Democracy Live
Secure Select 1.0

Remote Accessible Vote by Mail System

Staff Report

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Secretary of State's Office of
Voting Systems Technology Assessment

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I. INTRODUCTION

1. Scope

This report presents the test results for the all phases of the certification test of the Democracy Live Secure Select 1.0 Remote Accessible Vote by Mail (RAVBM) system. The purpose of the testing is to test the compliance of the RAVBM system with California and Federal laws. Testing also uncovers other findings, which do not constitute non-compliance, and those findings are reported to the RAVBM system vendor to address the issues procedurally. The procedures for mitigating any additional findings are made to the documentation, specifically the Secure Select 1.0 Use Procedures.

2. Summary of the Application

Democracy Live submitted an application for the Secure Select 1.0 system on December 19, 2016. Secure Select 1.0 is a cloud based application, solely for the purposes of ballot marking pursuant to Elections Code sections 303.3 and 19283.

Democracy Live was required to submit the following: 1) the technical documentation package (TDP); 2) hardware for functional testing (Windows and Apple OS systems, including all supported browsers, screen readers; 3) source code; and 4) the Democracy Live Secure Select 1.0 Use Procedures.

3. Contracting and Consulting

Upon receipt of a complete application, the Secretary of State (SOS) released a Request for Quote (RFQ) for assistance with the Source Code Review, Telecommunications and Security Review, and Usability, Accessibility and Privacy testing. The statement of work (SOW) also had the option for assistance with Functional Testing. That testing was conducted by SOS staff.

Through the formal California contracting process, the Secretary of State awarded a contract to SLI Compliance, a division of Gaming Laboratories International, LLC.

II. SUMMARY OF THE SYSTEM

Secure Select 1.0 application is an HTML 5 SPA (Single Page Application), which means that once the initial server call for the application is processed the entire application runs in the current browser session. Secure Select has three main components. A Ballot Definition File is created and passed into Secure Select. Secure Select parses the Ballot Definition File and presents a ballot style to a voter. The voter can optionally use a Screen Reader to navigate through the ballot. After marking their ballots and reviewing their selections, the voter must print their selections. The printed paper cast record is returned to the local elections official, where it will be remade into a ballot. The printed paper cast record and the ballot is kept together for auditing purposes.

Secure Select Components
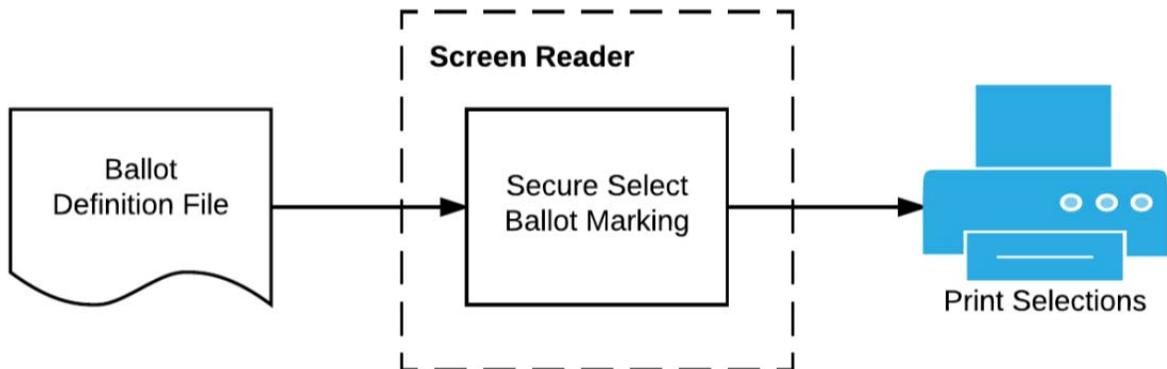
III. TESTING INFORMATION AND RESULTS

1. Background

Democracy Live submitted an application to the Secretary of State for certification of the Secure Select 1.0 RAVBM system on December 19, 2016. The system has two hosting mechanisms, vendor hosted or county hosted. For the purposes of this examination and certification, the SOS staff and the consultant tested the vendor hosted solution.

State examination and functional testing of this system was conducted by SOS staff. The functional test was conducted at the Secretary of State's office in Sacramento, California from May 15 to May 17, 2017. Phase I Accessibility testing was performed by thirty (30) volunteers throughout the state of California, from June 14 to June 16, 2017. The Software Review was performed by SLI from July 31 to August 7, 2017. Security and Telecommunications testing was performed by SLI from August 4 to August 21, 2017. A final Accessibility test

was administered by SOS staff from August 11 to August 17, 2017, with approximately nine (9) volunteers.

Secure Select 1.0 was evaluated against the applicable portions of the California Voting Systems Standards (CVSS). The CVSS were written in such a way to be applicable to a wide variety of voting technology, therefore the relevant portions of the CVSS were reviewed as it relates to the Secure Select 1.0 RAVBM system for purposes of this report. The use of "voting system" shall apply to RAVBM.

2. Functional Testing Summary

System Configuration:

The Secure Select 1.0 Remote Accessible Vote by Mail System is a software only solution. The vendor only requires that a customer provide ballot definition data.

For the functional test, the SOS provided Democracy Live with three test ballot data sets of California Elections as described below:

1. State of California Primary Election – Fictional Jurisdiction
2. State of California General Election - Fictional Jurisdiction
3. State of California Recall Election – October 2003 Statewide Recall Election

The vendor provided two test machines for the Functional Test. The base configurations of the systems were as follows:

Machine Type	OS	Screen Reader	Browser
Apple Laptop	OS X 10.12	VoiceOver	Safari 10.1
Lenovo Laptop	Windows 10	Narrator	Internet Explorer 11,Edge 10

SOS staff used each machine provided to access, mark and print the paper cast vote record as described in the Secure Select 1.0 Use Procedures. Each test environment exercised undervotes, overvotes, all contest marking, and write-ins. Staff also used keyboard functions, standard USB mice, and the touchpad on the laptops to mark selections.

Undervotes

The system warned of undervotes, and allowed the tester to proceed to the end of the ballot to print the paper cast record.

Overvotes

The system warned of overvotes, and allowed the tester to proceed to the end of the ballot and print the paper cast record.

Write-Ins

The system allowed the tester to make write in selections with a fifty (50) character limit.

Printed Paper Cast Record

Each paper cast record printed displays the Election Type, the precinct number, and the ballot style/type. The paper cast record also produces a QR Code near the top right of the paper cast record. State of California staff used multiple QR Code readers to decipher the information contained within the QR Code. An Example of the QR Code data is below:

Table 2A: QR Code Data	
v:1.2 bs:1 **pid**:CP05 **id**:1497039770174.532 **1:1** 2:2 3:1 4:1 5:1 6:1 7:1 14:1 15:1	
Key	**Data Value**
v	QR Code Format Version
bs	Ballot Style Code
pid	Precinct Identifier
id	Unique ballot identifier generated by Secure Select
1:1	Contest Number: Selection Number (First Contest, First Candidate Marked)

SOS staff identified some minor issues and clarification with the Use Procedures. The vendor was provided with the issues and adequately modified the Use Procedures.

3. Accessibility, Usability, and Privacy Testing

For Accessibility, Usability and Privacy Testing the SOS conducted two phases of End User Usability testing. Additionally, SLI conducted three phases of testing for Accessibility, Usability and Privacy: documentation of usability and accessibility testing performed during system development, functional usability and accessibility testing and privacy testing.

SOS End User Usability Testing - Phase I

Phase I of End User Usability testing was conducted from June 14 to June 16, 2017. The testing was conducted by SOS staff. Approximately thirty (30) testers participated in the testing. The testers were recruited through several channels including several

groups within the accessibility community. Each tester used his/her own technology, including any auxiliary peripheral devices and screen reading software to access, mark, and print their paper cast vote record.

The testers were asked to complete pre and post surveys, documenting such information as demographics, the technology used for testing, and the tester's post-test experience using the system. The survey results of each are included in **Attachment A** of this report. Please note that personally identifying information such as names, email addresses, and telephone have been redacted.

The technical issues identified as requiring mitigation or responses are listed below in **Table 3A**.

Table 3A: Phase I Tester Technical Issues	
Issue	**Response/Mitigation**
1. Non-accessible return package.	The SOS will develop a model template for the return instructions of the paper cast vote record. The SOS along with jurisdictions will educate voters on the restrictions of Remote Accessible Vote by Mail voting, including email return of the paper cast vote record is not an option at this time.
2. Time limitations.	Test configuration had a five minute time limit enabled, which impacted testers who needed longer to complete their selections. Because this was a test configuration and not part of Secure Select 1.0, this is not an issue.
3. Unlabeled graphic - language choice.	Regarding the language links, this is because it is written using Chinese characters. This request is the same as writing "Chinese" in English which would not be accessible for Chinese users.
4. Tester logged out of system and returned later to complete ballot.	The system cannot restrict printing, as there is no data transmitting back to the server once the ballot marking session starts. Jurisdictions have a system of "checks and balances" in place to mitigate voters from voting multiple times in a single election.
5. When scrolling down the list of contests, 35 is repeated for each selection.	JAWS did tend to repeat the words "x checkboxes." The grouping was removed and a label for "x checkboxes" was added before the set to remove that repetition for JAWS users. This was retested with IE, Edge, Firefox, Safari, Chrome, Narrator+IE, NVDA + Firefox, Jaws 18+IE, Jaws 17+IE, Jaws 16+IE.
6. Tester used the page down button, which appeared to display a "different screen", causing some disorientation.	Animated scroll added to smooth the transition between focus items. Tested with IE, Edge, Firefox, Safari, Chrome, Narrator+IE, NVDA + Firefox, Jaws 18+IE, Jaws 17+IE, Jaws 16+IE

7. The screen only moved down when used the arrows (or mouse) were used to advance it. This meant that each time the tester jumped from contest to contest, the screen jumped significantly, causing them to lose their place. The tester had to scroll up several times during the propositions to reorient.	If the keyboard is used to change focus, then scroll with the mouse, select and option using the mouse, then go back to keyboard control it jumps back to the last keyboard position. Logic added to sync keyboard focus with mouse interaction. Tested with IE, Edge, Firefox, Safari, Chrome, Narrator+IE, NVDA + Firefox, Jaws 18+IE, Jaws 17+IE, Jaws 16+IE.
8. When using NVDA, tester was unable to read the labels associated with checkboxes for the various contests when using the arrow keys to move the screen reader's virtual cursor through the ballot.	This is a known issue/functionality for NVDA (https://github.com/nvaccess/nvda/issues/5742). NVDA support mentions pressing tab to change focus does read the label correctly. Users can also press NVDA+Tab to read the label. This issue is also not present in Firefox, which is NVDA's preferred browser.
9. Tester text description of a contest was improperly labeled as "edit."	This is a known issue (marked as low priority) for NVDA + IE. https://github.com/nvaccess/nvda/issues/6639. This does not happen on any version of JAWS, or NVDA + Firefox.
10. The secure ballot allows a person to put in non-english characters in the write-in box, but if they do, the barcode won't print correctly at the end screen (and the application becomes mostly unusable after the attempt to print).	QR Code library has been updated (which supports UTF 8 characters).
11. "No Selections" could probably be something that doesn't contain the word "No" in it, as "No" is a valid selection on many choices. Maybe	Changed to "Zero Selections Made."

