate the “independence” of visually-impaired voters?

• If the AAPD/PVA prevails, what remedies, if any, will the Court mandate:
  • Provision of multiple types of accessible systems in each polling place?
  • Modifications to the AutoMark to accommodate dexterity-impaired voters?
  • Modification or elimination of California’s paper trail requirements?
  • Prohibition on using paper trails as an official record for recounts or audits?
  • Provision of improved technology to make paper trails accessible to the blind?
What’s next: New Solutions for Accessibility

• Making paper trails accessible to the blind and visually-impaired:
  • Provide audio readback of printed contents of the paper trail printout
    • Adapt Kurzweil-NFB Reader for use with existing paper trail systems, or
    • Print paper trail using OCR fonts and use built-in OCR scanner

• Solving the “paper handling” problem for ballot marking devices (AutoMARK):
  • Give dexterity-impaired voters the option of having their marked ballot:
    • Ejected into a privacy envelope for transfer to scanner by poll worker/aide
    • Deposited into a secure ballot box for scanning after the polls close
Conclusions / Lessons Learned

• Accessible voting poses a variety of difficult challenges:
  • Technical    (e.g., which assistive interfaces work best for a given disability?)
  • Legal        (e.g., what is the legal meaning of “accessibility”, “independence”?)
  • Policy       (e.g., what is a fair and effective use of public funds for voting?)

• HAVA was well-intended, but its implementation has been severely flawed:
  • Failed to establish effective standards for how accessible systems should work
  • Provided billions in funding for new systems and set tight spending deadlines
  • Voting system vendors rushed products to market with inadequate designs
  • Aggressive deadlines forced jurisdictions to make hasty purchase decisions
  • End result is that the deployed systems don’t adequately meet voters’ needs

• Technology has the potential to make voting more accessible to disabled voters:
  • Existing “accessible” voting systems fail to fully meet that potential
  • That potential will not be fully realized unless and until:
    • More effective standards are established for accessible voting systems
    • Disability advocates and experts are included in setting those standards
    • Voting systems vendors are held to rigorous design and testing standards