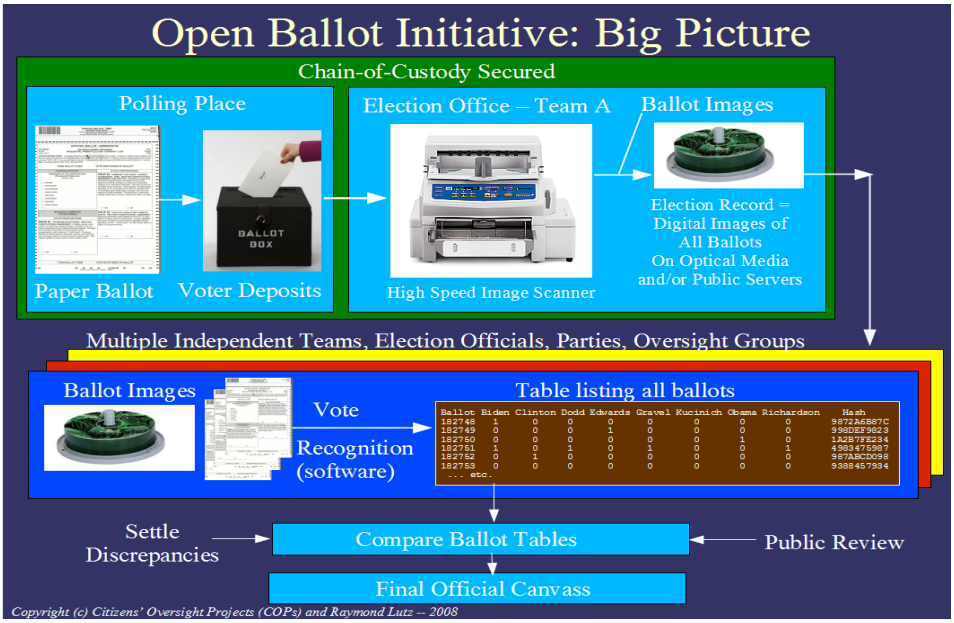
WHITE PAPER

The Open Ballot Initiative

White Paper written by Ray Lutz

Updated: 10 Jan 2017 Revision 42 (Previously Updated: 26 Mar 2008 Revision: 16)

Visit OpenBallotInitiative.org for more information.



The Open Ballot Initiative (TOBI) utilizes an "open tally" method that allows the public to perform and fully scrutinize the tally. It can be deployed immediately whenever paper ballots are used as an adjunct to existing canvass procedures. If election districts already use machines that create ballot images, it can be deployed and result in substantial savings over time-consuming auditing procedures..

TOBI is proposed to restore confidence in our elections. Today, election officials are under time and budget constraints, yet need to produce a high-quality result and avoid hacker vulnerabilities and the risk of compromised employees. With TOBI, there is no central-tabulator manipulation opportunity providing much higher confidence to elections officials and the public while avoiding expensive manual audits.

Note: This was originally named the Comparative Optical Recognition Election Completion Technique (CORECT) was originally defined and documented in 2008 by Raymond Lutz.

TOBI Key Attributes

- **Durable Paper Ballots**
  The use of durable paper ballots that can be easily imaged, recounted and audited is assumed.
- **Ballot Images**
  High-speed image scanners snap pictures of paper ballots and create a frozen image data set. We prefer that this step be performed separately from the vote-recognition process, by a team that has no part of vote tabulation. Lower-cost and harder-to-hack commercial off-the-shelf "COTS" scanners are allowed.
- **Image Verification**
  A small sample of original ballots must be compared with their corresponding images. Can be done during the scanning and does not involve vote tabulation. We recommend the creation of a video showing occasional comparisons of images with physical ballots.