"Selection Left Blank" would be better.	

SOS End User Usability - Phase II

Phase II of End User Usability testing was conducted by the SOS from August 18 to August 24, 2017. Approximately nine (9) volunteers tested the Secure Select 1.0 system for usability and accessibility. During this phase of testing only two (2) issues were identified amongst the users. Both were issues identified in Phase I of testing, Items 1 and 8 from **Table 3A**. Both issues identified are not reflective of the Secure Select 1.0 system.

Consultant Phase Accessibility, Usability, and Privacy Testing

SLI conducted three phases of testing for Accessibility, Usability and Privacy. Phase I was a review of the Secure Select 1.0 documentation of usability and accessibility testing performed during system development. Phase II included all Accessibility and Usability testing. Phase III included Privacy testing.

SLI used the following tools in **Table 3B** to during testing to evaluate Secure Select 1.0.

Table 3B: Consultant Tools		
Tool Name	**Tool Purpose**	**Tool Use**
Wave Web Accessibility evaluation tool	Tool to evaluate accessibility of web sites, to WCAG 2.0 and Section 508.	The vendor provided url's were run through MAUVE to help determine accessibility.
A11y.css	Tool to evaluate web application regarding conformance to ISO 9241-171: Ergonomics of human-system interaction Guidance on software accessibility.	The vendor provided url's were run with A11y to help determine compliance.
Evaluera website	Tool to evaluate web applications regarding conformance to WCAG 2.0 standards.	The vendor provided url's were run through 508 checker to help determine compliance.
Chromevox – Screen reader extension of Google Chrome.	Tool is a screen reader that is an extension of Google Chrome, to assist visually impaired users.	Screen reader used for Accessibility and Usability testing.

Phase I Documentation Review

The documentation was reviewed by SLI to verify and validate the manufacturer's documentation of usability and accessibility performed during system development. Review of the TDP validated that the requirement was satisfactorily covered.

Phase II-A Usability Testing

SLI evaluated Secure Select 1.0 against Section 3.2 *et al* of the CVSS. This section covers the requirements for Usability of a system. SLI found that the vast majority of the requirements were satisfactorily met. Secure Select 1.0 failed on two (2) of the requirements. Each is listed in the table along with a response/mitigation:

Table 3C: Phase II-A – Usability Testing		
CVSS Requirement	**Result**	**Mitigation/Response**
CVSS (3.2.8.e): Voter Inactivity Time	Secure Select 1.0 does not meet this requirement.	Secure Select 1.0 cannot regulate a voter's inactivity, voting session time, or place any other time restraints on a voter using the system. The system concludes the session once the voter retrieves the ballot. Thus, there is no longer any communication with the system to place a time restriction of any sort on the voter.
CVSS (3.2.8.f): Alert Time – Upon expiration of the voter inactivity time, the voting system shall issue an alert and provide a means by which the voter may receive additional time. The alert time shall be between 20 and 45 seconds. If the voter does not respond to the alert within the alert time, the system shall go into an inactive state.	Secure Select 1.0 does not meet this requirement.	

Phase II-B Accessibility Testing

SLI evaluated Secure Select 1.0 against the applicable portions of the CVSS for Accessibility Testing for compliance. The table below shows each of the applicable CVSS sections, and the result of compliance.

Table 3D: Phase II-B – Accessibility Testing	
CVSS Requirement	**Result**
CVSS (3.3.1.a.i.1): Accessibility throughout the voting session - A VEBD shall be integrated into the manufacturer's complete voting system so as to support accessibility for disabled voters throughout the voting	Review of the requirement validated that the requirement was satisfactorily covered.

session. Documentation of Accessibility Procedures - The manufacturer shall supply documentation describing: recommended procedures that fully implement accessibility for voters with disabilities; and CVSS (3.3.1.a.i.2): How a VEBD supports those procedures.	
CVSS (3.3.1.b) : Complete information in alternative formats - When the provision of accessibility involves an alternative format for ballot presentation, then all information presented to non-disabled voters, including instructions, warnings, error and other messages, and contest choices, shall be presented in that alternative format	Review of the requirement validated that the requirement was satisfactorily covered.
CVSS (3.3.1.d): Secondary means of voter identification - If a voting system provides for voter identification or authentication by using biometric measures that require a voter to possess particular biological characteristics, then the system shall provide a secondary means that does not depend on those characteristics.	Review of the requirement showed that no biometric measures are required, so this requirement is not applicable.
CVSS (3.3.1.e.i): Accessibility of paper-based vote verification - If a VEBD generates a paper record (or some other durable, human-readable record) for the purpose of allowing voters to verify their votes, then the system shall provide a means to ensure that the verification record is accessible to all voters with disabilities. i. Audio readback for paper-based vote verification - If a VEBD generates a paper record (or some other durable, human-readable record) for the purpose of allowing voters to verify their votes, then the system shall provide a mechanism that can read that record and generate an audio representation of its contents.	Review of the requirement validated that the requirement was not applicable, as a voter will implement their own hardware. If a voter has equipment that utilizes either OCR technology, or a QR reader with audio playback, then they would be able to obtain an audio read back of their printed ballot.
CVSS (3.3.2.c): Distinctive buttons and controls - Buttons and controls on accessible voting stations shall be distinguishable by both shape and color. This applies to buttons and controls implemented either "on-screen" or in hardware. This requirement does not apply	Review of the requirement validated that the requirement was not applicable, as a voter will implement their own hardware.

to sizeable groups of keys, such as a conventional 4x3 telephone keypad or a full alphabetic keyboard.	
CVSS (3.3.2.d): Synchronized audio and video - The voting station shall provide synchronized audio output to convey the same information as that which is displayed on the screen. There shall be a means by which the voter can disable either the audio or the video output, resulting in a video-only or audio-only presentation, respectively. The system shall allow the voter to switch among the three modes (synchronized audio/video, video-only, or audio-only) throughout the voting session while preserving the current votes.	Review of the requirement validated that the requirement was not applicable, as a voter will implement their own hardware. Synchronized audio/video, video-only, or audio only are all obtainable. If voter environment contains a screen, audio output and a screen reader, synchronized output is available. Voter can turn off audio to have video only. Likewise voter can turn off video display to have Audio only.
CVSS (3.3.3.b.1): Audio-tactile interface - The accessible voting station shall provide an audio-tactile interface (ATI) that supports the full functionality of the visual ballot interface. Full functionality includes at a minimum: o Instructions and feedback on initial activation of the ballot (such as insertion of a smart card), if applicable; CVSS (3.3.3.b.2): Instructions and feedback to the voter on how to operate the accessible voting station, including settings and options (e.g., volume control, repetition); CVSS (3.3.3.b.3): Instructions and feedback for navigation of the ballot; CVSS (3.3.3.b.4): Instructions and feedback for contest choices, including write-in candidates; CVSS (3.3.3.b.5): Instructions and feedback on confirming and changing votes; CVSS (3.3.3.b.6): Instructions and feedback on final submission of ballot.	Review of the requirements validated that these requirements were not applicable, as voter will implement their own hardware.
CVSS (3.3.3.c.vii): Audio features and characteristics - Voting stations that provide	Review of the requirements validated that these requirements were not applicable,

audio presentation of the ballot shall do so in a usable way, as detailed in the following sub-requirements. iv. Intelligible audio - The audio presentation of verbal information by both recorded and synthetic speech shall be readily comprehensible by voters who have normal hearing and are proficient in the language. This includes such characteristics as proper enunciation, normal intonation, appropriate rate of speech, and low background noise. Candidate names shall be pronounced as the candidate intends. This requirement applies to those aspects of the audio content that are inherent to the voting system or that are generated by default.	as voter will implement their own hardware.
CVSS (3.3.3.d): Ballot activation - If the voting station supports ballot activation for nonblind voters, then it shall also provide features that enable voters who are blind to perform this activation.	Review of the requirement validated that the requirement was satisfactorily covered.
CVSS (3.3.4.b): Support for non-manual input - The accessible voting station shall provide a mechanism to enable non-manual input that is functionally equivalent to tactile input. All the functionality of the accessible voting station (e.g., straight party voting, write-in candidates) that is available through the conventional forms of input, such as tactile, shall also be available through non-manual input mechanisms such as mouth sticks and "sip and puff" switches.	Review of the requirements validated that these requirements were not applicable, as a voter will implement their own hardware.
CVSS (3.3.6.a): Reference to audio requirements - The accessible voting station shall incorporate the features listed under the requirements for voting equipment that provides audio presentation of the ballot.	Review of the requirements validated that these requirements were not applicable, as voter will implement their own hardware.
CVSS (3.3.6.b): Visual redundancy for sound cues - If the voting system provides sound cues as a method to alert the voter, the tone shall be accompanied by a visual cue, unless the station is in audio-only mode.	Review of the requirement validated that the requirement was satisfactorily covered.
CVSS (3.3.7): Use of ATI- For voters who	Review of the requirements validated that

lack proficiency in reading English, the voting equipment shall provide an audio interface for instructions and ballots.	this requirement was not applicable, as a voter will implement their own hardware.
CVSS (3.3.8): Speech not to be required by equipment - Voting equipment shall not require voter speech for its operation.	Review of the requirement validated that the requirement was satisfactorily covered.

