State of Colorado Uniform Voting System

Request for Proposal Response

December 4, 2013

RFP # CDOS-UVS-2013-01

BUSINESS PROPOSAL

Alternate Format Ballot Solutions

Five Cedars Group, Inc.

Portland, OR 97291

503-329-4700

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1. EXECUTIVE SUMMARY

The Five Cedars Group is pleased to respond to Colorado's Uniform Voting System RFP, specifically to the accessible ballot portion of the RFP. We are not proposing a new election management system or election hardware but on the opportunity for Colorado to adopt an existing, proven system for providing voters with disabilities an alternative to going to a poll to vote or to have to use a paper mail-in ballot. Our response is to propose that Colorado adopt the Alternate Format Ballot process that has been used in Oregon since 2008.

"Most places require the voter to go to the ballot. But in Oregon, the ballot comes to the voter." -- Secretary of State Bill Bradbury, 2007.

There are thousands of Colorado voters with disabilities who are not able, without help, to either vote at the polls or vote a vote-by-mail ballot. Voters with vision, manual dexterity or other physical disabilities deserve access to a balloting process that allows them to vote in private, independently, and at a location that meets their individual needs or limitations.

The Alternate Format Ballot (AFB), in HTML or the large font printed paper format, meets those needs. Thousands of Oregon voters with disabilities have used and relied on the AFB process to cast their ballots. The AFB has truly touched people's lives in a positive way. The AFB generation, distribution, and two form factors were designed to benefit voters and yet work within an existing vote by mail system. It can do the same for Colorado's disability community and within your existing vote-by-mail or absentee ballot process.

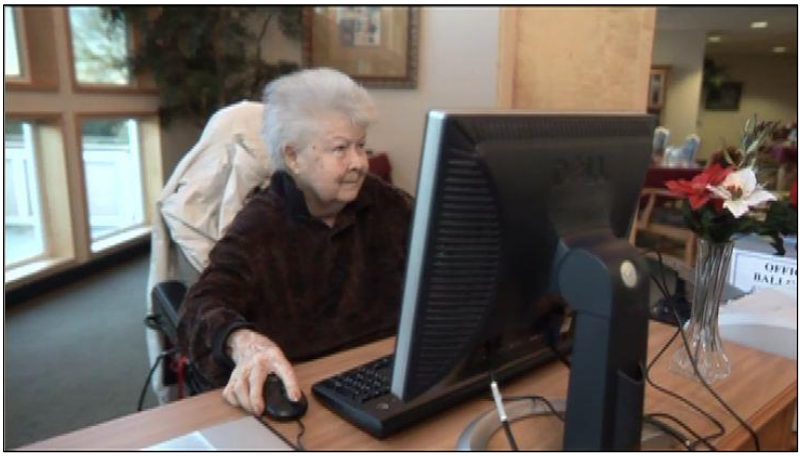


Fig 1 - Senior citizen voting in her bathrobe at a rehab facility

The HTML Alternate Format Ballot works on any browser, does not require an active internet connection to work, can be emailed, has two user selected viewing formats and works with third party commercial off-the-shelf (COTS) assistive software and hardware. The AFB's were designed for voters who are vision-impaired, disabled, UOCAVA or any registered voter who does not have access to a ballot or a place to vote.

The Large Print Ballot (11" x 17" or 8.5" x 14" paper) is especially useful for people with macular degeneration as it can be mailed to voters who pre-select to receive a LPB.

With the AFB process, county election officials have an easy-to-use conversion application that lets them create AFB's quickly and accurately. In Oregon, the server hosted conversion application uses the same ballot definition data fields county election officials had previously entered into the Oregon Centralized Voter Registration (OCVR) system. Thus, the HTML and large print formats are created using the same ballot data that is used to create the regular printed ballots that are routinely mailed to registered voters.

One key factor to consider in implementing the AFB process is if all counties and jurisdictions use the same format for providing XML data to the AFB Generator, only one copy of the AFB software will serve the entire state. What this means is as few as one or as many as sixty-four counties can use the same process. It's an extensible process.

The Ballot Generator program can be implemented and installed in one of two configurations:

a) On a state owned and controlled server with all ballot generation performed by state or county personnel.
b) As a software as a service (SAAS) on FCG's servers with the ballots being generated by FCG and then retrieved securely by state or county staff.

There are advantages to both implementation paths. The difference in cost is detailed in the Cost Proposal.

The Five Cedars Group is ready to implement an Alternate Format Ballot system in the great state of Colorado. We would welcome either a state-wide implementation or a trial in a few selected counties.

2. COMPANY OVERVIEW

The Five Cedars Group (FCG) is an Oregon corporation (S-Corp) focused on using technology to help people vote, in private, and using the digital devices they have access to and in the location they happen to be. FCG developed the Alternate Format Ballot for the State of Oregon and it has been used in over 18 elections since the 2008 National Primary.

The Five Cedars Group story starts with its founder, John Schmitt, and his determination to create great products. In early 1993, several years after leaving Intel, John founded the OakTree Digital agency with a desire to do great projects for great clients while simultaneously creating a great work environment for exceptional people. OakTree Digital grew to be one of Portland's premier digital agencies with clients as diverse as Intel, Microsoft, Oregon Health and Sciences University (OHSU), Portland Development Commission, The Lemelson Foundation, etc. OakTree completed well over 3,000 client projects from e-learning tracking, to hospital's door key tracking and management system, to a HIPPA compliance application, to the Alternate Format Ballot.

In 2007, OakTree bid on and won the opportunity to build the Alternate Format Ballot product for the Oregon Secretary of State. The AFB process and ballots got their first test during the May 2008 Primary. This is a quote from a voter in that first election:

> *"The Alternate Format Ballot has given me the ability to do something I've never been able to do in my 18 years of being a registered voter--it has provided me the opportunity to mark my ballot privately and independently." -- Angel C. Hale, Training Center Director, Oregon Commission for the Blind*

The Alternate Format Ballot (AFB) has truly touched people's lives in a positive way. The AFB is an HTML ballot used by voters with disabilities, particularly those with vision or mobility concerns. Oregon also uses the AFB for military or overseas voters (UOVOCA).

While building an HTML and PDF ballot generating system may seem out-of-place at an internet development agency, the user interfaces, complex JavaScript, multiple browser testing, and assistive software testing required was not that different than many of the projects OakTree had successfully delivered over the years. Not that much different but so much more meaningful.

In February 2013, after running the agency for twenty years, John sold the agency side of OakTree to another Portland based agency, Grady Britton, so he could pursue his passion: the Alternate Format Ballot. For branding reasons, Grady Britton wanted the OakTree name so John renamed the remaining company "Five Cedars Group" as there are five people in the Schmitt family and the Cedar tree is an amazingly hardy and adaptive tree. Regardless of a name change, the entrepreneur spirit of the company lives on.

3. Company Financial Status

Five Cedars Group, Inc. is a privately held, Oregon company. As we discussed in the company overview, Five Cedars recently shed the internet marketing side of our business to focus on the election business, especially alternate ways for people to vote.

We'd been in business as OakTree Digital for over twenty years and enjoyed the respect, references and repeat business from our hundreds of clients. In our new life as Five Cedars we have only one client and that is the State of Oregon. We have had an ongoing contract (with many amendments) with the Secretary of State's office since August 2007. Five Cedars owns the intellectual property and all rights to the AFB source code and process.

As a private company, for over twenty years, we have never revealed our financial statements to a prospect or in an RFP. The only time we have disclosed private financial information was when we were negotiating a partial purchase of the company in 2012. We value our reputation for customer satisfaction and history of never failing to deliver to a client what we've promised to deliver.

We have maintained good banking relations with the Northwest Bank in Lake Oswego, Oregon for the past eight years. We have never been sued, had any judgments against us and have never filed for bankruptcy.

4. Relevant Business Experience

Five Cedars Group (then OakTree Digital) launched its first database-driven website application in 1994. In those days, application development for the Internet was a new (and wild!) frontier. Today, our application engineers are seasoned pros—with over 75 years of combined experience. This depth and focus forms Five Cedar's backbone, and ensures project success.

Our engineering team approaches every project consultatively. From evaluating the pros and cons of developing a custom application versus integrating a third party tool, we keep the goal of project success for the client our guiding principle. Experience tells us that nothing is more discouraging than completing a complex project, but failing to meet its business objectives.

When we first bid on the Oregon RFP for the Alternate Format Ballot back in 2007, we weren't familiar with the world of elections. We did, however, have a deep knowledge of human interface design, data driven application development, JavaScript and experience testing applications on multiple platforms and multiple browsers.

For the six years the AFB has been in use in Oregon, Five Cedars has been involved in over 18 state wide elections, and four national elections. We have become working partners with the staff at the state elections office and with Washington and Multnomah counties, Oregon's two largest counties and the biggest users of the AFB.

Five Cedars implemented and currently maintains the Alternate Format Ballot system and process for the State of Oregon. The original contract was granted in August of 2007 and has had 17 amendments over the years to add features and expand functionality.

References for the Oregon AFB installation and support are:

Oregon Secretary of State's Office:

Don DeFord, HAVA Coordinator and project manager 503- 986-0523, don.deford@state.or.us

Ericka Haas, former Business Analyst for the HAVA (Help America Vote Act) program, 503-580-9959, ericka.haas@ericstates.org

Washington County Election Office:

Mickie Kawai, Elections Division Manager, 503-846-5800, mickie_kawai@co.washington.or.us

John Montoya, Elections Coordinator, 503-846-5806, John_Montoya@co.washington.or.us

5. PRIOR PROPOSALS

In July 2007 Five Cedars Group (known then as OakTree Digital) submitted a response to the June 12, 2007 Oregon Secretary of State RFP (#7147) for an "Alternate Format Ballot" project to create HTML ballots from XML output files from the Oregon Centralized Voter Registration System (OCVR).

The project contact was the Oregon HAVA Coordinator at the time, Gene Newton. The contract administrator was Brent Kibby, CPPB, (503) 986-0514. On August 6, 2007 we were notified that we had won the opportunity and a contract was signed on August 8, 2007. The project was started and completed to the state's satisfaction.

Since then we have had multiple amendments to the contract for additional features, such as modifying the Ballot Generator to not only produce HTML ballots but also Large Print Ballots (PDFs) that are printed by the counties on 11"x17" or 8.5"x14" stock paper for use by voters with vision disabilities such as macular degeneration.

The current project manager and HAVA coordinator is Don DeFord, (503) 986-0523, don.deford@state.or.us.

The most recent amendment was to incorporate into the AFB some of the text, navigation and colored button features demonstrated in the "Anywhere Ballot" work funded through the University of Baltimore as part of the Accessible Voting Technology Initiative of the ITIF (funded by a grant from the U.S. Election Assistance Commission).

6. Project Approach

Five Cedars recommends that Colorado select a subset of counties to do a trial implementation of the AFB by selecting 10-20 counties that demonstrate the most need for an alternative to existing assistive voting platforms and who demonstrate the desire and capability to execute on such a trial. Our experience has been that the biggest need is in the most populated counties but that may not be true in Colorado's case.

The basic steps to implementing the AFB in Colorado are to:

a. Identifying the responsible project parties and their roles
b. Defining the deliverables in interaction discussions
c. Identifying the counties or jurisdictions to be supported
d. Picking a target election for the trial
e. Selecting the number of languages desired (may be only English for a trial)
f. Defining the data conversion aspects based on XML formats available from SCORE
g. Defining the text and formats of Colorado ballots
h. Defining the types of training and schedule for training county staff
i. Identifying any supportive disability groups and what role they might play in a trial, etc.

A full project task list and schedule would be one of the first deliverables for a trial project.

The programming development approach to this project would be to identify the differences and specific requirements that differentiate the target Colorado voter and ballot from the existing ballots being used in Oregon (See Appendix B). Once those unique differences are identified and documented, FCG's programming staff would proceed to create an AFB process and ballots specific to Colorado but based on the code and process that currently exists in the Oregon implementation. The one-time costs for this conversion are outlined in the Cost Proposal.

6.1 Project Management

FCG uses Basecamp and Microsoft Project charts to track identified deliverables, delivery dates, assignment of tasks, and project notes. We closely tie project efforts to billable hours as to track project progress vs. budgeted funds. Open communication and weekly (sometimes daily) status meetings between key personnel is paramount to keeping a project on track, within mutual expectations, and marching on toward the finished product.

6.2 UVS Software

The AFB Ballot Generator is a server based program that monitors separate county file folders looking for a county file to be dropped into a folder for processing. When it detects a new data file it reads the XML and creates ballots which are written back into the same folder so that once all the ballots are generated the county can easily retrieve them. The county contact (or FCG

staff) is sent an email message notifying them when the ballots are ready to be retrieved, usually within a matter of minutes.

FCG's process for determining requirements is to hold an "objectives definition" meeting(s) with CDOS and representative county staff to review the existing AFB process and ballots, noting any obvious differences or changes to be made. Once these changes are identified, FCG would prioritize them and re-present them back to CDOS for approval. This presentation might be with mock-ups, drawings, or actual HTML ballots.