- **Cryptographically Secured**
  Images are secured using Secure-Hash Algorithm signatures on individual ballot images and on blocks of ballots. This eliminates risks of ballot image alteration and adding/deleting/swapping-out images.
- **Open Ballots**
  Officials publish the dataset of images and the corresponding Cast Vote Record (CVR) so anyone can easily recount the ballots either "by hand" (reviewing images directly or on the internet) or using recognition software. We envision ballots can be hosted on public servers by major providers such as Google and on read-only digital media (like Blue-Ray data disks).
- **Standard Cast Vote Record**
  A data file using standard CVR is produced can be compared with other participants (such as political parties, NGOs, etc), where each record identifier allows the original ballot to be retrieved, and the vote as recognized is recorded.
- **Dispute Resolution**
  Includes a standard method where election officials and oversight groups can consistently interact so as to compare their results and raise concerns prior to election certification.

Benefits

- **Open Ballot Data**
  Publishing ballot data allows public scrutiny eliminates the need to trust election officials and software. Data is formatted according to open public standards.
- **High Integrity**
  Eliminates vulnerabilities to central-tabulator manipulation that is unfortunately still possible despite improvements in security. The manipulation we are primarily concerned with is the shifting (flipping) of perhaps >3% of the votes so as to flip a close election.
- **Low Audit Costs**
  Reduces the cost and complexity of manual tally audits. TOBI requires only that a small sample of ballots are inspected and compared with original ballots to confirm that the images are indeed an accurate reproduction of the actual ballots. Hand tallying the vote is not required at this stage, only a matching inspection.
- **Lower Equipment Costs**
  Allows the use of much less expensive Commercial Off-the-Shelf (COTS) scanners to be used instead of custom designed scanners used only in elections with associated risk of integrated back-doors.
- **Lower Oversight Costs**
  Reduces the cost for oversight groups to perform 100% election audits using automated equipment or by hand. Other proposals do not empower citizen oversight of elections to restore voter confidence.
- **Open Source Not Required**
  Does not require that open source and instead relies on open data formatted according to open standards. Open source requires trusted parties to scrutinize computer code and does not guarantee the absence of vulnerabilities.
- **Secure Chain Of Custody Minimized**
  Once the ballots are imaged and published, physical ballots could be destroyed or compromised with no ill effect.
- **Procedures Largely Unchanged**
  Most elections offices will find the proposal attractive because their tabulation procedures can largely remain unchanged while reducing self-auditing costs.
- **Better Than Sampling Audits**
  Most districts do not respect the strict requirements for self-audits or may not conduct audits at all. Those conducted are unreliable and incomplete, resulting in extensive legal challenges. TOBI eliminates the need for sampling audits and associated legal challenges. However, minimal ballot inspection audits are required.
- **Superior Voter-Intent Determination**
  High-resolution digital images of ballots allows voter intent to be resolved much more easily than old-school op-scan equipment. Eliminates the need for white-out and “vote enhancement.” Some scanning software allows

the operator to inspect the ballot if over-votes are detected. The CVR should contain a note that such an override occurred during processing.

- **Scalable**
  Leverages document imaging technology so as to be scalable to large districts, many ballot options, and advanced voting methods such as Rank-Choice Voting (RCV), single transferable votes (STV) and proportional representation.

Problem in a nutshell: Elections can be hacked

Elections are important in any democracy, and there is significant pressure to cheat the system. As a result, voting equipment, scanner equipment, and "central tabulators" have all been used to change the results of elections.

Moving to open-source software is one proposal, but even open source software is subject to hacks and back-doors.

Some groups are suggesting that hand-counting ballots at precincts is the way to finally return confidence to election results. However, that solution is too expensive and time consuming in large districts and with complex ballots, do not support advanced voting techniques, and oversight is costly and difficult.

Sampling audits place undue trust in elections officials and we have found few districts actually perform audits correctly.

