



NIST Voting Technology Series
NIST VTS 100-1

**Administering Accessible
Vote by Mail Systems**
Challenges and Innovations in Elections Offices

Lynn Baumeister
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Abstract

Accessible vote by mail (AVBM) provides options for voters with disabilities to complete their absentee or vote by mail ballots independently and privately. AVBM is especially important for voters with print disabilities that make it difficult to read or handle paper.

This report reviews current elections offices' practices in administering accessible vote by mail and considers their innovations and current challenges. One of the most important challenges is difficulties exchanging voter data and ballot style information between the election management systems and the AVBM system. A strong Common Data Format for ballot style data interchange would make providing AVBM more efficient. With the use of AVBM and electronic ballot return growing, strong standards will also support stronger cybersecurity practices while providing voters with print disabilities equal access to voting by mail.

Recommendations include gathering more detailed information about administrative practices, assessing the risks and benefits for different methods of electronic return, and investigating methods for directly counting an AVBM ballot without replication, including best practices for how voter selections are encoded.

Keywords

accessible voting; accessible vote by mail; AVBM; Common Data Format; election administration; print disabilities; vote by mail; VBM; voting systems.

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Introduction

Accessible voting by mail provides options for voters with disabilities to complete their absentee or vote by mail (VBM) ballots independently and privately. For the purposes of this report, we define accessible vote by mail (AVBM) as:

The ability for voters to receive and mark their ballot outside of a voting location, using their own equipment (with assistive technology as needed), and return their marked ballot to the election office.

AVBM complements the Help America Vote Act (HAVA)[1] requirement for an accessible voting system in every in-person voting location to support private and independent voting for voters with disabilities.

Making voting by mail accessible does not remove the requirement or need to provide accessible voting machines at in-person voting locations but provides the same option (voting by mail) to voters with disabilities that is offered to other voters.

Many states already offer a right to absentee voting for people with disabilities and older adults who may not be able to travel to a voting location, but still require voters to mark a paper ballot. AVBM is important in providing opportunities to vote privately and independently because it allows voters to use their own technology setup and assistive technology to mark their ballot.

AVBM makes the option for absentee voting accessible to voters with print disabilities. A person with a print disability is defined in the NIST Special Publication 1273 “Executive Order on Promoting Access to Voting” [2] as:

1. A person who is unable to read or use regular print materials as a result of temporary or permanent visual or physical limitations... this includes those who are blind or have a visual or physical disability that prevents them from reading or handling print materials.

2. A person who cannot effectively read print because of a visual, physical, perceptual, developmental, cognitive, or learning disability.

The full report includes a more in-depth discussion of the challenges of voting by mail for people with disabilities.

Under the Military and Overseas Voter Empowerment (MOVE) Act [3], elections are required to support voters covered by the Uniformed Overseas and Civilian Voters (UOCAVA) Act [4], providing a way for those voters to receive a blank ballot electronically (or as a PDF file) to print and return. For UOCAVA voters, the immediate challenge is the time it takes for ballots to be delivered by mail, both to the voter and back to the elections office. Some states allow ballots to be returned electronically, by email, fax, or by uploading the

ballot through a portal (though in some cases, the paper ballot must also be returned for the vote to be counted).

In some jurisdictions, the options used for UOCAVA voters can also act as an AVBM for voters with disabilities. Disability rights organizations have advocated for this option [5]. As a result, some states or local elections offices use their UOCAVA system for people with disabilities as well. Early providers of AVBM systems included Oregon, which worked with a local vendor to create a custom AVBM system [6]. Maryland, Ohio [7], and California [8] all implemented AVBM systems following litigation. Like Oregon, Maryland created a state-wide system [9], while the other two states issued requirements that counties provide a system of their choosing. Los Angeles County incorporated both AVBM and UOCAVA ballots and a novel feature to “pre-mark” a ballot for internal voting into their Interactive Sample Ballot (ISB) [10]. The current requirement, in most jurisdictions, that the AVBM system functions as a ballot marking device with the printed ballot returned to the elections office is a frustration to many voters with print disabilities. They want to complete the voting process entirely electronically – receive and mark their ballot, provide identification, and return their ballot. Voters with visual disabilities argue that they are unable to review the printed ballot. For voters with disabilities that affect their ability to handle paper, the steps to pack, sign, and return the printed ballot may not be possible to complete independently. There is active litigation over this issue, with advocates arguing that a fully electronic AVBM is the only way to fully meet the requirements of HAVA.