The point is, defining what CDOS and the counties need and want is the first step. This process will be somewhat iterative as often the client needs to see the "next revision" to trigger the discovery of an existing need that wasn't initially discussed in the discovery meetings. After an agreed upon time, the deliverable features list would be frozen.

The AFB Ballot Generator is written in Microsoft Visual Basic 2010 and runs in a .NET server environment. The process to generate both types of ballots (HTML and PDF's) is performed in one pass through the Ballot Generator. The AFB Large Print Ballot is generated using Ecrion's Ultrascale XF Rendering Server (8.5) software to convert the ballot XML data into large format PDF's (11x17 or 8.5x14, 16 or 18 point font ballots). FCG has an ongoing support contract with Ecrion which includes access to their developers thru email as well as their on-line Knowledge Base.

FCG AFB source code could be made available as a text document for examination by CDOS programmers if it is a Colorado requirement for acquiring software. The licensing rights to AFB machine readable code for future changes by CDOS programmers could be purchased by CDOS. Source code licensing fees are contained in the Cost Proposal. Five Cedars owns the intellectual property and all rights to the AFB source code and process.

There are version numbers in the AFB Ballot Generator as well as the ballots that are produced. There is also a date/time stamp contained in both ballot types indicating the version of the county XML file that was used to generate the ballots.

The HTML version of the AFB leverages W3C Accessibility Guidelines. Ballots generated by the Ballot Generator perform all the functions required to meet accessibility standards. A few of them are:

a) A ballot can be viewed one race at a time or the whole ballot at once. A voter can navigate back and forth between the two views of the ballot.
b) Each race/measure can be checked for "over or under voting".
c) The entire ballot can be checked for "over or under voting".
d) Races can have as many write-in names as the "Vote for X" number allows.
e) The Ballot Summary page displays a note indicating any "over or under voting".
f) The screen and font size are easily scaled for ease of reading.

g) All navigation indicators (buttons) are plainly identified and give visual cues when activated.
h) All navigation indicators are placed near the left margins so as not be lost when the screen is enlarged by screen magnifier software or the zoom functions of the browser (CNTL +, CNTL -).

The HTML ballots are self-contained, meaning once they are loaded into a browser they do not request any data, graphics or navigation from a server. Once a voter receives a ballot, there is no internet connection required. Voters can mark their choices, print their Ballot Summary and complete the voting process, literally anywhere. All the ballot's functions are self-contained in the JavaScript contained in the ballot. This is important for the following reasons:

a. Because the ballots don't rely on an active internet connection to work and the voting process is done entirely on the device the voter is using, there is no "refresh delay" or chance of a dropped connection, the device freezing, etc. interrupting the voting process.
b. Ballots can be emailed, opened later opened, and marked at the voter's leisure.
c. A state's entire collection of ballots for an election can be put on a laptop/tablet/USB device and carried into a facility that doesn't have an internet connection.
d. They can be zipped/unzipped for bulk emailing to a remote location.

Fig 2 - Voter marking his ballot via Jelly Bean input

The HTML ballots were originally designed specifically for the vision impaired and disabled voters. As such they work with the following assistive software:

a. JAWS
b. ZoomText
c. Window Eyes
d. Microsoft Navigator
e. Apple's VoiceOver

6.3 UVS Hardware

The hardware required for implementing the AFB ballot generation process depends on the implementation path chosen by CDOS. The AFB Ballot Generator process requires a basic Windows Server, either shared or a virtual partition.

If CDOS decides to bring the AFB ballot generation in-house, a suitable server will have to be supplied. Exact specifications can be determined by CDOS IT staff during testing of the process. For comparison, the Oregon version runs fine in a single processor, 2 GB virtual server environment. The process is basically a batch process with no real-time requirements so blazing speed and redundancies are not required.

If CDOS chooses to go the SAAS route, there is no internal server or other hardware required to generate the ballots as each county would transmit their ballot XML file to FCG's Citrix ShareFile account for processing on an FCG server.

If a county decides to place a laptop or other device in a polling place or make such devices available to a voter assistance team, a regular COTS laptop (PC or MAC), iPads or Surface Pro work just fine. The nice thing about supplying a voter assistance team a device with a USB port is the entire state's inventory of ballots could be pre-loaded on that device. The device can then be used to access anyone's correct ballot no matter where they are currently in the state, or where they actually reside, i.e., a voter may currently be in a rehabilitation center in a different county than they normally reside. iPads, however, typically require an internet connection to download ballots.

6.4 Database

The AFB Ballot Generator does not have or use a database as such. There are several XML text files it uses to populate certain data fields on the ballots, for instance, a list of county names, election official contacts, their emails (for confirmation emails), and the phone number of the election offices in case the voter needs to contact them.

6.5 Data Migration

The data that drives the ballot creation will come from SCORE XML exports of the ballot data (county, ballot style, date of election, type of election, races, candidates, measures, etc.). Sample data of an XML export is shown in the Sample Reports (Section 7).

Our experience over six years of producing ballots for Oregon has been that the biggest cause for ballot generation errors is due to bad or malformed XML data files. These are usually fixed by correcting the county's data at the source (SCORE), editing out extraneous data from, for instance, someone doing a copy/paste from Word into the ballot definition system, creating partial lists, etc. Most of these anomalies are caught by the Ballot Generator and automatically corrected. Some counties will need extra guidance (re-training) to generate good ballot data, for instance, in knowing how to properly enter an ordered list of items in a measure's text. This is where the online tutorial can be very helpful to the county staff.

6.6 Test Strategy

There are multiple points for testing any complex system and we have identified and created several in-house protocols for testing both the generation of ballots from XML data and the actual workings of the JavaScript driven code in the HTML ballot.

Actual verification of the ballot text, race, candidates, and measures, however, is left to the election officials in a county to verify. Testing of the voter's intent (which target box was selected and is coded into the 2-D barcode on the Summary Page) by scanning the Summary Page's 2-D barcode is easily verified by using 2-D barcode reader apps available on smart phones.

Verifying that an AFB voter's intent from the Summary Page is scanned correctly by a ballot-on-demand printer is again something done by the county as each ballot needs to be verified prior to the scan-able ballot being accepted for scanning.

6.7 Training

Training of state and county staff is part of any AFB implementation. The purpose and expectation of the AFB training is that of "train the trainer". The training FCG is prepared to deliver consists of:

a. Introduction to the AFB Process and Ballots
b. Steps for populating and generating AFB ballots from county data files.
c. How to install an AFB ballot on various devices (PC, iPad, etc.)
d. Demonstrations of typical usage of the ballot using a mouse, keyboard, touch screen, JAWS, sip and puff and Jelly Beans.
e. Generating and printing a Summary Ballot page.
f. Using a ballot-on-demand printer to generate a scan-able ballot.
g. Other topics as needed for Colorado specific requirements.

Onsite support should only be required if the state opts to install the AFB Ballot Generator on a state server. FCG staff is willing to make onsite calls whenever the state requests such an activity. After the initial installation and setup, any onsite visits will be paid by the client as outlined in the Cost Proposal.

An on-line self-study user training module will be developed specific to CDOS and county user's needs to be trained or be given a refresher course:

a. Populating and generating the AFB ballots?
b. Examples of any special text input "Tips and Tricks."
c. The steps a typical voter (3-5 personas) would take to get access to a ballot and how to vote using the AFB.

The cost for creating this interactive tool is specified in the Cost Proposal.

6.8 Implementation

The actual implementation of the AFB for Colorado would be to work with CDOS and select counties and apply the previously described project steps. There would be a series of onsite or conference calls to demonstrate the existing AFB process and ballots so CDOS and the counties can define the changes they would require. This would involve a series of iterative design/build sequences where CDOS and the counties would get to approve the progress to-date leading to a full demonstration of the system prior to a mock or actual election trial.

6.9 Support

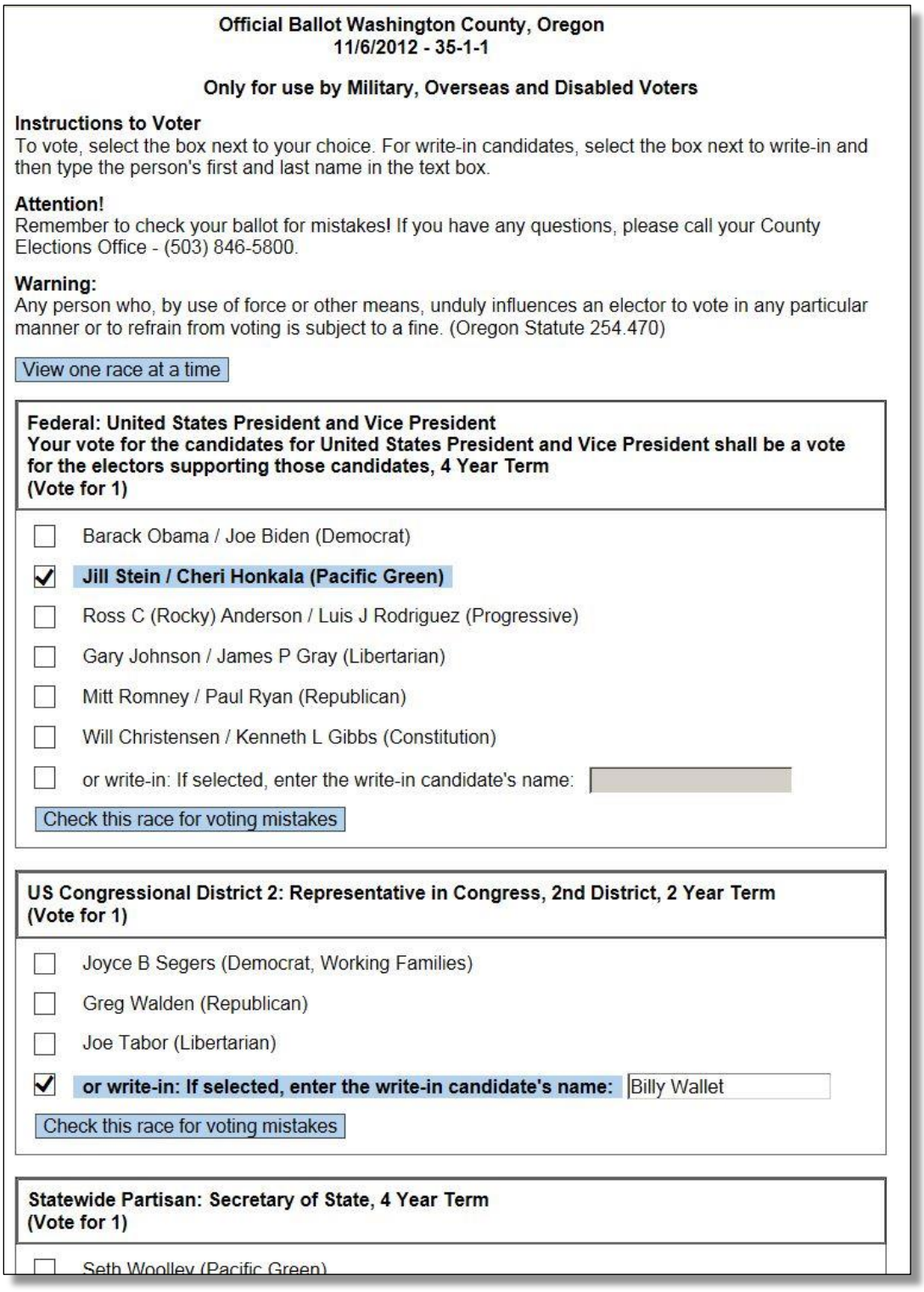
Support for the AFB process and any issues that may arise in a county prior to or during an election will be provided as part of the regular election period support FCG provides its customers. Support could be delivered by phone, email or, in unusual circumstances, by on-site visits. Fees for post-installation support are defined in the Cost Proposal.

FCG staff is available during regular business hours and by cell phone after hours. Due to the nature of the AFB system, such as the timing of when ballots are generated, etc., our current clients have never requested nor have needed 24/7 support.

Onsite server support of the AFB Generator should only be required if the state opts to install the Ballot Generator on a state controlled server. In the SAAS model of delivery, the Ballot Generator resides on a FCG secure server and is accessed by the counties through a Citrix ShareFile account.

7. Sample Reports

HTML Ballot screen shot showing viewing entire ballot mode.



Official Ballot Washington County, Oregon
11/6/2012 - 35-1-1

Only for use by Military, Overseas and Disabled Voters

Instructions to Voter
To vote, select the box next to your choice. For write-in candidates, select the box next to write-in and then type the person's first and last name in the text box.

Attention!
Remember to check your ballot for mistakes! If you have any questions, please call your County Elections Office - (503) 846-5800.