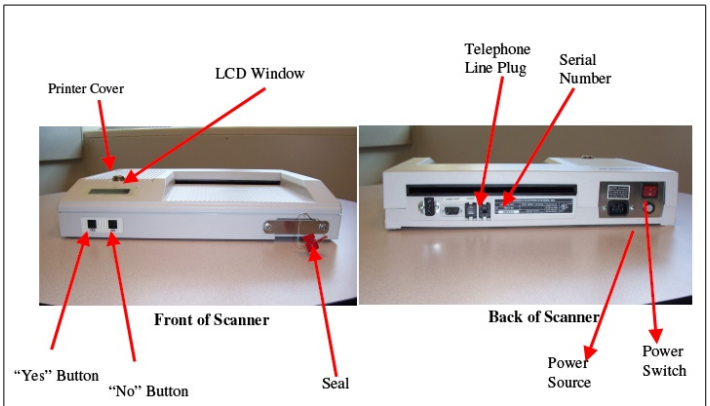
DRE Machines must be banned

"Direct-recording electronic" (DRE) voting machines accept input from the user on each race typically on a touch-screen and record the vote in the form of an internal tally. When first introduced, these machines provided no paper trail at all, allowing unlimited changes to the count without any means to check it. If a machine died or was reset, the votes could be lost. In some districts, these were retrofitted with a printed adding-machine type roll of tape, the Voter-Verified Paper Audit Trail (VVPAT) secured in a windowed chamber. But the paper tape is difficult to review and store, and voters rarely actually verify their vote. Since DRE machines are custom made and the software has been kept private and their only purpose is for elections, they are a target for back-doors so the results can be changed.

It is claimed that disabled voters prefer these machines as it lets them vote on their own. Helping a voter cast a ballot under the scrutiny of an observer is perhaps just as good, if not better. The claim that the disabled prefer the machines is a claim that should be checked. If indeed the machines are a help in that regard, they can be used to print a paper ballot so they can be scanned like the rest. The HAVA law specifies that at least one DRE per polling place is required for disabled voters. If touch-screen machines are used to print a paper ballot which the voter can check and can be later scanned, this is compatible with TOBI. This is the sort of system being introduced in Los Angeles in the very near future.

Scanned paper ballots

Durable paper ballots is an important step to allow the election to be completely checked by hand if necessary to see if it matches the conclusions of the scanners. These have been run through op-scan machines that convert the selected vote to the tally is, just like the DREs, custom written specifically and only for elections. This means it is fertile ground for hackers to install back-doors and hooks to allow the ultimate tally to be changed.



Diebold precinct Scanner still used in San Diego

Central Tabulators

Both the DRE machines, op-scanned paper ballots, and even hand counting at precincts all rely on a central tabulator to add up all the results from all precincts. This is usually only a program running on a PC, either a spreadsheet or perhaps a database application. In any case, the results can be just changed by an unscrupulous user or a hacker can get

into a specialized database program. Custom programs are perhaps more vulnerable to attacks of this type than standard, "off-the-shelf" products, which are designed for general robustness and are relied upon by many users for their accuracy.

Hand-Counted Paper Ballots at the Precinct

Some election integrity researchers are proposing that we return to hand-counted paper ballots, counted at the precincts. Actual time consumed by manual tally in San Diego show that it takes about 3.5 minutes per ballot-race including re-counts and issue resolution. This is very expensive and it does not solve all of the integrity problems. Scientific evaluation of manual hand audits estimate that they take about 7 seconds per race per ballot not including overheads, and error rate was between 1% and 2%. (See "Manual Tally Efficiency" in the list of references).

Hand counting advocates admit it is not feasible in larger precincts or when there are a large number of races. Precinct workers are not necessarily trustworthy, and it can be argued that it is probably better if they never handle ballots at all but simply have voters deposit ballots in the locked ballot box. There is no assurance that the ballots won't be "dropped" on the floor during the counting process, or numbers fudged when reported.

Precinct voting has other problems too. A Stanford study found that the location of the polling place, whether it is in a church, school, firehouse, or a person's home, will always slant the results of the election. (See Polling Places Can Affect Elections) The only way to avoid this entire question is to move to Vote by Mail (VBM) elections and larger voting centers. VBM provides additional safeguards against voter fraud if the signature is validated, and studies report that VBM elections produce similar voter turn out and do not bias either party.

With all that said, hand counting paper ballots is still the "gold standard" and when all else fails, you will turn to this approach. Yet, human beings are not well suited for such counting, while machines are specifically well suited to do it, as long as sufficient safeguards and redundancy exist. Machines do very well if there are no programming errors, unless humans get involved and monkey with the results.

