

From: Harvie Branscomb <harvie@electionquality.com>
Sent: Monday, July 15, 2013 2:50 AM
To: Public UVS Panel; Al Davidson (Temporary)
Cc: Suzanne Staiert; 'George Leing'; Johnson, Debra - Clerk and Recorder; waynewilliams@elpasoco.com; Deb Gardner; Faith Gross; Hilary Rudy; harvie@electionquality.com
Subject: Invitation for Public Comment on Voting System Requirements
Attachments: Branscomb_UVSRequirements-PublicComments_3hb.doc

To the Uniform Voting System committees and related staff

I have attached my detailed comments and observations and suggestions for the system requirements section of the UVS RFP. Unfortunately in brief time available it was not possible to comment on all of the sections, not was it possible to add to the document all the portions that needed to be added. With extra time much more could be done to improve this document. I hope that the sample that I have provided will tell that story effectively. There will undoubtedly be typos in my comments and I apologize for that.

Thanks very much for making the Draft RFP available even if for such a short period of time.

I hope that there will be future opportunities to return to this point and comment positively on a much more agreeable and beneficial document.

Harvie Branscomb
Member, CO UVS Public Participation Panel

----- Original Message -----

Subject: Invitation for Public Comment on Voting System Requirements
Date: Mon, 08 Jul 2013 13:57:28 -0500
From: CO Secretary of State <ColoSecofState@public.govdelivery.com>
Reply-To: ColoSecofState@public.govdelivery.com
To: harvie@electionquality.com

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Invitation for Public Comment
on
Voting System Requirements

For a Uniform Voting System in Colorado

Secretary of State Scott Gessler is moving Colorado to a statewide Uniform Voting System. Under a uniform system, all Colorado voters will have the same voting experience on the same voting equipment. The processes for issuing, casting and counting votes will be uniform throughout the state.

Part of the selection process is asking vendors to propose voting equipment through a Request for Proposal (RFP) that will be issued August 1, 2013.

The RFP will contain “system requirements”. Voting system vendors will use these requirements in developing their proposals.

We have posted a working draft of these requirements on the Secretary of State website for public review and comment between now and July 14, 2013. The document is posted in a MS Word format so it may be edited. Please give us your thoughts.

- If there are requirements that you do not believe are necessary, please explain why.
- If there are new requirements that you propose, please add and explain why you believe they should be included.
- If you believe a requirement should be edited, please provide the suggested edits and any relevant comments.

To access the document and return it with your comments, follow these steps:

1. **Download/Save** the document to your computer, (do NOT edit directly on the website)
2. Make the edits or comments
3. Save and email the completed document to publicparticipationpanel@sos.state.co.us by July 14.

From July 8th through July 14th the draft system requirements can be found and downloaded at:

<http://www.sos.state.co.us/pubs/elections/VotingSystems/files/2013/UVSRequirements-PublicComments.doc>.under the “**Uniform Voting System**” heading



Scott Gessler
Secretary of State

Invitation for Public Comment on Voting System Requirements For a Uniform Voting System in Colorado

Colorado Secretary of State Scott Gessler intends to select a Uniform Voting System so all voters in all Colorado counties have the same voting experience on the same voting equipment and the processes for issuing, casting and counting votes will be uniform throughout the state.

Part of the selection process is asking vendors to propose voting equipment through a Request for Proposal (RFP) that will be issued August 1, 2013.

The RFP will contain "system requirements" that vendors will document whether or not they meet with any proposed system.

We have posted a working draft of these requirements on the Secretary of State website for public review and comment between now and July 14, 2013. The document is posted in a MS Word format so it may be edited.

- If there are requirements that you do not believe are necessary, please explain why.
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under the "**Uniform Voting System**" heading.

State of Colorado

Department of State



Uniform Voting System DRAFT – July 3, 2013

**RFP # CDOS-UVS-2013-01
Request for Proposal**

**Appendix B
System Requirements Table**

INSTRUCTIONS FOR COMPLETING SYSTEM REQUIREMENTS TABLES

NOTE: For the public input process, we have removed the Response Code column to provide more room for public comments.

The Vendor must assign a Response Code to each listed requirement. The Response Code values and meanings follow:

- 1 – The proposed solution provides full functionality for the requirement. Some configuration may be necessary. This functionality is considered part of the base solution cost provided in the Cost Proposal Base Cost category.
- 2 – The proposed solution provides partial functionality for the requirement. Customization and additional costs are required to meet full functionality. In such cases, the Vendor shall provide a description, in the Vendor Response column, of the partial functionality provided. If customization is proposed by vendor to meet full functionality, Customization Costs to provide complete functionality shall be included in the Cost Proposal in the Customization Cost category.
- 3 – The proposed solution does not provide the functionality required for the requirement. Customization and additional costs are required to meet full functionality. If customization is proposed, Customization Costs to provide complete functionality shall be included in the Cost Proposal in the Customization Cost category.
- 4 – The specific requirement is not met and the vendor does not propose a customization or service to meet it. In such cases the Vendor shall provide, in the Vendor Response column, an explanation of the reason(s) for not meeting the requirement, including any potential workaround options.
- 5 – The Vendor is not proposing a solution for this requirement or others within the requirement category, but is proposing solutions to requirements in other Appendix B table categories. For example, a vendor may be proposing a solution that addresses Scanning and Tabulation requirements, but is not proposing a solution for Electronic Voting Equipment. In this example, the vendor would mark all Electronic Voting Equipment requirements with a Response Code of “5”.

CDOS may include a Note at the end of a requirement statement requesting information from vendors. Vendors should address the Note by providing answers or information in the Vendor Response column. If the answer or information is lengthy and is provided in another area of the vendor’s RFP response, a specific reference to that area may be provided in the Vendor Response column.

System Requirements Tables for the following categories of requirements are contained in this Appendix B. Each category is further divided into sub-categories within the System Requirements tables.

- A – Election Management System (EMS)
- B – Polling Location Ballot Scanning and Tabulation Equipment
- C – Central Ballot Scanning and Tabulation Equipment
- D – Electronic Voting Equipment
- E – Ballot Envelope Scanning and Signature Verification
- F – Vendor Training and Support
- G – Certification, Auditing, Testing, Security and Documentation

The Requirements tables are set up to not allow rows to break across pages. If a vendor response is long enough to cause a table row to be longer than one page can handle, please change the row property for that particular row to allow it to break across pages.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Election Creation	A-1	Allow county and state election officials the ability to generate and maintain an administrative database containing the definitions and descriptions of political subdivisions and offices within their jurisdiction.	<p>“definitions and descriptions”? Sounds like the border database. How about “database that contains and can distinguish between identities of political subdivisions...”</p> <p>No database, election definition, ballot layout or ballot content, cast vote record, contents of memory card or report or log of any kind shall be treated as proprietary to the vendor or any other party.</p>
Election Creation	A-2	Provide for the definition of political and administrative subdivisions where the list of candidates or contests may vary within the voting location and for the activation or exclusion of any portion of the ballot upon which the entitlement of a voter to vote may vary by reason of place of residence or other such administrative or geographical criteria.	<p>A better way of putting this is: Provide for the entry, selection and reporting of data for political and administrative subdivisions wherein the list of candidates or contests may vary . Provide for the inclusion or exclusion of any contests depending upon specific list of overlaying districts. Provide for exclusion from tabulation of any contests by reason of place of residence or other such administrative or geographical criteria.</p> <p>It is a public policy issue whether any ballot to be counted only for federal and state should be especially counted selectively through partial exclusion rather than being duplicated such that all votes on the ballot are counted. I would hope that this requirement is not intended to presuppose that the decision is that certain ballots will be selectively counted. If so, then we should be concerned about the identity of the voter of a ballot becoming associated with the ballot.</p>
Election Creation	A-3	Provide software capability for the creation of newly defined elections and the retention of previously defined election formats. The system shall be designed so as to facilitate error-free definition of elections.	<p>What is the difference between “defined elections” and ‘defined election formats’?”</p> <p>“defined election formats should be specified by the CDOS in rule. Such formats should allow for interoperation of ballot design software with EMS systems and tabulation systems.</p> <p>Have database backup capabilities adequate to allow full recovery in case of damage to or loss of hardware.</p>