Warning:
Any person who, by use of force or other means, unduly influences an elector to vote in any particular manner or to refrain from voting is subject to a fine. (Oregon Statute 254.470)

View one race at a time

Federal: United States President and Vice President
Your vote for the candidates for United States President and Vice President shall be a vote for the electors supporting those candidates, 4 Year Term
(Vote for 1)

- ☐ Barack Obama / Joe Biden (Democrat)
- ☑ **Jill Stein / Cheri Honkala (Pacific Green)**
- ☐ Ross C (Rocky) Anderson / Luis J Rodriguez (Progressive)
- ☐ Gary Johnson / James P Gray (Libertarian)
- ☐ Mitt Romney / Paul Ryan (Republican)
- ☐ Will Christensen / Kenneth L Gibbs (Constitution)
- ☐ or write-in: If selected, enter the write-in candidate's name:

Check this race for voting mistakes

US Congressional District 2: Representative in Congress, 2nd District, 2 Year Term
(Vote for 1)

- ☐ Joyce B Segers (Democrat, Working Families)
- ☐ Greg Walden (Republican)
- ☐ Joe Tabor (Libertarian)
- ☑ **or write-in: If selected, enter the write-in candidate's name:** Billy Wallet

Check this race for voting mistakes

Statewide Partisan: Secretary of State, 4 Year Term
(Vote for 1)

- ☐ Seth Woolley (Pacific Green)

HTML Ballot showing the one-at-a-time view of a measure

Official Ballot Washington County, Oregon
11/6/2012 - 35-1-1

Proposed by Initiative PetitionStatewide Nonpartisan: Ballot Measure 82 - Amends Constitution: Authorizes establishment of privately-owned casinos; mandates percentage of revenues payable to dedicated state fund

Result of "Yes" vote: "Yes" vote amends state constitution to authorize privately-owned casinos; requires such casinos to give percentage of monthly revenue to State Lottery for specified purposes.

Result of "No" vote: "No" vote maintains current state of the law, which does not authorize any privately-owned casino within state; tribal casinos authorized pursuant to gaming compacts.

Summary: Amends constitution. Currently, Oregon Constitution prohibits the operation of privately-owned, non-tribal casinos within the state. Under measure, State Lottery shall permit the operation of privately-owned casinos within the state, provided that the particular operation is approved through an initiative law. Privately-owned casinos must be located within an incorporated city, and city electors must also approve casino location. The privately-owned casino shall pay 25% of adjusted gross revenues each month to a dedicated state fund for the purposes of fostering job growth, educational achievement, vibrant local communities, protecting and improving natural environment, and supporting all federally recognized Indian tribes in Oregon. Amendment prohibits the operation of privately-owned casino within 60-mile radius of existing tribal casino operating on reservation land.

Estimate of Financial Impact: This measure has an indeterminate financial impact. Currently the Constitution prohibits casinos in Oregon, and this measure amends the Constitution to allow casinos. However, if the measure is adopted, there may be a financial impact to certain local government entities that receive revenue derived from tribal gaming operations, because tribal gaming revenues may decline.

☐ Yes

☑ **No**

Check this measure for voting mistakes

← Back | View Full Ballot | Next →

HTML Ballot Summary Page showing voter's intent and over/under votes

Official Ballot Washington County, Oregon
11/6/2012 - 35-1-1
Summary of Votes

Federal: United States President and Vice PresidentYour vote for the candidates for United States President and Vice President shall be a vote for the electors supporting those candidates, 4 Year Term (Vote for 1)

You voted for: **Jill Stein / Cheri Honkala (Pacific Green)**

US Congressional District 2: Representative in Congress, 2nd District, 2 Year Term (Vote for 1)

You wrote in: **Billy Wallet**

Statewide Partisan: Secretary of State, 4 Year Term (Vote for 1)

You voted for: **Kate Brown (Democrat, Working Families)**

Statewide Partisan: State Treasurer, 4 Year Term (Vote for 1)

You voted for: **Michael Paul Marsh (Constitution)**

Statewide Partisan: Attorney General, 4 Year Term (Vote for 1)

You voted for: **Ellen Rosenblum (Democrat)**

Senate District 30: State Senator, 30th District, 4 Year Term (Vote for 1)

You voted for: **Ted Ferrioli (Republican, Democrat)**

House District 59: State Representative, 59th District, 2 Year Term (Vote for 1)

You under voted for this race.

Statewide Nonpartisan: Commissioner of the Bureau of Labor and Industries, 2 Year Term (Vote for 1)

You voted for: **Bruce Starr**
You voted for: **Brad Avakian**
You voted for more than 1. Your vote will not count for this race.

Statewide Nonpartisan: Judge of the Supreme Court, Position 3, 6 Year Term (Vote for 1)

You under voted for this race.

Sample of Large Print Ballot 11"x17" with 18 point font (not to scale).

Official Ballot - Multnomah County, Oregon - Special Election 2013 Page 1 of 3
5/21/2013

Instructions to Voter - Use A Pen (Blue or Black Ink)

To ensure your vote counts, completely fill in the oval ⬬ to the left of the response of your choice.

To write in a name, write the name on the solid line and fill the oval ⬬ to the left of the write-in line.

Attention! Remember to inspect your ballot for mistakes! If you make a mistake, call your County Elections Office (503) 988-3720 to ask for a replacement ballot.

PORTLAND COMMUNITY COLLEGE DISTRICT--ZONE 4

Director, Zone 4, 4 Year Term
(Vote for 1)

- ⬭ Jim Harper
- ⬭ Bernardo Tuma
- ⬭ or write-in: _____

MULTNOMAH EDUCATION SERVICE DISTRICT

Director, Pos. 2, At Large, 4 Year Term
(Vote for 1)

- ⬭ Patrick Lasswell
- ⬭ Nels Johnson
- ⬭ or write-in: _____

PORTLAND SCHOOL DISTRICT #1JT (M)

Director, Zone 4, 4 Year Term
(Vote for 1)

- ⬭ Martin Gonzalez
- ⬭ Steve Buel
- ⬭ or write-in: _____

Director, Zone 5, 4 Year Term
(Vote for 1)

- ⬭ Pam Knowles
- ⬭ or write-in: _____

Director, Zone 6, 4 Year Term
(Vote for 1)

- ⬭ Tom Koehler
- ⬭ David Morrison
- ⬭ or write-in: _____

CITY OF PORTLAND

Measure 26-150 - Renew five-year levy to prevent child abuse, child hunger

Question: Shall Portland continue abuse, neglect prevention, children's programs; five-year levy $0.4026 per $1,000 assessed value beginning 2014; require audits?

This measure renews current local option taxes.

Summary: Renews the Portland Children's Levy; supports proven programs designed to prevent childhood hunger, prevent child abuse and neglect, help children arrive at school ready to learn, provide safe constructive after school alternatives for kids, and help foster children succeed.

002 Continue voting on other side ➡

Sample of XML Data Exported from Oregon's OCVR

```
<?xml version="1.0"?><xml xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<election date="5/21/2013" title="Special District May 2013" type="SE">
<jscode value="34"><ballot_style name="84" party="Non Partisan"
LPB_SIZE="Eleven_By_Seventeen" FileCreationDate="2013-04-19T11:24:03">
<races>
        <race order="1">
                <district_name value="PCC ZONE 1" />
                <position_name value="Director, Zone 1" />
                <vote_for value="1" />
                <term value="4 Year Term" />
                <candidates>
                        <candidate name="Denise Frisbee" />
                </candidates>
</race>
        <race order="2">
                <district_name value="Tigard-Tualatin School District #23JT" />
                <position_name value="Tigard-Tualatin School Director - Pos 1" />
                <vote_for value="1" />
                <term value="4 Year Term" />
                <candidates>
                        <candidate name="Barry Albertson" />
                        <candidate name="Moses Bullock" />
                </candidates>
</race>
        <race order="3">
                <district_name value="Tigard-Tualatin School District #23JT" />
                <position_name value="Tigard-Tualatin School Director - Pos 3" />
                <vote_for value="1" />
                <term value="4 Year Term" />
                <candidates>
                        <candidate name="David Matheson" />
                        <candidate name="John Goodhouse" />
                        <candidate name="Dana Terhune" />
                        <candidate name="William E Barber" />
                </candidates>
</race>
```

8. Sample Project Artifacts

Five Cedars Group regards its internal project management documentation as proprietary. Our tools and methods of using them to manage a project to a successful conclusion is a competitive advantage and we decline to show them here.

What we are proud to show as an example of the kinds of research to find great solutions to problems displayed in the Technical Solutions document we produced for Oregon's Elections Division when we built the Large Print Ballot (LPB). It also shows the cooperative work and spirit between, then OakTree and the state. These are taken from PDF's and re-sized to fit in this proposal but they are informative and readable.

This is the table of contents:

Technical Solutions for Large Print Ballot Project Documentation (Sample)

Technical Solutions for Large Print Ballot Project Documentation Sample (con't)

Specifications for Large Print Ballots

INTRODUCTION

The goal of this project is to add a Large Print Ballot (LPB) feature to the existing Alternate Format Ballot Generator system that Oregon adopted and used for the 2008 statewide and national elections. The AFB Generator process will be augmented to include an option for the counties to download Adobe PDF formatted ballots ready to print (two sided) on an industry standard printer.

Large Format Ballots can be requested by voters needing larger print formatted ballots for ease in their voting. They have been typically printed on 11x17 paper and are returned in the secrecy envelope and processed individually by the county election staff.

The LPB formatted ballots will be generated from the same OCVR XML files that are currently used to create the AFB HTML ballots. The process is being automated to keep the HTML AFB and LPB files in sync so no extra work is required by the counties to have both formats available.

TECHNICAL SOLUTION OVERVIEW

The Large Print Ballot functionality will be implemented by modifying the existing AFB generator process so that two electronic formatted ballots are produced. Whenever a county's ballots are exported from the OCVR by county election officials, the XML ballot data file is placed in the AFB/LPB input folder and once recognized by the AFB/LPB generator process, each ballot will be automatically converted into both an HTML AFB and a LPB file in PDF format with the same file name as the HTML ballot file.

Implementing the LPB requires a break in the flow of the AFB processing with the XML stream of ballot data being redirected to an XML-to-PDF server function (to be installed on State servers) which will take a ballot definition file (XSL) and apply the formatting to the Ballot XML data. The XSL file is created in a desktop editing tool similar to Quark in that you get to see the page formatted on the screen.

The beauty in this solution is the ballot formats can be changed relatively easily by changing the XSL file. The solution being provided for the fall test and the spring 2010 elections assume a single ballot format.

The system flow diagram in Appendix A shows the process for modifying the AFB process and creating the LPB function

LPB Format Issues

Working with Gene Newton, the Oregon HAVA Coordinator, we held two conference call JAD sessions with county election staff to explore LPB format restrictions, font styles and county differences in headings, etc. The notes from those meetings are in Appendix B. These meetings were instructive and helped educate the counties on the use and process that will generate the LPB.

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Technical Solutions for Large Print Ballot Project Documentation Sample (con't)

Specifications for Large Print Ballots

However, the task of discovering an ideal format(s) for a LPB was not easy nor, at this writing, conclusive in finding the "perfect" format. Some of the research OakTree did and the documents Mr. Newton supplied, while helpful in framing the desired results (easy to read text) lead us to try the American Printing House (APH) recommended font, APHont. Again, the results have been good but inconclusive.

It is instructive to share the American Print House' definition of "large print":

> Large print is generally defined as print for text passages that is larger than the print used by that segment of the population with normal vision. The sizes of print most commonly used by the sighted population range from eight to twelve points in size. The American Printing House for the Blind takes the position that large print for use by the low vision population is print that is eighteen points in size or larger.

APH's recommendations are based on replicated research performed by APH and other agencies. Their researchers studied the impact of various large print characteristics on reading speed, comprehension, literacy, and usability by large print users and found subjects had better scores in all areas tested when using APHont.

These guidelines are outlined in the following statements:

1. A font that is at least 18 points in size.
2. X-height and t-heights of at least 1/8 inch.
3. A typeface without serifs.
4. Spacing between lines of print of at least 1.25 spaces.
5. Headings and subheadings that are larger and bolder than regular large print text.
6. Paragraphs that are block style and use 1 inch margins. The left margin should be justified and the right hand margin should not be justified. There should be no first-line indentations to delineate paragraphs.
7. Printed materials with no columns or divided words.
8. Black print on white, ivory, cream, or yellow paper with a dull finish so as not to promote glare.
9. Print that is not used over a background design or other graphical material.
10. Graphics that are not only enlarged, but maintain the same contrast, clarity, and appropriate coloration as those prepared for their sighted peers.
11. Graphic materials, such as maps, graphs, and charts, which also adhere to type size, font, and other large print guidelines. (Guidelines for maps are under development.)
12. Full-color or high-quality black line art rather than gray-scale or shaded drawings.
13. Books that weigh no more than 32 ounces and are no larger in dimension than 9 inches by 12 inches by 2.5 inches.

As you can tell, these guidelines are aimed at books which we maintain have more flexibility in format than a ballot which may demand different levels of concentration, shorter range of eye movements, and must be folded and mailed in an envelop.

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Specifications for Large Print Ballots

1.1 Fonts and Sizes Specs

We investigated using APH's APHont (See Appendix B) but found that Arial font tested as well and has bolder lines which the test subjects reported was easier to read. Again, not all the test results are in but it seems to be a toss up between the two fonts. This will not delay our moving ahead with LPB development as our process is flexible enough to change fonts later in the roll-out. Whether we can support the option of two fonts has not been scoped out but would require additional budget.