The Open Ballot Initiative

TOBI takes the sensitive part of the election, that is recognizing and tallying the vote, and exposes it to intense public scrutiny and redundant 100% audits. It allows the use of Commercial off-the-shelf (COTS) document processing equipment which is already heavily tested and utilized in the private sector and is even respected by the courts in the operation of most major businesses today. This provides for rapid reporting of results and complies with nearly all requirements of the HAVA law, is scalable to complex elections and is much less costly than hand counting or polling-place electronic voting using proprietary DREs. It avoids all the downsides of hand-counted paper ballots while still providing most of the benefits and more. The following is an outline of the preferred implementation but we are willing to work with the community to resolve any issues with these design choices.

Uses Conventional Paper Ballots

- No electronic equipment is required for voting. Voters at polling places can complete ballots using standard writing instruments exactly as they do if they are voting by mail. Typically, this means darkening bubbles next to the desired vote.
- Voters sign-in as usual, either on paper or in computerized "poll books" and are provided with an appropriate ballot.
- Locked deposit boxes are provided at each polling location. Ballots should be inserted by the voter. Precinct workers do not handle ballots excessively or attempt to tally the vote.
- If voters complete their ballots at home (Vote-by-Mail), they can mail the properly completed ballot to the tabulation center, hand-carried, or deposited in a polling-place deposit box. When these are received, they should be logged by the precinct workers and inserted into the ballot box. Election officials should maintain a voter look up to allow voters to confirm that their ballot has been received and counted.

Options and Notes

- If available, polling-place scanners can be used for a preliminary count in the precincts. These scanners must include a locked ballot box or

appropriate sealed box where the scanned ballots are deposited. Some equipment now available also produce ballot images on digital media.

- Said scanners can be used to provide feedback to the voter in terms of alerting to over or under voting, and therefore complying with some of the desirable parts of HAVA.
- Preferably, no vote-counting firmware or software is distributed to the precincts, there is no concept of a "sleep-over", no need to check or validate source code, etc. Any reporting by the precincts is only preliminary in nature.
- Preferably, scanners in the polling places, if used, are not relied upon for the final tally whatsoever. If scanners are used to alert the voter for over or under voting, they can create a preliminary count, but this count is not official and useful for news media feedback only.

Chain of custody

- Each locked/sealed drop box is transported to the tabulation center and unlocked in a secure area, viewed by time-compression video cameras (perhaps one frame per second or 5 seconds.) Camera data is uploaded to an Internet site for review by the public.
- Inspectors log in the ballots from each precinct, including the number of blank ballots, number of VBM ballots, etc. as provided by the log sheets from the precinct. (Note: today, checking the number of ballots received is checked at the precinct but this allows for possible fraud by polling place workers.)
- The ballots are transferred to manageable boxes in preparation for processing.
- On Vote-By-Mail ballots, signature validation is performed as it is today.

Uses Digital Image Scanning

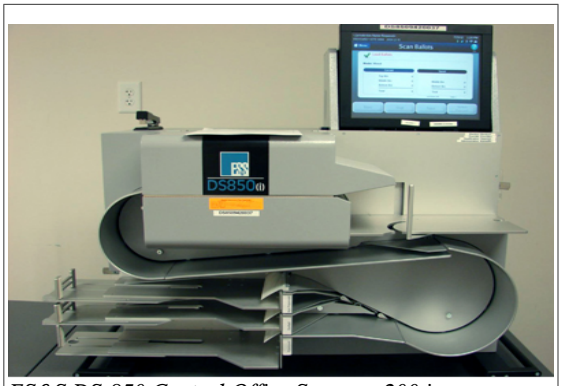
- Image scanning can be performed by Commercial Off-the-Shelf (COTS) high-speed image scanners with no custom modification for the vote counting application. Ballots are scanned to page-sized, high-resolution (200+ dpi) images of each ballot.
- The scanning process is less vulnerable to fraudulent attacks if the content of the ballots is unknown (i.e. no image recognition at this stage and no tallying is performed) and the result is purely ballot images, such as in PDF files. A worthy goal is to fully certify the election as images prior to any vote-extraction processing.
- High-end scanners are used by corporate document management departments and are not custom designed for elections. This eliminates the likelihood that any hackable back-doors exist in these units. Since only images are created, such back-doors are extremely difficult to implement. Demanding that these commercial products be "open" or "non-proprietary" is counter productive. It does not matter if they are proprietary because they are not affecting the output of the tally and are very hard to alter to do so. But with that said, it is still not impossible.