Scope and focus of this report

In 2022, roughly half of the 50 states, and additional counties and municipalities provide some form of accessible option allowing voters with disabilities to vote by mail.

A key challenge to improving AVBM is to understand how these programs work, with a focus on their administration. This report does not address the voter experience. This report seeks to understand the challenges and lessons learned by election officials administering AVBM. The information in this report is a compilation of anecdotal information gathered through unstructured conversations with election officials about their experiences. The goal of these conversations was to learn about:

- What challenges they experience
- Innovations and workarounds that help them administer the program effectively
- Lessons learned that they would pass on to other elections offices

To get started, we held conversations with three commercial vendors that provide AVBM systems: Enhanced Voting, DemocracyLive, and Five Cedars¹. Our goal was to understand the general workflow that AVBM requires and get a sense of how different (or similar) the products available to election officials are.

We then spoke with election officials providing AVBM that gave us a good view of the range of administration experience. In some states where the state supplies the AVBM system, we were able to talk to officials from both state and local offices. These conversations included administrators from state (6), county (8), and municipal (1) offices in California, Colorado, Maryland, Nevada, North Carolina, Ohio,

¹ Company names are used informatively and do not represent an endorsement by NIST-see disclaimers.

Oregon, Pennsylvania, and Virginia. They used the most common AVBM systems in several different administrative configurations.

In working on this report, we assume that best practices in cybersecurity are in place, focusing instead on the administrative issues in AVBM.

An overview of administering AVBM

One of the important variations in how AVBM is administered is based on whether there is a statewide system, purchased and managed by the state elections office, or whether a local elections office must select or purchase their own, with no standardized state procedures.

However, whatever the system or how it is provided to voters, there is a high-level process for administering AVBM, from an elections offices' perspective.

1. **Setting up the AVBM system.** Like any other voting system, the AVBM system must have voter data and ballot styles data so that the AVBM system can identify a voter and deliver the correct style ballot to the voter.
2. **Providing AVBM access to the voter.** Voters typically submit a request to vote with an AVBM ballot. Once the request is received, the elections office emails the voter instructions for how to access their AVBM ballot. Some jurisdictions also send AVBM voters an official VBM package so that their ballots are returned in the same envelopes as other VBM voters.
3. **Receiving the ballot and authenticating the voter.** As vote by mail ballots are returned to the elections office, they are "checked in." The voter is identified in the voter registration database and their record is marked to show that they have returned a ballot. This step includes any process to correct defects such as a missing signature (the "cure" process).
4. **Tabulating the AVBM ballot.** Depending on the AVBM system and each elections office's process, the ballot may need to be replicated so that the tabulator can read it.

Variations in AVBM systems

The core of all the AVBM systems is a web-based application that allows voters to mark their ballots. Additional functionality is where the AVBM systems distinguish themselves from each other. For example, the AVBM system may also:

- Provide universal access for all voters when AVBM is available to all voters
- Provide a means for voters to request an AVBM ballot when that step is required
- Provide an automatic email response (with access instructions) to requests for AVBM ballots
- Provide a way for voters to request assistance
- Let voters view a sample ballot, specific to them
- Provide digital instructions for marking and returning the ballot as well as other required materials (such as oaths, witnesses, or attestations)
- Collect signatures digitally
- Let voters return their marked ballot, and other required materials, electronically

Not every AVBM system offers all those options and not every election office chooses to use all of the features available in the AVBM system they are using. For example, in order to use a feature that will automatically email access instructions to voters requesting AVBM, the system must be configured with email template(s), with macros (to be filled in by the AVBM system) as well as links and attachments as needed with instructions and other materials.

Overlaps and differences in administering voting by mail and AVBM

In some jurisdictions we talked to there was little overlap with the processes for regular VBM. In other jurisdictions there was considerable overlap, with AVBM ballots going through the same processes with other VBM ballots - particularly for the check-in and tabulate steps. This is summarized in Table 1.

