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May 7, 2020

The Honorable Bill Quirk
State Capitol, Room 2163
Sacramento, CA 95814

Support for AB2400

Dear Assemblymember Quirk,

I write in support of AB2400.

By allowing jurisdictions to conduct risk-limiting audits (RLAs) of some contests provided they continue to conduct the 1% post-election manual tally (PEMT) of all other contests, AB2400 makes it easier for California jurisdictions to conduct pilots of risk-limiting audits than AB2125 did, without dropping scrutiny of individual contests below that required by the PEMT.

Requiring a jurisdiction to conduct an RLA of *every* contest, as AB2125 does, is a tall order the first time a jurisdiction implements risk-limiting audits. AB2400 allows jurisdictions to “get their feet wet” with RLAs without committing to an enormous change all at once, as AB2125 required. Thus, under AB2400, it is likely that far more jurisdictions will participate, thereby providing valuable experience to improve the trustworthiness of California elections and to inform future audit legislation and regulation.

I understand that some individuals and organizations recommend using digital images for audits. That would in fact undermine election integrity, as explained by the 2018 National Academies of Science, Engineering, and Medicine report:¹

Voter-verifiable paper ballots provide a simple form of such evidence provided that many voters have verified their ballots. The ability of each voter to verify that a paper ballot correctly records his or her choices, before the ballot is cast, means that the collection of cast paper ballots forms a body of evidence that is not subject to

¹National Academies of Sciences, Engineering, and Medicine, 2018. *Securing the Vote: Protecting American Democracy*, The National Academies Press, <https://doi.org/10.17226/25120>

manipulation by faulty hardware or software. These cast paper ballots may be recounted after the election or may be selectively examined by hand in a post-election audit. **Such an evidence trail is generally preferred over electronic evidence like electronic cast-vote records or ballot images. Electronic evidence can be altered by compromised or faulty hardware or software.** (National Academies at 94, emphasis added)

The vulnerability of digital images of ballots is not merely theoretical: Bernhard et al.² show that ballot images can be manipulated between “in flight” to alter votes.

As a result, audits that rely on images in lieu of the underlying paper might be able to uncover some kinds of problems, but they can never provide affirmative evidence that election outcomes are correct—precisely what risk-limiting audits do provide, if the paper trail is trustworthy. Establishing whether a voter-verified paper trail is trustworthy can be accomplished through demonstrably secure chain of custody and “compliance audits.”³

Some have argued that it suffices to audit using digital images, provided some images are checked manually against the underlying paper records. While that is true in principle, numbers matter: to limit the risk to a given level using that approach requires examining *more* paper ballots than an RLA that does not rely on the images.

Indeed, I understand that for these reasons, in the drafting of AB2125 you rejected the proposal that audits could be based on images.

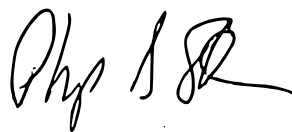
AB2400 has my enthusiastic support. It will provide every California jurisdiction the opportunity to conduct a risk-limiting audit of one or more contests, without undue burden or disincentives. I expect far more California jurisdictions will gain

²Bernhard, M., K. Kandula, J. Wink, and J.A. Halderman, 2019. UnclearBallot: Automated Ballot Image Manipulation. *Proc. 4th International Joint Conference on Electronic Voting (E-Vote-ID '19)*.

³See, e.g., Appel, A.W. and P.B. Stark, 2020. Evidence-Based Elections: Create a Meaningful Paper Trail, Then Audit, *Georgetown Law Technology Journal*, in press. Preprint: <https://www.stat.berkeley.edu/~stark/Preprints/appelStark20.pdf>

experience with risk-limiting audits if AB2400 passes.

Sincerely,

A handwritten signature in black ink, appearing to read "Phil B Stark", with a long horizontal flourish extending to the right.

Philip B. Stark