Bell & Howell 8140DCI Spectrum XF Scanner, an example of a (circa 2008) Commercial off-the-shelf (COTS) high-duty cycle scanner capable of 140 pages per minute, scanning both sides of the page at 200dpi resolution. It has a 500-sheet input capacity.

- Document imaging technologies are deployed heavily in private industry today, with many large businesses choosing to scan all documents that are received and immediately shred and recycle the paper. Such document images have been tested in court, with images scanned and reduced to optical media acknowledged as extremely difficult to "hack." Shredding and recycling originals preserves the privacy of their customers. In TOBI, however, the original ballots are preserved for any later challenges to the scanning process.
- To scan all the ballots in San Diego County (about 1.5 million ballots) would take at least 178 hours using a single machine. However, about 30% of the ballots (about half of the VBM ballots) can be scanned in advance of election day on a daily basis to create ballot images without actually attempting

to tally the vote. Multiple scanners will be needed to expedite the work on election night.

- A limited number of highly trained workers operate the scanners in a secure area. This approach does not suffer from the lack of trained poll workers seen when the scanners or DREs are deployed to all the polling places.
- In our preferred implementation, as each ballot is scanned, it is imprinted with a sequence number. This sequence number is visible on the paper ballot and is also incorporated into the image file. Imprinting functionality is a common optional feature of such scanners.



ES&S DS-850 Central Office Scanner, 200 images per minute (double sided) with the ability to sort ballots into three output trays.

- It is recommended that no optical recognition of the content of the ballots be attempted at this time by these workers. Modern document scanners may provide such recognition as a standard part of their functionality. However, performing image processing on the images as they are produced provides a small incentive to manipulate the ballots in some fashion by the workers. Therefore, this step should be separately processed by a separate team of workers who have no impact on the eventual tally. It is necessary for these workers to check the quality of the scanned images as they are produced. We encourage that a video be produced by the staff which includes the occasional comparison of physical ballots with ballot images so as to thwart any challenges to the purity of the scanning process.
- That said, some image scanners not only scan the image but present it to the worker if there are any over-votes, so that worker can view the ballot and determine the voter intent based on the ballot image.

Election Record

Stack of DVDs is one option for publishing the result of the election

- The primary output of the scanning process conducted by election officials are optical media containing images of all the ballots and other associated data files. This may also be published to public websites or hosted on generic servers such as by Google.
- We anticipate that actually these will be published in two phases:
    1. Election night ballots including all VBM ballots previously scanned and all ballots cast at polling places except for provisional ballots.
    2. Later-processed VBM ballots and provisional ballots.
- Assuming 8.5 x 11 ballots (double-sided) scanned at 200dpi (dots-per-inch) resolution (black and white only, like a fax) the compressed image files are approximately 150K bytes per side, say 300KB for both sides, and then encoded into a container file format like PDF. Both sides of the ballot are contained in the same file, and the file is named according to the sequence number. This resolution is more than adequate to resolve the vote and any extraneous markings, but higher resolutions can improve voter intent discrimination.
- We anticipate that images may be stored in PDF format using two level (B&W) pixels using Huffman Run-length encoding (RLE) with pixel resolution at least 200 dpi (dots per inch). The PDF format is a multi-image per file format so that all ballot pages can be displayed, and they are easily viewed without any custom software. An example ballot image in PDF format is attached unaltered at the end of the document.
- The images could be contained in about 1/3 the space if they are encoded in raw binary form rather than PDF but are not as easy to use and view, and PDF contains digital signatures and other helpful fields.
- Each ballot has identifying marks on it to separate it into ballot types and should be recognizable by

vote recognition software. The ballot type may be provided as a barcode, such as code 39.