Phase III Privacy Testing

SLI evaluated Secure Select 1.0, for compliance with California Elections Code requirements for privacy within an RAVBM system, in addition to the applicable portions of the CVSS. The table below shows each of the applicable code sections and CVSS sections, and the result of compliance.

Table 3D: Phase III – Privacy Testing	
Applicable California Elections Code Section & CVSS Requirement	**Result**
EC Section 19295(a): The RAVBM shall not have the capability, including an optional capability, to use a remote server to mark a voter's selections transmitted to the server from the voter's computer via the Internet.	Review of the requirement validated that the requirement was satisfactorily covered.
EC Section 19295 (b): The RAVBM shall not have the capability, including an optional capability, to store any voter identifiable selections on any remote server.	Review of the requirement validated that the requirement was satisfactorily covered.
EC Section 19295(c): The RAVBM shall not have the capability, including the optional capability, to tabulate votes.	Review of the requirement validated that the requirement was satisfactorily covered.
CVSS (3.2.4.1.a): Visual privacy - The ballot, any other visible record containing ballot information, and any input controls shall be visible only to the voter during the voting session and ballot submission.	Review of the requirement validated that the requirement was satisfactorily covered, as the voter will utilize their own hardware in the environment of their choosing.
CVSS (3.2.4.1.b): Auditory privacy - During the voting session, the audio interface of the voting system shall be audible only to the voter.	Review of the requirement validated that the requirement was satisfactorily covered, as the voter will utilize their own hardware in the environment of their choosing.
CVSS (3.2.4.1.c): Privacy of warnings - The voting system shall issue all warnings in a way that preserves the privacy of the voter and the confidentiality of the ballot.	Review of the requirement validated that the requirement was satisfactorily covered, as the voter will utilize their own hardware in the environment of their choosing.
CVSS (3.2.4.1.d): No receipts - The voting system shall not issue a receipt to the voter	Review of the requirements validated that this requirement was not

that would provide proof to another of how the voter voted.	applicable, as voter will implement their own hardware, and print their own marked ballot, as a RAVBMS system.
CVSS (3.2.4.2.a): No information shall be kept within an electronic CVR that identifies any alternative language feature(s) used by a voter.	Review of the requirement validated that the requirement was satisfactorily covered, as CVR's are not created.
CVSS (3.2.4.2.b): No information shall be kept within an electronic CVR that identifies any accessibility feature(s) used by a voter.	Review of the requirement validated that the requirement was satisfactorily covered, as CVR's are not created.

The Secure Select 1.0 systems allows for voter privacy. This is achieved by removing client side storage of marked selections. A voter is able to verify and print the paper cast record for submission to a local elections official.

4. Security and Telecommunications Testing Summary

SLI Compliance performed Security and Telecommunications testing on the Secure Select 1.0 RAVBMS. During the testing, SLI conducted a documentation review, functional security testing, and telecommunications and data transmission testing. A summary of each phase and the results are listed below.

Documentation Review

SLI conducted a documentation review of the TDP provided by Democracy Live for the Secure Select 1.0 RAVBMS. SLI evaluated the documentation for the following applicable portions of the CVSS:

Table 4A: Documentation Review	
CVSS Standard	**Result**
5.5 Vote Secrecy on DRE and EBM Systems	Review of the TDP validated that the requirement was satisfactorily covered.
6.1.2 Data Transmissions	Review of the TDP validated that the requirement was satisfactorily covered.
6.2 Design, Construction, and Maintenance Requirements	Review of the TDP validated that the requirement was satisfactorily covered.
6.2.1 Confirmation	Review of the TDP validated that the requirement was satisfactorily covered.
7.2 Access control	Review of the TDP validated that the requirement was satisfactorily covered.
7.2.1 General Access Control	Review of the TDP validated that the requirement was satisfactorily covered.
7.2.2 General Access Control	Review of the TDP validated that the requirement was satisfactorily covered.
7.4.5 Software Reference Information	Review of the TDP validated that the requirement was satisfactorily covered.

7.4.6 Software Setup Validation	Review of the TDP validated that the requirement was satisfactorily covered.

Functional Security

SLI next conducted functional security testing as part of the Security and Telecommunications testing on the Secure Select 1.0 RAVBMS. The testing consisted of 1) testing the relevant software and operating security system configuration, for pertinent vulnerabilities and 2) testing of hardware, including examination of unused hardware ports, and security measures applied to those ports. **Table 4B: Functional Security**, lists the applicable CVSS Standards, the testing performed, any vulnerabilities, along with the vendor response/mitigation when applicable.

Table 4B: Functional Security				
CVSS Standard	**Testing Performed**	**Vulnerability**	**Recommended Mitigation**	**Response**
5.5 Vote Secrecy on DRE and EBM Systems	Testing was performed to verify how the system handled a ballot being printed and the browser closed, as well as when the ballot is closed prior to being printed. Attempts were made to resume a ballot, as well as to determine if any ballot information resided in history or cache.	N/A	N/A	N/A
7.2.1 General Access Control	Testing was performed of multiple server setups which included an unrestricted test setup, and a data domain whitelist protected system to verify that the whitelisting of JavaScript Object	Possible attack vector would be whitelisting a commonly used JSON repository domain. So such domain whitelisting should remain jurisdiction or	Recommended mitigation is to minimize users and rights to web server, as well as to monitor JSON files and server audit logs as continuously as possible, while the web server	Democracy Live server administrators are in control of whitelisting domains allowed to host ballot definition files. By default,

	Notation (JSON) domains successfully blocks load of JSON files from an invalid domain.	vendor controlled specific	is running.	only Democracy Live owned domains will be allowed to host ballot definition files. If a county requires county hosted ballot definition files, only domains owned by counties will be added to the whitelist. No public or commonly used JSON repositorie s will be added to the whitelist at any time.
7.2.2 Access Control Identification	Testing was performed to verify the system's ability to correctly process invalid data domain white listings. Two different test systems were tested in order to verify that an open system accepts	N/A	N/A	N/A

	JavaScript Object Notation (JSON) ballot definition files from anywhere, and that the locked down SS-CA application successfully blocks non-whitelisted domains.			
7.2.4 Access Control Authorization	Testing was performed to verify the systems Invalid data domain whitelisting. Two different test systems to verify that an open system accepts JSON ballot definition files from anywhere, and that the locked down SSCA application successfully blocks non-whitelisted domains.	N/A	N/A	N/A
7.4.5 Software Reference Information	Testing was performed to confirm that the Secure Select 1.0 system contains a Verification URL that contains a Hash code Value that can be checked to verify if the source code has been modified.	Testing was unable to find a method of successfully modifying the server code to verify if the protection method was viable. In theory the functionality is there however at this point testing is unable to	N/A	Democracy Live confirms that the hash code verification page does, in fact, change with any change to the codebase.

		verify validity.			
7.4.6 Software Setup Validation	Testing was performed to confirm that the Secure Select 1.0 system contains a Verification URL that contains a Hash code Value that can be checked to verify if the source code has been modified.	N/A	N/A	N/A	
7.6 Telecommunications and Data Transmission	Tests were performed to verify that if the system utilizes electrical or optical transmission, that the ballot was sent via SSL, no receipt is utilized to verify. What is sent is a blank ballot, that does not contain any voter data or voting selections.	N/A	N/A	N/A	
7.8 Testing – Security	Confirmed that Secure Select 1.0 does not have, nor require, internet access once the ballot has been downloaded. There are no external connections from the ballot to any outside server or service. With the exception of sending the ballot to a connected printer to be printed, there are	N/A	N/A	N/A	

	no external connections to or from the ballot.			
7.8.1 Access Control	Testing was performed to confirm that access control was maintained. Attempts to attack the system included XSS, SQL Injection, Directory listings, and http login pages, as well as SSL certificate information.	N/A	N/A	N/A
7.8.2 Data Interception and Disruption	Verified that this system does not utilize telecommunications for the transmission of official voting data – only the delivery of a blank ballot that does not contain voter data or choice selections.	N/A	N/A	N/A

Telecommunications and Data Transmission Testing

Finally in conducting the Security and Telecommunications testing on the Secure Select 1.0 RAVBMS, SLI performed telecommunications and data transmission testing. SLI tested the communication of the Secure Select 1.0 system, including encryption of data, as well as protocols and procedures for access authorization. The following table, **Table 4C: Telecommunications and Data Transmission Testing,** outlines the testing performed, vulnerabilities, and the vendor response/mitigation when applicable.

Table 4C: Telecommunications and Data Transmission Testing			
CVSS Standard	**Testing Performed**	**Vulnerability**	**Response/Mitigation**
6.1.2 Data Transmission	Testing included transmissions of the Secure Select 1.0 SPA (Single Page	N/A	N/A

	Application) voting ballot that is served from a Hosted webserver, to the voter. Scans were performed to determine if there were any basic web server vulnerabilities in the initial serving of the browser application that houses the Secure Select 1.0 ballot. None were found.		
6.2. Design, Construction, and Maintenance Requirements	Verified that Secure Select 1.0 system consists of a SPA format ballot which is typically used for absentee and mail-in ballot marking. Secure Select 1.0 does not utilize specific telecommunications channels once the ballot has been downloaded and opened on the end voter's machine.	N/A	N/A
6.2.1 Confirmation	Testing included accessing of a ballot from the host and checking for confirmation. This requirement was determined to be not applicable, as the system only allows the voter to mark and confirm marked ballots prior to printing out a ballot summary card. There are no live connections from the application to a remote server. All selections are cleared after browser has been closed.	N/A	N/A

Security and Telecommunications Results

SLI found no discrepancies within Democracy Lives' Secure Select 1.0 RAVBMS.