Another issue is both APH and the National Association for Visually Handicapped (Appendix X) suggestions for using "at least 18 pt font" may lead to the notion that all 18pt fonts are the same physical size. This is not a true assumption and given we are trying to optimize both readability and page utilization we may have to compromise on one or the other.

While we are certain that the APHont is better for reducing eye strain when reading a book, voting should not present the voter with the long periods of eye movements associated with book reading. Based on the testing to-date, Arial and APHont seem to be of equal preference.

If, however, we just look at actual font sizes (numeric and comparative size) the 16.5pt APHont is the same size at the 18pt Arial font. This has implications for getting maximum text on to a page and limiting a ballot's page count. Here's a sample showing their similarities but also the economy of 16.5 pt APHont:

The Quick Brown Fox Jumped 18 pt Arial
The Quick Brown Fox Jumped 16.5 pt APhont

When you bold Arial font it gets bigger, taking more space but because it gets bigger it has darker lines making reading easier for some.

The Quick Brown Fox Jumped 18 pt Arial
The Quick Brown Fox Jumped 18 pt Arial Bold

APHont, however, maintains its size when bolded>

The Quick Brown Fox Jumped 16.5 pt APhont
The Quick Brown Fox Jumped 16.5 pt APhont Bold

Note: Our testing showed that very small differences in font size and spacing led to whole races being pushed to a new column or to a new page increasing the ballot's page count and leaving gaps of white space.

1.2 Leading (Inter-line Spacing)

Our testing found that readability did not seem to be affected by using a smaller leading (space between lines) at certain points in the Candidate races nor between paragraphs in the Measures. There seems to be adequate white space around these short statements to

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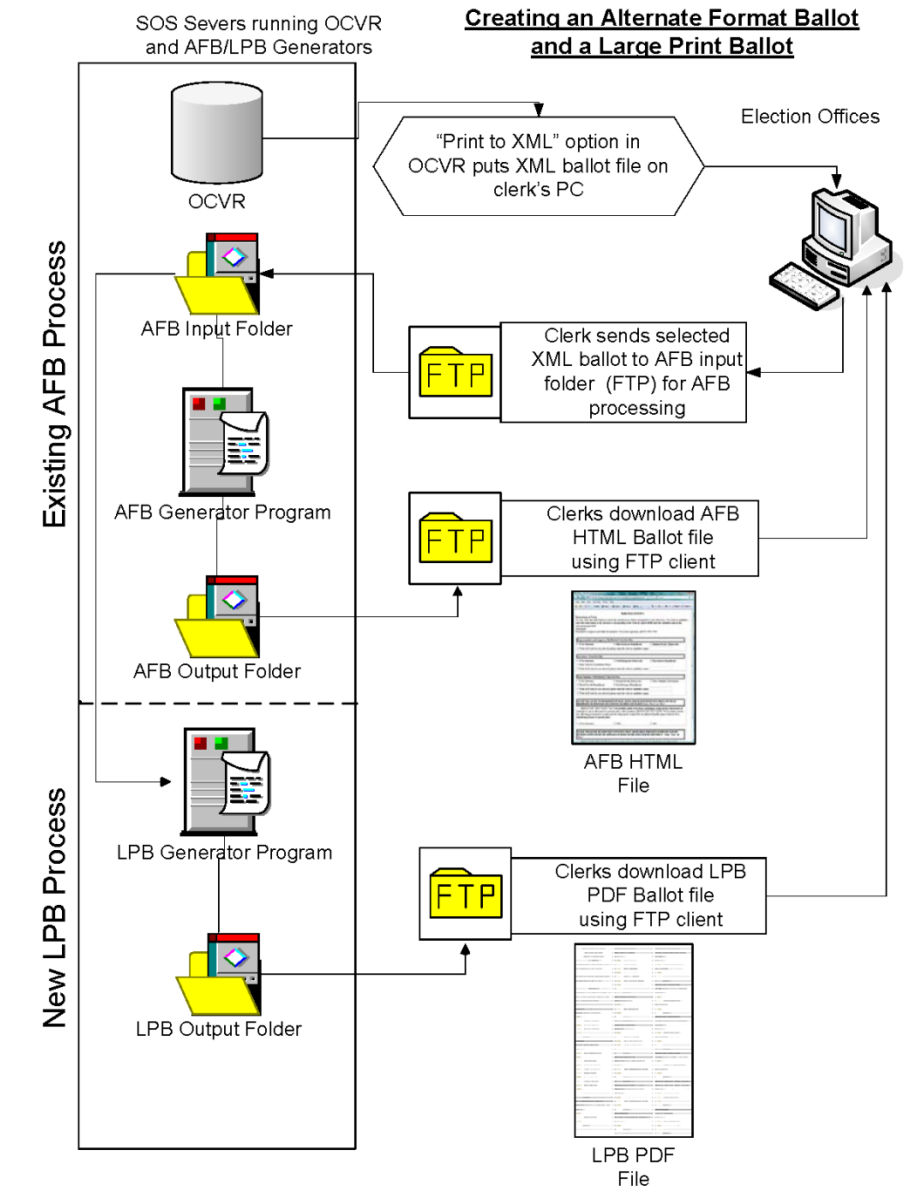
Specifications for Large Print Ballots

Appendix A – System Diagram

Generating the AFP and LPB Ballots



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Technical Solutions for Large Print Ballot Project Documentation Sample (con't)

Specifications for Large Print Ballots

Appendix F – Test Ballot Feedback (to-date)

Actual Ballot Feedback on Three 8.5x14 Samples:
Sample A = 16pt APHont, B= 18pt APHont, C= 18pt Arial

Hi Gene,

I took the three large print ballots to the Oregon Disability Mega Conference in Portland last week. I spoke to 12 people who are all involved in self advocacy. One person has a physical developmental disability and the other eleven people experience intellectual disabilities. They include people from Portland, Pendleton, Salem, Newport, and Eugene. 8 of the people are women and 4 are men (I don't think this matters but diversity is good). Here is what people said

Ballot A) No one chose this ballot

Ballot B) Nine people chose this ballot. Comments included...
- "It is easier to read for some reason"
- "I like the bold and white spaces. Some people shade things too much and it makes it harder to see. The shading and white parts on this ballot are good."
- "It looks bigger then the others and it's easier to read. I like how the instructions are really big. I goofed on my last ballot and I think this big one will be easier to fill out."
- "I like the bold print. I would use this ballot because it has allot of white space and I wouldn't worry about messing it up."
- "I like the shading."
- "The instructions stand out more and it is easier to focus on".

Ballot C) Two people chose this ballot. Comments included...
- "It looks like the letters are bigger"
- "I can see the print better"

One person said that they all look good and are easy to read.

I hope this helps,

Hannah

Hi Gene,

I talked to ten people total.

Almost EVERYONE said C was the best.
One person liked the shading, the rest did not.
Most said they'd have to use their cctv's to do anything with this.

People requested a dotted line connecting the name to the arrow, explaining that it is VERY hard to make sure things are straight in line, especialy with macular degeneration.

What I can say is that this has increased the awareness and now I need to give some demonstrations... and gosh I feel not as confident as I want to doing this if I do it...

Best,
Jeanne-marie

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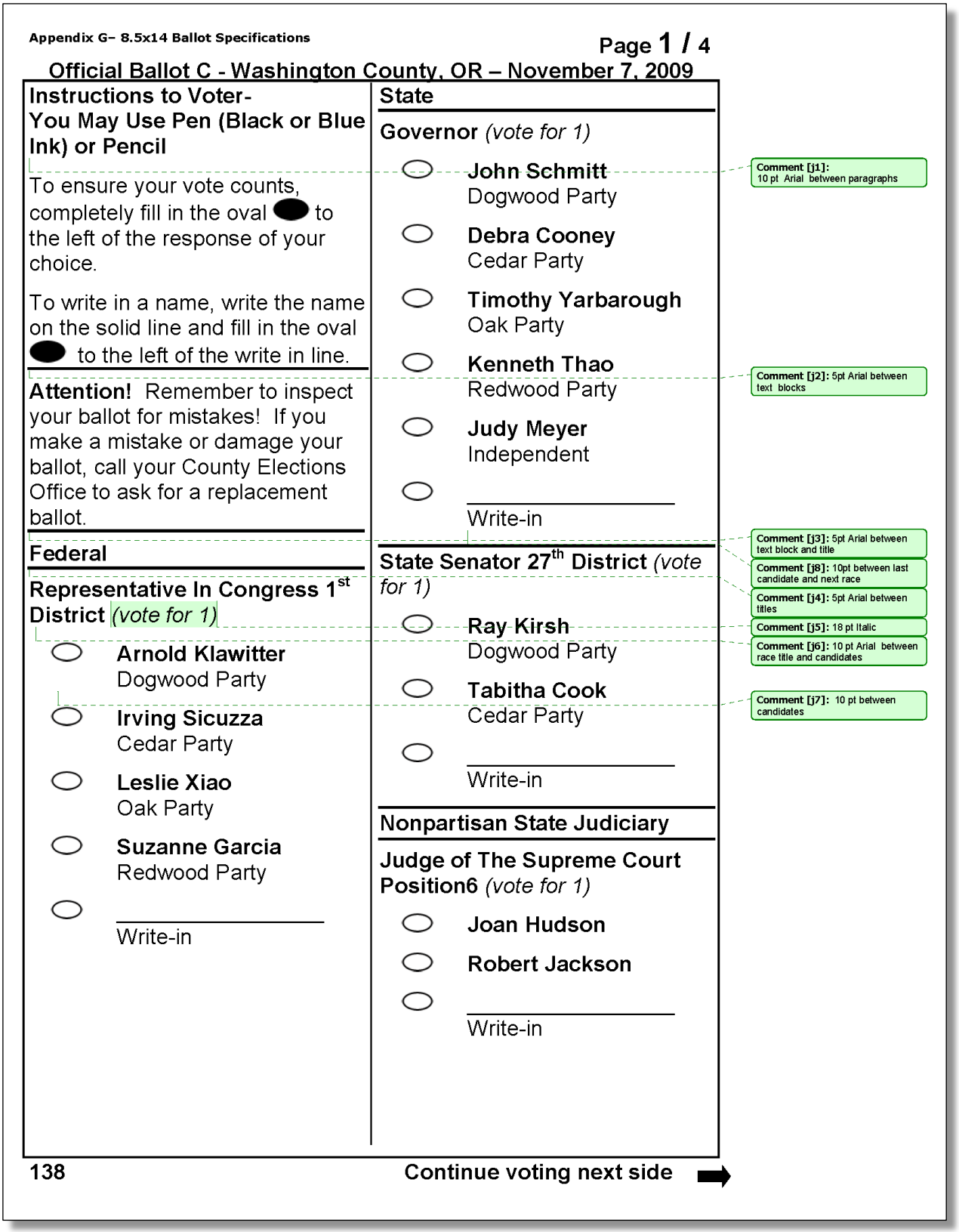
Technical Solutions for Large Print Ballot Project Documentation Sample (con't)



Appendix G– 8.5x14 Ballot Specifications

Page 1 / 4

Official Ballot C - Washington County, OR – November 7, 2009

Instructions to Voter-
You May Use Pen (Black or Blue Ink) or Pencil

To ensure your vote counts, completely fill in the oval ⬬ to the left of the response of your choice.

To write in a name, write the name on the solid line and fill in the oval ⬬ to the left of the write in line.

Attention! Remember to inspect your ballot for mistakes! If you make a mistake or damage your ballot, call your County Elections Office to ask for a replacement ballot.

Federal

Representative In Congress 1st District *(vote for 1)*

- ⬭ **Arnold Klawitter** Dogwood Party
- ⬭ **Irving Sicuzza** Cedar Party
- ⬭ **Leslie Xiao** Oak Party
- ⬭ **Suzanne Garcia** Redwood Party
- ⬭ _____ Write-in

State

Governor *(vote for 1)*

- ⬭ **John Schmitt** Dogwood Party
- ⬭ **Debra Cooney** Cedar Party
- ⬭ **Timothy Yarbarough** Oak Party
- ⬭ **Kenneth Thao** Redwood Party
- ⬭ **Judy Meyer** Independent
- ⬭ _____ Write-in

State Senator 27th District *(vote for 1)*

- ⬭ **Ray Kirsh** Dogwood Party
- ⬭ **Tabitha Cook** Cedar Party
- ⬭ _____ Write-in

Nonpartisan State Judiciary

Judge of The Supreme Court Position6 *(vote for 1)*

- ⬭ **Joan Hudson**
- ⬭ **Robert Jackson**
- ⬭ _____ Write-in

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Continue voting next side ➡

Comment [j1]: 10 pt Arial between paragraphs

Comment [j2]: 5pt Arial between text blocks

Comment [j3]: 5pt Arial between text block and title

Comment [j8]: 10pt between last candidate and next race

Comment [j4]: 5pt Arial between titles

Comment [j5]: 18 pt Italic

Comment [j6]: 10 pt Arial between race title and candidates

Comment [j7]: 10 pt between candidates

9. General Questions

The following is a list of questions and FCG's responses regarding various aspects of the UVS functionality and the UVS project.

