



March 2, 2020

The Honorable Alex Padilla
 Secretary of State
 1500 11th Street
 Sacramento, CA 95814

Cc: Los Angeles County Registrar Dean Logan, Los Angeles County Supervisors, Senate Elections Committee Chair Tom Umberg, and Assembly Elections Committee Chair Marc Berman

RE: Request for revisions to Voting Solutions for All People’s (VSAP 2.0) Conditions for Approval

Dear Secretary Padilla:

The organizations and individuals listed below write to you because we are gravely troubled by remaining fundamental security flaws in Voting Solutions for All People (VSAP) 2.0, and to respectfully request that you require additional conditions on the approval of VSAP 2.0 to enhance voters’ trust in the integrity of elections in Los Angeles and wherever it might be used in the future.

Los Angeles’s VSAP 2.0 has the potential to positively influence the election system market as the nation’s first publicly-owned voting system while also modernizing elections in Los Angeles County. But Los Angeles County has not yet complied with provisions stipulated in SB 360 for research and development that require disclosure of the source code used, which leaves unfulfilled the promise that VSAP 2.0 could become the nation’s first open-source voting system¹. We ask the County and State to work diligently to comply with

¹ SB 360’s explicitly stated intent included that “California receive the benefits of the publicly funded development of a nonproprietary voting system in the state.” Section 19202(e)(1) allowed local jurisdictions to contract and pay for “Research and development of a new voting system that has not been certified or conditionally approved by the Secretary of State and uses only nonproprietary software and firmware with disclosed source code...” Though Los

SB 360 and to lead California and the nation toward increased election transparency and security by releasing VSAP 2.0's source code as open-source under a prudent governance plan.

We are appreciative that the State imposed key certification requirements in your January 24th 2020 conditional approval, particularly the conditions that enhance security, require the option for voters to use hand-marked paper ballots, and require a review of the functionality and usability of the "More" button on BMDs. However, we remain concerned that VSAP 2.0 still has serious flaws that necessitate further conditions on approval.

Though we understand it is not possible for Los Angeles to resolve these issues before the March 3rd primary, we respectfully request that you impose these conditions to the extent possible before the November 2020 election and certainly before granting full certification.

1) VSAP 2.0 must be re-designed to either use separate ballot boxes or to redirect the paper path so that a ballot does not pass under the print head after being reviewed by the voter.

We recognize that VSAP 2.0's design was aimed to give all voters, even those that can't handle a paper ballot, the opportunity to mark, verify, and cast a paper ballot privately and independently and we commend the intention of this mechanism. However, VSAP 2.0's design includes a major inherent security flaw in that the ballot passes under the print head after the voter has cast it. This security flaw exists even though the print head is normally lifted by VSAP 2.0 software when the ballot is reinserted. The problem is that if the software is hacked, it can direct the print head to tamper with the verified ballot.

University of California at Berkeley Professor Dr. Philip Stark, inventor of risk-limiting audits, summarized the danger in VSAP 2.0's current design in his January 20th public comment:

"The design of the VSAP BMD is defective from a security perspective: the ballot passes under the print head after the voter last sees the paper. This allows the 'opportunity to mark' flaw.² The use of a cam to lift the print head while the ballot is cast is not adequate protection, because that cam is itself controlled by software. The paper path for casting the ballot should not include the print head. The ballot box should be physically separate from the BMD, or at least not in the same path as the printer."

This flaw could be addressed by redesigning VSAP 2.0's BMDs to make it mechanically impossible for verified ballots to travel under the print head before being deposited in the ballot box. We understand this change will take time. In the interim we ask you to require Los Angeles to disable the automatic feed mechanism for verified ballots in VSAP 2.0 BMDs and to remove the attached ballot boxes. Instead, the County should provide unattached ballot boxes into which voters can deposit the ballots printed by the BMDs after the voters have verified their votes.

This will significantly reduce the risk profile of the VSAP 2.0 system in the short term. Los Angeles could make the same kind of accommodations for voters with disabilities as do other California counties that use BMDs and separate ballot boxes.

Angeles County contracted with Smartmatic to develop VSAP, it has not yet disclosed the source code it created and used, and so California has not yet received the benefits that SB 360 intended and explicitly called for.