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Election Creation	A-4	Generate all required master and distributed copies of the voting program in conformance with the definition of the ballot for each voting location and voting device, including devices required to facilitate mail-in voting and voters with disabilities.	<p>“definition of the ballot” and “voting location” are unrelated things. What is the “voting program”?</p> <p>“Generate a master copy of the election definition in a standardized, authorized format that can be easily copied for distribution to each voting location and each authorized voting device regardless of manufacturer including any devices required to facilitate mail-in voting and voters with disabilities.</p> <p>Facilitate the installation and auditing of the “trusted build” as required in CDOS rule XXX</p>
Election Creation	A-5	Provide for all distributed copies of the voting program, resident or installed, in each voting device to include all software modules required to monitor system status and generate machine-level audit reports, to accommodate device control functions performed by voting location officials and maintenance personnel, and to accept and accumulate votes.	Provide for all installed copies of the trusted build in each voting device to monitor log and report changes of system status
Election Creation	A-6	Provide for a unified, integrated centralized database that allows global edits. Note: Please describe how the system minimizes the need to update a particular data element in multiple locations for a change made to that data element anywhere within the database.	Provide for a software and database structure that facilitates avoidance of repetitive tasks and that logs and reports the contents of all edits.
Election Creation	A-7	Provide a mechanism for executing test procedures which validate the correctness of election programming for each voting device and ballot style and ensure that the ballot display corresponds with the installed election program.	Provide recommended test procedures and conforming system functions that permit testing without use of any “test mode”, to confirm the validity of the trusted build, to confirm the operation of equipment as designed, to confirm that the election definition functions correctly for each election, each voting device, each ballot style, each contest and each contest choice for all forms of entry of voter intent.

**SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM
A – ELECTION MANAGEMENT SYSTEM (EMS)**

Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Election Creation	A-8	Be able to receive data electronically from the Secretary of State and counties via electronic storage media or data transfer in an agreed upon format that contains, at a minimum, the following data: <ul style="list-style-type: none"> a. Full candidate name b. Candidate sequence, title and text of ballot questions, and voting language options c. Office name d. Contest name e. Number to vote for each office f. Party affiliation g. Number of eligible registered voters at the precinct h. Number of active registered voters at the precinct 	Be able to receive the election definition electronically from the Secretary of State and counties via electronic storage media or data transfer in a CDOS authorized format that in printed form is human readable and that contains, at a minimum, the following data:
Election Creation	A-9	Be capable of returning data electronically to the Secretary of State and counties via electronic storage media or other data transfer in an agreed upon format that contains, at a minimum, the following information: <ul style="list-style-type: none"> a. Full candidate name b. Office name c. Contest name d. Number of votes for candidates and ballot questions e. Number of votes against ballot questions f. Number of people voting summary and by party affiliation (if applicable) g. Number of registered voters at the precinct level (by party affiliation if applicable) 	Be capable of returning data electronically to the Secretary of State and counties via electronic storage media or other data transfer in a CDOS authorized format that is in printed form human readable and contains, at a minimum, the following information: Have database backup capabilities adequate to allow full recovery in case of damage to or loss of hardware.
Election Creation	A-10	Allow the EMS user the ability to create custom voter instructions that may include images.	Provide a function to design and print or display voter instructions in multiple languages to be used on paper including the ballot or on electronic displays that includes digital pictures or other images
Election Creation	A-11	Provide the flexibility to have an election coded by a vendor, county, state or other third party and import or export as necessary.	What is election coding? Provide for security such that no third party could alter the installed trusted build or election definition or any other software used without permission of the Designated Election Official.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Election Creation	A-12	Accommodate multiple languages (English and Spanish required). Note: Please explain the capabilities of your system to handle multiple languages.	
Election Creation	A-13	Allow for a mock election setup and support for public use prior to the initiation of a live election.	Provide for mock election safe testing and public hands-on demonstration and practice prior to use in a live election
Ballot Creation	A-14	Provide for standard ballot layouts.	Provide for compatibility with at least one CDOS authorized format for standard ballot layouts
Ballot Creation	A-15	Provide user ability to customize the standard ballot layouts.	Provide for authorized user ability to create and customize ballot layouts with full logging of all activities.
Ballot Creation	A-16	Provide user ability to create new ballot layouts.	Not needed
Ballot Creation	A-17	Allow for creation of a multi-page ballot. Note: Please explain how your system handles the creation of multi-page ballots.	Do the multi page ballots have a code used to match them? ;This is an important public policy issue to be discussed. Provide for flexibility in how the distribution of contests on multiple page is organized
Ballot Creation	A-18	Have the capability to reprogram a ballot for an electronic voting device. Note: Please explain the process and procedure, with time frames, required to re-program a ballot on the electronic voting device in the event that there is a change to a name or contest on the ballot in the final few weeks before an election.	What is the electronic voting device? Possible duplication of A-15
Ballot Creation	A-19	For each election, generate and maintain a contest and candidate database and provide for the production or definition of properly formatted ballots and electronic images. This database will be used by the system to format ballots or edit formatted ballots within the applicable jurisdiction.	Watch for confusion in the use of phrase “electronic image”.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Ballot Creation	A-20	Provide software capability for the creation of newly defined ballot layouts, for the retention of previously defined ballot formats, and for the modification of a previously defined ballot format. The system will be designed so as to facilitate error-free definition of ballot layouts for electronic voting equipment and optical scan equipment.	
Ballot Creation	A-21	Provide a mechanism for the definition of the ballot, including the definition of the number of allowable choices for each office, contest, measure, and for special voting options such as write-in candidates. Note: Please state your solution's maximum number of potentially active voting positions (arranged to identify party affiliations if a primary election), offices and their associated labels and instructions, candidate names and their associated labels and polling instructions, and issues or measures and their associated text and instructions.	
Ballot Creation	A-22	Provide for all voting options and specifications as provided for in the Colorado Revised Statutes, including the requirements for a recall election (C.R.S. § 1-12-18) and instant runoff voting (IRV) (C.R.S. § 1-7-1003). Note: Ranked Voting Methods, including IRV, are currently features used in local jurisdiction elections and not at the State or County level. However; since counties often conduct elections for local jurisdictions, please explain the capabilities of your system to create and process a ballot that contains one or more contests requiring a ranked voting and tabulation process.	IRV should be referred to in its more generic form- rank choice voting. Voting methods currently listed in law are insufficient to save the state from another quick retirement. The functions of which the voting system might want to be capable should be listed here as targets for optional but desired development, if the party does not require an end to this project. I will attempt to start a list as an attachment to this document if there is time.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Ballot Creation	A-23	Import/export ballot information and voter registration information to and from Colorado’s centralized statewide database.	This apparently electronic (is it?) required connection between a voting device and SCORE seems problematic from the point of view of maintaining a provable privacy of voter intent on each ballot.
Ballot Creation	A-24	Generate sample ballots for each ballot style.	Sample ballots should appear identical to regular ballots, with the exception of a marking in an area that is not used for voting. These ballots can be used for tests however, the ballots that are used for official tests must be the same as ballots to be used in the election.
Ballot Creation	A-25	Generate a consolidated sample ballot containing all races, issues and questions.	This ballot should be marked to indicate that it is not the real ballot layout to be voted upon.
Ballot Creation	A-26	Produce ballot content output for paper ballot printing, with the following capabilities: <ul style="list-style-type: none"> a. Accommodate non-proprietary print-ready format (e.g. PDF). b. Accommodate multiple stub sizes within same election. c. Accommodate multiple stubs on a ballot. d. Accommodate variable paper ballot stub sizes up to three (3) inches. e. Customize paper ballots with sequential numbering and static fields. <p>Note: Please provide your ballot size capabilities and layout options.</p>	<ul style="list-style-type: none"> a. Accommodate a CDOS authorized non-proprietary print-ready format. b. Provider for independent printing of stubs that are intended to become identifiable to voters in a manner such that in no instance nor in any media except the printed ballot itself does both the stub content and the content of the face of the ballot become simultaneously accessible. <p>E: mark the face of ballot with a non-sequential and unpredictable label that can be used to associate the paper ballot after the stub is removed with the photographic image of the paper ballot with the cast vote record. Such a label should not be visible to the voter nor to election officials while voting. Stubs must be numbered and may be numbered sequentially and also contain static fields for an indication of ballot style and related data .Stubs must be easily removed.</p>
Ballot Processing	A-27	Output ballot content to secure file electronic media.	This is very unclear. Probably this is intended to mean the content of the face of the ballot prior to voting. Ballot content must be kept independent of the identity of the voter before and after voting.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Ballot Processing	A-28	Output ballot content to accommodate accessible voting, including adjustable audio and visual output. Note: Please detail capacity limits of data fields for accessible voting (e.g. font sizes, display options).	This is unclear. It need not extend beyond the HAVA requirement. Ballot content should be optionally made accessible via audio as well as enhanced visual displays
Ballot Processing	A-29	Allow users to electronically adjudicate ballots to reflect voter intent, while retaining the originally marked ballot image. Note: Please explain the process and time efficiency of ballot adjudication using your system.	“electronically adjudicate”? Facilitate the human interpretation and manual or electronically assisted recording of voter intent marked on physical ballots both at the time of counting and during any resolution process or authorized process, Machine interpretations and human interpretations or re-interpretations shall be logged as such and remain disambiguated.
Vote Results Reporting	A-30	Report vote tally results by individual upload. Note: For the purposes of this RFP, the Vote Results Reporting requirements are shown as part of the EMS. Some vendors may have a reporting module that is considered separate from their EMS and, if so, can explain that in their response to this requirement.	Unclear. “Individual upload” sounds suspiciously like some particular implementation. It may be this requirement is intended to produce reported aggregate totals for each batch. If so, this must also make clear that batches may not contain ballots rendered identifiable either by their uniqueness of ballot style or by their labeling. In addition, there must be a requirement to report ballot contents by ballot- the cast vote record.
Vote Results Reporting	A-31	Report vote tally results by contest jurisdiction-wide.	Tally results shall also contain the number of under and over votes counted such that these tallies sum to the number of ballots voted in the election jurisdiction-wide. In addition, a report of stub counts by precinct should be made. This should correspond to the sum of the vote tallies.
Vote Results Reporting	A-32	Report vote tally results by contest by precinct.	Tally results shall also contain the number of under and over votes counted such that these tallies sum to the number of ballots voted in each precinct.
Vote Results Reporting	A-33	Report the total votes for each candidate for each contest, as well as by candidate by precinct.	This requirement is confusing. Presumably all the tallies mentioned above and below here contain the total votes for each candidate as well as under and over votes. This must be made clear, but not by adding this requirement separately.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Vote Results Reporting	A-34	Report vote tally results by voting location.	Tally results shall also contain the number of under and over votes counted such that these tallies sum to the number of ballots voted at each voting location. This tally will often be problematic as a violation of constitutional anonymity of the vote due to unique ballot styles containing unique contests. This privacy problem will have to be considered in this requirement. The simple solution is not to report vote tallies by voting location, but rather report ballot stub counts by polling location. When report by ballot source is to be made, it should be of the ballot stub only- a record that indicates voter participation in the election and that is intended to remain identifiable to the voter.
Vote Results Reporting	A-35	Report vote tally results by ballot source (e.g.. Early Vote, Election Day, Mail, and Provisional).	Like A-34 this requirement will surely cause privacy violations since ballot source is simply optional to the voters' choices. It is a mistake to mark ballots by ballot source, and it is a mistake to maintain physical collections of voted ballots by ballot source for reasons of privacy. Ballots containing voter intent must be mixed with other sources and sorted only by precinct in order to provide for anonymity. When report by ballot source is to be made, it should be of the ballot stub only- a record that indicates voter participation in the election and that is intended to remain identifiable to the voter. My understanding is that "early vote" does not exist as a voting method under 1303, nor does "election day".
Vote Results Reporting	A-36	Report votes by ballot style.	Again this is unwise for privacy reasons. A count of ballot stubs should be done instead.

**SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM
A – ELECTION MANAGEMENT SYSTEM (EMS)**

Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Vote Results Reporting	A-37	Report undervotes and overvotes in each contest, with the option to exclude.	There is no reason to have an option to exclude except in a brief summary report. Under and overvotes must be reported and reconciled for each aggregation of each kind where vote counts are reported. This reconciliation must be performed by the equipment and optionally by hand. Discrepancies must be reported logged and alerted to the user upon discovery. Undervotes must be accounted for in a manner that allows multi choice contests (choose 2 of 3 etc.) to be reconciled with the number of stubs collected / ballots cast.
Vote Results Reporting	A-38	Report a summary of results in addition to the detailed Statement of Votes Cast reports.	This requirement is vague. The summary of results should be in a form that contains specific minimum amounts of information. It should be presented in a human and machine readable format authorized by the CDOS. In machine readable format it must be easily converted into a conventional spread sheet that can be manipulated by amateur users without confusion.
Vote Results Reporting	A-39	Report certified write-in candidate results in each contest with the ability to exclude.	Write in identification and recording must be better specified here. This requirement must be substantially explained. For example if the write – in line has been marked and the target is not marked and the printed target for a legitimate candidate has been voter marked, the vote is counted for the legitimate candidate. The requirement ought to specify how the voting system is to recognize that a write-in is present and how it will deal with the exception cases where the voter does something unusual as described above. To leave no mention of this is irresponsible. The treatment vis a vis the list of certified write-in candidates also should be spelled out.
Vote Results Reporting	A-40	Import election night voter registration counts for Active and Total voters and report percent turnout relevant to vote tally for both Active and Total registrations.	What are “active” voters compared to “total”? Has not 1303 done away with this distinction? Perhaps what was intended is to report turnout as a function of both total voters registered as well as total eligible to vote?

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Vote Results Reporting	A-41	Export each report in PDF, XLS, TXT and CSV formats.	This specificity is good but it leaves out EML which is a standard format under development intended for interoperability of election data. Perhaps the CDOS will require a better format in the future and some provision should be made for adaptation of an existing format to a new one in the future. Note that XLS is a somewhat proprietary format with several instances of incompatible versions. And voting systems currently in place export XLS in a very difficult to use form. This must be avoided in the future.
Vote Results Reporting	A-42	Provide for Zero reports to be printed prior to first upload.	To require “zero reports” is ridiculous. The purpose of the report is to show the aggregate tally that the system reports prior to commencing to tally a new batch or election. This is a standard tally report that is expected to be zero, but should not be described that way prior to the actual tally being performed. This is an example of how a perfectly reasonable test of integrity has turned into a habit that is so repetitive and anticipated that it has gained its own name and perhaps even special software that violates the purpose of the test in the first place.
Vote Results Reporting	A-43	Allow reports to be run at any time before, during or after the upload process.	It should be possible to run any report at any time, but it must be clear in the report what the status of the voting system is so that the report itself will not be misconstrued. Such as a partial count report that is fraudulently misrepresented as a final. Each report must be reliably time stamped such that its meaning cannot be mistaken.
Vote Results Reporting	A-44	Provide customization of report headers (e.g. “Unofficial” or “Final Unofficial”), contest labels and print layout. Note: Please explain any character limitations imposed by your system on labeling, reporting or exporting.	Customization of report headers can be used to misconstrue the meaning of a report, but it is a useful tool if properly used. One of the reports that must be made to clarify the context of any report time stamp is a report of significant time line events through the entire election tabulation process (starting from when the trusted build is loaded into the hardware). Vendors should be made especially aware of Colorado’s very early start of tabulation rule to make sure that time stamps are compatible with what we allow.

**SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM
A – ELECTION MANAGEMENT SYSTEM (EMS)**

Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Vote Results Reporting	A-45	<p>When the total number of votes cast and counted in any precinct by early voters and mail-in ballot is less than the current threshold of ten, the returns for all such precincts in the political subdivision shall be reported together to maintain privacy, per C.R.S. § 1-8-308(b). This is also applicable to property owner ballots.</p> <p>Note: Please explain how your system will accommodate this requirement.</p>	<p>This is confusing and describes a serious problem in an inappropriate way. To maintain privacy with required mail-in or vote center, many different procedures will be needed. This requirement needs a huge amount of work. Note that it is not only the results reporting that must accommodate privacy concerns, it is the ballot handling and sorting and batching itself. We will need a requirement to mix ballots across polling locations, across voting days, across voting methods and then sort by ballot style (or for practical purposes, sort by ballot style for mail-in before envelope opening) in order to maintain anonymity of ballots that also become cast vote records. Ballot stubs only should be used for accounting of the user of voting methods and voting locations. To attempt to transition through the 1303 change and stick with C.R.S. § 1-8-308(b) will be wholly inadequate,</p> <p>Note that zero votes will be “cast and counted in any precinct” under 1303. And “early voting” does no longer exist.</p>
Vote Results Reporting	A-46	<p>Allow the minimum threshold number of votes to be changed if the legal requirement changes. This requirement is referring to C.R.S. § 1-8-308(b).</p>	Ibid
Vote Results Reporting	A-47	<p>Be able to suppress or include property owner ballot results.</p>	<p>All ballots must be accounted for in the count of stubs- a count that does not suffer from any privacy concerns. So any suppression that takes place must be carefully specified and limited, and logged and made clear to the public so that stub accounting can be compared to vote count accounting. This area again will require considerable discussion about how to best provide for accuracy and privacy for the voter.</p>
Vote Results Reporting	A-48	<p>Provide an option to suppress a race or candidate from all reports, when withdrawn from ballot.</p>	<p>The allowance for suppression of election results means that there must be heightened concern for fraudulent or mistaken reporting of contests that have not been withdrawn. Additional supervision and oversight should be required to “suppress a race or candidate” and it must not be allowed to affect only a portion of a contest.</p>

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Vote Results Reporting	A-49	Highlight the candidate/measure with the most votes in each contest.	Only in contest wide reports. To do so in partial contest reports would be misleading. This seems like an optional feature not a requirement.
Vote Results Reporting	A-50	Have the capability to report political party designation for each candidate for partisan elections.	ii see no objection to this requirement. Perhaps it is therefore necessary for the election database to contain the information about whether the contest is “partisan”. It is also desirable for the election database to be able to recognize the difference between a general, a primary and a coordinated election. See earlier requirement about database.
Import/Export	A-51	Display detailed upload status for each portable vote storage media unit (e.g. memory card) by polling location and counting center. For example, we should be able to visually confirm an exact match between the physical portable vote storage media unit being uploaded and the unit identified by the EMS. (e.g. If a user is uploading "Polling Location A, Memory Card 01", onscreen the user should be able to visually confirm that the system is uploading "Polling Location A, Memory Card 01."	This requirement seems to be incomplete. Clearly the intention is to require portable storage media to be clearly and unambiguously marked in a manner that can be directly compared and easily distinguished as same or different from the indications on the EMS or other voting equipment.
Import/Export	A-52	Prevent the upload of wrong or duplicate portable vote storage media units. Note: Please explain your system’s safeguards against errant or multiple uploads from portable vote storage media units.	This requirement may lead to problems with the testing of these “vote storage” media cards. This topic must be carefully considered in making requirements. The systems that prevent multiple uploads encounter situations where rules intended to maintain integrity are broken in order to complete the task. This requirement should be very carefully reviewed in relation to the actual experience with problematic formatting and uploading of memory cards. This requirement also presupposes the use of memory cards, but this may be restrictive to the vendor. Again a more careful requirement may be needed.
Import/Export	A-53	Produce and print a list, at any time in the process, showing which portable vote storage media units have and have not been uploaded.	Note that IF memory cards are in use and they are in the mission critical path to deliver the vote totals to the public, then this requirement takes effect.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM A – ELECTION MANAGEMENT SYSTEM (EMS)			
Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Import/Export	A-54	Save a report to a local or portable drive for transfer to a networked computer.	Is this requirement actually to say that no voting device or EMS may be connected to a WWAN or WLAN or hard wired LAN connected to the internet at large? If so it should say so. Perhaps the requirements that affect memory cards that deliver “votes:” to the EMS should also be used for memory cards that deliver “vote counts” to the reporting system.
Import/Export	A-55	Display error messages and instructions to recover during uploading, reporting, importing and exporting.	In view of actual experiences this requirement seems incomplete. Display complete and detailed error messages to the operator during all phases of election processing and include within these messages either the precise action to be taken as a remedy or the location where these precise instructions may be obtained. In addition, the event log and error log should be immediately accessible so that the operator can review the exact steps taken prior to an exception being encountered.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM B – POLLING LOCATION BALLOT SCANNING AND TABULATION EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Scanning	B-1	Notify voter/user of errors before accepting ballot.	It is not clear if counties will be using polling place scanning and tabulation. Some or many or perhaps all will offer mail-in ballots and envelopes in place of flat paper ballots. Even if flat paper ballots are provided, there is no indication that counties are required to provide optical scanner equipment at the polling center. All the flat ballots might be transported to central count and tabulated far from the voter. This it is uncertain what role this category of equipment will play if any. I am not taking time to detail my suggestions for this portion of the RFP, presuming that more time will become available to remedy the faults and omissions of this section before the RFP goes out.
Scanning	B-2	Retain an electronic image of each voted paper ballot in a non-proprietary format.	
Scanning	B-3	Capture votes from paper ballots.	
Scanning	B-4	Accept overvoted ballots upon review.	
Scanning	B-5	Accept undervoted ballots.	
Scanning	B-6	Handle multi-page ballots, including when the pages become separated from each other (votes will count regardless of the sequence pages are scanned or if some pages are not scanned). Note: Please explain how your system accounts for multi-page ballots.	
Tabulation	B-7	Have the ability to write cast vote records to a media that will not report the results until Election Day.	
Tabulation	B-8	Provide a means to upload or transmit vote count results to the EMS.	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM C – CENTRAL BALLOT SCANNING AND TABULATION EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Scanning	C-1	Retain an electronic image of each voted paper ballot in a non-proprietary format.	<p>Retain a scanned digital photographic image of each voted paper ballot in a format authorized the CO DOS. Retain also a digital text representation (cast vote record) of the contents of the ballot in machine and human readable form authorized by the DOS. Each physical ballot and each scanned digital image shall be paired together and also to the corresponding cast vote record using a pairing method that allows ballots to be transported and inspected without breaking the pairing. Scanned images and cast vote records may optionally be delivered to the public without interfering with the pairing. The pairing method shall preferably not be available to the voter at the time of handling the ballot.</p> <p>Nothing in these requirements necessitates the colocation or coincidence of the ballot interpretation into a cast vote record with the tabulation of the cast vote records to produce various vote subtotals and totals.</p> <p>Cast vote record aggregation can be served by a separate component from a separate vendor.</p>
Scanning	C-2	Scan paper ballots into designated batches.	Scan paper ballots into identifiable and locatable batches wherein individual ballots are not identifiable by voter.
Scanning	C-3	Verify ballot quantities by batch prior to commitment to the system.	“commitment to the system” unclear
Scanning	C-4	Verify ballot quantities by batch after commitment to the system.	
Scanning	C-5	Rerun a batch of ballots, if necessary, without impacting results to date.	It is unclear how this would be accounted for
Scanning	C-6	<p>Have the ability to delete committed ballot batches from the system.</p> <p>Note: Please explain how your system manages batch accountability identification.</p>	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM C – CENTRAL BALLOT SCANNING AND TABULATION EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Scanning	C-7	Identify and segregate ballots with overvotes for manual or electronic image review.	
Scanning	C-8	Identify and segregate ballots with write-ins for manual or electronic image review.	
Scanning	C-9	Identify and segregate ballots that cannot be read for manual or electronic image review.	
Scanning	C-10	Identify and segregate ballots that are read as blank for manual or electronic image review.	Identify and segregate ballots with undervotes or that are read as blank for manual or electronic image review. This could be two different requirements.
Scanning	C-11	Provide information to the user as to why a ballot was segregated.	
Scanning	C-12	Identify a batch of ballots with a unique number and indicate count is zero upon beginning a scan and giving a total number of ballots processed at the close of the batch.	Identify each batch of ballots with a unique number and demonstrate that a counter is set to zero upon beginning a scan and giving a total number of ballot page sides processed at the close of the batch.
Scanning	C-13	Provide statistics of batches in committed batches. Note: Does your system have a batch size and/or number of batches limitation and, if so, what is it?	Double use of batches here? What means “committed batches”? this needs work. Likely batch commitment is too detailed and vendor design specific for this specification.
Scanning	C-14	Have database backup capabilities. Note: Please explain your system database backup capabilities and protocols. Please address time constraints and general and real time redundancy.	What database? Backup facilities must be sufficient to recover from a software or hardware failure or loss of equipment. The worst case recovery must permit at a minimum rescanning of every ballot. No conceivable failure would result in the inability to obtain new equipment and to rescan the ballots and produce election results.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM C – CENTRAL BALLOT SCANNING AND TABULATION EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Scanning	C-15	Handle multi-page ballots, including when the pages become separated from each other (votes will count regardless of the sequence pages are scanned or if some pages are not scanned). Note: Please explain how your system accounts for multi-page ballots when pages are out of order or when all ballot pages are not returned.	IN addition, accounting must be made clear for stub counts vs. multipage ballots vs. ballot pages vs. ballot pagesides.
Tabulation	C-16	Capture votes from paper ballots.	Interpret voter intent and produce a cast vote record containing a text readable version of the contents of the ballot in a format authorized by the DOS.
Tabulation	C-17	Accept overvoted ballots upon review.	Also allow visual observation of the entire ballot in case of undervote and facilitate resolution of additional failures to interpret voter intent.
Tabulation	C-18	Accept undervoted ballots with or without review.	Note that all of these “reviews” in fact all of the operations of the ballot scanning equipment for central count should facilitate public observation – preference to be given to systems that offer highly visible evidence of all of their functions such as large display screens and with additional ability to be monitored remotely.
Tabulation	C-19	Allow the option to disable or enable review of undervoted ballots.	Also allow visual observation of the entire ballot in case of undervote and facilitate resolution of additional failures to interpret voter intent.
Tabulation	C-20	Write cast vote records to a media that will not report the results until Election Day.	This is an unreasonable request. There is no such media yet invented. Store cast vote records in a manner to prevent tabulation until ballot return deadline.
Tabulation	C-21	Provide a means to upload or transmit vote count results to the EMS.	Restrictions to obtain security are needed here. Transmit is too general. Perhaps memory cards should be required, but this is very limiting.
Error Handling	C-22	Identify and reject ballots that are from another election.	Log any exception such as identification of a ballot from another election.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM C – CENTRAL BALLOT SCANNING AND TABULATION EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Error Handling	C-23	<p>Continue high-speed ballot processing while outstacking and sorting ballots to user identified categories that need additional attention.</p> <p>Note: Please describe how your system handles these situations:</p> <ol style="list-style-type: none"> a. Ballots are unreadable by the scanner. b. Notifying the user when a ballot has been scanned successfully or not. c. Notifying the user that a ballot has been previously scanned. d. Identifies where a voter marked the box for a write-in and where the voter did not mark the box, but did enter a write-in candidate on the line. 	<p>Preference to be given to systems that are capable of sorting the face of ballots (stub removed) by voter intent of contest choice. By default, such a system would sort the top of ticket contest by candidate and under and overvote so that one contest can be immediately audited to check for any degradation of interpretation that might have crept in.</p> <p>The outstacking of user identified ballots might be a feature of one manufacturer’s central count system. This raises the question if this requirement is here to bias the result towards one vendor.</p> <p>Additional requirement: Preference to be given to a solution capable of detecting either machine or hand printed marks indicating the precinct number on a ballot that has been preprinted only by true ballot style. True ballot styles are far fewer in number if precinct numbers are not required as part of the style. Stamping or hand placement of the precinct number reduces cost and makes for simplicity.</p> <p>Additional requirement: Preference to be given to a solution that permits voter to indicate “not voting” as an alternative to undervoting. The significant reduction in purposeful undervoting as a result will allow much more accurate interpretation of voter intent by machine.</p>

