

# VoteAllegheny Recommendations for Voting System Demos



VoteAllegheny is a non-partisan volunteer election integrity organization. Our members include cybersecurity experts, computer scientists, election judges, and poll watchers. We have served on the Allegheny County Citizens' Election System Advisory Panel, have briefed a former PA Secretary of State, and have educated national security officials. Since 2006 we have helped Allegheny County officials monitor and improve election integrity. More information is available at [www.VoteAllegheny.org](http://www.VoteAllegheny.org).

## Best Approach

VoteAllegheny believes that, at present, the best balance of voting integrity, cost, and reliability is provided by voter-marked paper ballots, counted at the polling place by a scanner, re-counted by the County using high-speed scanners, with a random sample of ballots hand-recounted using a statistically justified recount protocol.<sup>1</sup>

## Ballot-Marking Devices (BMD)

An alternative to a hand-marked ballot is a paper ballot produced by a “ballot-marking device” (BMD). A BMD is a touch-screen computer that guides a voter through making selections and then produces a paper ballot. Machine-marked ballots enable some voters with disabilities to vote independently without an assistant. However, machine-marked ballots can have issues.

1. Evidence indicates that many voters fail to carefully check whether a machine-marked ballot accurately shows their choices—this is a problem if an error was made (or if a machine has been compromised so it records something other than the voter's choices). One reason voters might not carefully check a machine-marked ballot is that some ballot markers may print small paper ballots using relatively small fonts. Voters with vision issues may have difficulty reviewing a machine-marked ballot, and might skip the verification step.
2. Another issue is that many machine-marked ballots contain bar codes, representing the voter's choices, that humans can't read. Meanwhile, the scanners in many systems read only the bar codes—they ignore the printed words that you can see. As a result, even the most diligent voter can't validate a machine-marked ballot, if the part that counts is the part that humans can't read. A buggy or compromised machine could print text showing a voter's choices, but print bar codes that count for the wrong candidates.

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<sup>1</sup> Principles and Best Practices for Post-Election Tabulation Audits, 12/2018 (<https://tinyurl.com/y3aqlg4p>).

3. If an emergency occurs which causes a widespread electricity failure for multiple hours, both BMDs and scanners may run into trouble. However, if most voters are accustomed to hand-marking ballots, the disruption will be less than if it is necessary to train everybody on the spot how to mark paper ballots.
4. A final issue with BMDs is expense. To support voters with disabilities, Allegheny County is required to provide one BMD per polling place, so we must purchase that many BMDs. However, some counties plan to use machine-marked ballots for *all* voters. This multiplies the above issues (lack of verification; unreadable bar codes; and much higher costs).

It is possible to make a BMD that marks a pre-printed ballot, or prints a ballot visually very similar to a pre-printed ballot. It is also possible to scan printed words instead of bar codes. To improve the privacy of voters with disabilities, VoteAllegheny advocates BMDs that mark pre-printed paper ballots, or that print ballots that are visually very similar to pre-printed paper ballots. VoteAllegheny also advocates BMDs that do not encode voter choices in bar codes.

Many PA counties, and many jurisdictions across the country, have been using voter-marked, precinct-counted ballots for years. For example, from 2006 through 2018, nearby Indiana County provided pre-printed ballots that voters could hand-mark, or machine-mark using a BMD without bar codes.

## Summary

1. For reasons of voting integrity, cost, and reliability, VoteAllegheny recommends the purchase of a system which relies on
  - hand-marked paper ballots for most voters,
  - a ballot-marking device per polling place to support voters with disabilities,
  - all ballots counted by a scanner before leaving the polling place.

We further recommend that reliance on bar codes should be minimized (for technical reasons, 2-D codes, which look square, are better than 1-D codes, which appear like row of vertical lines).

2. If you attend a voting-system demo, we encourage you to hand-mark a paper ballot. Voter-marked paper ballots have become the gold standard for voting because they cannot be remotely hacked or manipulated. We hope most voters will hand-mark paper ballots to help protect their votes and support honest elections.

3. If you try using a BMD machine to mark a ballot, inspect the ballot it produces carefully. Is it easy to read? How long does it take to check what the machine has printed after you are done voting? If the ballot has bar codes, can you compare the content of the bar codes to the printed words? You might ask the vendor how much time it takes election workers to hand-audit whether bar codes match the printed words that voters can read.