² "Serious design flaw in ESS ExpressVote touchscreen: 'permission to cheat'", 9/14/2018, <https://freedom-to-tinker.com/2018/09/14/serious-design-flaw-in-ess-expressvote-touchscreen-permission-to-cheat/>

In the long term it should be possible to redesign VSAP 2.0 so that it's mechanically impossible for the ballots to pass under the print head after being verified by the voter. Until then, or if that is too costly, requiring the use of traditional ballot boxes, as done in other counties, is necessary to avoid this major security flaw.

2) VSAP 2.0 must be re-designed to not rely on QR codes or barcodes for tabulation.

We are also gravely concerned that VSAP 2.0 uses QR codes for actual tabulation. Although voters can verify the selections that the BMD prints on their ballot in their own language, they cannot do so on the QR codes that VSAP 2.0 will actually use to tally votes.

This concern is shared broadly by computer scientists and election security experts, who instead recommend that jurisdictions not use ballot-marking devices with QR codes or barcodes.³ In the seminal election security publication released last year by The National Academies of Sciences, Engineering and, Medicine, the authors stated that barcode-based devices “raise security and verifiability concerns”.⁴

As described in a discussion document from the US's National Institute of Standards and Technology (NIST):

“Malicious or faulty production of a barcode may cause a vote capture device to present the voter with different ballot selections than what will be interpreted by the voting machine. If barcodes are used for tabulation of cast ballots, any modification of a voter’s ballot selections may go undetected and impact the election results.”⁵

Although the State’s conditional approval admirably requires that the jurisdiction verify that the information in the QR code or barcode matches the voter-verified human-readable text when conducting post-election audits, this is not enough. The number of ballots verified in this fashion is too small to catch sophisticated malicious discrepancies, and there would be major questions about how to handle any discrepancies found.

Colorado’s Secretary of State has disallowed the use of QR codes and other printed barcodes, saying they pose a threat to election security and verifiability of ballots. Here’s an excerpt from the state’s September 16, 2019 press release:

“Colorado Secretary of State Jena Griswold announced that Colorado will stop using ballots with QR codes. The removal of QR codes will increase the security of vote tabulation and ensure voters can accurately verify that their ballots are correctly marked... Although voters can see their vote choices, they cannot verify that the QR code is correct... QR codes could be among the next target of an attack and are potentially subject to manipulation.”

We acknowledge that modifying VSAP 2.0’s tallying system to use optical character recognition (OCR) to tally the actual voter-verified human-readable text instead of relying on QR codes would likely take time. However,

³ See, e.g., Hursti, Harri. Presentation to the Presidential Advisory Commission on Election Integrity, September 12, 2017; Andrew W. Appel, Richard A. Demillo, Philip B. Stark, “Ballot-Marking Devices (BMDs) Cannot Assure the Will of the Voters,” pp. 16-17, April 21, 2019, <https://ssrn.com/abstract=3375755>.

⁴ “Securing the Vote: Protecting American Democracy,” National Academies of Sciences, Engineering, and Medicine, p. 80, <https://www.nap.edu/catalog/25120/securing-the-vote-protecting-american-democracy>.

⁵ NIST discussion paper, <https://collaborate.nist.gov/voting/pub/Voting/CyberSecurity/BarcodesEncodingPaperJune14-2019.pdf>, June 14, 2019.

it is completely feasible. Both the Hart InterCivic Verity Voting system⁶ and Smartmatic BMD A4-600⁷ use OCR to tally votes on ballots printed by their ballot marking devices. This change is absolutely crucial for ballots to be truly voter-verified.

3) Please require ballot-on-demand printers for voters who prefer hand-marked paper ballots.

We are pleased that the conditional certification of VSAP 2.0 includes the requirement that all polling locations offer voters the option to hand-mark a paper ballot. This provision recognizes that many voters prefer hand-marked paper ballots and many election experts believe they have inherent advantages including creating a paper trail that — unlike a BMD printout — cannot be hacked which increases voter confidence.

Nevertheless, using write-in absentee ballots will be highly problematic because requiring voters to actually hand-write their selections — offices, candidates, ballot measure numbers, etc. — will slow voters down dramatically, induce errors that may disenfranchise voters, and make votes hard to read and count. It also violates California Elections Code Section 13103's requirements that all ballots must list the title of each office and all the qualified candidates in addition to the titles and summaries of measures. Although write-in ballots may have been the only solution available for the March primary, this issue must be rectified for the following elections.