Table 1 Similarities and differences between AVBM and voting by mail processes

Process	Similarities to VBM	Differences from VBM
Delivery	VBM package (printed ballot, return envelope, etc.) is mailed to all VBM voters, including AVBM voters	AVBM voters are emailed instructions and access methods for the AVBM system
Packing	AVBM ballots may be packaged and returned in an official envelope	AVBM ballots may be packaged in a plain envelope or one the voter prints
Returning	AVBM ballots can be returned by the same methods as other VBM ballots	AVBM in some states' ballots may be returned electronically
Returning electronically	The process for collecting UOCAVA ballots returned electronically (by upload, fax, or email) may also be used for AVBM, especially if they use the same voting system	The process for collecting electronically returned AVBM ballots may be different than the UOCAVA process
Verification	AVBM ballots go through the same signature verification or witness verification as other VBM ballots.	Voters with disabilities may have higher than average problems with signature verification, adding to the manual processing time
Counting	AVBM ballots may use the same tabulation method as other VBM ballots.	AVBM ballots (like UOCAVA ballots) may require replication so they can be read by the ballot scanners

Additional staff time needed

There are two reasons why AVBM is not more available and why it is not offered more broadly to anyone who would like to use it:

- Restrictions in state and local election laws
- Resources needed for administration

For elections administrators, the fact that an additional voting procedure requires additional steps in the same timeline as everything else in a busy election period is, by far, the most significant issue. For some jurisdictions that additional time is minimal, for others it is significant. Table 2 shows two ends of the spectrum.

Table 2 Extra resources needed for election administration

Minimal extra resources needed	Significant extra resources needed
<ul style="list-style-type: none"> • AVBM is part of the election management system • Little effort is needed to set up and send AVBM ballots • AVBM ballots are returned in a form that can be easily tabulated as is or printed for tabulation 	<ul style="list-style-type: none"> • AVBM is a separate system, even when used by the entire state • Voter and ballot style data has to be transferred to the AVBM system • AVBM ballots have to be manually replicated for tabulation

UOCAVA - similar, but not the same

At some point in most of our conversations, election officials mentioned pain points around UOCAVA, saying that the AVBM system is used to support UOCAVA voters as well. Most often the processes are similar to, but different in critical ways, from the processes for UOCAVA voters, and this requires clarity and care. For example, in some jurisdictions, although both UOCAVA and AVBM voters mark their ballot using the same system, the AVBM voters are emailed a different set of instructions than the UOCAVA voters and sometimes are also mailed a package with the envelopes needed to return the ballot.

When discussing electronic return of AVBM ballots, election officials frequently mentioned challenges they run into with ballots from UOCAVA voters.



Story from the field

AVBM ballots can be run through our tabulator without needing to be remade, despite being printed on paper that is a different size than the regular hand-marked VBM ballots. But not ballots from UOCAVA voters that are printed on A4 paper or returned via fax; the latter have too much distortion.

- *County election official*

Unexpected benefits

We heard from more than one election office that having the AVBM system available had allowed them to better serve:

- Voters displaced by emergencies such as forest fires or floods
- Voters dispatched to assist with emergencies in other parts of the state or country
- Voters finding themselves unexpectedly in the hospital or skilled nursing facility



Story from the field

We still have voters living in other parts of the country due to the fire last summer. This gives us another way to deliver their ballot to them that they can access from anywhere.

- County election official

Challenges in administering AVBM

In our conversations with elections staff about administering AVBM we heard both about the routine parts of the process and aspects that make AVBM challenging. This section walks through the steps needed to support AVBM and the challenges experienced in those areas by elections staff.

Setting up the AVBM system

The issues in this phase of the process include challenges moving data from the main election management system (EMS) to the AVBM system and proofing a separate set of ballots for AVBM.

Loading ballot styles and voter data into the AVBM system

In order to deliver the correct ballot to a voter, the AVBM system needs voter data, ballot styles, and the information necessary for connecting a voter with the correct ballot style. Election management systems (EMS) have well-established processes for producing printed ballots and getting ballot styles loaded into in-person voting machines. However, few have good support for exporting the voter data and ballot styles to a separate system, leaving the AVBM systems to solve the data transfer problem without a common data format to rely on.