1) What staff support from CDOS and counties do you envision needing during the implementation of the UVS in a county? Identify each resource by location (CDOS or county), role or responsibility, technical skills needed, suggested expertise in years, and any clarifying comments. *Answer: We would need committed partners (no more than 5-7) who have a vested interest in making the implementation a success. What that means is CDOS and counties need to make the right decision makers available in a timely fashion. Having access to one or more election officials or their delegates from more than one county to get a broader view, including at least one IT person familiar with SCORE and its export capabilities, and a dedicated project manager, preferably at CDOS.*

2) How many county implementations do you feel you could support simultaneously?

   Answer: From a computer system approach, if all 64 counties use the same SCORE export data facility to produce XML formatted ballot data files, we can support the entire state's implementation. From the practical aspect of interfacing with and training county personnel, a more realistic approach would be to do a trial with 10-20 counties first and assess the success of their adoption before bringing more counties online.

3) What is your coverage, terms, and duration for warranties of the hardware, software, and other deliverables provided pursuant to this RFP? *Answer: We warrant our software to be free from defects for 90 days after acceptance testing at the client site.*

4) What is your coverage, terms, and duration for maintenance of the hardware components of your UVS solution? *Answer: We are not recommending or supplying hardware.*

5) What is your coverage, terms, and duration for licensing of the software components of your UVS solution? *Answer: We license the usage of our software for annual periods but can pro-rate those periods (longer) to avoid licenses expiring during an election season.*

6) Are updates and modifications to the UVS because of legislative mandates a part of your support agreement or are they custom enhancements? *Answer: Any modifications to the AFB Balloting System required due to legislative mandates are considered "modification requests" to the system. These requests would be treated as any computer system program change and the work would be charged at the hourly rate quoted in the Cost Proposal.*

7) What is the certification status of each component within your proposed solution? Include a matrix showing the following:
   - Component Identification *Answer: Not Applicable.*
   - Federal certification date *Answer: Not Applicable.*
   - The federal certification standard currently met (e.g. 2005 VVSG) *Answer: Not Applicable, but the AFB does meet the 2005 VVSG guidelines.*
   - Any state certifications *Answer: Oregon has approved the AFB process and Ballot but they have no certification need as the Summary Pages that are mailed in are re-cast onto scan able ballots which then go through Oregon's certified election process.*
   - Projected certification date and standard if not currently certified *Answer: Not Applicable.*
   - Projected certification date and standard for a future planned upgraded certification *Answer: Not Applicable.*

8) What features of your proposed solution exist to ensure ballot secrecy? Please describe those features. *Answer: The voter's Ballot Summaries are placed inside a secrecy envelope by the voter and mailed to the county election office. The vote-by-mail processes have ballot secrecy elements built-in.*

9) What is your organizational chain-of-command for escalating problems needing resolution? *Answer: Every client is given a FCG contact person and the company president's email and phone number if an issue is unresolved or needs immediate attention.*

10) What purchase options do your company offer (e.g. payment in full upon delivery, financing, leasing)? *Answer: We require software usage licenses be paid in full (for the current state fiscal year) at the beginning of the implementation project. Our terms are 15 days for license payments. Other project fees are invoiced as progress billings as work is completed.*

11) What is the maximum number for each of the following items that your Election Management System allows:
   - Precincts: *Unlimited*
   - Contests: *Unlimited*
   - Candidates: *Unlimited*
   - Political Parties: *Unlimited*
   - Ballot Styles: *Unlimited*

- Precincts per Ballot Style: *Unlimited*
- Ballot Styles per Precinct: *Unlimited*

Answer: The AFB Ballot Generator creates ballots using the XML data files supplied to it. It has no built-in limitations regarding the number of precincts, contests, candidates, parties, measures, etc.

12) What interface capabilities, with the CDOS voter registration system (SCORE), can your Election Management Software provide? *Answer: The AFB Ballot Generator relies on an XML data feed consisting of a county's ballot information. There is a suggested data mapping that could be provided but we are assuming the Ballot Generator would require some modifications to meet the needs of Colorado's SCORE output format. The fees for any modification are included in the Cost Proposal.*

13) What are the security features and capabilities of your proposed system and processes? Include the following areas in your response to this question:
- How do you protect the audit logs (e.g., encryption, hashing)? *Answer: Not Applicable.*
- Does your system documentation contain suggested security auditing procedures? If so, please provide. *Answer: Not Applicable.*
- Do you provide an executable application whitelist with digitally signed programs? *Answer: Not Applicable.*
- How does your system prevent unauthorized, non-whitelisted applications from running? *Answer: Not Applicable.*
- What specific hardening procedures and standards are your voting devices held to? *Answer: Not Applicable.*
- What database encryption mechanisms are used by your system for data at rest and in transit? Please describe, in detail, all uses of data encryption/decryption in your proposed solution. *Answer: Not Applicable.*
- What password features are included in your proposed solution (e.g., complexity, reuse)? *Answer: Passwords for accessing the state's secure FTP site or FCG's Citrix ShareFile site are maintained by state or county staff.*
- Is there any remote communication technology associated with your proposed solution? *Answer: Data files from county offices are transferred to a state server via secure FTP or to FCG's servers via the Citrix ShareFile application.*

14) What post-election audit capabilities are provided by your system and what processes or procedures do you offer to support a post-election audit, including a risk limiting audit? *Answer: Each voter's Summary Page is sent to the election offices on a piece of paper which is then available for any post-election audits, if necessary.*

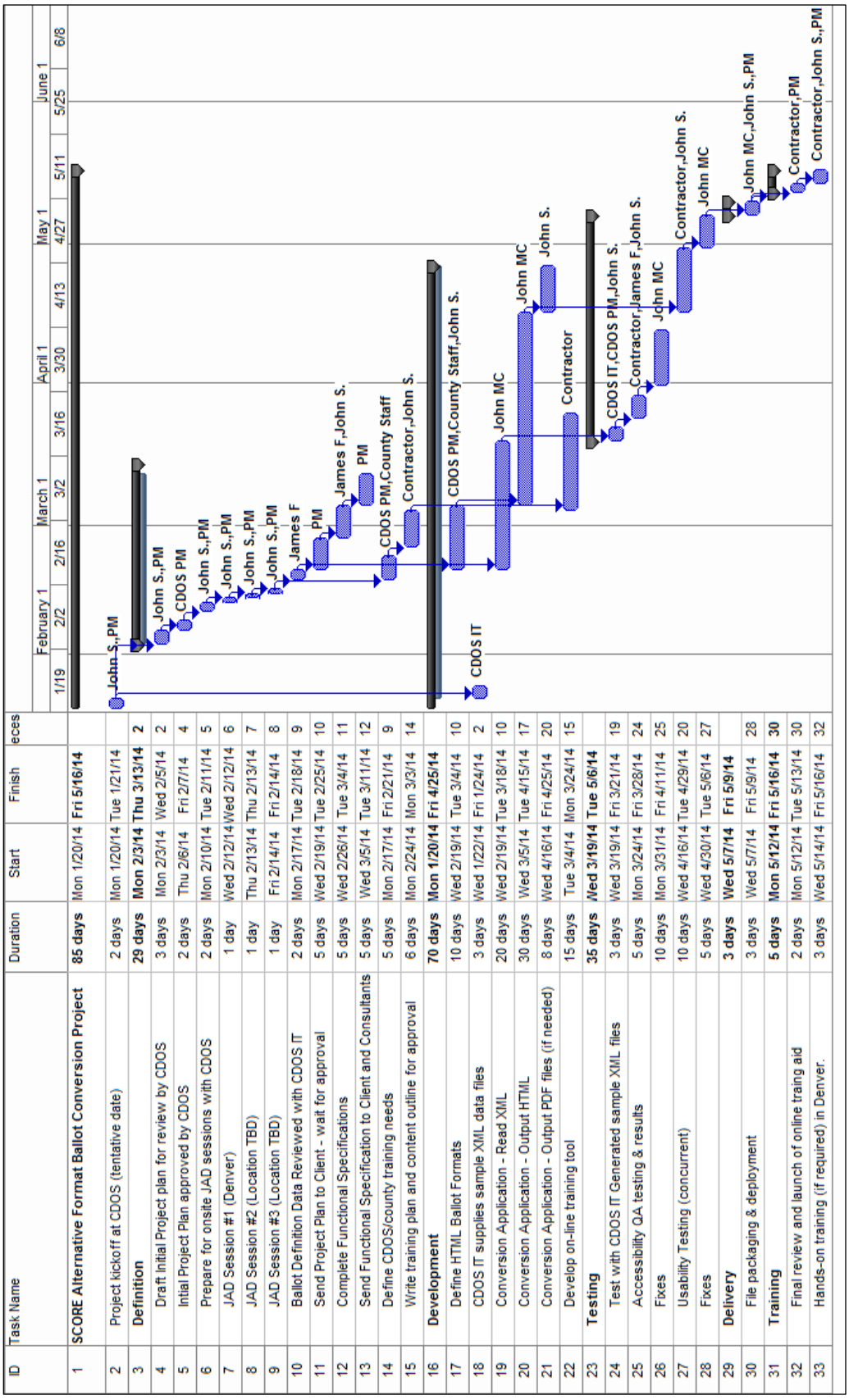
15) To what extent, if any, do the hardware and software products you are proposing to Colorado meet the requirements of Section 508 of the Rehabilitation Act of 1973 and subsequent amendments to that Act?

Answer: The HTML version of the AFB leverages W3C Accessibility Guidelines. Ballots generated by the Ballot Generator perform all the functions required to meet accessibility standards. A few of them are:

a) A ballot can be viewed one race at a time or the whole ballot at once. A voter can navigate back and forth between those two views of the ballot.
b) Each race/measure can be checked for "over or under voting".
c) The entire ballot can be checked for "over or under voting".
d) Races can have as many write-in names as the "Vote for X" number allows.
e) The Ballot Summary page displays a note indicating any "over or under voting".
f) The screen and font size are easily scaled for ease of reading.
g) All navigation indicators (buttons) are plainly identified and give visual (or auditory) cues when activated.
h) All navigation indicators are placed near the left margins so as not be lost when the screen of fonts are enlarged.

16) What products or services do you provide in the areas of Voter Education and Voter Outreach? *Answer: None at this time but would be interested in exploring opportunities.*

10. PRELIMINARY PROJECT SCHEDULE AND STAFFING PLAN



ID	Task Name	Duration	Start	Finish	Predecessors
1	**SCORE Alternative Format Ballot Conversion Project**	**85 days**	Mon 1/20/14	**Fri 5/16/14**	
2	Project kickoff at CDOS (tentative date)	2 days	Mon 1/20/14	Tue 1/21/14	
3	**Definition**	**29 days**	**Mon 2/3/14**	**Thu 3/13/14**	**2**
4	Draft Initial Project plan for review by CDOS	3 days	Mon 2/3/14	Wed 2/5/14	2
5	Intial Project Plan approved by CDOS	2 days	Thu 2/6/14	Fri 2/7/14	4
6	Prepare for onsite JAD sessions with CDOS	2 days	Mon 2/10/14	Tue 2/11/14	5
7	JAD Session #1 (Denver)	1 day	Wed 2/12/14	Wed 2/12/14	6
8	JAD Session #2 (Location TBD)	1 day	Thu 2/13/14	Thu 2/13/14	7
9	JAD Session #3 (Location TBD)	1 day	Fri 2/14/14	Fri 2/14/14	8
10	Ballot Definition Data Reviewed with CDOS IT	2 days	Mon 2/17/14	Tue 2/18/14	9
11	Send Project Plan to Client - wait for approval	5 days	Wed 2/19/14	Tue 2/25/14	10
12	Complete Functional Specifications	5 days	Wed 2/26/14	Tue 3/4/14	11
13	Send Functional Specification to Client and Consultants	5 days	Wed 3/5/14	Tue 3/11/14	12
14	Define CDOS/county training needs	5 days	Mon 2/17/14	Fri 2/21/14	9
15	Write training plan and content outline for approval	6 days	Mon 2/24/14	Mon 3/3/14	14
16	**Development**	**70 days**	**Mon 1/20/14**	**Fri 4/25/14**	
17	Define HTML Ballot Formats	10 days	Wed 2/19/14	Tue 3/4/14	10
18	CDOS IT supplies sample XML data files	3 days	Wed 1/22/14	Fri 1/24/14	2
19	Conversion Application - Read XML	20 days	Wed 2/19/14	Tue 3/18/14	10
20	Conversion Application - Output HTML	30 days	Wed 3/5/14	Tue 4/15/14	17
21	Conversion Application - Output PDF files (if needed)	8 days	Wed 4/16/14	Fri 4/25/14	20
22	Develop on-line training tool	15 days	Tue 3/4/14	Mon 3/24/14	15
23	**Testing**	**35 days**	**Wed 3/19/14**	**Tue 5/6/14**	
24	Test with CDOS IT Generated sample XML files	3 days	Wed 3/19/14	Fri 3/21/14	19
25	Accessibility QA testing & results	5 days	Mon 3/24/14	Fri 3/28/14	24
26	Fixes	10 days	Mon 3/31/14	Fri 4/11/14	25
27	Usability Testing (concurrent)	10 days	Wed 4/16/14	Tue 4/29/14	20
28	Fixes	5 days	Wed 4/30/14	Tue 5/6/14	27
29	**Delivery**	**3 days**	**Wed 5/7/14**	**Fri 5/9/14**	
30	File packaging & deployment	3 days	Wed 5/7/14	Fri 5/9/14	28
31	**Training**	**5 days**	**Mon 5/12/14**	**Fri 5/16/14**	**30**
32	Final review and launch of online traing aid	2 days	Mon 5/12/14	Tue 5/13/14	30
33	Hands-on training (if required) in Denver.	3 days	Wed 5/14/14	Fri 5/16/14	32

Fig 3 - Hypothetical AFB Conversion Project Gantt chart Showing representative tasks, assigned personnel, estimated start and completion dates.