- **EXAMPLE:** Assuming 1.5 million ballots in San Diego County, the total space requirements is approximately 300K x 1.5M = 450 GB. Hard disks are hard to buy today with capacities less than 1TB. All ballot image data will fit on one portable HDD. Most counties are much smaller than San Diego.
- The Election data set is available to any citizen who wishes to purchase it for a nominal fee.
- We envision that ballot images may be conveniently hosted on public trusted servers thereby allowing any citizen to thoroughly review the ballots.
- To ensure that the images are not changed, the image set is accompanied by a data file which lists the digital signature of each image file, using MD5 (message digest 5). Such signatures have the property that they are very easy to calculate but very difficult to predict and even small changes in the image file will result in a change in the digital signature. (See the reference on MD5.) Thus, once the image set is published, any single image cannot be changed without also changing its digital signature. PDF format can include a "Modification Detection and Prevention" (MDP) signature based on the MD5 message digest algorithm. The list of signatures of all images is needed to prevent the change of both the image and the signature at the same time within the file.
- In addition, the entire set of ballots should be secured with a block signature derived from all ballot signatures in the set. Thus, at the end of the election, we have a small set of signatures which encompasses all ballot images in the election, making changes to the set computationally impossible.

Tallying the Vote -
Comparative Optical Recognition

- Election officials then perform optical mark recognition (OMR) of the vote on ballots.
- This step is best performed after the ballot image data is finalized to avoid the small possibility that the image data could be tampered with based on the content of the vote. However, because of other checks in the system, it can also be argued that those checks sufficiently mitigate this danger, and recognition of the vote can be performed simultaneous with the generation of the images.
- The results of each ballot are provided as a Cast Vote Record in a separate data file, with the index of each record being the imprinted serial number of the scanned ballot, corresponding to the file name of the image file. The format of this data file will be clearly documented such that all oversight groups can produce the same format.
- Parties and oversight groups may use any standard or proprietary software or other means, including manual inspection of the ballot images, to capture the vote from the ballot images.
- Each group creates a flat data file (with the same format as that used by election officials).
- The results of all the groups can be compared. If there are any differences, those ballots can be inspected individually.
- The parties to the election and any oversight group can challenge the recognized vote on any ballot to election officials and request that officials inspect the images and reach an official ruling. This step must have some limitations to avoid an endless series of challenges by a group that wishes to delay the results of the election.
- Over time, with the various recognizers checking each other, they will improve until there are very few ballots requiring manual recognition.
- Companies with large storage servers, (perhaps Google) may wish to upload the entirety of the election ballot images to the Internet so the ballots can be inspected by millions of Internet users. A virtual hand count can be implemented among those users, with any comments to the ballots kept as an associated set of user remarks. The ballot can be viewed along with the associated recognized vote for each ballot. No hacking is possible as the entirety of the election is available for inspection.
- The "central tabulator" is redundantly implemented by each party and oversight group, eliminating the danger of election management system bugs, external hackers, or an unscrupulous

or compromised worker. The tally is simply the sum of all of the records in the data file.

Checking your vote

- It was initially proposed that any voter be able to check that his ballot was included in the ballot set. This feature has been withheld pending further development.

Deploying TOBI

- It is very feasible to deploy this method immediately, even if any other means is used to count the ballots.
- The method requires paper ballots.
- If precinct scanners are exclusively used, rescanning the ballots to create the images is necessary.
- If elections officials are already is scanning ballots at their central office (which is likely, so as to handle the VBM (absentee) ballots) then they can be instructed to also create the ballot images with no or little increase in overhead.
- Some popular ballot scanners, such as the ES&S DS 850 and DS 200 already produce ballot images. Election officials need only disable deleting the images and make them available to the public.
- As election officials are now ready to move to modernize their processing equipment, it is an opportunity to embrace TOBI and realize a significant savings in processing while still enhancing voter confidence in the result.