SLI did identify two potential vulnerabilities, as listed in **Table 4B.**

5. Software Review Testing Summary

SLI Compliance performed a review of the Secure Select 1.0 software. The purpose of the review was to identify discrepancies within the software code, and compliance with the California Voting System Standards (CVSS). The results and vendor mitigation/response are listed in the following table:

| Table 5A: Source Code Review Discrepancy and Mitigation/Response ||
Discrepancy	Vendor Mitigation/Response
5.2.7.e: Dead Code – Two discrepancies written for the "Dead Code" (CVSS 5.2.7.e) requirement found in the source code base reviewed, as a result, two discrepancies were written against the code base.	Secure Select has been developed with multiple return statements in some functions as a method of defensive programming to keep application logic clear and concise. Democracy Live believes these discrepancies are acceptable for the following reasons. 1. Using multiple return statements to avoid complicated nesting logic is considered a best practice. 2. The files identified to not actually have any "dead code." All code is executable depending on logic conditions. 3. CVSS specifies it is ok to use multiple return statements in a function when using "defensive programming."
5.2.6.a-h: Sufficient Header Comments – Three discrepancies written for the "Sufficient Header Comments" (CVSS 5.2.6.a-h) requirement found in the source code base reviewed, as a result, three discrepancies were written against the code base.	Header comments are used to document and explain functionality of code. Democracy Live agrees additional comments can be added to the codebase to document all functions and is willing to include these comments in the next release of Secure Select.

IV. COMPLIANCE WITH STATE AND FEDERAL LAWS AND REGULATIONS

1. Elections Code Review

1) §19293 (b) Remote accessible vote by mail system standards adopted by the Secretary of State pursuant to subdivision (a) shall include, but not be limited to, all of the following requirements:

(1) The machine or device and its software shall be suitable for the purpose for which it is intended.
(2) The remote accessible vote by mail system shall preserve the secrecy of the ballot.

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(3) The remote accessible vote by mail system shall be safe from fraud or manipulation.

(4) The remote accessible vote by mail system shall be accessible to voters with disabilities and to voters who require assistance in a language other than English if the language is one in which a ballot or ballot materials are required to be made available to voters.

The system meets these requirements. The system demonstrated English, Spanish and Chinese languages, however with external translation services; the system can support other languages as required.

2) §19295 A remote accessible vote by mail system or part of a remote accessible vote by mail system shall do not any of the following:

(a) Have the capability, including an optional capability, to use a remote server to mark a voter's selections transmitted to the server from the voter's computer via the Internet.

(b) Have the capability, including an optional capability, to store any voter identifiable selections on any remote server.

(c) Have the capability, including the optional capability, to tabulate votes.

The system meets these requirements.

2. Section 508 and WCAG Compliance Review

Secure Select 1.0 was written to WCAG 2.0 guidelines to implement accessibility features. The system also complies with the applicable portions of Section 508.

V. Conclusion

The Democracy Live Secure Select 1.0 remote accessible vote by mail system, in the configuration tested and documented by the California Democracy Live Secure Select 1.0 Use Procedures, meets all applicable California and federal laws. The Democracy Live Secure Select 1.0 remote accessible vote by mail system is compliant with all California and federal laws.
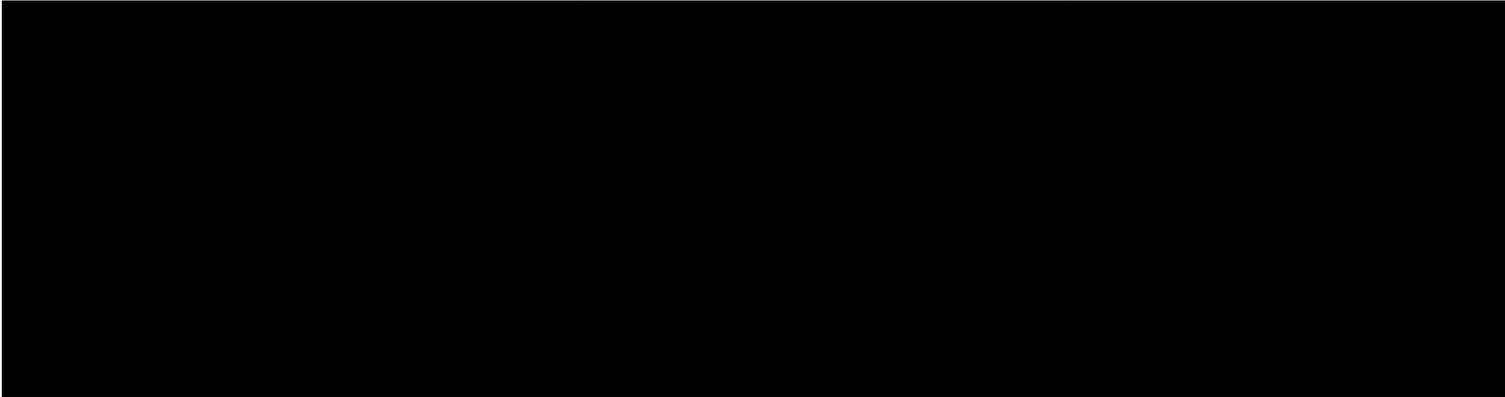
ATTACHMENT A

Democracy Live Secure Select 1.0 Pre-Test Survey

Q1 Name

Answered: 18   Skipped: 1

#	RESPONSES	DATE

Q2 Age

Answered: 19   Skipped: 0

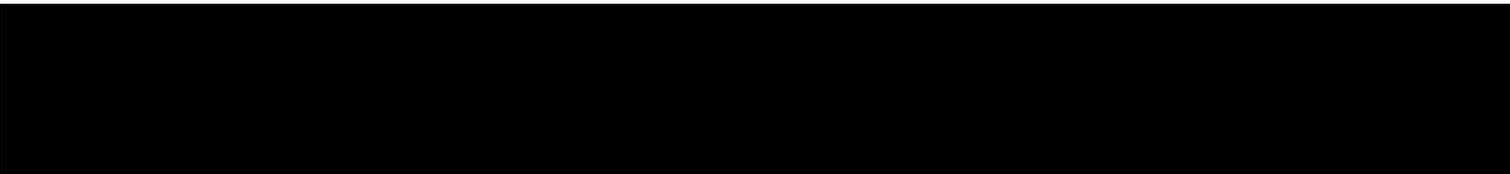| #	RESPONSES	DATE

Q3 Phone

Answered: 19   Skipped: 0
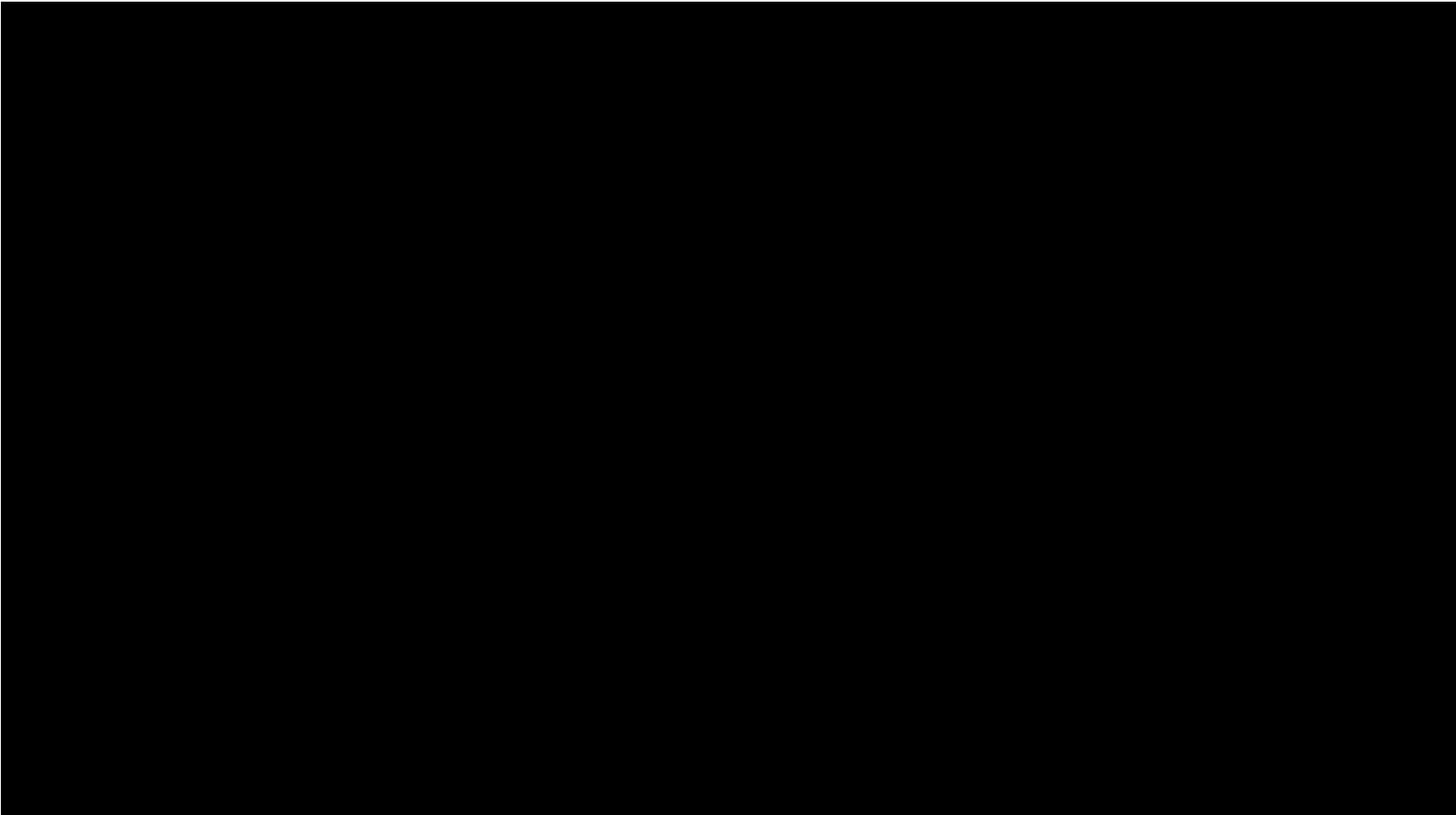
#	RESPONSES	DATE

Q4 Email

Answered: 19   Skipped: 0

Q5 Please describe the disabilities or difficulties you have that may interfere with you being able to mark a ballot privately and independently.