11. PROPOSED STAFFING

Staffing for the development and implementation phases for Colorado's adoption of the AFB generation process and ballots would be accomplished by the Five Cedars team lead by John Schmitt and one of several contracting resources Five Cedars has employed over the AFB's six year development cycle, such as:

Sabio One Technologies, led by James Franco, principal consultant. Sabio One delivers projects within the Microsoft stack including ASP.NET, WPF and mobile platforms. Sabio One has delivered multiple projects for Five Cedars (previously OakTree Digital) for clients such as the State of Oregon, Northwest Textbook Depository and multiple projects for Intel Corporation.

Xerratus, led by John McGuinness, a senior .NET consultant. Xerratus specializes in C#. NET 3.5, utilizing MVC, WPF and WCF foundations from Microsoft. Xerratus has delivered multiple projects for Five Cedars (previously OakTree Digital) for clients such as CareOregon (health care), Digimarc, Northwest Energy Efficiency Alliance, and multiple projects for Intel Corporation.

We can't assign a particular named project manager or eLearning contract resource yet as this is currently a hypothetical project with no defined start or proposed completion date. If CDOS decides to move ahead with this project, we will gladly supply names, resumes, and experience levels for the entire project team.

John Schmitt earned a BA in Economics and an MBA in MIS from the University of Minnesota. He worked for Intel for fourteen years in product marketing and technical sales. For three years he was vice-president and managing editor of a Microsoft Windows software directory. He founded OakTree Digital in 1993 which became Five Cedars Group in January of 2013.

Under John's leadership, the company has taken on a wide range of information projects and has won many awards: Twice for being one of Portland's "Best Places to Work", multiple project awards from Intel, and a Brandon Hall Research award for the "Best Custom Content" for an interactive alcohol server's training course (client: Oregon Restaurant Association). For eight years, John personally managed the production of Willamette Week's annual "Give!Guide" fund raising website, which last year raised $1.8 million dollars for 104 local non-profits.

FCG's president, John Schmitt, has presented papers on accessible voting at multiple national conferences, and testified at the Presidential Commission on Election Administration (PCEA) public meeting in Denver on August 8, 2013. (See Appendix A).

12. UVS SYSTEM REQUIREMENTS

Because of the nature of the Alternate Format Ballots, their target voters and the fact that the AFB process fits within most existing election processes, Five Cedars Group is only responding to the requirements tables D, G and H. These requirements are defined by CDOS as:

- **D – Electronic Voting Equipment** – this category includes hardware and software that allow a voter to enter a vote by interfacing with an electronic device (e.g. touchscreen, touch controls, audible speech, sip and puff, paddles) rather than manually marking a ballot. By statute, the electronic voting equipment must generate a verifiable paper trail in the form of a printout or an actual machine marked ballot. The electronic voting equipment may or may not tabulate the votes. If the equipment is the type that marks a ballot, it is possible that the ballot will be scanned and tabulated by another piece of equipment. In this case, the machine marked paper ballot is the VVPAT.

- **G – Vendor Training and Support** – this category addresses training and support requirements of the voting system vendor.

