Date of Hearing: April 25, 2019

ASSEMBLY COMMITTEE ON ELECTIONS AND REDISTRICTING
Marc Berman, Chair
AB 1784 (Santiago) – As Amended April 22, 2019

SUBJECT: Elections: open-source paper ballot voting systems.

SUMMARY: Appropriations $16 million to the Secretary of State (SOS) to distribute to eligible counties for the development of open-source paper ballot voting systems, as specified. Specifically, **this bill**:

1) Appropriates an amount not to exceed $16 million dollars to be made available to the SOS, upon appropriation by the Legislature in the annual Budget Act or another statute, for the purpose of awarding matching funds to counties for the costs associated with developing an open-source voting system. Requires the SOS to establish an application process and develop procedures for the distribution of funds awarded pursuant to this bill.

2) Requires a county to comply with all of the following to be eligible for an award of funds:

    a) All of the system's software components must be licensed under an open-source license approved by the Open Source Initiative (OSI) and all other counties must be able to access and modify the software for free; and,

    b) All votes cast using the system must be recorded and tabulated using voter-verified permanent paper ballots.

3) Prohibits a county from being awarded more than $8 million dollars pursuant to the program established by this bill.

4) Permits a county that receives an award of funds to develop an open-source paper ballot voting system pursuant to this bill to also use those funds to establish procedures for the sharing or distribution of the system and to assist other counties in using components of the system that have been certified by the SOS.

5) Requires a maximum of $8 million dollars to be awarded as follows:

    a) Requires funds to be awarded at a ratio of $3 of fund money for every $1 of county money from any source, including state funds, if a county meets all of the following requirements:

        i) All of the system's software components paid for using state or county funds must be licensed exclusively under the GNU General Public License 3.0.

        ii) All of the system's software components must be open-source during development, using a process that is open to public feedback. Requires development to be carried out in public repositories by January 1, 2021.

iii) All of the system's software components eligible for an award of matching funds pursuant to this bill must be certified or conditionally approved by the SOS, or approved by the SOS as part of a pilot program pursuant to existing law, for use during the November 8, 2022 general election.

b) Requires funds to be awarded at a ratio of $2 of fund money for every $1 of county money from any source, including state funds, if a county meets all of the following requirements:

i) All of the system's software components must be licensed exclusively under the GNU General Public License 3.0, all of the system's software components must be open-source during development, using a process that is open to public feedback and development must to be carried out in public repositories by January 1, 2021.

ii) All of the system's software components eligible for an award of matching funds pursuant to this bill must be certified or conditionally approved by the SOS, or approved by the SOS as part of a pilot program pursuant to existing law, for use during the November 5, 2024 general election.

6) Requires all other funds to be awarded at a ratio of $1 of fund money for every $1 of county money from any source, including state funds, up to a maximum of $8 million dollars.

7) Requires a county to refund to the SOS all funds awarded pursuant to this chapter if the SOS fails to certify an open-source paper ballot voting system for tabulating VBM ballots that meets the requirements of this bill by December 31, 2026.

8) Requires a county to refund to the SOS all funds awarded pursuant to this bill that have not been encumbered by December 31, 2026.

EXISTING LAW:

1) Requires the SOS to adopt and publish voting system standards and regulations governing the use of voting systems, as specified.

2) Requires the SOS to study the performance of voting systems in use in the state.

3) Prohibits a voting system, in whole or in part, from being used unless it has been certified or conditionally approved by the SOS prior to any election at which it is to be used.

4) Requires a vendor or a county seeking certification or approval of a voting system to cause an exact copy of the approved source code for each component of the voting system to be transferred directly from either the United States Election Assistance Commission or the voting system testing agency that evaluated the voting system and is approved by the SOS, and deposited into an approved escrow facility, as specified.

5) Requires the SOS to adopt regulations relating to all of the following:

a) The definition of source code components of a voting system or ballot marking system, including source code for all firmware and software of the voting system or ballot marking system, as specified.

b) Specifications for the escrow facility, including security and environmental specifications necessary for the preservation of the voting system or ballot marking system source codes.

c) Procedures for submitting voting system or ballot marking system source codes.

d) Criteria for access to voting system or ballot marking system source codes.

e) Requirements for the applicant to include, in the materials deposited in escrow, build and configuration instructions and documents so that a neutral third party may create, from the source codes in escrow, executable object codes identical to the code installed on certified or conditionally approved voting systems or ballot marking systems.