Answered: 18   Skipped: 1

#	RESPONSES	DATE
1	I am totally blind.	6/18/2017 2:44 PM
2	I work with the SOS on accessibility matters at the polling place and have been asked to assist.	6/15/2017 7:42 PM
3	Totally blind	6/15/2017 5:04 PM
4	I am almost totally blind, and cannot see ballots.	6/14/2017 4:49 PM
5	I am blind and do not trust accessible voting machines so would prefer to continue voting by absentee ballot. I am unable to fill out an absentee ballot independently because it requires sight.	6/14/2017 12:19 PM
6	Cerebral Palsy, which impacts my fine motor skills and speech.	6/14/2017 10:35 AM
7	legal blindness, can not read printed material	6/14/2017 10:02 AM
8	I have a physical disability and use a motorized scooter.	6/14/2017 9:58 AM
9	blindness	6/14/2017 6:41 AM
10	blind	6/14/2017 4:18 AM
11	Optic nerve hypoplasia	6/14/2017 12:12 AM
12	Totally blind. Also, can't do stairs. Would like the ability to vote at home which most others seem to take blithely for granted. The only means of "absentee voting" politicians and bureaucrats have seemed to come up with, so far, to make that happen is sending print ballots and calling the case closed. This is WAY overdue. Thanks for finally getting there!	6/13/2017 11:54 PM
13	I am totally blind in both eyes without any visual acuity at all, not even light perception.	6/13/2017 9:01 PM
14	I am totally blind and cannot read the print ballot or determine which holes pertain to which answer I wish to mark.	6/13/2017 8:20 PM

15	I am totally blind and cannot read the ballot or mark the ballot independently. It is difficult to get to my poling place so I have my husband mark my absentee ballot.	6/13/2017 7:49 PM
16	Legally blind for the past 16 years	6/13/2017 7:09 PM
17	totally blind	6/13/2017 7:07 PM
18	I am blind / visually impaired	6/13/2017 7:02 PM

Q6 Which language would you prefer voting in ?

Answered: 18   Skipped: 1
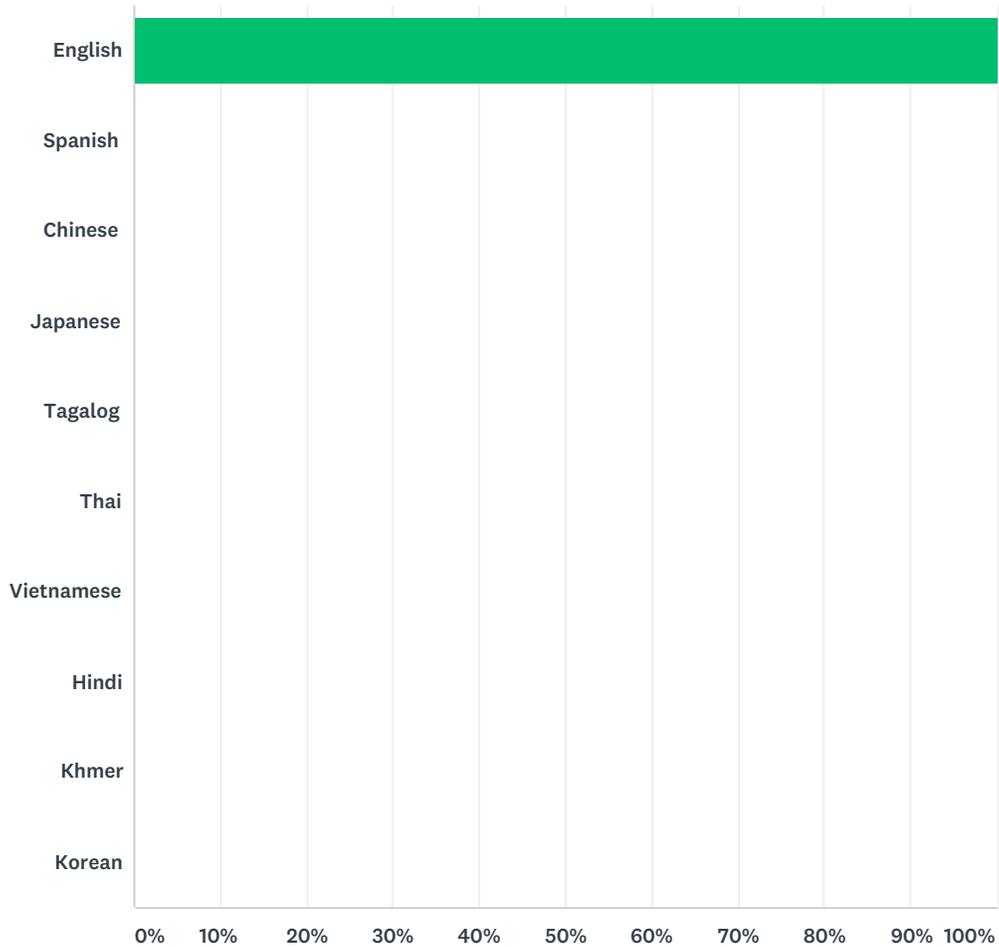
ANSWER CHOICES	RESPONSES	
English	100.00%	18
Spanish	0.00%	0
Chinese	0.00%	0
Japanese	0.00%	0
Tagalog	0.00%	0
Thai	0.00%	0
Vietnamese	0.00%	0
Hindi	0.00%	0

Khmer	0.00%	0
Korean	0.00%	0
TOTAL		18

#	OTHER (PLEASE SPECIFY)	DATE
1	English	6/13/2017 7:09 PM

Q7 Have you ever voted before?

Answered: 18   Skipped: 1
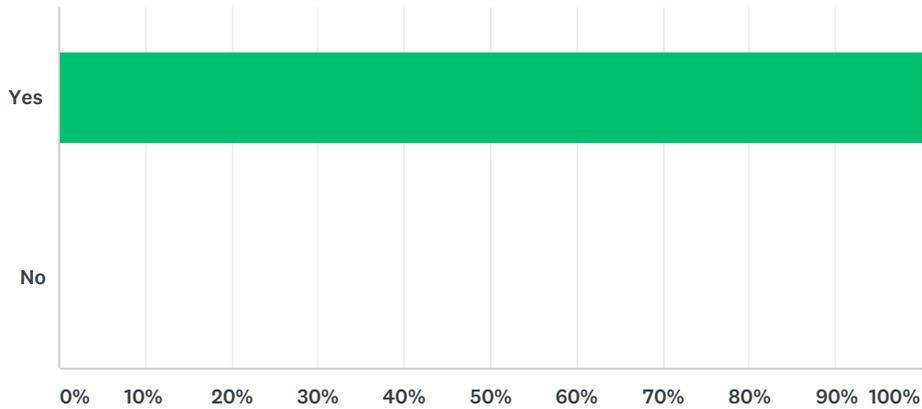
ANSWER CHOICES	RESPONSES	
Yes	100.00%	18
No	0.00%	0
TOTAL		18

Q8 If "No", what has prevented you from voting in the past?

Answered: 0   Skipped: 19

#	RESPONSES	DATE
	There are no responses.	

Q9 What method of voting do you use most often?

Answered: 18   Skipped: 1
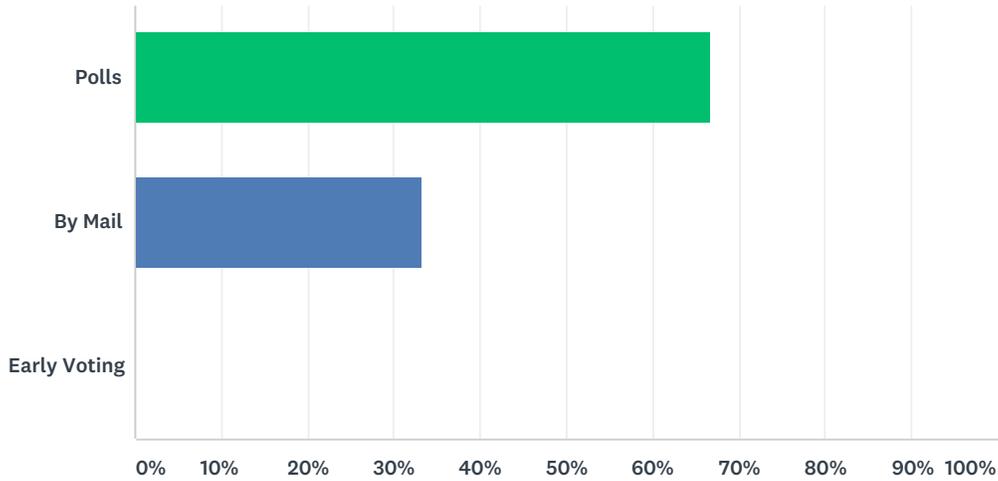
ANSWER CHOICES	RESPONSES	
Polls	66.67%	12
By Mail	33.33%	6
Early Voting	0.00%	0
TOTAL		18

#	OTHER (PLEASE SPECIFY)	DATE
1	I sometimes vote early, since I'm not sure my polling place is accessible.	6/13/2017 11:54 PM
2	When voting by mail, someone must mark the ballot and hope that my signature matches the signature on file.	6/13/2017 9:01 PM
3	accessable voting machine	6/13/2017 7:02 PM

Q10 Have you ever used a voting system with any special accessibility accommodations?
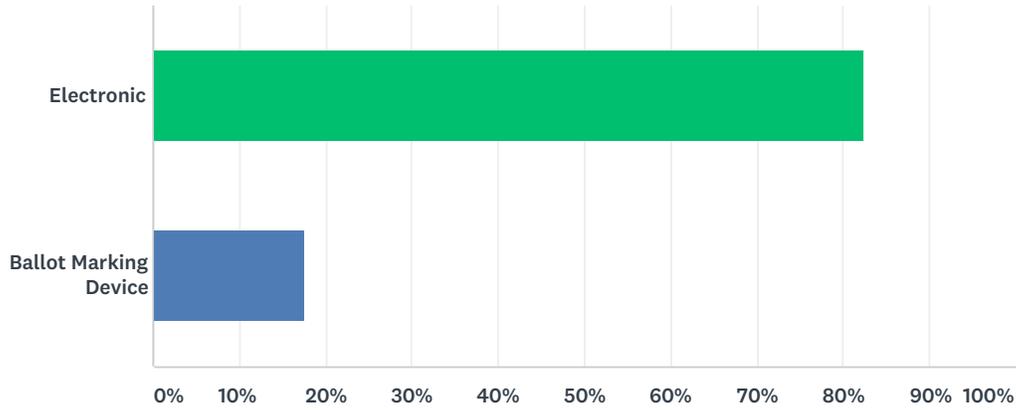
Answered: 19   Skipped: 0
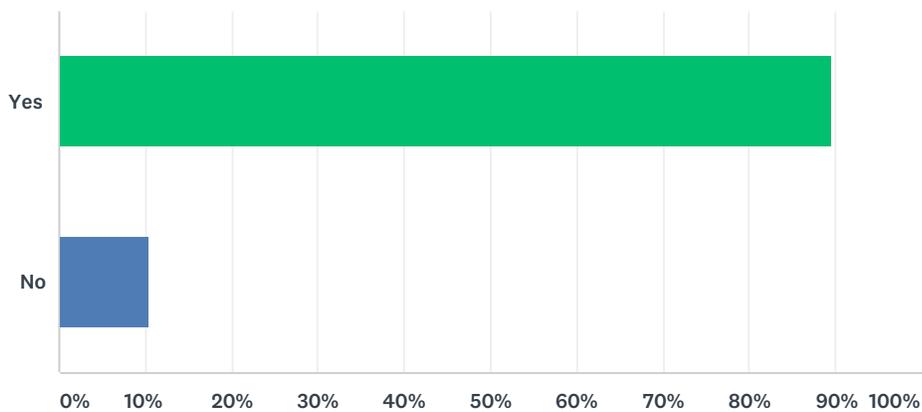
ANSWER CHOICES	RESPONSES	
Yes	89.47%	17

No	10.53%	2
TOTAL		19

Q11 If "Yes", which type of voting system?

