

## Introduction

The Voter Verified Paper Ballot (VVPB) concept was created by Rebecca Mercuri in order to provide an effective way to confirm the results of elections conducted on electronic equipment, as anonymous balloting is incompatible with traditional auditing procedures. All fully-electronic (touchscreen, DRE, Internet) voting systems are subject to the limitations and risks of computer technology. This includes the inability of examination, no matter how thorough, to detect the presence of hardware and/or software that could be used, deliberately or inadvertently, to alter election outcomes.

Numerous and well-documented failures in electronic voting implementations provide ongoing confirmation of these serious vulnerabilities. Votes have been subtracted, swapped between candidates, and entirely vanished in actual elections, inevitably raising questions about the declared results. Democratic elections require independent verification that a) all balloting choices have been recorded as intended and b) vote totals have been reliably and indisputably created from the same material examined by the voters. VVPB provides an auditable way to assure voters that their ballots will be available to be counted.

The VVPB concept has grown in popularity and is increasingly being reflected in legislation and standards efforts worldwide. This brochure was prepared in order to respond to the misinformation that is being circulated by some organizations and individuals who are intent upon thwarting VVPB deployment for election monitoring.

## Definitions

**Barcode:** Printed representation of data in a reliable, machine-readable, image form. Should be non-proprietary for voting.

**DRE:** Ballot selections are Directly Recorded to an Electronic medium from choices made by the voter. Includes cryptographic-based verification methods.

**Mercuri method:** A VVPB system that displays the paper behind a transparent window and requires the voter to validate the choices printed on it prior to casting. The voter must also be provided with a way of voiding the ballot if it is incorrect.

**Optically scanned ballot:** A type of VVPB that is prepared (either by hand or with computer assistance) and then read into a computer by a scanning device at the precinct. Tactile (non-Braille) versions are available for the visually impaired.

**Poll or precinct:** A location, generally near where the voter lives, that is designated for balloting during the election.

**Touchscreen:** The ballot display screen is touched by the voter to make selections.

**VVPB:** A Voter Verified Paper Ballot is created by the voter (manually or printed by the voting system) to represent election choices. The voter examines this document for correctness, and then places it into a ballot box for use in confirming vote totals and in case of recounts.

Further material is available at:  
[www.notablessoftware.com/evote.html](http://www.notablessoftware.com/evote.html)



## Facts About Voter Verified Paper Ballots

by

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*Is it expensive to add VVPB capability to electronic voting machines?*

It should not be, since many DRE and touchscreen voting machines already contain printers that are used for end-of-day totals. Manufacturing costs for ballot printing units are estimated at only \$50 each, and supplies are similarly low in cost. Some voting system manufacturers have grossly inflated prices to discourage this safety feature in elections.

*Will delays at the polls occur due to printers jamming and running out of paper or ink?*

This is unlikely. Paper is used successfully in everyday point-of-sale transactions, and high-reliability printers (that can contain enough supplies for election day) are available for voting applications. Poll workers need no more skill than convenience store employees, to quickly add paper and ink from supply kits.

*Do computer-based voting systems provide enough reliability to eliminate the need for paper?*

Without VVPB there is no way to independently audit the election results. Equipment failures, configurations and programming errors have resulted in costly election recalls and disputes that could have been prevented with VVPB.

*Why are recounts still necessary?*

Computers reduce the ability to provide the checks and balances that ensure correctness and impartiality in democratic elections. Recounts enable transparency and enhance voter confidence in election results.

*Could a voter verified paper ballot be used as a receipt to sell votes?*

When implemented correctly (such as by using the Mercuri method), a VVPB cannot be retained by or identified with the voter in any way.

*Are VVPB supporters impeding voting equipment purchases?*

No, but some vendors are. Ballot printouts have been required in DRE auditing for over a decade, but vendors chose to generate these after the election from electronic data (rather than during vote casting so each voter can independently verify their own ballot record). The concept for VVPB has been publicized and available since the mid-1990's, but its need was ignored and features deliberately were not provided.

*Are visually impaired, physically challenged, and foreign-language voters discriminated against by VVPB?*

Not at all. DRE and touchscreen voting systems have mechanisms for reading the ballot to the voter via headphones to confirm the correct recording of their choices. The U.S. Department of Justice has deemed this acceptable for paper ballots as well.

*Can paper ballots be counted quickly and in a reliable fashion?*

Of course, they have been for decades. Modern barcoding and optical scanning technologies ensure the efficiency and security of VVPB products. Studies show paper is the most accurate election medium.

*Can ballots be removed, altered or substituted, thus creating auditing problems?*

No, the contents of the ballot boxes will be guarded by simple procedural controls along with digital seals (as used with lottery, airline, and concert tickets) printed on each VVPB.

*Does government legislation require that we computerize our election systems?*

Compliance can be met (at a tenth of the cost of DRE/touchscreen) with optically scanned balloting systems, supplemented with an accessible voting device at each precinct.

*Since election systems are inspected and certified, why isn't this sufficient?*

Generally, only a few sample machines are inspected for certification, and this is not the equipment that the voters actually use. It is very difficult to determine if the equipment at the polls is identical to that which was certified, and a number of communities have discovered unauthorized modules installed in their systems. Certification is performed under trade secret restrictions, and a thorough examination may not be allowed or possible, even when materials have been escrowed.

*Will pre- and post-election testing by the local election officials turn up all irregularities or defects?*

No, because such testing is scripted and often does not reflect actual voting scenarios for all ballot combinations. There is a large and growing list of actual instances where improper configurations of voting or tabulation equipment were not detected.

*Could hackers gain access to our election systems to attack them?*

Certainly. Elections are inherently adversarial, and are conducted by officials currently in power, so there is considerable motive and opportunity for corruption by insiders. A high level of technical expertise is not necessary to rig or trigger a breach.

*Are computerized voting systems easier to use and provide faster election returns?*

DRE and touchscreen machines are slower and often more confusing than most optically scanned balloting methods, especially for the disabled. Returns have been delayed by hours or even days when equipment has malfunctioned. If such an emergency happens, VVPBs provide the option of an immediate hand-count.