6) Requires the SOS to have reasonable access to the materials placed in escrow, under any of the following circumstances:

a) In the course of an investigation or prosecution regarding vote counting or ballot marking equipment or procedures.

b) Upon a finding by the SOS that an escrow facility or escrow company is unable or unwilling to maintain materials in escrow in compliance with state law.

c) In order to fulfill the provisions of existing law related to the examination and certification or conditional approval of voting systems or ballot marking systems.

d) In order to verify that the software on a voting system is identical to the certified or conditionally approved version.

e) For any other purpose deemed necessary to fulfill the provisions of existing law.

7) Provides that any person is guilty of a felony, punishable by imprisonment pursuant to existing law for two, three, or four years who, before or during an election:

a) Tampers with, interferes with, or attempts to interfere with, the correct operation of, or willfully damages in order to prevent the use of, any voting machine, voting device, voting system, vote tabulating device, or ballot tally software program source codes.

b) Interferes or attempts to interfere with the secrecy of voting or ballot tally software program source codes.

c) Knowingly, and without authorization, makes or has in their possession a key to a voting machine that has been adopted and will be used in elections in this state.

d) Willfully substitutes or attempts to substitute forged or counterfeit ballot tally software program source codes.

8) Permits a local jurisdiction to contract and pay for the following:

a) Research and development of a new voting system that has not been certified or conditionally approved by the SOS and uses only nonproprietary software and firmware with disclosed source code, except for unmodified commercial off-the-shelf software and firmware, as defined pursuant to existing law.

b) Manufacture of the minimum number of voting system units reasonably necessary for either of the following purposes:

   i) To test and seek certification or conditional approval of the voting system pursuant to existing law; or,

   ii) To test and demonstrate the capabilities of the voting system in a pilot program pursuant to existing law.

FISCAL EFFECT: Unknown

COMMENTS:

1) **Purpose of the Bill**: According to the author:

> The cost of replacing California's obsolete voting machines with new proprietary voting systems is astronomical. Last year's budget included $134.3 million in General Funds to help counties replace aging voting systems, but in 2017 AB 668 (Gonzalez) contemplated the need for at least $600 million in total spending for new voting systems overall.
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> Worse, proprietary voting systems lack transparency and have proven vulnerable to security threats. At the 2017 DEF CON security conference testing proprietary voting systems "every piece of equipment … was effectively breached in some manner". Their report concluded it was a "national security threat".
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> In contrast to the secret, proprietary software created and controlled by private vendors, open-source paper ballot voting systems would be openly licensed and therefore transparent and open to public inspection.
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> An open-source paper ballot system would be freely available to any county to use and modify. Some estimates are that this could cut in half the overall cost of new voting systems. This would save the state and counties hundreds of millions of dollars, make elections more secure, and increase confidence in their reliability and transparency.
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> AB 1784 would establish an Open-Source Paper Ballot Voting Systems program to authorize the Secretary of State to administer a matching funds program with a total of $16 million in matching funds to counties to speed their development, certification, governance, and distribution of open-source voting systems to other counties.
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> Any county that receives matching funds must license the voting system's software under an OSI approved open-source license to ensure other counties can

use and modify it for free. Also, all votes must be recorded and tabulated using voter verified paper ballots.

This modest investment will save California and its counties tens of millions of dollars after systems have been certified because every county will be able to use and build on them for free.

Open-source paper ballot voting systems will increase transparency, earn voters' trust, and help California lead the nation to more secure elections.

2) **2018 and 2019 Open-Source Voting System Legislative Budget Requests**: Last year, the Senate Budget Committee and Budget Subcommittee No. 4 received a proposal requesting $8 million in matching funds for counties to develop and certify publicly owned, open-source paper ballot voting systems. The additional funding would have allowed the SOS's office to administer a matching program, where interested counties would receive resources needed to develop, certify, and implement open-source platforms. This item was held open and not voted on in the Senate Budget Subcommittee No. 4.

   In March, a substantially similar legislative budget request was submitted to the chairs of the Assembly Budget Committee and Budget Subcommittee No. 4, requesting an appropriation of $16 million in matching funds for counties to develop, certify, and share publicly owned open-source paper ballot voting systems. According to the request, the need is urgent because the SOS gave notice it is withdrawing certification of all California voting systems not tested and certified to meet the current California Voting Systems Standards (CVSS). The request states that the $16 million will allow the SOS's office to administer a matching funds program to two or more counties to speed their development, certification, governance, and distribution of open-source voting systems licensed to ensure they are freely available to any county to use and modify based upon their needs.

3) **Governor's Budget and New Voting Machines**: The Governor's 2018-2019 budget included $134 million in one-time General Fund spending to purchase new equipment for county voting systems. The equipment included hardware, software, and initial licensing to replace existing systems and technology. Under the proposal, counties provide a dollar-for-dollar match to receive the state funding.