The process of transferring voter data and ballot styles to the AVBM system was a common pain point for elections staff, whether it was handled at the state level, at the local level, or a mix of the two. The degree of assistance the state office offers varies from providing a full service to just setting requirements.

The combination of systems in use makes a difference to the ease of this step, as both the EMS and AVBM systems share the responsibility. A few of the systems, especially those built by the states themselves, have a strong integration between the systems. One of the systems is made by an EMS vendor. Other AVBM systems have invested in creating tools to manage the data formats.

Another variable in the process of loading the ballot styles and voter data is who manages both the voter registration files and the AVBM system. In states where the system is managed at the state election office, the relationship between them and the local offices can make a difference in the efficiency with which AVBM can be administered.



Story from the field

In our state, a centralized technical team does all the loading of ballot styles, taking that workload, and requirement for technical expertise, off of the counties.

- *Statewide AVBM system manager*

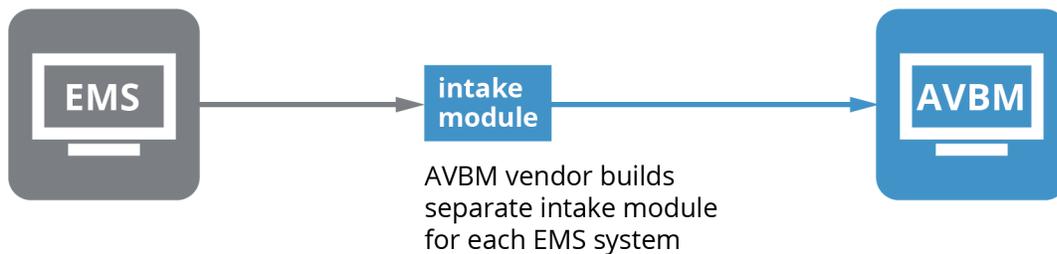
These variables affect the entire process of setting up an election, reviewing the ballot formats for accuracy, and the day-to-day operation of administering the AVBM system during the election.

We heard three scenarios described for loading ballot styles and voter data into the AVBM:

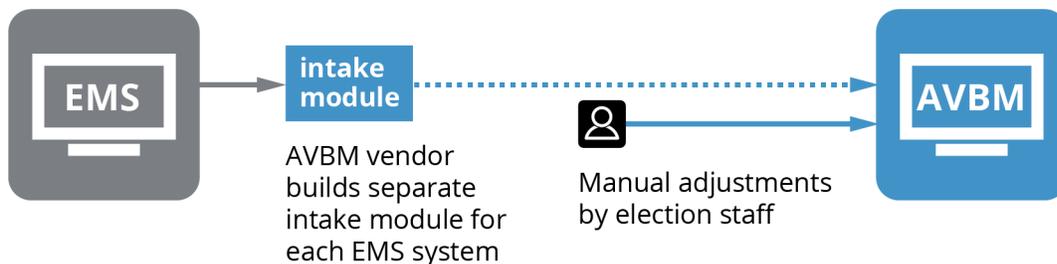
- The voting system's EMS export of ballot styles includes all the necessary data
- The voting system's EMS export of ballot styles is incomplete

- The AVBM is an integral part of the EMS; no data transfer is needed

The voting system’s EMS export of ballot styles includes all the necessary data: In this situation, ballot styles import cleanly into the AVBM system. This was more likely when the voting system was a newer version. Unfortunately, each EMS has its own output format, rather than following a common data format. As a result, a commercial AVBM system must include custom code for each EMS, constructing code modules for transferring the data from each EMS and providing tailored instructions for importing that data into the AVBM. Once the AVBM vendor has created the custom code, these data transfers can be done easily, but any changes to the EMS system’s export capabilities require corresponding changes in the AVBM intake module.



The voting system’s EMS export of ballot styles is incomplete: In this situation, the voting system’s EMS export only contains some of the data needed to produce ballot styles. After the import, election officials manually key in missing ballot information. They rely on the AVBM system for tools and instructions for each voting system’s EMS export format. This is the most time-consuming with all the challenges of any data transfer combined with manual additions that both take time and add opportunities for mistakes.



