

## House Bill 0759

### Election Law – Postelection Tabulation Audits – Risk-Limiting Audits SUPPORT

Ways and Means  
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I am a Professor of Computer Science at The George Washington University. My research of the last fifteen years has been in the general area of computer security and privacy, with a special emphasis on the integrity of electronic voting systems. My qualifications and complete CV, as well as more details about my work, may be found on my website<sup>1</sup>. I have provided written and oral testimony to Committees of the Maryland Legislature on several Bills and have also provided oral and written testimony to the State Board of Elections<sup>2</sup>.

#### **I STRONGLY SUPPORT THIS BILL.**

The literature in the field of election security is clear, unequivocal and non-partisan: computerized election systems present multiple opportunities for intentional alteration of election outcomes and are also vulnerable to error. This assessment applies to the optical scan voting systems used in Maryland and includes voting machines that are not on the internet. Experts recommend that, in addition to making every attempt to secure the voting systems used, an independent, public, risk-limiting audit<sup>3</sup> of the voter-verified paper ballots should be performed after every election to verify that the election outcome correctly represents the voter-verified evidence<sup>4</sup>. An election should be certified only after it passes the audit.

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<sup>1</sup> <http://www.seas.gwu.edu/~poorvi/>

<sup>2</sup> <https://www2.seas.gwu.edu/~poorvi/MarylandAudits/>

<sup>3</sup> The latest version of the Voluntary Voting System Guidelines adopted by the Election Assistance Commission requires voting systems to enable ballot comparison risk-limiting audits (the most efficient RLAs), see <https://www.eac.gov/voting-equipment/voluntary-voting-system-guidelines>; Post-election audits of the election outcome are recommended by the following: a report of the National Academies of Sciences, Engineering, and Medicine, see: “Securing the Vote: Protecting American Democracy”, 2018, <https://doi.org/10.17226/25120>; the Presidential Commission on Election Administration, see: “The American Voting Experience: Report and Recommendations of the Presidential Commission on Election Administration”, January 2014, pg. 66, <https://law.stanford.edu/wp-content/uploads/sites/default/files/publication/466754/doc/slspublic/Amer%20Voting%20Exper-final%20draft%2001-04-14-1.pdf>.

<sup>4</sup> P.B. Stark and D.A. Wagner, “Evidence Based Elections”, IEEE Security and Privacy, special issue on electronic voting, 2012. [www.stat.berkeley.edu/~Estark/Preprints/evidenceVote12.pdf](http://www.stat.berkeley.edu/~Estark/Preprints/evidenceVote12.pdf)

This Bill has several valuable features: it requires a risk-limiting audit of at least one statewide contest following each statewide election, performed through the manual examination of randomly-chosen individual paper ballots or batches of paper ballots. It also requires that the audit be completed before certification and that an election outcome found to be incorrect by the audit should be corrected, and that the audit be transparent, both in process and in the prompt and detailed announcement of its results.

Friendly suggestions are as follow:

- **Definition of risk limit:** The notion of a “risk limit” is central to a “risk limiting audit”. The Bill should define these terms<sup>5</sup>, because that would allow you to be more precise about what “sufficiently strong statistical evidence” means in the description of what the RLA shall accomplish.
- **Risk-limiting audits check only the outcome, not the count:** Risk-limiting audits do not attempt to check or correct electronic counts; the goal is simply to check the outcome. An audit might unearth evidence that the electronic count is incorrect, but small errors in electronic counts would not result in a full manual count<sup>6</sup>.
- **Paper ballots should be drawn from all categories of ballots:** The Bill should include text requiring that ballots are drawn from in person, absentee, provisional and early votes, and that the original voted paper ballots should be examined for in person and absentee voters (in particular hand-transcribed absentee ballots should not replace voter-verified absentee ballots during the audit). The vote itself (not the bar code) should be read for ballots generated by the Express Vote machines.
- **Risk-Limiting Audits Workgroup:** The Bill requires the formation of a Risk-Limiting Audits Workgroup to guide the state in its processes. In addition to what is in the Bill, the work group could be charged with designing compliance audits that ensure the security of the evidence trail of the paper ballots (and, to the extent possible, the electronic images used in the electronic audit). I believe that Maryland already does have some compliance audits in place, so these could be enhanced if necessary.

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<sup>5</sup> For example, you may add to in section I (a)(4) the definition of the risk limit as follows:

“The risk limit is the corresponding, small pre-determined, maximum chance of not requiring a full manual count of paper ballots in an audited contest if a full manual count of the paper ballots would find a different outcome than the outcome determined by the electronic count”.

<sup>6</sup> You could address this as well as the issue of being more precise about “sufficiently strong evidence” by replacing, in in I(c)(2)(II) “...there is sufficiently strong evidence ...” with “... the maximum chance of a full manual count finding a different outcome than the outcome determined by the electronic count is no larger than the risk limit, or until there has been a full manual count”.

As in the past, I will be happy to help Maryland design and implement the audits. Please do not hesitate to ask. I congratulate the committee on a strong bill that serves the interests of Maryland's voters.

Respectfully,

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*Note: affiliations are included for identification only*

**Poorvi L. Vora** is Professor of Computer Science at The George Washington University. Her research focus has been on end-to-end independently verifiable (E2E) voting systems. She was a member of the team that deployed E2E voting system Scantegrity II in the Takoma Park elections of 2009 and 2011. She has worked with the National Institute of Standards and Technology (NIST) on definitions of desired properties of E2E systems, and on information--theoretic models and measures of voting system security properties. She obtained her Ph.D. from North Carolina State University.