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Ballot	D-1	Display choices for the contests, candidates and measures of the election for each ballot style.	<p>To define this section as “electronic voting equipment” is to extrapolate beyond the requirement of HAVA without quite making the mistake of specifying this as “DRE”, yet the requirements here appear to be compatible with the existing and poorly received “DRE plus VVPAT” solution.</p> <p>This section should perhaps be entitled System Components Necessary to Achieve HAVA Compliance.</p> <p>It is crucial that vendors be allowed to offer a solution that is simply HAVA compliant and no more than that in order to serve the alternately abled communities better. One obvious and important alternative is the Ballot Marking Device solution. This must be kept fully available in the requirement set out below. I have not taken the time to extrapolate and correct each of the requirements with that in mind due to severe lack of time enforced by the schedule decided by the SOS.</p> <p>It is highly desirable if not essential that every vote including those cast by the alternately-abled/disadvantaged communities should be recorded onto a same size/weight/style paper ballot as the ballots collected from mail-in and polling centers. That ballot must be the record of the vote. It should have every reason to have been verified by the voter, even if necessary with the help of technology. No vote counting ought to be separately taking place in an electronic device such that the ballot of record is either a VVPAT or the electronic record that produced it. Full paper ballots of record that are identical in form for all voters except for ballot style is what we should require.</p>
Ballot	D-2	When activated for the voter, list the appropriate contests and measures on the first series of screens presented, in order to give the voter the opportunity to verify that they will be voting on the correct ballot.	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Ballot	D-3	Tabulate each voter’s candidate and question selections as the ballot is cast.	
Ballot	D-4	Have a public counter that displays the number of ballots cast.	
Ballot	D-5	<p>Make clear to the voter how to cast a ballot, such that the voter has minimal risk of doing so accidentally, but when the voter intends to cast the ballot, the action can be easily performed.</p> <p>Note 1: Please describe how voters, including voters with disabilities, will be able to review their write-in input to the ballot interface, edit that input, and confirm that the edits meet their intent.</p> <p>Note 2: Please describe how your electronic voting units provide a method by which voters with disabilities can choose the language of the ballot visually and through audio devices.</p>	
Accessibility	D-6	<p>Provide electronic voting equipment designed to allow for installation in a voting location such as to accommodate access by voters with disabilities in compliance with the Americans with Disabilities Act (ADA), HAVA and all applicable federal and state laws that address accessibility to voting for persons with disabilities.</p> <p>Note: Please describe how your system’s features comply with HAVA, ADA and other Federal and State laws that require accessibility for voters with a variety of disabilities, including visual or cognitive impairments.</p>	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Accessibility	D-7	<p>Display, or accommodate, a ballot as defined in accordance with C.R.S. § 1-5-704. The size of a ballot position and the font size of candidate information must be in accordance with Colorado Election Rule 45.</p> <p>Note: Please stipulate the maximum available positions on the voting device, based on such size of a ballot position and the font size of candidate information, to be used for an election.</p>	
Accessibility	D-8	<p>Include a privacy enclosure or voting booth that contains the electronic voting device(s) designated for voters with disabilities and comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) providing sufficient dimensions to allow access to voters who use wheelchairs.</p> <p>Note: Please explain how your voting device complies with all forward and side reach requirements of the ADAAG.</p>	
Accessibility	D-9	<p>Include a voting enclosure, used for an electronic voting device, that provides privacy for all voters while voting, is well lit, and is equipped with a fixed or adjustable writing surface of a height that is designed to accommodate voters with disabilities in accordance with ADAAG.</p>	
Accessibility	D-10	<p>Include electronic voting units adaptable for voters with disabilities either through adjustability of the device or the voting booth or inclusion of an auxiliary device. The auxiliary device should also be lightweight and removable making it portable for use on a voter's lap or provide an alternative solution.</p> <p>Note 1: Please describe your accessible alternative input devices. List such devices and explain the operation of the device and how it accommodates voters with disabilities.</p> <p>Note 2: Please explain how your proposed system accommodates voters with visual disabilities. Include with the description how portions of the</p>	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
		<p>displayed ballot may be intensified and/or enhanced, in contrast and font size and then restored to initial size.</p> <p>Note 3: Please explain how your electronic voting device can be repositioned to accommodate a variety of voters with disabilities. Include any information about the ability of the voter to independently adjust the device.</p> <p>Note 4: Is the voting screen glare-free regardless of positioning?</p> <p>Note 5: Please explain any magnifying capacity of the electronic voting device.</p> <p>Note 6: If your electronic voting unit uses an activation card, please explain how it may be used easily and independently by voters with disabilities including voters who use wheelchairs and people with visual disabilities.</p> <p>Note 7: Please explain how your electronic voting unit adequately provides secrecy for a voter who uses a wheelchair.</p> <p>Note 8: Please describe additional features of your system that are designed to accommodate voters with disabilities.</p>	
Accessibility	D-11	<p>Allow for importing of audio ballot content from an outside source (e.g. candidates or pre-recorded text).</p> <p>Note: Please explain the process and procedure, with time frames, required to re-program the audio read-back on the voting device in the event that there is a change to a name or contest on the ballot in the final few weeks before an election.</p>	
Accessibility	D-12	<p>Provide for audio instructions for the ballot and a mechanism for voters with visual impairments to cast a ballot, either on the voting unit itself or on a separate device designed for this purpose. The process shall imitate the process used by sighted voters with the exception of the audio interface.</p>	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Accessibility	D-13	Support an enlarged ballot for voters with visual impairments. Following the casting of a vote the machine must reset to its initial state to accommodate the next voter.	
Accessibility	D-14	Accommodate voters regardless of their ability to read. Note: Please explain how such individuals would be instructed to utilize the audio interface.	
Accessibility	D-15	Allow for connection of personal auxiliary devices, such as sip/puff or jelly switch devices. Note: Please describe such capabilities provided by your system.	
Ease of Use	D-16	Be designed so that actions performed by the voter, such as making a vote selection or changing a vote, are easily understood so that errors are prevented to the maximum extent possible, and so that recovery from an erroneous action is facilitated by the features of the system prior to casting the ballot. Note: Please explain how your proposed system facilitates voter actions prior to casting a ballot.	
Ease of Use	D-17	Accommodate font sizes that are adjustable for ease of sight.	
Ease of Use	D-18	Show the voter a summary screen at the end of the ballot indicating the choices made and/or skipped.	
Ease of Use	D-19	Allow the voter the ability to change a selection until the voter is satisfied with the choice at anytime prior to the final casting of a ballot. Note: Please explain here how your proposed voting system allows the voter to review and/or modify his/her selections before final casting of the votes.	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Ease of Use	D-20	Provide a method for the voter to confirm their choices before casting the ballot, signifying to the voter that casting the ballot is irrevocable and directing the voter to confirm their intention to cast the ballot, and shall further signify to the voter that the ballot has been cast after the vote is stored successfully.	
Ease of Use	D-21	Provide a means to demonstrate the operation of the electronic voting device to the voters.	
Ease of Use	D-22	Not permit a voter to over-vote a contest and will enable the voter to correct their selections. Note: Please explain how your proposed system shall not allow a voter to over-vote a contest and enable the voter to correct his or her selections.	
Ease of Use	D-23	Warn voters that they have under-voted a contest and permit them to correct or accept the under-vote. Note: Please explain here how your proposed system shall warn voters that they have under-voted a contest and permit them to correct or accept the under-vote.	
Ease of Use	D-24	Provide a means of recording the votes cast for write-in candidates for any contest that allows write-in candidates. This capability shall allow the entry of as many names of candidates as the voter is entitled to select for each contest in compliance with Colorado's Election Law. Note: Please explain how your proposed system allows for write-in votes for any authorized contest.	
Ease of Use	D-25	Allow county personnel to modify the voter instructions for the ballot and equipment.	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Ease of Use	D-26	Provide a screen response that would allow a voter to request the list of certified write-ins. The list, specific to the voter's unique ballot style, should appear on the screen (pop-up) for the voter to view and select from.	
Uninterrupted Operation	D-27	Provide, in case of power interruption, a means for voting operations to continue. This feature shall consist of either an uninterruptible power supply (UPS) or other means to keep electronic voting equipment active.	
Uninterrupted Operation	D-28	Provide for continuous uninterrupted operation for a minimum of two hours in case of power failure. Note: Please specify how long your system will operate without an external power source and under what conditions. If the device does not have a battery backup, what size of UPS will be required to maintain operation for two hours?	
Uninterrupted Operation	D-29	In the event of the failure of an electronic voting unit, retain a record of all votes cast prior to the failure. Note: Please explain how your system retains and reports votes cast in the event of a loss of power.	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Voter Verifiable Paper Trail	D-30	<p>Include, with each voting device, the functionality of a Voter-Verified Paper Audit Trail (VVPAT) that meets all Federal and State Certification requirements. The receipt can be in the form of a printed record produced by the voting device or an alternate solution if the voting device is not a Direct Recording Electronic voting system.</p> <p>Note 1: Please explain how your proposed voting device complies with this requirement.</p> <p>Note 2: Explain if your proposed system has an alternate means of counting the VVPAT in the event of a hand count of such VVPAT. The alternative means can include but is not limited to the availability of bar codes and readers for each VVPAT.</p>	<p>This requirement ought to match the HAVA requirement that is its genesis. In particular it could more openly accept a ballot marking device model where the resulting Paper Audit Trail is indistinguishable from a voter marked paper ballot. The way this is written tends to anticipate the perpetuation of the DRE.</p> <p>In addition, this requirement ought to prevent the dependence on the “electronic voting equipment” for tabulation. The primary tabulation system should be the paper record of the voter intent, even if it is not directly voter marked.</p> <p>Machine reading of bar codes on VVPATs is not an acceptable alternative because the contents of the bar code is not directly human verifiable and thus the voter cannot verify the voter intent captured there.</p>
Voter Verifiable Paper Trail	D-31	<p>Have the capability for the print on the VVPAT to be large enough and dark enough for voters to verify and for poll workers to read easily in recount.</p> <p>Note: Please explain the type of paper used to record the VVPAT and the characteristics of the paper impression to ensure ease of reading and fade resistance.</p>	<p>The requirement here ought to be the same as for the voter marked paper ballot. What we see here presumes a continuation of DRE status quo.</p>