There is no need to transfer data: In this situation, the AVBM system is integrated into the EMS: voter records and ballot styles don’t need to be transferred to a separate AVBM system. Although some voting systems have an AVBM option that is integral to their system, this scenario is most common when the AVBM is built and maintained by the elections office (usually the state), rather than an outside vendor. In this case the data transfer is seamless.



AVBM is run directly from the EMS

One obvious solution to the challenge of loading the AVBM system with complete data for each election is a standard data interchange format that supports interoperability allowing different commercial or state systems to interact seamlessly. This would also reduce the risk that a change caused by an EMS system update would have cascading effects on the AVBM system. The Common Data Format (CDF) Project [11] for ballot style data transfer is one such approach.

Proofing ballot styles

Election staff must proof-read paper ballots and electronic ballots for every presentation of the ballot. An AVBM system is an additional presentation method that also must be proofed. The challenge is the additional staff time required as well as the proofing process.

Some elections officials mentioned that the appearance or layout of the ballot styles in the AVBM system looked different from the way that the rest of their ballots looked, making comparisons more challenging.



Story from the field

We find that proofing two ballots with different visual presentations, for example a pre-printed ballot and ballot on a screen, can be slower - or require two people working together.

- *Statewide custom AVBM system manager*

We also heard about strategies to reduce the workload of setting up the AVBM system.



Story from the field

Rather than loading and proofing the ballots for the entire state, we preemptively proof and load for urban or larger counties where we expect requests for AVBM ballots. For smaller counties, where we might not have any requests for an AVBM ballot, we wait for a request before loading and proofing ballots for that county. The downside is that last minute AVBM requests mean a last-minute push for election staff.

- *Statewide AVBM system manager*

Providing AVBM access to voters

AVBM voters require more communication, both to get access to the system and (sometimes) for support in using it. That communication is typically conducted via email but needs the same careful content consideration and preparation as other communications with voters.



Story from the field

We never call it internet voting. It is not internet voting. It is a ballot delivery method. In our county we can deliver your ballot to you over the counter, through the mail, or by emailing you a link to view your ballot on your computer

- County election official

Training local election staff

Election staff at the state level have to train county and local elections operations staff on the AVBM system and the processes around it. Ensuring that AVBM procedures are followed accurately and consistently not only requires training, but additional quality monitoring throughout the process.



Story from the field

I find that ensuring elections staff can administer assistance is one of the biggest barriers to independent voting. I take pro-active training steps to ensure our election staffers know how everything works.

County election official

Preparing materials for AVBM voters

Because AVBM voters are using a different system than other VBM voters, the election staff follow different processes to ensure that AVBM voters have what they need to complete and return their ballot.

For some offices, this means extra steps to help their voters be successful:

- Creating a different package of physical and electronic communications to send to the voter.
- Creating separate material for AVBM, such as an envelope with a tactile indicator for where a signature belongs (such as a hole punch) or a tactile differentiator on the return envelope so it can be identified by touch.

The email instructions sent to AVBM voters are another step that election staff must fit into their election administration processes. There may be several emails with instructions for accessing, marking, printing, and returning the AVBM ballot. Some send out the emails manually, others may use an automated system.

In general, they were strategic about it: jurisdictions with lower AVBM use might send emails manually, and those with higher AVBM volume might use an automated system (sometimes part of the AVBM system) to email instructions to AVBM voters. Although getting everything set up to allow for emails to go out automatically when a request comes in may not be difficult, it is yet another system to manage.

Receiving the ballot and authenticating the voter

The process of checking in returned ballots has two steps: receiving the ballots and verifying voter identity according to local requirements

Collecting returned AVBM ballots

Most of the elections offices we talked to require the voter to print their marked ballot and return the physical printed marked ballot to their local elections office. In those situations, AVBM ballots are returned using the same method as other VBM ballots (USPS, drop-box, hand-delivery to the elections office).

However, some states allow for electronic return. Depending on the state, electronic return options may include upload to an election portal, email attachment, or fax. Each electronic return option needs a corresponding process for regularly checking the email, portal, or fax repository where ballots are returned, just as drop-boxes or other return methods are checked each day.