- **H – Miscellaneous Requirements** – this category identifies miscellaneous requirements related to auditing, voting system certification, testing of hardware/software, security, and system documentation.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Ballot	D-1	Display choices for the contests, (candidates and measures) of the election for each ballot style.	1	The AFB's display the Race and Measure fields and content that the state or county had included in the Ballot data files used to generate the ballots.
Ballot	D-2	When activated for the voter, display prominent ballot identifiers, including precinct, party, and similar identifiers, in order to give the voter the opportunity to verify that they will be voting on the correct ballot.	1	Each Ballot has text headers that identify the type of Election, Date, County or Municipality, Party (if appropriate), and Ballot Style so the Voter can double-check they have received the correct Ballot.
Ballot	D-3	Record each voter's candidate and measure selections as the ballot is cast. **Note:** This requirement is not applicable to certain ballot marking devices that depend on a produced paper ballot being processed and tabulated elsewhere.	1	As the Voter marks their choices on the AFB there are visual cues (target area box gets checked, voter's choices are highlighted in light blue, and if they are using accessible software they are given a verbal indication of "checked or unchecked") that their vote has been captured on the AFB Ballot.
Ballot	D-4	Have a public counter that displays the number of ballots cast or marked, depending on the functionality of the electronic voting equipment.	4	Since the AFB ballot is an HTML file that could be read on multiple types of devices not necessarily housed in a polling place, this feature is not currently provided.
Ballot	D-5	Make clear to the voter how to cast a ballot or print a marked ballot, such that the voter has minimal risk of doing so accidentally, but when the voter intends to cast the ballot or complete the ballot marking session, the action can be easily performed.	1	Voter instructions for marking the Ballot are at the top of the Ballot. The link to the Ballot Summary page is at the bottom of the Ballot and shows the Races and Measures and whether the voter has marked their choice yet. The button marked "Print Your Ballot" is only on the bottom of the Summary page so the Voter can only print their Ballot after being given a chance to review their choices.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Ballot	D-6	Assure that the ballot marking device automatically returns to a state such the next voter cannot learn how the previous voter voted, once the paper ballot is printed.	2	Since the AFB Ballots are HTML pages that run on industry standard browsers, there is no built-in feature or function to clear the device of one voter's ballot other than to close the browser. None of the ballot information or the voters' choices are saved after the browser window is closed. A button could be added to the Ballot to perform that function.
Ballot	D-7	Allow voters, including voters with disabilities, to be able to review their write-in input to the ballot interface, edit that input, and confirm that the edits meet their intent. **Note:** 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.	1	For each race on the Ballot there is a voting target area followed by text announcing that this line is for writing in the voter's candidate's name which is followed by a text block for typing in the voter's choice (AFB Ballot accepts > 500 characters). The Large Print Ballots have a target area and space for the name of the voter's choice. Both AFBs provide the same number of write-in spaces as the number of candidates a voter is allowed to vote, i.e. "Vote for N".
Ballot	D-8	Provide a method by which voters with disabilities can choose the language of the ballot visually and through the audio interface. **Note:** 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 the audio interface.	2	There is no restriction on the number of languages the AFB's could be generated to support. But, once a voter is presented with a Ballot of a certain language the only way to change that language is to provide them with a different Ballot, either by downloading a Ballot of the desired language or providing a different PDF/printed version, in the case of the Large Print Ballots.
Hardware	D-9	Display a Protective counter showing the count of all ballots processed on the equipment, which is not reset after an election.	3	Since the AFB ballot is an HTML file that could be read on multiple types of devices not necessarily housed in a polling place, this feature is not currently provided.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Hardware	D-10	Display the unit serial number(s) of tabulation devices both physically and within any applicable software, logs, or reports.	3	Since the AFB ballot is an HTML file that could be read on multiple types of devices not necessarily housed in a polling place, this feature is not currently provided.
Accessibility	D-11	Provide electronic voting equipment designed to allow for installation in a voting location accommodating 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. **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. Identify the EAC standards your system meets.	1	While our proposal is for a software solution that runs on COTS PC's, laptops, tablets and smart phone, the voting process follows the accessible guidelines in HAVA Section 301 and the EAC's 2005 VVSG Usability and Accessibility Requirements Sec 3.1 and 3.2. The HTML AFB works with any assistive device that has at least two states (i.e., a sip and puff device, jellybeans, etc.), works with JAWS, screen magnifiers and other adaptive SW for voters with visual impairments. The ballot can be voted one race at a time, gives a warning of over/under voting (three ways), and produces a Summary page for visual (or scanned) verification by the voter.
Accessibility	D-12	Meet the standards for accessible voting systems listed in section 1-5-704, C.R.S. The size of a ballot position and the font size of candidate information must be in accordance with Colorado Election Rules. **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.	1	The HTML AFB ballots meet the accessible voting standards listed in 1-5-704, C.R.S. The font size that appears on a voter's screen is adjustable by the voter through font enlargement controls in the browser (CNTRL+, CNTRL-) or device screen preference controls. There is theoretically no maximum for available positions as the screen will create a scroll bar if there are more than 20+ candidates in a race.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Accessibility	D-13	Include a privacy enclosure or voting booth that contains the electronic voting device(s) designated for voters with disabilities and complies with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) providing sufficient dimensions to allow access to voters who use wheelchairs. **Note:** Please explain how your voting device complies with all forward and side reach requirements of the ADA and ADAAG.	3	Since the AFB ballot is an HTML file that could be read on multiple types of devices not necessarily housed in a polling place, this feature is not currently provided.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Accessibility	D-14	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. **Note 1:** Please describe your accessible alternative input devices. List such devices and explain the operation of each device and how it accommodates voters with disabilities. **Note 2:** Please explain how your proposed system accommodates voters with visual disabilities. Include with the description how portions of the displayed ballot may be intensified and/or enhanced, in contrast and font size and then restored to the initial size. **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. **Note 4:** Is the voting screen glare-free regardless of positioning? **Note 5:** Please explain any magnifying capacity of the electronic voting device. **Note 6:** If your electronic voting unit uses an activation card, please explain how it may be used easily by voters, including voters with disabilities. **Note 7:** Please explain how your electronic voting unit adequately provides privacy for a voter who uses a wheelchair. **Note 8:** Please explain how a voter can verify the accuracy of the cast votes. **Note 9:** Please describe additional features of your system that are designed to accommodate voters with disabilities.	2	FCG's AFB Ballot Generator and Ballots are software and we are not proposing any hardware as part of the AFB solution. The HTML AFB ballots are typically downloaded by authorized election staff or voters from a State website. The ballots themselves run in a browser so are capable of being used on any PC, laptop, MAC, tablet or smart phone that send print output to a printer. **Note 1:** The AFB ballots can be voted using only the TAB and space bar. Devices such as sip and puff, Jelly Beans, joysticks, etc. are being used successfully by voters today. **Note 2:** Voters with visual impairments can use the assistive software they have on their own device (JAWS, etc.) or use the auditory or magnification tools available on all devices today. **Note 3:** Current clients use iPads with and without Bluetooth keyboards, Surface Pro with keyboards (USB or the snap-on). **Note 4:** Not applicable. **Note 5:** The font size that appears on a voter's screen is adjustable by the voter through font enlargement controls in the browser (CNTRL+, CNTRL-) or device screen preference controls. **Note 6:** Not applicable. **Note 7:** There is nothing in AFB's that innately provides privacy but the fact that a voter can vote at home or at a place of their choosing mitigates privacy concerns. **Note 8:** The voter can review the Summary page on the screen and then again once it is printed. **Note 9:** The AFB Generator produces Large Print Ballots (PDF's) for voters with visual acuity (macular degeneration, etc.) issues.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Accessibility	D-15	Allow for importing of audio ballot content from an outside source (e.g. candidates or pre-recorded audio.). **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.	4	The AFB process does not have a capability for importing an audio ballot. The audio features supported by the AFB are those used by assistive software tools like JAWS, Windows Navigator, Apple's VoiceOver, etc.
Accessibility	D-16	Allow for a voter to change volume and/or speed of an audio ballot. **Note:** Explain how the voter can fast-forward through instructions and measure text.	1	The audio features supported by the AFB are those used by assistive software tools like JAWS, Windows Navigator, Apple's VoiceOver, etc. The volume controls are part of the normal controls for device being used. Depending on the assistive SW being used the voter can tab forward or use the down arrow to fast forward through the ballot text.
Accessibility	D-17	Provide for audio instructions for the ballot and a mechanism for voters with visual impairments to cast a ballot or print a marked 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.	1	The HTML AFB ballots were originally designed just for voters with disabilities so the navigation, textual clues and process had to be similar to what the voter experiences when using their assistive device for other tasks. Because most of the terms and ballot language is specified by state laws, the ballot context is the same for all voters.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Accessibility	D-18	Support an enlarged-print ballot screen image for voters with visual impairments. Following the casting of a vote or the printing of a marked ballot, the machine must reset to its initial state to accommodate the next voter.	1	The AFB ballots can be re-sized for voter convenience by the font enlargement controls in the browser (CNTRL+, CNTRL-), native screen magnifier or by using assistive SW like ZoomText, Window Eyes, MAGic, etc. Resetting the browser to the default settings is accomplished by resetting the font size control to 100%. Any votes recorded are not lost by refreshing or resizing the fonts. The AFB Generator also produces Large Print Ballots (PDF's) for voters with visual acuity (macular degeneration, etc.).
Accessibility	D-19	Accommodate voters regardless of their ability to read.	1	The HTML AFB process works within the voting processes of the state. There is nothing in the product that rules out its use by a voter assistance program to assist non-readers to vote.
Accessibility	D-20	Allow for connection of personal auxiliary devices, such as sip/puff or jelly switch devices. **Note:** Please describe such capabilities provided by your system.	1	The AFB product accepts inputs from keyboards, mice, or any peripherals supported by the device's operating system and the input ports available (serial, USB, etc.). Assistive peripherals like sip and puff, jelly beans, joy sticks, etc. that use 3.5mm connections are easily supported with connection devices such as the StealthSwitch3.
Ease of Use	D-21	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 or printing a marked ballot. **Note:** Please explain how your proposed system facilitates voter actions prior to casting a ballot or printing a marked ballot.	1	There are clear instructions at the top of the ballot which mimic the same way the voter would vote if they were using a paper ballot. If a voter wants to change their vote they perform the same action they would on any web based form; click the checked box and it will be unchecked. Using the AFB requires no more skill than any browser based form.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Ease of Use	D-22	Accommodate font sizes that are adjustable for ease of sight.	1	Font sizes can be adjusted to meet the voter's needs either through the font controls built into the ballot, their browser or device screen preference controls.
Ease of Use	D-23	During the voting process or prior to casting the vote, display (visually or using audio, as applicable) a summary indicating the choices made or skipped.	1	Once the voter has completed voting (or at any time they desire) they select the button that will display their Summary page. The Summary displays each race, whether voted or not, the choice(s) selected by the voter and an indication of an over or under vote. The voter can review their votes and decide if they are ready to actually print their ballot summary.
Ease of Use	D-24	Allow the voter the ability to change a selection until the voter is satisfied with the choice at any time prior to the final casting of a ballot or printing a marked 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 vote or printing of the marked ballot.	1	If a voter wants to change their vote they perform the same action they would on any web based form; click the checked box and it will be unchecked. Using the AFB requires no more skill than any browser based form. For each race/measure there is a button for checking for over/under votes. At the bottom of the ballot there is a button for checking the entire ballot and if the voter still wants to over/under vote a race or measure, it will noted on the Summary page. They are able to return to the ballot to change or mark their choices again.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Ease of Use	D-25	Provide a method for the voter to confirm the choices before casting the ballot or printing a marked ballot, signifying to the voter that casting or printing the ballot is irrevocable and directing the voter to confirm his/her intention to cast or print the ballot, and shall further signify to the voter that the ballot has been cast or printed after the voting session is complete.	1	The AFB does not currently give the voter an indication that printing the ballot summary is an irrevocable act. Our current clients did not ask for that feature as there may be a reason to allow the voter to re-print their summary, such as a printer malfunction or they notice a mistake on the summary that they missed on the screen and want to go back to the ballot and re-vote a race or measure. Additional text stating the act of printing is confirmation of their intention to cast their ballot could be added to the Summary screen's instructions.
Ease of Use	D-26	Provide a means to demonstrate the operation of the electronic voting device to the voters.	1	A set of photos and text descriptions of the process a voter goes through would satisfy this requirement. One client used an online PowerPoint presentation with audio to teach their counties the process and it was very successful.
Ease of Use	D-27	Disallow a voter to overvote a contest and will enable the voter to correct the selections. **Note:** Please explain how your proposed system shall not allow a voter to overvote a contest and enable the voter to correct his or her selections.	2	The AFB has three ways to alert a voter that they have overvoted. Each race and measure has a button marked "Check this race (measure) for voting mistakes" which will indicate if they've overvoted. They can also press the "Check ballot for mistakes" button before going to the Summary page. Once on the Summary page there will be a comment for each race or measure overvoted indicating that their vote will not be counted for that race or measure. Voters can always return to the race/measure to change their voting preferences and eliminate their overvote. Voters are allowed to overvote as it may indicate a protest vote.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Ease of Use	D-28	Warn voters that they have undervoted a contest and permit them to correct or accept the undervote. **Note:** Please explain here how your proposed system shall warn voters that they have undervoted a contest and permit them to correct or accept the undervote.	1	The AFB has three ways to alert a voter that they have undervoted. Each race and measure has a button marked "Check this race (measure) for voting mistakes" which will indicate if they've undervoted. They can also press the "Check ballot for mistakes" button before going to the Summary page. Once on the Summary page there will be a comment for each race or measure they undervoted indicating that their vote will not be counted for that race or measure. Voters are allowed to undervote. Voters can always return to the ballot's races/measures to change their voting preferences and eliminate their undervote.
Ease of Use	D-29	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.	1	For each authorized contest there is a voting target area followed by text announcing that this line is for writing in the voter's choice of candidate name. This note is followed by a input text block for typing in the voter's choice (AFB Ballot accepts > 500 characters). The Large Print Ballots have a target area and space for the name of the voter's choice. Both AFBs provide the same number of write-in spaces as the number (N) of candidates a voter is allowed to vote, i.e. "Vote for N".
Ease of Use	D-30	During election setup, provide an option to provide the voter with a list of certified write-in candidates.	3	This is a feature that is not currently implemented as our current clients have not requested it. This could be accomplished by providing a drop-down list of certified write-in candidates and making the text write-in block for the "none of the above" written in choice of the voter. Only the voter's written in name or the selected name would appear on the Summary. See Cost Proposal for customization fees.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Ease of Use	D-31	Provide a screen response that will allow a voter to request a list of certified write-ins if the election setup provided that option.	3	See item D-30.
Ease of Use	D-32	Allow authorized users the ability to modify the voter instructions for an electronic or audio voting session.	2	This is a feature that is not currently implemented as our current clients have not requested it. Voter instructions can be changed prior to AFB ballot generation process but our current clients have controlled all ballot changes centrally.
Ease of Use	D-33	Provide an authorized user an ability to reset screen calibration, including between uses in an election. **Note:** Please explain if your electronic voting equipment logs such calibration and produces any warnings when calibration needs to be reset.	1	The HTML AFB's run on COTS hardware and software so screen size, font size, background colors, etc. can be changed for the benefit of each individual voter, if desired.
Uninterrupted Operation	D-34	Provide, in case of power interruption, a means for voting operations to continue. This feature shall consist of either an un-interruptible power supply (UPS) or other means to keep electronic voting equipment active. **Note:** Please specify how your system will provide notice of power loss or low-battery state, so that election judges or election officials can take appropriate steps.	3	Since the AFB ballot is an HTML file that could be read on multiple types of devices not necessarily housed in a polling place, this feature is not currently provided.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Uninterrupted Operation	D-35	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?	3	Since the AFB ballot is an HTML file that could be read on multiple types of devices not necessarily housed in a polling place, this feature is not currently provided.
Uninterrupted Operation	D-36	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.	3	Since the AFB ballot is an HTML file that could be read on multiple types of devices not necessarily housed in a polling place, this feature is not currently provided.
Voter Verifiable Paper Trail	D-37	Include, with each voting device, the functionality of a Voter-Verified Paper Audit Trail (VVPAT) that meets all Federal and State Certification requirements. **Note 1:** Please explain how your proposed voting device complies with this requirement. **Note 2:** Explain if your proposed system has an alternate means of counting a non-ballot type of VVPAT for audit purposes. The alternative means can include but is not limited to the availability of bar codes and readers for the VVPAT.	1	The Summary page has a 2-D barcode that contains the voter's intent which is read by a ballot-on-demand printer to produce a scan-able ballot.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM D – ELECTRONIC VOTING EQUIPMENT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Voter Verifiable Paper Trail	D-38	Provide a means for voters with disabilities (visually impaired or unable to read) to review the VVPAT. **Note:** The review of the VVPAT by voters that cannot see or read the VVPAT requires a feature that enables read-back from the physical VVPAT.	1	The HTML AFB is viewed and voted within whatever assistive software/hardware the voter has access to. (See the list of supported software in page XXX). A voter can verify their ballot choices on the screen or by scanning their ballot Summary page with an OCR equipped scanner. If they find a discrepancy from what they thought they voted, they can go back to the ballot, make the changes they desire, and re-print the ballot.
Voter Verifiable Paper Trail	D-39	Have the capability, if proposing a VVPAT solution that is not an official marked ballot, for the print on the VVPAT to be large enough and dark enough for voters to verify and for election judges to read easily during a recount. **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. For instance; 18 point font, bold and double spaced would be preferred.	1	The Summary page produced by the AFB and mailed in as a ballot is typically printed on standard printer paper (20lb, 90 brightness) in 12 point Arial font double spaced. Bold highlighting is used to call out titles of the race/measure and the voter's choices: "You voted for: **Jill Stein (Pacific Green Party)."** The Summary page font size could be enlarged to 18 point font for ease of readability recognizing that could impact the number of pages a voter's Summary expands to.
Transport-ability	D-40	Be easily transported. **Note:** Describe the transportability characteristics of your electronic voting equipment (e.g. weight, width, height, wheels).	1	The HTML AFB is the ultimate in transportability. The generated ballots for an entire state can be copied to a USB, CD or laptop for voter assistance groups to use when helping voters in hospitals, rehab centers, etc. The Ballots should be posted on the SOS "Go Vote Colorado" web site for authenticated voters to download. These transportability benefits were used last fall by Oregon to assist registered voters stuck in the aftermath of hurricane Sandy in NY to obtain a ballot and attestation form and vote.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Hardware & Software Support	G-1	Include availability of vendor support personnel to assist in hardware and software installation and setup onsite.	2	Onsite support should only be required if the state opts to install the AFB Generator on a state server. FCG staff is willing to make onsite calls whenever the state requests such an activity. After the initial installation and setup any onsite visits will be paid by the client as outlined in the Cost Proposal.
Hardware & Software Support	G-2	Include availability of vendor support personnel to assist in hardware and software installation and setup from a remote help desk.	1	FCG staff is available during regular business hours and by cell phone after hours. Due to the nature of the AFB system, our current clients have never requested nor have needed 24/7 support.
Training	G-3	Include availability of vendor supported onsite training personnel to train CDOS and County users.	1	Onsite support should only be required if the state opts to install the AFB Generator on a state server. FCG staff is willing to make onsite calls whenever the state requests such an activity. After the initial installation and setup any onsite visits will be paid by the client as outlined in the Cost Proposal.
Training	G-4	Include availability of self-study user training via the Internet or electronic media.	1	A self-study user training module will be provided specific to CDOS and County user's needs to demonstrate 1. What jurisdictions need to do to generate the AFB ballots and 2. The steps a typical (3-5 personas) voter should take to get access to a ballot and how to vote using the AFB. The cost for creating this interactive tool is specified in the Cost Proposal.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Voting Period Support	G-5	Provide 24-hour available technical support for all system components beginning sixty days prior to an election and continuing until the completion of the official canvass (generally twenty days after an election). **Note:** Please describe your capability to provide extended support, beyond twenty days after and election, for circumstances such as a recount.	2	FCG staff is available during regular business hours and by cell phone after hours. Due to the nature of the AFB system, our current clients have never requested nor have needed 24/7 support.
Hardware Parts and Supplies	G-6	Include hardware solutions for the UVS that are supported by a supply chain contingency plan. **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).	4	FCG's AFB Generator and Ballots are software and we are not proposing any hardware as part of the AFB solution. The HTML AFB's are generated by programs that FCG developed and own. They rely on Microsoft's VB and .NET development tools. The AFB Large Print Ballot is generated using Ecrion's Ultrascale XF Rendering Server software to convert the ballot XML data into large format PDF's (11x17 or 8.5x14, 16 or 18 point font ballots). Even if Ecrion were to go out of business, the 64 bit version should continue to perform for years to come.
Hardware Parts and Supplies	G-7	Make equipment parts and supplies available through December 31, 2020.	2	See G-6. We can assume that browser technology will continue to evolve and it's FCG's plan to continue to follow technical trends as they develop.
Hardware Parts and Supplies	G-8	Not require royalty fees, user fees, or other charges or limitations on the printing of ballots designed or printed on vendor devices. Similarly, no fee or limitation shall be placed on any electronic file, report or representation of the vote produced by vendor devices or software.	1	Our cost proposal does not include any royalty fees, user fees, or other charges or limitations on the generation or printing of ballots. There are no fees or limitations on any electronic file or representation of the vote produced by the AFB ballot generation or distribution process.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM H – MISCELLANEOUS REQUIREMENTS				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Auditing	H-1	Store sufficient data in an unalterable 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: 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 1:** Please explain what audit trail techniques and audit reports are incorporated in your proposed system. **Note 2:** Please provide a list of all audit log files, the file location within the voting system, and the procedures to navigate to and retrieve them from the voting system. **Note 3:** Please describe steps needed to protect the audit logs from possible unintentional or intentional erasure or alteration. **Note 4**: Please provide a sample set of audit reports (system logs, etc.) from an election in a county with 200,000 or more registered voters (not necessarily in Colorado).	4	Not Applicable.
Auditing	H-2	Accommodate random audits on electronic voting and tabulation devices.	4	Not Applicable.
Auditing	H-3	Accommodate random audits on paper vote capture and tabulation devices.	4	Not Applicable.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Auditing	H-4	Log all activity on voting equipment including: when turned on/off, any errors, power failure, power restoration, when an error occurred and when an error was resolved.	4	Not Applicable.
Auditing	H-5	Run real time reports, when needed.	4	Not Applicable.
Auditing	H-6	Run post-election diagnostics on all auditable equipment in a manner that does not endanger the integrity of the election record. **Note:** Please explain your system's post-election diagnostic capabilities.	4	Not Applicable.
Auditing	H-7	Provide for adequate information to facilitate a recount under Colorado law.	1	The AFB voter produces a printed ballot Summary that is then a physical item available for recount purposes.
Auditing	H-8	Have a permanent paper record of each vote for audit purposes.	1	See H-8.
Auditing	H-9	Support a Risk Limiting Audit, as defined in section 1-7-515(5)(b), C.R.S. sufficient to audit the functionality of electronic and paper vote capture as well as vote tabulation devices. **Note 1:** Please describe how your proposed system supports the execution of a Risk Limiting Audit. **Note 2:** Does your solution place unique identifying numbers on ballots as they are scanned? **Note 3:** Section 1-7-515, C.R.S. stated that Colorado must begin risk-limiting audits in 2014, but was revised in the 2013 session to extend the start of the requirement to 2017.	4	Not Applicable.
Auditing	H-10	Incorporate a real time clock as part of the system hardware and all audit log record entries shall include a date/time stamp.	4	Not Applicable.
Auditing	H-11	Use a real time clock that will continue to run during a power loss.	4	Not Applicable.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Auditing	H-12	Print audit reports on the standard system hardcopy output device when 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.	4	Not Applicable.
Auditing	H-13	Create audit records during the election definition and ballot preparation phases showing completion of the baseline ballot layouts and any modifications to them, a description of the modifications and a date/time stamp.	4	Not Applicable.
Auditing	H-14	Create audit records during the pre-election phase that include electronic and manual data entered and maintained by election personnel, election definitions, instances of all final ballot layouts and the ballot preparation edit event log.	4	Not Applicable.
Auditing	H-15	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.	4	Not Applicable.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Auditing	H-16	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: a. System startup diagnostic and status messages. b. Checks that pre-count reports show zeroes. 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.	4	Not Applicable.
Auditing	H-17	Provide an in-process audit report, for post-election use, consisting of data containing a record when each vote is initiated and each ballot is cast.	4	Not Applicable.
Auditing	H-18	Print reports necessary to assist election officials in performing a manual count as required by Colorado election law and rules. **Note 1:** Please explain how your proposed system can create the reports necessary to allow election officials to perform and validate a manual count. **Note 2:** Please explain how, in the case of a recount, the election can be reconstructed ballot by ballot, while still maintaining voter privacy.	2	**Note 1:** Not Applicable. **Note 2:** The AFB voter produces a printed ballot Summary that is then a physical item available for recount purposes.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Auditing	H-19	Record audit log entries onto durable non-volatile storage.	4	Not Applicable.
Auditing	H-20	Export audit logs in formats suitable for use by elections officials and the public including common electronic formats (PDF, Excel, CSV, TXT, EML).	4	Not Applicable.
Certification	H-21	Be certified or certifiable by the EAC, another state, or Colorado. **Note 1:** If not certified, please explain. **Note 2:** See section 1-5-601.5, C.R.S. for Colorado voting system certification compliance with federal regulations. RFP section 5.3.11 has a question on certification status of vendor proposed solutions.	1	The AFB Generator and Ballots do not have certifications other than Oregon's elf-certification. The AFB is a ballot marking tool that adheres to the accessible guidelines in HAVA Section 301 and the EAC's 2005 VVSG Usability and Accessibility Requirements Sec 3.1 and 3.2. The ballots are verified by the counties before they are made available to voters. Once the voter's printed ballot Summary is placed in the vote-by-mail secrecy envelope and mailed in, the entire VBM process is already certified.
Testing	H-22	Be configurable so as to be capable of performing the following functions on all system hardware/software, in compliance with current Colorado statutes and rules: a. Hardware test b. Logic and Accuracy Test c. Post-Election Audit d. Pre-Recount Logic and Accuracy Test e. And capable of performing the Colorado Risk Limiting Audit commencing no later than 2017.	4	Not Applicable.
Testing	H-23	Allow authorized 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…). **Note:** Please explain how your system allows for pre-determined simulation for creating test ballots and electronic voting equipment test input.	1	AFB XML data files or the HTML ballots themselves can be edited to simulate special circumstances for testing. Standard test files with known outputs are available to verify any system updates or software modifications.
Testing	H-24	Have the capability to test ballot layouts 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.	1	AFB XML data files or the HTML ballots themselves can be edited to simulate special circumstances for testing.