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM E – BALLOT ENVELOPE SCANNING AND SIGNATURE VERIFICATION			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Mail Ballot Envelope Processing	E-1	<p>Provide hardware with the capability to scan mail ballot envelopes and perform the following functions:</p> <ul style="list-style-type: none"> a. Scan and capture voter ID barcode b. Scan and capture envelope and signature images c. Log envelope as received d. Endorse (customizable) & date/time stamp envelope e. Separate envelopes that may need manual intervention <p>Note: Please provide information about your ballot envelope sorting equipment, including what versions are available for counties with various volumes of envelopes. Can your equipment perform all these above functions in a single pass? If not, please explain the number of passes required and the actions taken on each pass.</p>	<p>A desirable option is to provide sorting by ballot style as marked on the outside of the envelope (or showing through a window of the envelope). This will help alleviate many privacy issues and concerns by causing ballots removed from envelopes in batches to be of identical ballot style.</p> <p>This requirements needs extension to provide means for pre and post verification that the image of the signature is sufficient to provide desired accuracy of signature matching.</p> <p>Note that if the envelope is not handled by a human being and seen by eye, it will not be possible to verify that the signature on the envelope was actually hand written.</p> <ul style="list-style-type: none"> f. Provide the capability to read the ballot style of the enclosed ballot to confirm that it matches with the identity of the envelope that it is contained in. (this can be done with a windowed envelope that shows the relevant portion of the ballot stub).
Mail Ballot Envelope Processing	E-2	Be capable of generating an output file, with voter ID and voter’s envelope signature, to be matched with SCORE voter registration data and used in the Automated Signature Verification process.	File of format authorized by CO DOS. File should allow human oversight and interoperability with SCORE and other components. Interface with SCORE must be auditable.
Mail Ballot Envelope Processing	E-3	Be configurable for ballot envelope size and design.	Range of envelope size and design?
Mail Ballot Envelope Processing	E-4	Automatically separate envelopes with non-matching signature, missing signature, unreadable signature, voter affidavit required, or voter ID required into a separate stack or identify them for easy separation.	<p>“unreadable signature” means? “identify them for easy separation” means?</p> <p>Does this allow imprinting of scanned envelopes to show their status?</p>