Some states that allow electronic return built their own system for accepting and housing ballots rather than using the mechanism provided by the AVBM vendor. Their goal is to have all voter transactions on their own servers rather than the vendor's servers.

One state we talked to only accepts AVBM ballots returned electronically, into their own server, which simplifies their process. However, even electronic systems can cause challenges. One of the difficulties we heard about was electronically returned ballots being electronically delivered to the wrong elections office's folder.



Story from the field

If a voter moves after receiving their [AVBM] ballot, the change of address causes the AVBM system to direct their ballot to their new elections office. The new office can't process that ballot, so they have to manually move it to the originating office's inbox on the portal. It's similar to what happens when a voter drops their mail ballot into another county's drop box, but done electronically.

- *Statewide custom AVBM system manager*

Checking signatures for oath and witness declarations

In some jurisdictions the bulk of signature verification for VBM is handled mechanically - using scanners and software to digitally compare the signature with the ballot with the signature on file in the voter registration database.

A general problem elections offices are encountering is the difficulty of comparing a signature signed by hand (so-called “wet” signatures”) with those signed on a device like an electronic pad at a Department of Motor Vehicles (DMV). In some cases, AVBM also has this problem; in some cases, comparing an original wet signature on file to one made by maneuvering a mouse or a finger on a screen.

There are also many challenges for voters with visual disabilities in placing their signature correctly. This can cause automated signature capture to fail. And in some cases, a ballot might be rejected.



Story from the field

Some states allow ballots to be accepted with a signature anywhere on the envelope, or anywhere on the (blank) flap of the envelope - not just in the expected location. This guidance is included in statewide procedures for counting AVBM ballots

- *Statewide AVBM system manager*

Curing incomplete return packages

Vote by mail ballots are often rejected for missing necessary items. According to the EAC Election Administration Voting Survey, a missing or mismatched signature is the most common reason, accounting for approximately half (49.1%) of all rejected ballots [12].

This can be true for both paper and digital AVBM ballot returns. For example, a voter might upload their marked ballot, but not their signature, the complete return form, or witness signatures.

One advantage of AVBM is that the cure process can be handled more quickly because it can be done through the email address where the AVBM ballot and instructions were originally sent, rather than through regular mail.



Story from the field

In addition to sending letters with forms to be returned (a further accessibility challenge) a few states are experimenting with an SMS-based cure process, making it easy for any voter to provide a signature on-screen.

- *Statewide AVBM system manager*

Tabulating AVBM ballots

Printed ballots mailed to voters for manual marking do not need special treatment when returned. Those ballots are printed on cardstock that can be put through tabulators. Likewise, printed ballots that capture the voter’s selections in the QR code can sometimes be read by the tabulator without needing to be remade.

On the other hand, AVBM ballots that voters print on a consumer printer, with thin paper stock typically can’t go directly into a tabulator. This is true for PDF ballots sent to voters to print and mark by hand and for ballots marked digitally and then printed.

Ballots that are a facsimile of a hand-marked ballot with ovals or other marking targets rely on the exact position of each marking target. They must be replicated onto a conventional ballot.

Offices with low volume may hand-count ballots instead of making a copy. Jurisdictions that replicate those ballots have different processes they use:

- Replicating the ballot manually by marking a new one on regular ballot stock
- Using a ballot marking device to mark and then print a new ballot
- Creating a copy by reading symbology such as a bar or QR code on the returned ballot
- Printing ballots, returned electronically, on paper that the tabulators can handle or by reading the original and reproducing the markings using one of the above procedures

Whatever process is used for replication, it needs resources and time for teams of election workers to mark the replacement ballot and then review the new ballots for accuracy. This also add storage requirements so that the replication can be audited when required.

Additional systems to manage

Every new method of voting adds training and resource requirements to administer the procedure correctly and accurately. Despite the advantages of AVBM, each additional system deployed by an elections office comes with a cost for the staff, including:

- Multiple login credentials to manage and use
- User interface idiosyncrasies to learn – and work around
- Another system to install, maintain and set up for each election
- Creating and maintaining operating procedures
- Training staff in their use

There are also challenges in creating and managing those materials for voters, especially when the system may change between elections. When voters are confused, they require additional support, and may be discouraged enough to simply not cast a ballot.