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Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Testing	H-25	Provide capability to permit diagnostic testing of all the major components within each electronic vote capture device.	1	AFB ballots can and are tested on a wide variety of operating systems, devices and browser versions. Test files with known outputs are available for testing after any software upgrade or enhancement.
Testing	H-26	Ensure non-contamination of voting data through tests of all data paths and memory locations to be used in actual vote recording.	4	Not Applicable.
Testing	H-27	Provide evidence in an audit record that test data has been expunged.	4	Not Applicable.
Testing	H-28	Allow the ability to load and test audio ballots in electronic vote capture equipment.	4	Not Applicable.
Testing	H-29	Provide the ability to print all necessary reports for proofing the results of logic and accuracy testing.	4	Not Applicable.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Security	H-30	Provide an environment whereby all databases and data are maintained with provisions for operational security, access control and auditability. **Note 1:** Please describe the authentication protocols for access to the EMS database and your system's processes for providing operational security and auditability. **Note 2:** System security must not obstruct authorized access to event or audit logs, and printing or exporting of reports.	1	Depending on the AFB ballot generation configuration selected the security issues are different. Using the self-installed version of the AFB, all server security issues would fall to the CDOS IT staff. Using the SAAS option, where the ballot data is sent to FCG's servers for processing means FCG bears the security responsibility. Our servers are in a controlled secure facility of a national co-location service provider. **Note 1:** Direct access to the EMS database is not required. Exported ballot XML data files and processed ballots are transmitted to/from county staff via Citrix's ShareFile services. **Note 2:** Each county is given a login/password to access their own unique data folder.
Security	H-31	Require two factor authentication for access to the EMS and all tabulation equipment. This means an authorized user will need a physical device (e.g. token, card) and something memorized (e.g. password) to access the software or equipment.	4	Not Applicable.
Security	H-32	Allow tamper evident seals to be placed on all equipment doors, openings, and data access points such that unauthorized access is either prevented or clearly indicated by the damage to or destruction of a seal. **Note:** Please describe the security offered by your proposed system relating to tamper evident seal placements.	4	Not Applicable.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Security	H-33	Allow all access points to equipment to be visible and subject to oversight of seals, unless the access point is behind doors or a cover. Access points that are not visible should also accommodate tamper evident seals.	4	Not Applicable.
Security	H-34	Report unauthorized modifications to audit data or audit logs. **Note:** Please explain your system's capabilities to restrict user authorizations and access rights for creating, reading, modifying, and deleting audit data or logs.	4	Not Applicable.
Security	H-35	Allow for installation and auditing of a Trusted Build per Colorado Election Rules.	1	All AFB Software have version numbers and dates of generation for auditing. The HTML and PDF ballots contain a date and time stamp from the XML data file that was used to generate the ballots for tracking purposes.
Documentation	H-36	Include a clear set of documented instructions for election judges to set up voting equipment. These instructions should be modifiable by county personnel.	2	A self-study user training module will be provided specific to CDOS and County user's needs to demonstrate 1. What jurisdictions need to do to generate the AFB ballots and 2. The steps a typical (3-5 personas) voter should take to get access to a ballot and how to vote using the AFB. The cost for creating this interactive tool is specified in the Cost Proposal. This PDF could be modified by county staff.
Documentation	H-37	Include documented instructions for troubleshooting any voting equipment issues that may arise.	2	User guides for the AFB Generator will be crafted to meet the needs and requirements for using the products.
Documentation	H-38	Include a complete set of User and Technical documentation.	2	User guides for the AFB Generator will be crafted to meet the needs and requirements for using the products.

SYSTEM REQUIREMENTS TABLE for the COLORADO UNIFORM VOTING SYSTEM G – VENDOR TRAINING & SUPPORT				
Requirement Sub-Category	Req. ID	UVS Requirement (The System will …)	Response Code	Vendor Response
Documentation	H-39	Include current certification documentation and VSTL and/or state test reports.	1	The AFB Generator and Ballots do not have certifications other than the state of Oregon's self-certification. The AFB is a ballot marking tool that adheres to the accessible guidelines in HAVA Section 301 and the EAC's 2005 VVSG Usability and Accessibility Requirements Sec 3.1 and 3.2. The ballots are verified by the counties before they are made available to voters. Once the voter's printed ballot Summary is placed in the vote-by-mail secrecy envelope and mailed in, the entire VBM process is an EAC certified process.

APPENDIX A: PCEA TESTIMONY

Presidential Commission on Election Administration
Public Hearing
Thursday, August 8, 2013

John Schmitt, President, Five Cedars Group, Inc.

Good afternoon distinguished members of the PCEA Committee.

My name is John Schmitt. Six years ago, my company, Five Cedars Group, developed the Alternate Format Ballot for Oregon's voters with disabilities. I'm very proud that we've helped provide an easy and secure means for our state's voters who would otherwise have difficulty voting.

As Americans we're proud to live in a democracy in which we're free to vote. But is the slogan "one person, one vote" a reality for everyone? Can the most vulnerable of our citizens really vote without being subjected to unrealistic physical demands? Imagine that you're 35 and have developed macular degeneration. Or 75 and the painful arthritis in your hips put you in a wheelchair. Now imagine how you'll get to your polling place. By the way, it's a cold rainy day in November!

In 1968, while on a business trip, my father was in a car accident that left him a quadriplegic for 27 years. My siblings and I know first-hand the difficulties families are faced with to transport a wheelchair bound person to a specific location on a particular day. For us abled bodied to assume we've served the needs of the disabled because there's one "accessible" voting machine at a polling place is to not understand the sometimes heroic efforts it takes to get them there. And, it doesn't have to be that way.

My dad did have use of his arms and using two sticks Velcrod to his palms got quite proficient at pecking out engaging letters on his trusty IBM Selectric typewriter. That was over twenty years ago. Today, my neighbor Dave, who was hurt in an accident two years ago and is now a quad, takes pictures of his kids with his smart phone and posts them on Facebook. Times have changed. People with disabilities are using PC's and mobile devices in their everyday lives. We can and should leverage their existing abilities and strengths to make it easier for them to vote.

At the EAC's Accessible Voting Conference in April an attendee commented that "going to the polls to vote like everyone else gives voters with disabilities a sense of dignity and self-worth." That may be true for some, but is that everyone's reality?

Last November, after waiting several hours to vote, a blind California woman, Lisamaria Martinez, was asked to walk to a second polling place because the accessible machine at her polling place didn't work. How much dignity and respect do you think she felt? Enough that she and four other plaintiffs are suing Alameda County.

Having the “right to vote” should not mean you have the right to stand in line for hours or be told you can’t vote at this polling place. Imagine how you’d feel if this happened to you.

Commissioners, I came to Denver today to ask your help to put “better reality” in our nation’s elections for voters just like Ms. Martinez.

The 1986 Uniformed and Overseas Citizens Absentee Voting Act (UOCAVA) as well as the Defense Department’s Federal Voting Assistance Program’s (FVAP) MOVE and EASE programs have made it easier for military and other overseas voters to vote. We have given our soldiers extra time to receive a ballot, mark their choices, and mail, email, or fax their voting intentions to their local election offices. This act and these programs have made their “right to vote” a reality. But, only for UOCAVA defined voters.

Since these programs work, let’s extend the rules for participation. I’m asking that you strongly recommend the rules of the Uniformed and Overseas Citizens Absentee Voting Act (UOCAVA) be expanded and its benefits be made available to anyone who needs additional assistance in exercising their right.

Commissioners, no one doubts that Poll workers work very hard and really do want to help everyone vote. But if the equipment provided is difficult to set up, if election staff budgets are being cut, and with a limited number of voting days, poll workers are fighting a losing battle.

In Oregon, we make HTML ballots available through a website or email and mail large format (18pt font) ballots to voters who request them. Interestingly, last November the age range of our large format ballot voters was 29 to 103. Some of them could have been veterans previously covered by UOCAVA. We can make voting privately, independently and securely a reality.

Your recommendation could empower people with disabilities to vote on the digital devices they already have and use on a daily basis. Expanding the UOCAVA rules to cover voters with disabilities will help make elections Free, Fair and Accessible for everyone.

Thank you for your time and service!

Sincerely,

John Schmitt
President
Five Cedars Group, Inc.
john.schmitt@fivecedarsgroup.com

APPENDIX B : OREGON'S AFB PROCESS AND VOTER PERSONAS SERVED

This fold-out poster shows the Oregon Alternate Format Ballot process and a sample of the types (personas) of voters currently served by the AFB, both in HTML and Large Print Ballot styles. This is not necessarily the same process that would be implemented for Colorado but is included to demonstrate the starting point for adapting the AFB for Colorado's voters with disabilities, whether they are physical or locational.