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM E – BALLOT ENVELOPE SCANNING AND SIGNATURE VERIFICATION			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Mail Ballot Envelope Processing	E-5	Have an option for sort/pass to various methods with the ability to customize sorting definition (e.g. style, precinct, district, unaccepted ballots, signature discrepancy and no signature).	Sorting by style will be a huge advantage for privacy when batching ballots. Some consideration should be made to encourage products that have multiple sorting trays so that style sorting can be effective.
Mail Ballot Envelope Processing	E-6	Provide a high-volume solution for counties with a large voter population. Note: Please specify the throughput capacity on your high-volume envelope processor.	Any requirements for accuracy? Any requirement for functionality? Requirement for human supervision oversight or intervention?
Mail Ballot Envelope Processing	E-7	Provide a low-volume solution for counties with a small or medium voter population. Note: Please specify the throughput capacity on your low-volume envelope processor.	Low cost threshold requirement?
Mail Ballot Envelope Processing	E-8	Provide configurable reports for tray id, tray count and pieces status.	Format and medium for reports to be authorized by DOS
Automated Signature Verification	E-9	Contain certified or tested/proven Automated Signature Verification (ASV) software, which can automatically compare a voter's ballot envelope signature with the SCORE voter registration signature based on a customer selected confidence determination.	Tested/proven by what? This requirement that ASV be included is problematic.
Automated Signature Verification	E-10	Be configurable to meet or exceed a state required acceptance threshold for signature acceptance.	Is this a requirement to dumb down the system arbitrarily to enforce an acceptance rate? In what units will the "required acceptance threshold" be stated?
Automated Signature Verification	E-11	Provide user activity logs.	Provide complete system activity logs that are human and machine readable. Logs to include full description of all human intervention and technical failures such as power fail.
Automated Signature Verification	E-12	Provide an audit function to verify the accuracy of machine accepted signatures.	The audit should be facilitated but not provided by the vendor per this requirement.
Automated Signature Verification	E-13	Extract returned ballot envelopes for manual review when the signature does not meet the acceptance threshold level.	What are the units of and basis for the "acceptance threshold level"? What about other instances requiring human intervention?

**SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM
E – BALLOT ENVELOPE SCANNING AND SIGNATURE VERIFICATION**

Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Automated Signature Verification	E-14	<p>Create a record when the signature does not meet the acceptance threshold level. This record will be used to generate a letter when the signature cannot be manually verified.</p> <p>Note: Please explain your process for creating and using these records.</p>	<p>Record becomes a flag in SCORE? How? By direct connection? Letters to be automated? Is this adequate?</p>

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM F – VENDOR TRAINING & SUPPORT			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Voting Period Support	F-1	Provide technical support for all system components beginning 60 days prior to an election and continuing until 30 days after an election for each County.	What level of tech support- on site? Backup support to county or state support personnel?
Hardware Supply Chain	F-2	<p>Include hardware solutions for the UVS that are supported by a supply chain contingency plan.</p> <p>Note: Please provide an explanation of your supply chain contingency planning. The intent of this requirement is to assess the risk to Colorado of one or more of your suppliers not being able to provide needed components. Identify the depth of your supply chain (e.g. one, two or more suppliers deep).</p>	

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – CERTIFICATION, AUDITING, TESTING, SECURITY AND DOCUMENTATION			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Certification	G-1	Be certified by the EAC or another state. Note: If not certified, please explain.	Current statutory requirement is VVSG 2002.
Auditing	G-2	Create and log audit records for all phases of election operations.	Too vague... what does the verb “log” mean? All “phases”? Operations? “audit records?” All undefined terms.
Auditing	G-3	Store sufficient data in a system audit log file to allow the auditing of all operations related to election setup, ballot creation, ballot tabulation, results consolidation and report generation. The audit log file shall contain: <ul style="list-style-type: none"> a. An identification of the program and version being run. b. An identification of the election file being used. c. A record of all options entered by the operator, including operator ID. d. A record of all actions performed by a subsystem of the system. e. A record of all tabulation and consolidation input. f. Audit log records that are created and maintained in the sequence in which operations were performed, with date/time stamps. Note: Please explain what audit trail techniques and standard audit reports are incorporated in your proposed system.	Including unanticipated powerdowns and memory card removal and insertion. Store sufficient data in a system audit log file to allow the auditing of all operations related to election setup, ballot creation, ballot collection, batching, transportation, ballot interpretation and tabulation, results consolidation and report generation. The audit log file shall contain:
Auditing	G-4	Accommodate random audits on electronic voting and tabulation devices.	Very non specific- “accommodate”? Random audits refers to existing statute prior to RLA? Requirement must specify Risk Limiting Audit conforming to audit principles www.electionaudits.com RLA is not an audit of a device, it is an audit of an election. Thus the audit applies to all election processes, not just paper vote capture and tabulation devices.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – CERTIFICATION, AUDITING, TESTING, SECURITY AND DOCUMENTATION			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Auditing	G-5	Accommodate random audits on paper vote capture and tabulation devices.	Ibid
Auditing	G-6	Log all activity on voting equipment including: when turned on/off, by whom, any errors, when an error occurred and when an error is resolved.	Power fail should be included Logs must be human and machine readable (sortable by type, time, etc.)
Auditing	G-7	Run real-time reports, when needed.	Why “when needed?” does the equipment know that?
Auditing	G-8	Run post-election diagnostics.	Consisting of what? And to prove what? Without this specificity the requirement is meaningless.
Auditing	G-9	Provide audits for recounts.	Is providing audits for recounts separate than for original counts? Possibly especially if recounts are by hand.
Auditing	G-10	Have a permanent paper record of each vote for audit purposes.	Permanent anonymous human readable paper record of voter intent for each vote of each voter
Auditing	G-11	Support a Risk Limiting Audit on both electronic tabulation and paper ballot tabulation devices. Note: Please describe how your proposed system supports the execution of a Risk Limiting Audit.	Electronic voting devices need not be “tabulation” devices (ie. they do not have to be conventional DRE) They could be ballot marking devices. Optical scanner devices need not provide tabulation- might only provide voter intent capture to create a cast vote record.
Auditing	G-12	Incorporate a real-time clock as part of the system hardware and all audit log record entries shall include a date/time stamp.	
Auditing	G-13	Use a real-time clock that will continue to run during a power loss.	Run during a power loss -> keep time after a power loss.
Auditing	G-14	Print audit reports on the standard system hardcopy output device if the following conditions are met: a. The generation of an audit trail report does not interfere with the production of other output reports. b. The entries can be identified so as to facilitate their recognition, segregation and retention. c. The physical security of the audit record entries can be ensured.	Print audit reports in hard copy? This is too limiting and sounds like a particular vendor. Physical security of the audit entries secured? This requirement is mysteriously phrased.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – CERTIFICATION, AUDITING, TESTING, SECURITY AND DOCUMENTATION			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Auditing	G-15	Create audit records during the election definition and ballot preparation phases showing completion of the baseline ballot formats and any modifications to them, a description of the modifications and a date/time stamp.	<p>“baseline ballot formats” mean s?</p> <p>Election definition phase EMS would preferably include tools to collect detailed ballot inventory and chain of custody tracking. Preference to be given to system solutions that assist in and enforce collection of adequate ballot chain of custody.</p>
Auditing	G-16	Create audit records during the pre-election phase that include manual data maintained by election personnel, samples of all final ballot formats and the ballot preparation edit listings associated with them.	<p>“ballot preparation edit listings”?</p> <p>Create audit records during the pre-election phase that include electronic and manual data entered and maintained by election personnel, election definition, instances of all final ballot formats and the ballot preparation edit event log.</p>
Auditing	G-17	Create audit records prior to the initiation of ballot counting to verify hardware and software status. These particular audit records shall include the identification of the software release, the identification of the election to be processed and the results of hardware and software diagnostic tests.	<p>Create audit records by generating e.g. tabulation reports prior to the initiation of ballot interpretation/tabulation to verify hardware and software status. These particular audit records shall include the identification of the software release, the identification of the election to be processed and the results of hardware and software diagnostic tests.</p>