Answered: 17   Skipped: 2

ANSWER CHOICES	RESPONSES	
Electronic	82.35%	14
Ballot Marking Device	17.65%	3
TOTAL		17

#	OTHER (PLEASE SPECIFY)	DATE
1	both DRE and BMD	6/15/2017 5:04 PM
2	electronic voting machine with talking menus	6/14/2017 12:19 PM
3	Being assisted by poll worker or a friend on a mail in vote.	6/14/2017 11:21 AM
4	Verbal machine with headphones	6/13/2017 7:09 PM
5	accessible voting machine for the blind and visually impaired	6/13/2017 7:02 PM

Q12 What operating system are you using?

Answered: 19   Skipped: 0
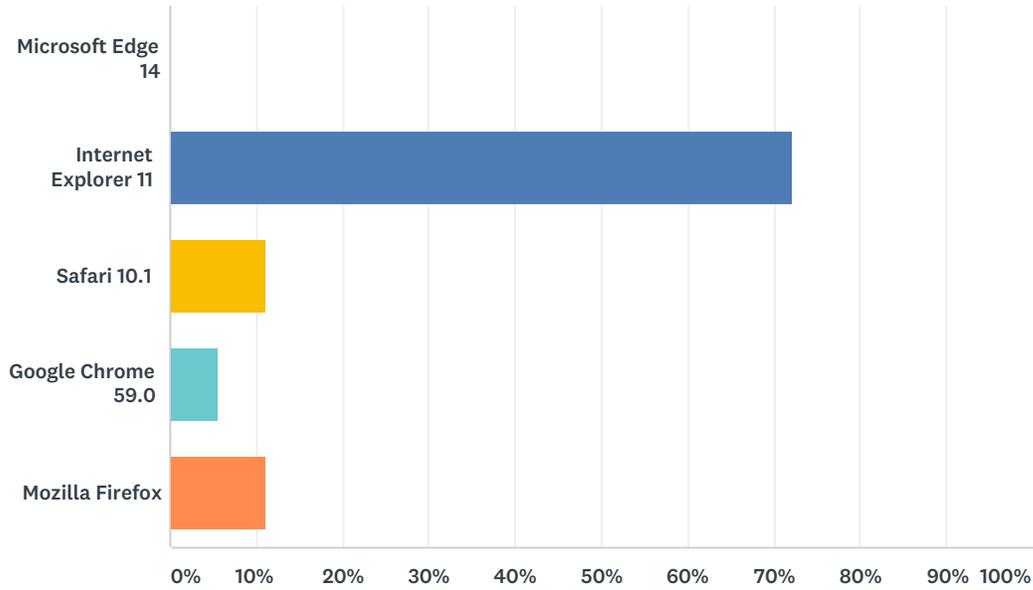
Democracy Live Secure Select 1.0 Pre-Test Survey
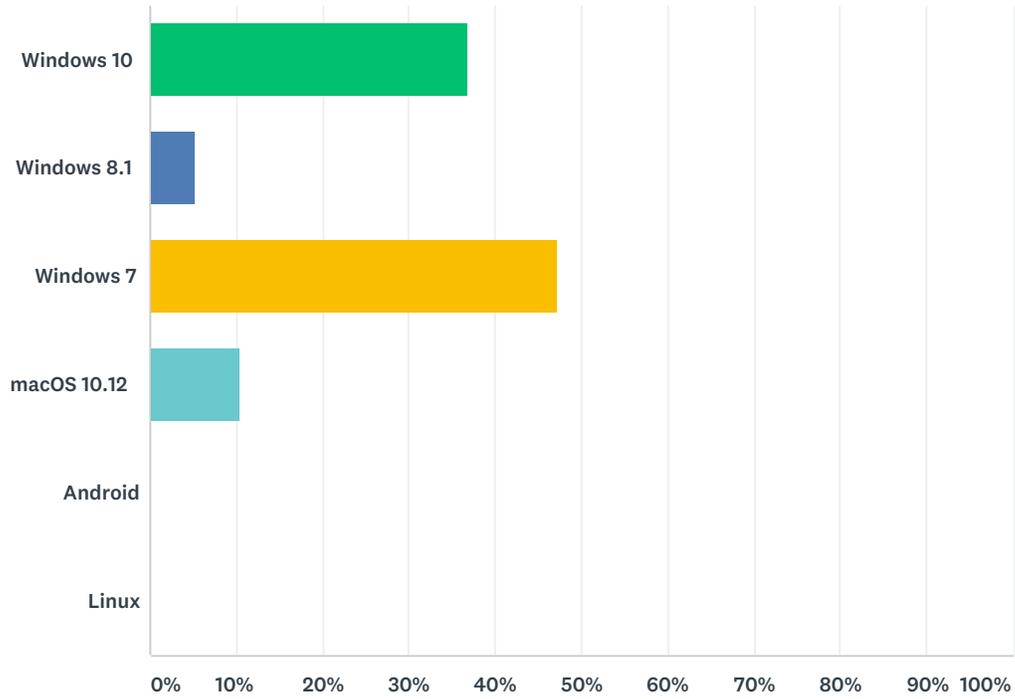
ANSWER CHOICES	RESPONSES	
Windows 10	36.84%	7
Windows 8.1	5.26%	1
Windows 7	47.37%	9
macOS 10.12	10.53%	2
Android	0.00%	0
Linux	0.00%	0
TOTAL		19

#	OTHER (PLEASE SPECIFY)	DATE
1	iOS	6/14/2017 11:27 AM
2	IOS 9.2 on my iphone	6/14/2017 12:25 AM
3	Home premium edition	6/14/2017 12:01 AM

Q13 What internet browser are you using?

Answered: 18   Skipped: 1

ANSWER CHOICES	RESPONSES	
Microsoft Edge 14	0.00%	0
Internet Explorer 11	72.22%	13
Safari 10.1	11.11%	2
Google Chrome 59.0	5.56%	1
Mozilla Firefox	11.11%	2
TOTAL		18

#	OTHER (PLEASE SPECIFY)	DATE
1	firefox	6/14/2017 11:27 AM
2	Internet Explorer 9?	6/14/2017 10:10 AM
3	with most recent updates	6/14/2017 12:01 AM

Q14 List the auxiliary devices and/or software you are using for electronic accessibility.

Answered: 14   Skipped: 5

Democracy Live Secure Select 1.0 Pre-Test Survey
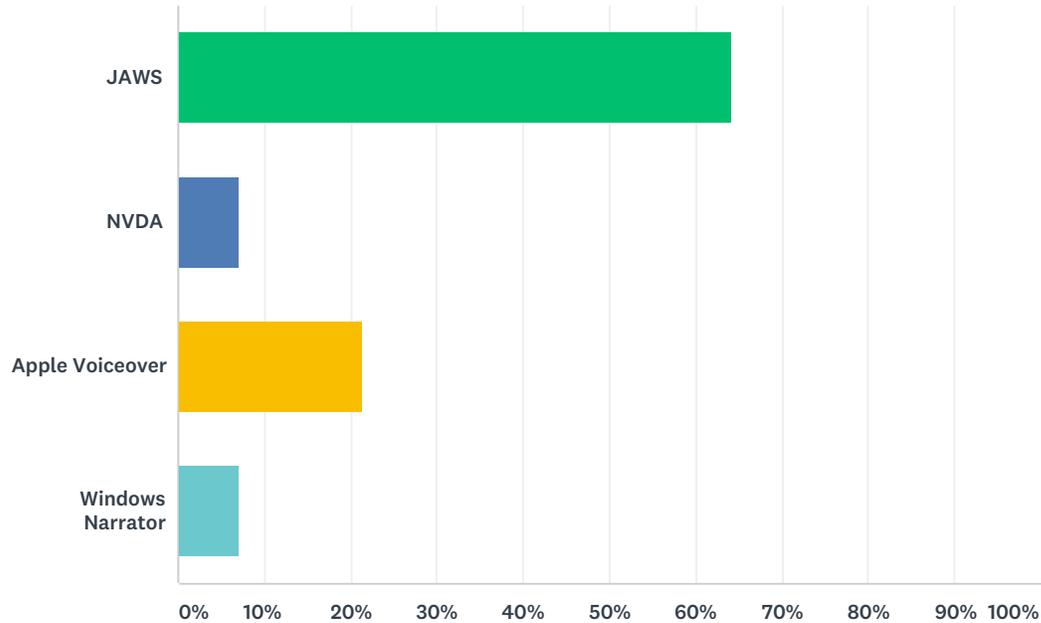
ANSWER CHOICES	RESPONSES	
JAWS	64.29%	9
NVDA	7.14%	1
Apple Voiceover	21.43%	3
Windows Narrator	7.14%	1
TOTAL		14

#	OTHER (PLEASE SPECIFY)	DATE
1	System Access	6/18/2017 2:48 PM
2	None.	6/15/2017 7:45 PM
3	Window-Eyes	6/15/2017 5:07 PM
4	Focus 80 braille display	6/14/2017 12:26 PM
5	I also use an iPhone with VoiceOver enabled.	6/14/2017 11:27 AM
6	Mouse keys, filter keys and sticky keys (accessibility features in Windows 7 (and 10).	6/14/2017 10:50 AM
7	Also have access to Window-Eyes and System Access. Can download JAWS at great need. Can also test on Samsung Galaxy S6 w Google TalkBack w optional Bluetooth keyboard if desired.	6/14/2017 12:01 AM
8	Jws for Windows for speech and a Power Braile forty on a Dell Desktop computer.	6/13/2017 9:06 PM
9	iPad	6/13/2017 7:20 PM
10	Window-Eyes	6/13/2017 7:14 PM
11	JAWS 18	6/13/2017 7:10 PM

Q15 What is the make and model of the hardware you are using (PC, Laptop, Tablet, etc.)?