Compatible Equipment

As of this writing, the following equipment is known to generated ballot images that are compatible with the concept of TOBI, although format details may differ and require conversion.

Clear Ballot Fujitsu fi-6800	Uses COTS, typically high-speed scanners
Dominion	Imagecast Central
ES&S	DS 200 precinct scanner.
ES&S	DS 850 central office scanner.
Hart InterCivic	eScan

References

This section is provided for those reading printed versions of this topic.

- Help America Vote Act - http://www.copswiki.org/twiki/bin/view/Common/HelpAmericaVoteAct
- Letter Report on Electronic Voting - http://www.copswiki.org/twiki/pub/Common/CorectMethod/LetterReportOnElectronicVoting-NationalResearchCouncil.pdf
- Hand Count Presentation - http://www.democracyfornewhampshire.com/files/Hand_count_training_D-fest_July_5_2007.pdf
- Polling Places Can Affect Elections -- http://www.copswiki.org/twiki/bin/view/Common/PollingPlacesCanAffectElections
- Manual Tally Efficiency -- "Post-Election Auditing Effects of Procedure and Ballot Type on Manual Counting Accuracy, Efficiency, and Auditor Satisfaction and Confidence" -- http://copswiki.org/Common/M1725
- RFC-1321, "The MD5 Message-Digest Algorithm" https://www.ietf.org/rfc/rfc1321.txt

About the Author

Raymond Lutz --

Mr. Lutz has over 35 years of experience in the document management industry. He founded the Multifunction Products Association (MFPA) in 1992 and has served as the editor and author of industry standards and recommendations. He holds a Master's degree in Electronics Engineering from San Diego State University. He is currently the National Coordinator for Citizens' Oversight Projects, a Delaware 501(c)3 nonprofit organization focused on civic engagement.

Mr. Lutz developed TOBI in its initial form in 2008. After seeing that the industry was a long way from adoption at that time, he focused on improving the oversight of election audit procedures, resulting the Snapshot Protocol. This was implemented in San Diego County, and extended to other counties in California in 2014. In the 2016 elections, the Snapshot protocol was extended to Florida and attempted in other states.

In June 2016, Mr. Lutz and Citizens Oversight sued the County of San Diego for not including about 285,000 ballots in the 1% manual tally audit procedure, resulting in a judgment from Superior Court largely in his favor. Review of audit procedures in other Counties in California and Florida leave much to be desired and point out that with out ongoing legal challenges, such audits will be continued to be short-cut so that they are actually better at covering-up fraudulent activity than detecting it. At the same time, it is recognized that the 1% manual tally and other audits, if executed properly are too expensive and time consuming, while not providing the sort of transparency exhibited by TOBI. The Risk Limiting Audit can reduce audit costs but assumes election officials complete it properly and requires a reliable chain of custody. For these reasons, TOBI is the approach endorsed by Citizens Oversight and many other election integrity groups, and is an extension of the "Brakey Method" championed by John Brakey of AUDIT-AZ.

Sample PDF Image

An actual PDF image file is attached to the end of the PDF version of this white paper. This image shows a ballot with two sides and has the following attributes:

Width = 1728 pixels
Height = 2218 pixels
Bit Depth = 1 bit/pixel
Resolution ~ 200 dpi
Compression = CCITT Fax (lossless RLE)
File Size (2 images) = 300 KB

Vote Osceola

Official Primary Election Ballot
August 30, 2016
Democratic Party
Osceola County, Florida

Papeleta Oficial para las Elecciones Primarias
30 de agosto de 2016
Partido Democrático
Condado Osceola, Florida

D100
EV

- To vote, fill in the oval completely (●) next to your choice.
- Use a black ballpoint pen.
- If you make a mistake, ask for a new ballot. Do not cross out or your vote may not count.

- Para votar, llene completamente el óvalo (●) al lado de su selección.
- Use un bolígrafo de tinta negra.
- Si comete un error, pida una papeleta nueva. No tache o puede ser que su voto no cuente.