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – CERTIFICATION, AUDITING, TESTING, SECURITY AND DOCUMENTATION			
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Auditing	G-18	<p>Create in-process audit records containing data documenting system operation during diagnostic routines and any machine generated error and exception messages. Examples of these audit records include:</p> <ul style="list-style-type: none"> a. System startup diagnostic and status messages. b. Zero totals check event. c. The source and disposition of system interrupts resulting in entry into exception handling routines. d. All messages generated by exception handlers. e. The identification code and number of occurrences for each hardware and software error or failure. f. All operator actions. g. Notification of system login or access errors, file access errors and physical violations of security. h. Other exception events such as power failures, failure of critical hardware components, data transmission errors, and other types of operating anomalies. 	<ul style="list-style-type: none"> i. Zero totals check event.--> check that pre count reports show zero
Auditing	G-19	<p>Provide for an in-process audit report of votes cast by each voter on each vote capture device. This report must be generated in a random order from the order of voters casting ballots, for privacy reasons.</p>	<p>Seems cvr is to be in random order on "vote capture device" . this phrase is far preferable to "electronic voting device" used as the category title.</p> <p>But this requirement of randomness may in effect require it to be electronic even if HAVA does not. Randomness is a desirable requirement if the VVPAT on a roll is being used. Apparently that is the assumption of this requirement. DRE with VVPAT is not a desirable solution because the record of the vote is unique and even without the order it will tend to violate privacy of the few individuals using it and ought not be favored in the requirements. If there is no sequential record of voter intent, then the randomness requirement is not needed. But the vote capture device should preferably be a ballot marking device.</p>

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – CERTIFICATION, AUDITING, TESTING, SECURITY AND DOCUMENTATION			
Requirement Sub-Category	Req. ID	UVS Requirement (The System will ...)	Comments
Auditing	G-20	<p>Print reports necessary to perform a manual count as required by Colorado election law and rules.</p> <p>Note 1: Please explain how your proposed system can create the reports necessary to perform a manual count.</p> <p>Note 2: Please explain how, in the case of a recount, the election can be reconstructed ballot by ballot, while still maintaining voter anonymity.</p>	<p>??? No idea what reports are needed to perform a manual count. The requirement for a preferential treatment of a flat ballot sorting function is relevant to hand counting a contest. If the election system is capable of sorting the ballots by contest choice, then hand counters have a much easier job to verify manually the machine sort, and verify the count of the physical pages already sorted.</p> <p>What are the reports necessary to perform a manual count if any?</p>
Testing and Auditing	G-21	<p>Be configurable so as to be capable of performing the following tests on all system hardware/software, in compliance with current Colorado statutes and rules:</p> <ol style="list-style-type: none"> Hardware test Logic and Accuracy test Post-Election Audit 	<p>Pre recount LAT also-</p> <p>Ideally this requirement would premeditate an improvement in CO's testing and auditing and recount statutes. With more time a discussion of improvements to these statutes could inform the RFP.</p>
Testing	G-22	<p>Allow user creation of scripted simulation Logic and Accuracy tests with various patterns (e.g. 1,2,3 or 1,1,1 or 1,2,3,4,5...).</p> <p>Note: Please explain how your system allows for scripted simulation for creating test ballots and electronic voting equipment test input.</p>	<p>Vendor created or dependence upon machine created test ballots is unwise. These will be almost guaranteed to fail to find the exceptional cases where the system fails to be accurate.</p> <p>Any scripted creation of test materials ought to be independent of the vendor of the system under test.</p>
Testing	G-23	<p>Have the capability to test ballot formats to verify the allowable number of votes for a contest or question and the combinations of voting patterns permitted or required by the using jurisdiction.</p>	<p>Vendor created test? Same argument as above.</p>
Testing	G-24	<p>Provide capability to permit diagnostic testing of all the major components within each electronic vote capture device.</p>	<p>What standard for passing test?</p> <p>Also need a requirement that the electronic vote capture device facilitate testing of its accuracy (calibration of touch screen, etc.)</p> <p>Testing of BMD is much easier than testing of DRE because the cast vote record becomes immediately available for checking, whereas with aggregate tabulation you cannot confirm any input to the DRE was responsible for the tabulation error.</p>

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Testing	G-25	Ensure non-contamination of voting data through tests of all data paths and memory locations to be used in actual vote recording.	Difficult to retain test validity under these restrictions. Tests should not be in “test mode” or using special “test ballots”
Testing	G-26	Provide evidence in an audit record that test data has been expunged.	Audit record log to include all full tabulation reports so that it is possible to verify zeroes as values in the regular (not “zero report”) report.
Testing	G-27	Allow the ability to load and test audio ballots in electronic vote capture equipment.	No special requirement needed- same as requirement to load and run an audio ballot. There should be no test mode here.
Testing	G-28	Provide the ability to print all necessary reports for proofing the results of logic and accuracy testing.	Print all reports is a requirement that affects all circumstances of use of the system not just testing. No special report should be created for testing purposes.
Security	G-29	Provide an environment whereby all databases and data are maintained with provisions for operational security, access control and auditability. Note: Please describe the authentication protocols for access to the EMS database and your system’s processes for providing operational security and auditability.	And adequate backup, and testing of the recovery mechanism. Note that security must not obstruct access to event and audit logs.
Security	G-30	Require dual authentication for access to the EMS and all tabulation equipment.	
Security	G-31	Allow tamper resistant seals to be placed on all equipment openings and data access points. Note: Please describe the security offered by your proposed system.	All access points to equipment to be visible and subject to oversight of seals, etc.
Documentation	G-32	Include a clear set of documented instructions for election judges to set up voting equipment. These instructions should be modifiable by county personnel.	
Documentation	G-33	Include documented instructions for troubleshooting voting equipment issues that may arise.	

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Documentation	G-34	Include a complete set of User and Technical documentation.	
Documentation	G-35	Include current certification documentation and VSTL and/or state test reports.	

Comments in general

I will not have time to cover all the omissions of this document at this point. Most glaring is the absence of any requirement that the systems accommodate oversight by public or facilitate public access to and usability of reports, etc. No mention of needs of canvass boards. No mention of trusted build. Almost no mention of handling of stubs- none for use of stubs to verify that the ballot style is correct in an incoming mail-in envelope. With the transition to all-mail-in we need additional safeguards like that. Otherwise we might soon see lots of Democratic primary ballots appearing in Republican envelopes, etc.

The system specified here is very close to what is in use today and my experience with that equipment is that it is often very unsuited to the task it is called upon to perform. Apparently the “users” are relatively unwilling to complain and demand improvement. But now is their unique chance. I hope that the survey to clerks that I proposed will be forwarded to them so they can actually honestly and openly admit to the weaknesses of existing equipment and procedures and get remedies included into this acquisition process.

Moreover I hope that we will actually add into the mix some innovative ideas that have already been percolating in the election vendor community and in academia. I have added a few favorites of my own in this review of the RFP document.

It is highly undesirable to require the use of automatic signature verification equipment unless it is clearly subsidiary to a responsible effort at direct human cognition and designed only to facilitate that. We have seen examples of something very unlike that in recent observations where the machine speeds the envelope images by operators who cannot have time to intercede. It is true that signature verification rates differ wildly from county to county. Let’s not make that uniform simply by turning it over to a machine. We can get lots of uniformity and easily lose integrity.

Please consider again taking the time to give this process the time it deserves considering the unusual changes happening in the election industry, the 1303 conversion of the state to all-mail and the still stinging aftermath of the 2000 election and the resulting HAVA law.

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[Many unpaid hours went into writing this report]