Answered: 19   Skipped: 0

#	RESPONSES	DATE
1	Nenovo IdeaPad	6/18/2017 2:48 PM
2	HP Pro Desk	6/15/2017 7:45 PM
3	desktop PC	6/15/2017 5:07 PM
4	labtop	6/14/2017 4:51 PM
5	Dell desktop PC, Optiplex 7010	6/14/2017 12:26 PM
6	Sony Vio computer. Its a PC using windows 7.	6/14/2017 11:27 AM
7	Dell Desktop PC	6/14/2017 10:50 AM
8	Lenovo desktop	6/14/2017 10:10 AM
9	Dell PC	6/14/2017 10:03 AM
10	pc	6/14/2017 6:41 AM
11	Apple MacBook Pro	6/14/2017 4:23 AM
12	iPhone 5s	6/14/2017 12:25 AM
13	Dell OptiPlex 755 (PC)	6/14/2017 12:01 AM
14	This is a Dell PC, desktop purchased in 2011.	6/13/2017 9:06 PM
15	Dell Laptop PC	6/13/2017 8:24 PM
16	Dell Optiplex 3010	6/13/2017 7:53 PM
17	PC And tablet	6/13/2017 7:20 PM
18	PC, custom, from Standard computers, APX 64-based system, 64-bit	6/13/2017 7:14 PM
19	Dell PC	6/13/2017 7:10 PM

Q16 What is the printer make and model you are using?

Answered: 19   Skipped: 0

#	RESPONSES	DATE
1	HP DeskJet	6/18/2017 2:48 PM
2	Xerox Copier - model unknown	6/15/2017 7:45 PM
3	Canon MX922	6/15/2017 5:07 PM
4	I do not know	6/14/2017 4:51 PM
5	HP Laserjet P3005DN	6/14/2017 12:26 PM
6	HP Lazar jet 1102	6/14/2017 11:27 AM
7	HP Laserjet P3011	6/14/2017 10:50 AM
8	HP photosmart C4400 series	6/14/2017 10:10 AM
9	HP	6/14/2017 10:03 AM
10	HP	6/14/2017 6:41 AM
11	Brother multifunction printer	6/14/2017 4:23 AM
12	Epsom	6/14/2017 12:25 AM
13	none	6/14/2017 12:01 AM
14	This printer is a Laser Jet Hp Printer.	6/13/2017 9:06 PM
15	HP Monochrome Laser HP1102 Professional	6/13/2017 8:24 PM

16	HP Laser Jet P1505n	6/13/2017 7:53 PM
17	Panasonic 550	6/13/2017 7:20 PM
18	HP Laserjet P2015	6/13/2017 7:14 PM
19	HP laser professional 1102?	6/13/2017 7:10 PM

# Q17 What antivirus software are you using?

Answered: 12   Skipped: 7
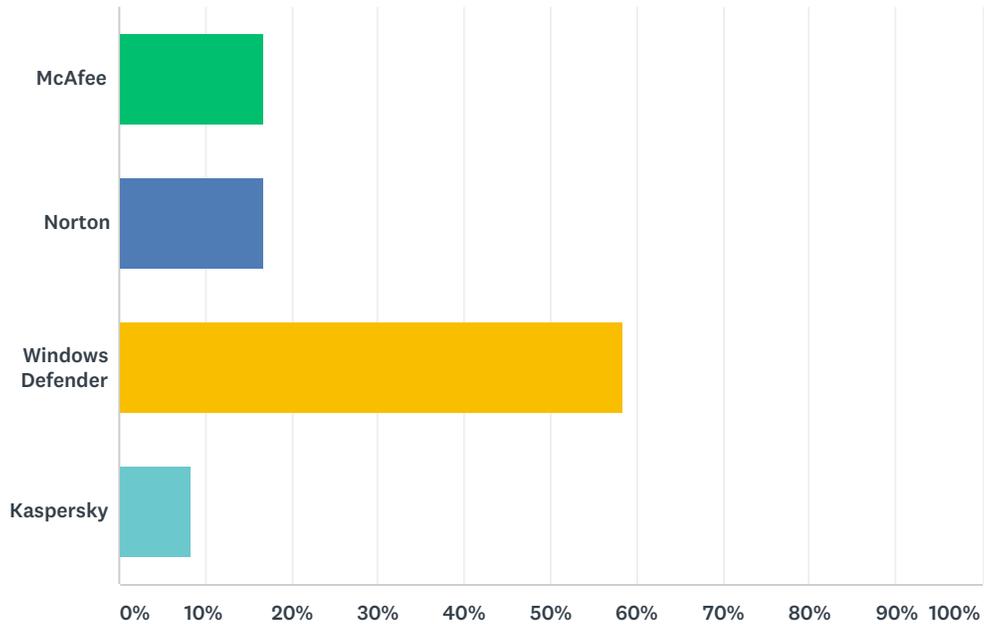
ANSWER CHOICES	RESPONSES	
McAfee	16.67%	2
Norton	16.67%	2
Windows Defender	58.33%	7
Kaspersky	8.33%	1
TOTAL		12

#	OTHER (PLEASE SPECIFY)	DATE
1	Other MS	6/15/2017 5:07 PM
2	Microsoft security essentials	6/14/2017 11:27 AM
3	Malware Bytes	6/14/2017 10:10 AM
4	nod32	6/14/2017 6:41 AM
5	don't know	6/14/2017 4:23 AM
6	Not sure of my antivirus software. Nor do I know whether or not I have antivirus software	6/14/2017 12:25 AM
7	Microsoft Security essentials?	6/14/2017 12:01 AM
8	Microsoft Security Essentials.	6/13/2017 9:06 PM
9	Microsoft Security	6/13/2017 7:53 PM

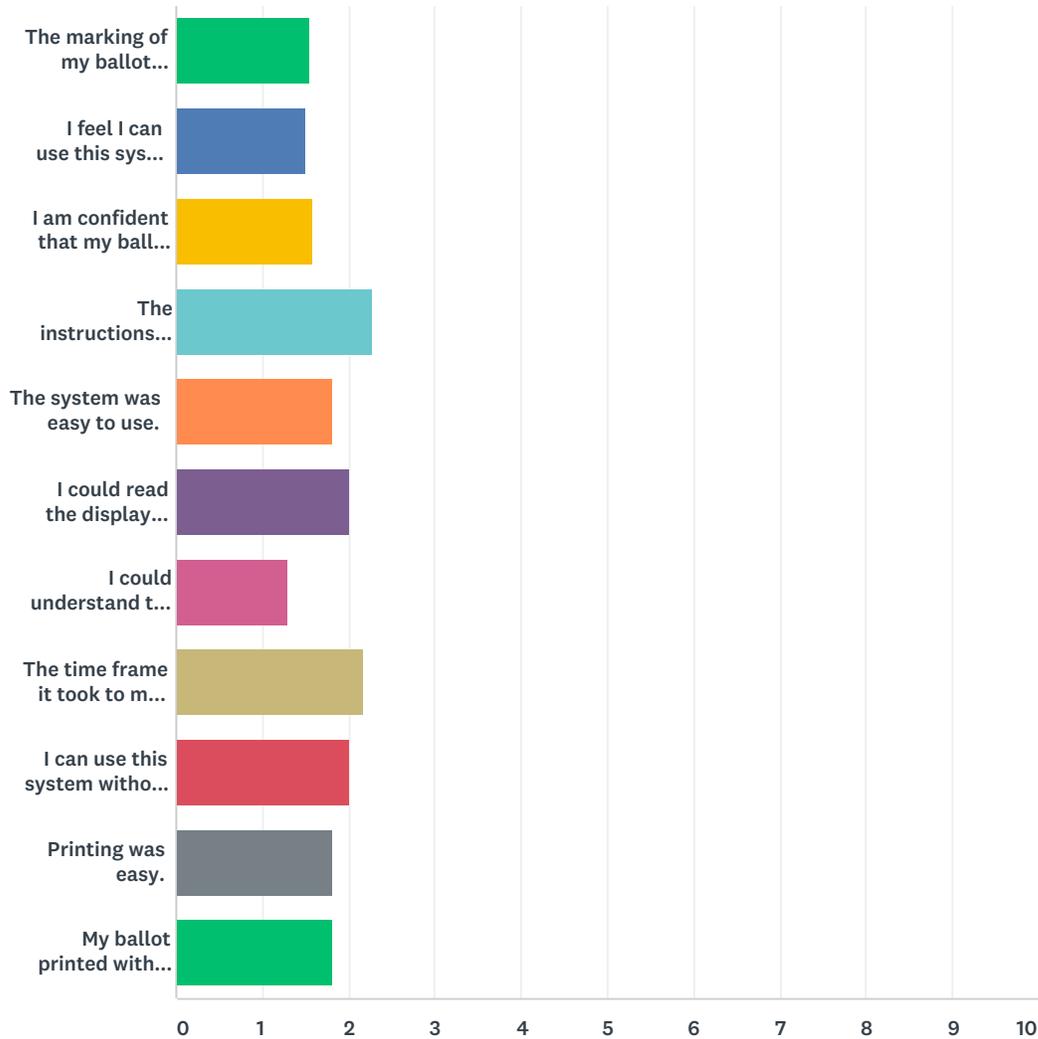| 10 | AT&T | 6/13/2017 7:20 PM |
| 11 | eSet Nod32 | 6/13/2017 7:14 PM |
| 12 | ESET NOD32 Antivirus. | 6/13/2017 7:10 PM |

Q18 Is your antivirus software up to date?