We therefore urge you to change the conditional certification provisions so they require all vote centers to offer standard, printed paper ballots, either printed in advance or by ballot-on-demand printers, as provided in many other California counties.

4) Please require new, full, and independent testing before final certification.

We are very concerned that many of VSAP 2.0's violations of the California Voting System Standards (CVSS) will not be fixed by the March 3rd election — and some not until 2021 — but we appreciate that the State's conditional certification directed the County to develop modifications to VSAP 2.0 to bring it into compliance with the CVSS requirements.

However, it is not clear whether the State intends to require the system to undergo further independent testing to affirm that the modifications do, in fact, remediate the violations of the CVSS, and also do not adversely impact the system in another way. As the National Election Defense Coalition and Free Speech For People wrote in their January 20th comment:

“VSAP should not receive certification until the areas of non-compliance have been remediated fully, and the modified system is re-tested by an independent testing authority to independently and transparently establish conformity with the CVSS.”

Voting system testing and certification best practices dictate that any modifications to a voting system to address non-compliance with standards must be tested by an independent testing authority to establish compliance with the standards. It is improper to simply accept assurances from the County and its contractor(s) that the system has been brought into compliance and no new liabilities created. We therefore

⁶ “New Jersey Certifies Newest Hart InterCivic Voting System”, June 4, 2019, New Jersey Certifies Newest Hart InterCivic Voting System

⁷ “Smartmatic Response to eRFI – New Voting System”, August 24, 2018, https://sos.ga.gov/admin/files/Smartmatic%20RFI_Redacted.pdf

respectfully request your office require a completely new set of independent tests and reports by Freeman, Craft, McGregor Group before certification.

Summary

We understand that these requests are impracticable to implement before the March 3rd primary. Therefore, we respectfully request that the above additional conditions for certification be adopted by the State and implemented in time for the November 2020 election or as soon as feasible depending on the requirement.

In a time when foreign governments and other bad actors are attacking our election systems, it is incumbent upon you as Secretary of State to address these issues to lessen voters' well-founded doubts about election security. Given the vast resources of those who would attack our elections, such vulnerabilities must be addressed, whether they're easy or difficult to exploit, because voter confidence is the cornerstone of our democracy.

Thank you.

FROM: California Clean Money Campaign	Trent Lange
Alliance for Democracy	Barbara Clancy
Californians for Disability Rights	Randy Hicks
Climate Hawks Vote	RL Miller
Courage California	Eddie Kurtz
Endangered Habits League	Dan Silver
Equal Justice Society	Meher Dhaliwal
Free Speech for People	John Bonifaz
Greenpeace USA	Jonathan Butler
Indivisible California State Strong	Spencer Hudson
Money Out Voters In	Michele Sutter
National Election Defense Coalition	Susan Greenhalgh
Progressive Democrats of America	Alan Minsky
RootsAction	Norman Solomon
Secure Elections Network	Stephanie Chaplin
Clean Elections Texas	Liz Wally
Honest Elections Oregon	Dan Meek
Feminists in Action	Jessica Craven
Indivisible CA-33	Duane Bindschadler
Indivisible CA-43	Vlad Popescu
Indivisible California Green Team	Jennifer Tanner
Indivisible East Bay	Andrea Lum
Indivisible Marin	Susan Morgan
Indivisible San Francisco	Anna Krasner
Indivisible San Jose	Rebecca Elliott
Indivisible Sausalito	Lisa Bennett
Indivisible Ventura	Adriene Couter
Normal Heights Indivisible	Mala Wingerd
Progressive Democrats of S.M. Mountains	Dorothy Reik
Rooted in Resistance	Ruth Richardson

SoCal 350

Jack Eidt

Dr. Richard DeMillo, Professor of Computer Science, Georgia Institute of Technology*

Dr. Douglas W. Jones, Associate Professor of Computer Science, University of Iowa*

Virginia E. Hench, Professor of Law, Retired, The University of Hawai'i - Manoa

Dr. Trent Lange, President and Executive Director, California Clean Money Campaign

Dr. Philip Stark, Professor of Statistics, University of California, Berkeley*

*Institutional affiliations of individual endorsers are provided for informational purposes only and do not imply the endorsement of those institutions.