United States Senator
(Vote for One)

Senador de los Estados Unidos
(Vote por Uno)

- ○ Roque "Rocky" De La Fuente DEM
- ○ Alan Grayson DEM
- ○ Pam Keith DEM
- ○ Reginald Luster DEM
- ● Patrick Murphy DEM

Representative in Congress District 9
(Vote for One)

Representante al Congreso Distrito 9
(Vote por Uno)

- ○ Valleri Crabtree DEM
- ○ Dena Grayson DEM
- ○ Susannah Randolph DEM
- ● Darren Soto DEM

State Attorney 9th Judicial Circuit
(Vote for One)

Procurador del Estado 9no Circuito Judicial
(Vote por Uno)

- ○ Jeffrey L. Ashton DEM
- ● Aramis Ayala DEM

State Senator District 15
(Vote for One)

Senador Estatal Distrito 15
(Vote por Uno)

- ○ Bob Healy Jr DEM
- ● Victor M. Torres Jr DEM

Clerk of the Circuit Court
(Vote for One)

Secretario de la Corte del Circuito
(Vote por Uno)

- ○ Arthur "Beau" Osborne DEM
- ○ John M. Overstreet DEM
- ● Armando Ramírez DEM

Sheriff
(Vote for One)

Alguacil
(Vote por Uno)

- ○ Rolando S. Banasco DEM
- ○ Luis "Tony" Fernandez DEM
- ○ Russell Gibson DEM
- ● Jose Sanchez-Garcia DEM

Property Appraiser
(Vote for One)

Tasador de Propiedad
(Vote por Uno)

- ○ Chris Mack DEM
- ● Katrina Scarborough DEM

Tax Collector
Universal Primary Contest
(Vote for One)

Recaudador de Impuestos
Contienda de Primaria Universal
(Vote por Uno)

- ● Orlando Gonzalez DEM
- ○ Bruce E. Vickers DEM

County Commissioner District 1
(Vote for One)

Comisionado del Condado Distrito 1
(Vote por Uno)

- ○ Peggy Choudhry DEM
- ● Michael E. Harford DEM

Circuit Judge 9th Judicial Circuit
Group 4
(Vote for One)

Juez de Circuito 9no Circuito Judicial
Grupo 4
(Vote por Uno)

- ○ Orley Burey
- ● Luis Calderón
- ○ Joseph Haynes Davis

Circuit Judge 9th Judicial Circuit
Group 14
(Vote for One)

Juez de Circuito 9no Circuito Judicial
Grupo 14
(Vote por Uno)

- ● Lorraine Elizabeth DeYoung
- ○ Dan Traver

Vote Both Sides of Page
Vote Ambos Lados de la Página

No. 4 Constitutional Amendment
Article VII, Section 3 and 4
Article XII, Section 34

N° 4 Enmienda Constitucional
Artículo VII, Secciones 3 Y 4
Artículo XII, Sección 34

Solar Devices or Renewable Energy Source Devices; Exemption From Certain Taxation and Assessment.

Proposing an amendment to the State Constitution to authorize the Legislature, by general law, to exempt from ad valorem taxation the assessed value of solar or renewable energy source devices subject to tangible personal property tax, and to authorize the Legislature, by general law, to prohibit consideration of such devices in assessing the value of real property for ad valorem taxation purposes. This amendment takes effect January 1, 2018, and expires on December 31, 2037.

Dispositivos Solares o Dispositivos de Fuente de Energía Renovable; Exención de Ciertos Impuestos y Tasaciones.

Se propone una enmienda a la Constitución del Estado para autorizar a la Legislatura, por ley, sobre la exención del impuesto ad valorem sobre la tasación del valor de los dispositivos solares o fuente de energía renovable sujetos al impuesto de la propiedad personal tangible, y para autorizar a la Legislatura, por ley, a prohibir la consideración de tales dispositivos para calcular el valor de los bienes inmuebles con fines de tributación del impuesto ad valorem. Esta enmienda entra en vigor el 1° de enero de 2018 y expira el 31 de diciembre de 2037.

● Yes/Sí

○ No /No

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