4) **Federal Election Security Funding**: On March 23, 2018, President Trump signed the Consolidated Appropriations Act of 2018 (Act)—the omnibus spending bill for the federal fiscal year ending on September 30, 2018. Among other provisions, the Act provided $380 million in Help America Vote Act funding to the U.S. Elections Assistance Commission (EAC) to make payments to states for activities to improve the administration of elections for Federal office, including to enhance election technology and make election security improvements. States that receive federal funds are required to provide a match of five percent of the funds received within two years of receiving the federal funds.

   According to information from the EAC, California's share of the federal funding is $34,558,876, and the state's required five percent match totals $1,727,944. The EAC notes that a joint explanatory statement prepared by Congress to indicate congressional intent on how the funds may be spent specifies that states may use the funds to replace electronic voting equipment that does not have a paper trail; to implement a post-election audit system;

to upgrade election-related computer systems to address cyber vulnerabilities; to facilitate cybersecurity training for state and local election officials; to implement established cybersecurity best practices; and to fund other activities that will improve the security of elections for federal office.

5) **California Voting System Standards and Previous Legislation**: Until 2014, California's voting system review process was designed to augment the federal voting system review and approval process. Prior to undergoing state review, electronic voting systems were required to be approved at the federal level. In 2013, however, due in part to frustration with the federal voting system certification process, the Legislature approved and the Governor signed SB 360 (Padilla), Chapter 602, Statutes of 2013, which significantly modified the procedures for the certification of voting systems that are used in elections held in the state. Most notably SB 360 removed the requirement that electronic voting systems had to be approved at the federal level before undergoing state review, and instead required voting systems to undergo more extensive and thorough testing, review, and certification to the CVSS by the SOS prior to being used in the state.

   SB 360 also was designed to facilitate a project that was then underway in Los Angeles County —the Voting Systems Assessment Project (VSAP), which subsequently has been renamed the Voting Solutions for All People Project. Because of Los Angeles County's size, diversity, and complexity, the County found that the commercial off-the-shelf voting systems available for purchase did not meet the county's needs. As a result, the county established VSAP to identify and implement a new voting system by first defining the kind of voting system it wanted, and then being directly involved in the system's development. Accordingly, SB 360 established a voting system review and approval process that envisioned a situation where a local jurisdiction might be involved in the research and development of a new voting system, rather than having a review and approval process designed around the assumption that all voting systems would be developed by private vendors that would then sell or lease their products to local jurisdictions. In addition to the VSAP in Los Angeles County, the City and County of San Francisco currently is considering developing its own voting system.

6) **Secretary of State Decertification of Certain Voting Systems**: Earlier this year, the SOS withdrew certification and conditional approval of all California voting systems, in whole or in part, not tested and certified to the CVSS, effective August 27, 2019. Under current law the SOS is permitted to decertify any voting system or part thereof, determined to be defective, obsolete, or unacceptable. The voting systems being decertified contain obsolete hardware and software components, and employ end-of-life operating systems that are no longer supported. According to an advisory sent to county elections officials, the Notice of Withdrawal does not apply to other voting technology such as remote accessible vote by mail systems or electronic pollbooks.

   According to the SOS's county advisory, there are three voting systems that have been tested and certified to the CVSS and there three more systems that are currently being reviewed and tested to CVSS.

   The withdrawal is effective August 27, 2019, however, pursuant to existing law, any election scheduled six months from August 27, 2019, shall not be affected by this action. Therefore, any federal, state, county, municipal, district or school election scheduled from August 27, 2019, until February 27, 2020, may continue to use voting systems not tested and certified to

CVSS. Additionally, in the advisory the SOS acknowledged that there may be circumstances that may hinder a jurisdiction from implementing a CVSS certified voting system by February 27, 2020, including, but not limited to, delays in the procurement process or a county budget. In recognition of unique challenges a county may face, the advisory stated that a written Request for Conditional Approval for Extension of Use may be submitted by a county to the SOS seeking to utilize a decertified system for any election scheduled after February 27, 2020.

7) **Voting Solutions for All People Project**: As mentioned above, in 2009, in partnership with the Voting Technology Project, and with the financial support of the James Irvine Foundation, the County of Los Angeles Registrar-Recorder/County Clerk (RR/CC) launched the VSAP with the goal of implementing a new and enhanced voting system that meets the growing voting system needs and challenges faced by Los Angeles County.