Answered: 19   Skipped: 0
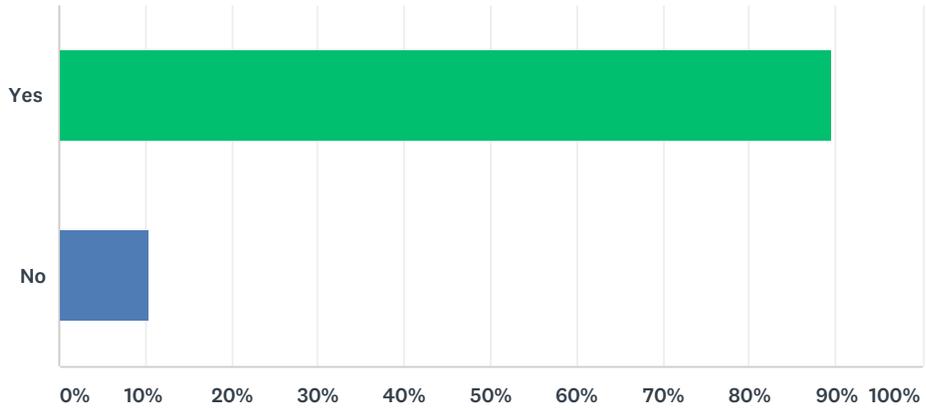
ANSWER CHOICES	RESPONSES	
Yes	89.47%	17
No	10.53%	2
TOTAL		19

Q1 For each question, please indicate how strongly you agree or disagree with the statement.
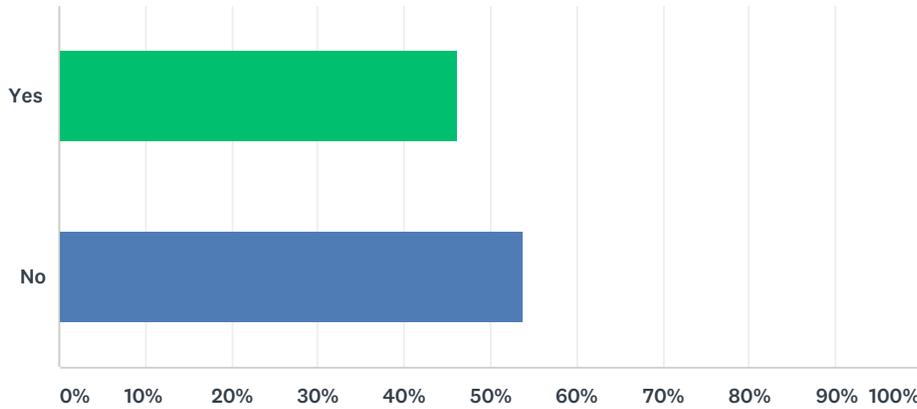
Answered: 13   Skipped: 0

	AGREE STRONGLY	AGREE SOMEWHAT	NEUTRAL	DISAGREE SOMEWHAT	DISAGREE STRONGLY	TOTAL	WEIGHTED AVERAGE
The marking of my ballot method was private.	61.54% 8	23.08% 3	15.38% 2	0.00% 0	0.00% 0	13	1.54
I feel I can use this system to mark my ballot independently.	75.00% 9	8.33% 1	8.33% 1	8.33% 1	0.00% 0	12	1.50
I am confident that my ballot was recorded accurately.	58.33% 7	25.00% 3	16.67% 2	0.00% 0	0.00% 0	12	1.58
The instructions were clear and complete.	54.55% 6	18.18% 2	0.00% 0	0.00% 0	27.27% 3	11	2.27
The system was easy to use.	50.00% 6	33.33% 4	8.33% 1	0.00% 0	8.33% 1	12	1.83
I could read the display easily.(If applicable)	66.67% 4	0.00% 0	16.67% 1	0.00% 0	16.67% 1	6	2.00

I could understand the speech output. (If applicable)	80.00% 8	10.00% 1	10.00% 1	0.00% 0	0.00% 0	10	1.30
The time frame it took to mark my ballot was what I expected.	54.55% 6	18.18% 2	0.00% 0	9.09% 1	18.18% 2	11	2.18
I can use this system without technical help.	54.55% 6	27.27% 3	0.00% 0	0.00% 0	18.18% 2	11	2.00
Printing was easy.	63.64% 7	9.09% 1	18.18% 2	0.00% 0	9.09% 1	11	1.82
My ballot printed with the correct selections.	58.33% 7	16.67% 2	16.67% 2	0.00% 0	8.33% 1	12	1.83

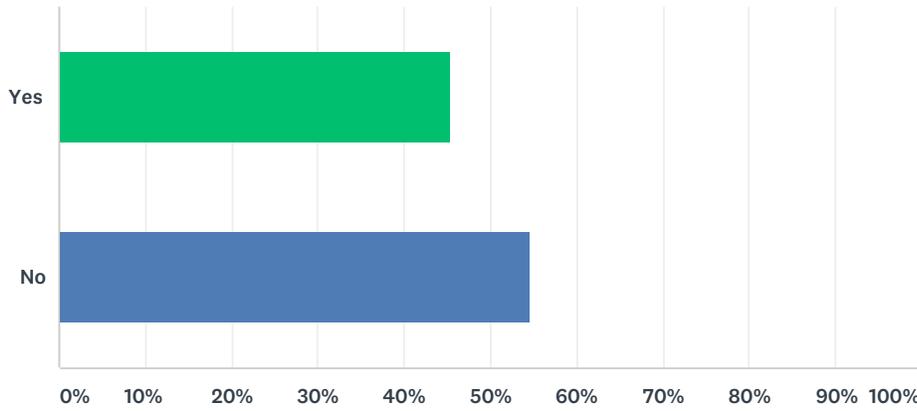# Q2 Would you be satisfied using this system to mark your ballot in an election?

Answered: 13   Skipped: 0

ANSWER CHOICES	RESPONSES	
Yes	46.15%	6
No	53.85%	7
TOTAL		13

Q3 Would you rather mark your ballot using another method?

Answered: 11   Skipped: 2

ANSWER CHOICES	RESPONSES	
Yes	45.45%	5
No	54.55%	6
TOTAL		11

Q4 If you prefer another method, what method would you prefer?

Answered: 8   Skipped: 5

#	RESPONSES	DATE
1	LA County BMD	7/18/2017 9:02 PM
2	I don't mind this system, but want to be able to e-mail my ballot and I couldn't successfully download the instructions for that part of the process.	6/19/2017 4:41 PM
3	Electronic voting at polls. Does not require my use of, or interaction with print. If I must mail something in print, it requires a sighted person. Independence lost! It's like being thrown back before women's suffrage or the advent of black folks being able to vote.	6/18/2017 4:51 AM
4	N/A	6/17/2017 9:25 PM
5	The current vote-by-mail process is more accessible and easier to complete.	6/16/2017 3:00 PM
6	I'd prefer a touch tone phone as an alternative to be available for those that are not blessed to have or be able to use a computer.	6/16/2017 1:36 PM
7	Voting by touch tone phone would also be great!	6/16/2017 1:14 PM
8	I usually vote absentee, but need a sighted person's help	6/16/2017 9:43 AM

Q5 Do you have any suggestions for changes on this system and/or any other comments you would like to provide?

Answered: 12   Skipped: 1

#	RESPONSES	DATE
1	I will send my suggestions to the Sec of State's office separately.	7/18/2017 9:02 PM
2	Voter should have to enter his/her address manually; too easy to fake.	7/5/2017 11:12 AM
3	The download appeared to be a PDF document and that is apparently what precluded me from a successful download. It would be better to have a document integrated into the system to show how to e-mail back the document.	6/19/2017 4:41 PM
4	If I had to mail it I would have an issue in getting my envelope address. other than that the system was great	6/18/2017 8:34 PM
5	I'm disappointed that the paranoya and fear mongering of those who are terrified that their votes will be misappropriated is allowing mine to be negated. Further, the system in question must be adjusted to be truly accessible, which IT IS NOT currently. It is clunky at best. The first question of this survey was whether I believed the MARKING of my ballot was private. The marking of the ballot itself is private and allows for independence, but if you force print down our throats, you negate those two very important things which are JUST AS important as a vote's lack of corruptability.	6/18/2017 4:51 AM
6	The time limit for filling out the ballot needs to be increased. It took me four tries to fill in my general election ballot because the system kept timing me out and kicking me back to the start of the process. Also, there is a problem with the language selection buttons on the top of the pages. The first language choice is an unlabeled graphic. It needs alt text to allow a screen reader user to know what language is being indicated.	6/17/2017 9:25 PM
7	Simplify the process for printing out the ballot and mailing it. The sequence of instructions seems out of order. It would be better to have you complete your selections first, then go through the process of printing out the materials to mail your ballot back in.	6/16/2017 3:00 PM
8	In the initial instructions, needing to have a scanner was not made clear. Actually, the initial survey asked about operating system, computing device, and printer, but there was no mention of a scanner or ocr program.	6/16/2017 1:36 PM
9	Instructions were not clear on how to submit the ballot after printing. We do have both a scanner and printer, but are unable to verify if the method we chose to send it by email was the correct method, a pdf image. This system would be great if our ballot could just be transmitted without having to scan a printed copy.	6/16/2017 1:14 PM
10	I wasn't able to log out of one of the ballots. When I did log out, I went back in, and it did not tell me that I had already voted. I'm concerned about that. I'm thinking it was because it was a test, and that if I really had voted it would not let me vote again.	6/16/2017 10:14 AM
11	The printing process which I chose to implement as a saved PDF had some issues but they may have been on my end, i.e. Office13 and its interactions with Adobe probably need soe technical troubleshooting. I was unable to test actual printing to paper. Definitely have screen reader users test for verbosity on the ballots as some folks may be confused by the repetition of the number of choices, i.e. when scrolling down the list you hear 35 repeated for each selection. That may have to do with the verbosity level of the screen reader. Again, just needs blind folks with screen readers to test the final ballot formats. Overall I am very satisfied. .	6/16/2017 9:44 AM
12	I do not know this system that well	6/16/2017 9:43 AM