Not heard - voters having difficulty marking their ballot

We thought we might hear election officials mention voter assistance as an area requiring additional staff time. However, officials we talked to said they were not hearing from voters about usability challenges for marking their ballot. Elections staff did not discuss time spent responding to phone calls and emails from voters who were having difficulty viewing and marking their ballots, as a pain point. The implication is that once voters are in the ballot marking section of the AVBM, voters aren't having difficulty viewing the contests and making their selections. The Voluntary Voting System Guidelines (VVSG) 2.0 [13] is a contributing factor in the usability of the ballot marking aspect of the AVBM systems by standardizing the requirements for usability and accessibility for voting systems. Many vendors and elections offices creating AVBM systems are relying on VVSG for their AVBM system interfaces as well.

Conclusions

The need for AVBM has been well established through its use in pioneering states like Oregon and litigation in several others. Almost half the states have an AVBM in place, with more jurisdictions coming onboard as use of voting by mail grows. Another sign of success is the robust set of both commercial AVBM systems and systems developed by the states themselves.

Although the number of voters using these systems varies in different jurisdictions, officials generally feel that it is an important option for their voters.

The MOVE Act required that states provide an electronic means to request and obtain blank ballots. This cut the time needed for a voter to receive, mark, and return an absentee ballot in half by making the delivery of that ballot nearly instantaneous. Some states have added opportunities for military voters to use email and fax for an equally fast return of the marked ballot.

For some election officials, AVBM is an extension of the features of UOCAVA voting to voters with disabilities. They emphasize the ability to deliver a ballot electronically and for voters to use their own technology to mark and print the ballot for return instead of going to a polling place and using the ballot marking device or other accessible technology.

For both voters with disabilities and UOCAVA voters, the use of technology to receive and return a ballot reduces barriers to voting. For example, in research with overseas voters, Center for Civic Design reported that voters in distant locations often expend considerable effort and money to return their ballot on time [14]. For overseas voters, the logistics of international mail are a barrier at the “last mile.”

For voters with disabilities that make using paper difficult, the final tasks of printing, reviewing, and packing the ballot for return are a similar barrier at the last mile. In these discussions, election officials did not mention complaints from voters about the usability of the marking process. Instead, the requirement to print and package the ballot was the most frequent complaint.

For those voters with print disabilities, the ability to do everything digitally, using their own assistive technology, is important. They require assistance for the final steps of printing the ballot, physically signing the envelope, and other actions, making it no longer an independent and private voting experience [2]. There have been bills and litigation introduced in several states to (for example) “require a county elections official to permit a voter with a qualifying disability, as defined, to use a certified remote accessible vote-by-mail system that enables the voter to return a completed ballot electronically”[15].

Current challenges for AVBM

There are still challenges for election administration in making AVBM a routine and efficient part of the voting options in every election.

These challenges include general issues of election administration and the adoption process for a new voting method:

- Every new voting method takes place during the same election time period, competing for resources, especially in smaller offices.
- The lack of a universally accepted common data format for importing voter records, ballot styles, and other data needed for AVBM adds to the administrative workload.

- The need to replicate ballots in some AVBM systems also adds to the workload.

These challenges and concerns about being able to handle the additional procedures can mean that even offices that would like to offer AVBM to a wider range of voters are reluctant to advertise AVBM broadly.

Defining who is eligible to use AVBM is also a challenge. The use of the term “print disabilities” adds clarity and a better understanding of the people affected by these scoping decisions. States are still exploring laws and regulations for who is eligible to use AVBM. For example, a law might limit it only to voters with print disabilities, to any voter with a disability, or to allow it for any voter. There are also several different approaches to how voters prove eligibility, from a strict proof to a simple personal assertion.

Without a national standard or consensus, both election officials and voters can be confused about the rules and how to determine eligibility for the AVBM system.

Finally, even as litigation and lawmaking are underway to allow for some form of electronic return, there are concerns about unresolved security issues.

All of these issues, from the practical to the legal, make administering AVBM more difficult, and can also raise barriers for voters with disabilities.