   According to VSAP background documents, the vision of the VSAP is to identify and implement a new voting system in a transparent and participatory manner that takes into account the needs and expectations of current and future Los Angeles County voters. The VSAP aims at achieving three goals in the process: 1) give current and future Los Angeles County voters an unprecedented opportunity to participate in the assessment and development process; 2) increase voter confidence in the electoral process through the participatory structure of the project; and 3) synthesize public input and research to acquire or develop a new voting system for the County.

   According to background information, the new voting system concept features touch-screen technology with a simple user interface, both audio and visual output and a built-in scanner, printer and ballot box. The new voting system will provide voters with options to scan in quick response (QR) coded ballots from their phone, enter their ballot choices in-person at the polling location, or vote by mail with printed ballots.

   Part of Los Angeles's VSAP project included a redesign of their VBM ballots. Last year the SOS certified Los Angeles County's VSAP Tally Version 1.0, making it the first publicly owned, open-source election tally system certified under the California voting system standards. The certification of the VSAP Tally system allowed Los Angeles County to use its newly designed VBM ballots for last year's November general election. The newly designed VBM ballot is the first step in implementing a new voting experience for LA County voters that is more accessible and convenient.

8) **San Francisco's Open-Source Voting Project**: In addition to the VSAP in Los Angeles County, the City and County of San Francisco is currently considering developing its own voting system. In November of 2008, the San Francisco Board of Supervisors created a Voting Systems Task Force comprised of individuals with backgrounds in good government, computer science or the computer industry, election administration, and accommodations of persons with disabilities, to make recommendations to the Board of Supervisors about voting system standards, design and development, as specified.

   In June of 2011, the Task Force's final report recommended, in part, that the Department of Elections should give strong preference to a voting system licensing structure that gives San Francisco all of the rights provided by a license approved by the OSI, as specified.

Over the course of a decade, San Francisco has debated and assessed the value of open-source voting. This project, however, has been stymied by a variety of factors. According to a 2017-2018 City and County of San Francisco Civil Grand Jury report, indecision around San Francisco's open-source voting project has kept the project in a state of hypothetical exploration. Moreover, through the course of its investigation the Civil Grand Jury found that clear structural and organizational obstacles to completing the project and achieving its benefits.

The report cited three reasons that the project has failed to gain traction. First, despite having a plethora of stakeholders with the right intentions and knowledge, expertise is scattered within City agencies and organizations and experts in elections administration, open-source experience, and purchasing are not structurally aligned. Second, the report states that there are too many people who need to sign off on the project for any one of them to make impactful and informed decisions. Thirdly, there is not a definitive project owner with both an institutional responsibility for the project and an eagerness to tackle it. According to the report, without structural changes that align city institutions and establish a clear leader, the dispersal of experts and decision-makers ensures the project's current pattern of disjointed progress and this will leave the project at an impasse, where repeated expensive and equivocal investigations are mistaken for progress.

In addition, the report included twenty-two findings, thirteen recommendations which center around clear ownership and creative partnerships, and requests for responses from certain offices, including the Mayor of San Francisco, the Director of the San Francisco Department of Elections, the President of the San Francisco Elections Commission, San Francisco's Chief Information Officer (of the San Francisco Department of Technology), and the San Francisco Controller.

9) **What Does Open-Source Software Mean**? Source code generally refers to the text that generates software or the code computer programmers can manipulate to change how a piece of software, such as a program or application, works. Open-source generally refers to something people can modify and share because its design is publicly accessible and the term open-source software generally refers to software with a source code that anyone can inspect, modify, and enhance. According to the OSI, the term open-source does not just mean access to the source code, it also includes the distribution terms of open-source software, which must comply with certain criteria.

Source code is governed by copyright and most are accompanied by a license that describes how the code may be used, and who controls it. Some software, also known as proprietary or closed source software, has source code that only the original owners that created it can modify it and thereby maintain exclusive control over it. In order to use the proprietary software a user usually agrees (usually by signing a license displayed the first time they run the software) that they will not do anything with software that the software's authors have not expressly permitted. In other words, the copyright serves to ensure a creator has control of the product and prevents others from duplicating, selling, or misappropriating their work. Examples of well-known proprietary software include Microsoft Windows and Adobe Photoshop.

Open-source software works differently and usually the original owner makes the source code available to others who would like to view it, copy it, learn from it, alter it, or share it.

Open-source software, similar to proprietary software, is accompanied by a license that affects the way a user may use, modify, or distribute software. There are many different open-source licenses that developers may choose to use for their program. In general, open-source licenses allow a user to use the open-source software for any purpose they choose. However, some open-source licenses stipulate that anyone who releases a modified open-source program must also release the source code for that program alongside it. Moreover, other open-source licenses require that anyone who alters and shares a program with others must also share that program's source code without charging a license fee. Examples of well-known open-source software include Firefox, Chrome, Linux, and Android.