How to address the challenges to providing AVBM

There are several technical projects that can move AVBM forward and potentially lead to innovations that will make it easier to administer.

- Accelerate development of a Common Data Format for ballot style data interchange. For AVBM, the data needed is for the ballot content because ballot layout is handled by each system that creates a ballot presentation.
- Collect input from jurisdictions already offering electronic ballot return to identify risks and benefits for each e-return method (fax, email, upload).
- Investigate methods for directly counting an AVBM ballot without replication, including best practices for how voter selections are encoded.

Collect and share best practices and procedures for:

- Defining “print disability” and eligibility requirements, including self-certification, third party certification, or a simple opt-in.
- How voters access their AVBM ballot and communicate with the elections office.
- Counting AVBM ballots, including procedures for replicating ballots. This information can be organized by different styles of AVBM printed ballots (for example, a facsimile of a hand marked ballot or a list style ballot).
- The voter experience, surveying voters with disabilities on successes, barriers, and satisfaction in using different AVBM systems.

In addition, the EAC, NIST, and other organizations can continue research towards guidelines and standards for AVBM systems, such as:

- Review the VVSG requirements for usability and accessibility for their applicability to AVBM interfaces.

- Continue research on secure, accessible, and equitable authentication methods for voter that don't compromise secrecy when returning a ballot, for both voters with disabilities and others including UOCAVA voters.
- Review research on the use of end-to-end verifiable voting protocols to protect the integrity of cast ballots in AVBM and to secure AVBM.

As the use of AVBM widens, it is important to ensure that administrative burdens do not end up restricting access to an independent and private vote by mail experience for everyone, as an unintended consequence.

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Appendix A: Methodology

When planning who to talk to for this report, we aimed for a cross section of representative jurisdictions. We looked for representation over AVBM systems, including ones that were built in-house, jurisdictions using a state-provided system and jurisdictions using locally-determined systems, and a mix of state and local election staff. Our conversations started with basic questions about their AVBM system and how it works in practice, including:

- What system(s) do you use to provide AVBM?
- What parts of AVBM administration does the system help automate and where does it add effort?
- What is your process for delivering AVBM ballots?
- What is your process for receiving, and tabulating AVBM ballots?
- How does administering AVBM fit into the rest of your processes?
- What challenges have you encountered? What are the pain points?
- If you were talking to another election office that was investigating how to setup AVBM, what would be your advice to them?

These were fact-finding discussions; we adjusted our questions based on what we were learning, asking about pain points we had heard in previous conversations, and sometimes following up to get additional detail.

Who we talked to

We talked to state, county, and municipal elections officials in 9 states. They were selected as representatives of different types of states, using as wide a range of the current AVBM systems as we could find, and their procedures for administering AVBM.

Three of the jurisdictions allow electronic return.

- One is using the upload feature provided by their commercial vendor
- One built their own process for accepting electronic return to their own servers as an option from a commercial system
- One has their own system, which uses electronic as the only return method

Details on the jurisdictions

State	AVBM system in use	Use of VBM [15]	Who we talked to:
CA	AVBM system: mix, certified by state Provided by county Systems discussed: Dominion, VSAP Interactive Sample Ballot Return options: printed ballot	All voters	County
CO	AVBM system: Democracy Live Provided by state Return options: printed ballot, upload via state-provided secure server, fax, or email	All voters	State County
MD	AVBM system: Online Ballot Marking Tool (state-built system) Provided by state Return options: printed ballot	No excuse	State Municipal
NC	AVBM system: Democracy Live Provided by state Return options: upload via Democracy Live portal (for visually impaired AVBM voters)	No excuse	State County
NV	AVBM system: EASE (state-built system) Provided by state Return options: upload via state-provided secure server	All voter	County
OH	AVBM system: mix, certified by state Provide by county Return options: printed ballot	No excuse	State
OR	AVBM system: mix, certified by state System discussed: Five Cedars Provided by county Return options: printed ballot	All voters	County
PA	AVBM system: Democracy Live Provided by state Return: printed ballot	No excuse	State
VA	AVBM system: Enhanced Voting Provided by state Return: printed ballot	No excuse	State Municipal