According to OSI website, there are a variety of open-source licenses approved by the OSI that are popular, widely used and have strong communities. For example, the GNU General Public License or GPL, is widely used by many open-source projects. In general, the terms of the GPL license specify that, if anyone modifies an open-source program and distributes a derivative work, they must also distribute the source code for their derivative work. In other words, no one can take open-source code and create a closed-source program from it – they must release their changes back to the community. Other open-source licenses function differently. For instance, the BSD license permits anyone to incorporate the program's source code into another program and does not require the user to release their changes back to the community.

10) **Specific License Requirements**: This bill requires certain conditions to be met for a county to be eligible to receive certain matching fund ratios. For instance, this bill requires, among other conditions, that all of the system's software components paid for using state or county funds to be licensed exclusively under the GPL 3.0 in order to be eligible to receive matching funds at higher ratios (3-1 or 2-1).

    The committee may wish to consider whether placing strict licensing preferences in statute is prudent public policy. These requirements may be best suited in regulations rather than statute. Moreover, will these strict licensing requirements limit a county's ability to be eligible to receive matching funds at higher ratios?

    Furthermore, this bill requires, among other conditions, that *all* of the system's software components paid for using state or county funds to be licensed exclusively under the GPL 3.0. In general, some voting systems are sold as a single unit comprised of a larger number of components, however, others are not. Will this bill limit which counties may be eligible to receive matching funds because it requires *all* of the systems software components paid for using state or county funds to be licensed under GPL 3.0?

11) **Strict Deadlines**: As mentioned above, this bill requires certain conditions to be met for a county to be eligible to receive certain matching fund ratios. In addition to requiring a specific open-source license, this bill also requires all of the system's software components eligible for an award of matching funds to be certified or conditionally approved by the SOS, as specified, by certain dates. Specifically, in order for a county to be eligible to receive matching funds at the highest ratio (3-1), this bill requires all of the system's software components eligible for matching funds to be certified or conditionally approved by the SOS for use during the November 2022 general election or, be in use during the November 2024 general election in order to be eligible for the 2-1 matching fund ratio.

It is unclear whether any county, including San Francisco given its long history of attempting to develop an open-source voting system, will be able to meet the strict timeframes outlined in this bill.

12) **National Conference of State Legislatures (NCSL) and Texas**: According to the NCSL, Travis County in Texas conducted a multi-year project to design new, more secure equipment with open-source software called STAR-Vote. The project, however, stalled in 2017 because the county was not able to find a vendor to cost-effectively build the system.

13) **Arguments in Support**: In support, the sponsors and various coalition members write:

> In contrast to secret, proprietary software created and controlled by private vendors, publicly owned open-source paper ballot voting systems would be openly licensed and therefore transparent for public inspection. Open- source software takes advantage of "many eyeballs" examining public code to find security flaws and other issues. Because open-source is publicly viewable, claims about security and accuracy can be independently verified…
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> AB 1784 would aid development, certification, governance, and sharing of such publicly owned, open-source paper ballot voting systems. Open-source voting systems can significantly reduce costs associated with replacement and maintenance compared to proprietary systems, and will provide counties with a more transparent, secure, and fair election process. The matching funds provided in AB 1784 will support at least two different counties' efforts, because each county can receive up to $8 million…
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> Over 3,000 Californians have already signed petitions urging passage of AB 1784. An overwhelming majority of Californians agree. A February California Clean Money Campaign poll of 772 likely voters found a 4-1 margin supported "having the California state budget provide matching funds to help counties develop and certify publicly-owned, open-source paper ballot voting systems" (66% Yes, 17% No, 17% Undecided).
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> Voters are so concerned about elections because our house is not secure. Whether threats to the integrity of our elections come from mischief or mistakes, from the outside of within, and whether real or imagined, a key way to give voters more confidence in elections is full transparency which means open-source voting systems using paper ballot systems that are owned by the public.

REGISTERED SUPPORT / OPPOSITION:

Support

California Clean Money Campaign (sponsor) (prior version)
California Association of Voting Officials (prior version)
California Common Cause (prior version)
Consumer Federation of California (prior version)
Courage Campaign (prior version)
Endangered Habitats League (prior version)

FairVote (prior version)
Franciscan Action Network (prior version)
Money Out Voters In (prior version)
Voting Rights Task Force (prior version)
Two Individuals

Opposition

None on file.

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