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Title of Proposal: Online Voter Registration & Ballot Marking and Counting: An Adaptable and Open Source Solution

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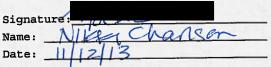Linda Lamone, State Administrator

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1   Technical Approach and Justification

1.1   Executive Summary

Over the years, the State of Maryland has implemented measures – including many recommended by the Federal Voting Assistance Program (FVAP) – that have made voting more accessible for Maryland's uniformed and overseas voters (UOCAVA voters). With funds from the FVAP's Electronic Absentee Systems for Elections Grants, the Maryland State Board of Elections (SBE) will improve the participation and voting experience of UOCAVA voters by implementing an online voter registration system and enhancing the State's existing online absentee ballot delivery system. This proposal is significant in that it addresses three critical components of the voting process – registering to vote, requesting a ballot, and voting the ballot.

The proposed online voter registration system will be a new system in Maryland. SBE in-house technical resources will design and develop the system to:

1. Allow UOCAVA voters to register to vote in Maryland or update their existing voter registration record online

2. Allow UOCAVA voters to submit a request for an absentee ballot as part of their online voter registration application

3. Be cost-effective, sustainable, and easily adapted for use by other jurisdictions using different voter registration systems

The proposed innovative enhancements to the State's online ballot delivery system are:

1. Integrating a ballot marking wizard tool

2. Capturing the voter's selections in a barcode that can then be used during canvassing to reproduce the voter's ballot in an optical scan readable format

3. Designing a cost-effective and scalable ballot delivery system that does not have to be used with the existing voter look-up website but can be shared with and easily implemented in other jurisdictions

In partnership with the Overseas Vote Foundation (OVF), SBE proposes to collect data to measure voter satisfaction with and the effectiveness of the registration and balloting process, ballot return, and acceptance rates and to track intervening variables that may impact results. A post-election survey of UOCAVA voters will be conducted, and data will be compared across time and across states.

1.2   Goals and Objectives

SBE proposes to develop, maintain, and host two web-based systems – an online voter registration system and online absentee ballot delivery system – for the life cycle of both systems.[1] The decision to develop and manage these systems internally (as opposed to buying a vendor's solution and the associated support and maintenance packages) is possible because of SBE's existing, in-house technical expertise. This offers two significant, cost-effective benefits:

1. Existing technical staff with extensive knowledge of the voter registration and absentee ballot process will develop the systems internally. This will allow SBE to maintain ownership of the base code and data, maintain the system at lower costs, and make modifications quickly and cost-effectively.

2. SBE will build a generic, system-neutral interface with existing election systems. Because Maryland will be returning to a paper-based voting system, it is prudent to develop the proposed systems so that extensive programming is **not** required if and when the existing systems change. This is a more sustainable and affordable model than tightly integrating the proposed web-based systems with the State's current election systems.

    Another benefit of the proposed model is that SBE's systems can be easily shared with other jurisdictions. While the recipient jurisdiction will need to make software changes to reflect its laws and practices, radical changes will **not** be needed to integrate with their existing systems. SBE also intends to minimize logic that is specific to Maryland, which further eases implementation in another jurisdiction. This scalable model can offer other jurisdictions a proven and no-cost solution.[2]

Please see modification to the following paragraph on page 29 of this document

~~After thorough internal testing, SBE proposes to consult with outside security auditors to review the code base and conduct a security audit and penetration testing for both systems.[3] Once the code base has been reviewed and found to be secure, the code will be licensed as open source under the GPL-3.0 license[4] and subsequently released. At that point, any individual can review the code base for security flaws, and SBE will establish a process to receive and review any feedback. It will also allow another jurisdiction or vendor to use the code and modify it as needed on the condition that the code continues to be open source.~~

The existing online absentee ballot delivery system (described in more detail in Section 1.2.2.1) currently includes measures to protect users' personal identifying information and any transmitted election material. The system's auto-generated documents are created when the voter selects the link to print the documents and are not stored in the system once the voter closes the window with the documents displayed. If there are five minutes of inactivity, the system

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[1] While the State has an existing online absentee ballot delivery system, SBE is rewriting the code because the existing system includes hardcoded business logic, is tightly bound to the State's existing voter look-up website, and will not work with SBE's choice of web servers.

[2] Both systems will be designed to provide information in English and Spanish and will be coded to add additional languages as needed.

[3] The proposed security audit will include physical access testing, software and server hacking, and a review of the code for security holes.

[4] http://www.opensource.org/licenses/gpl-3.0.html

ends the voter's session, and the voter must re-enter the system. Because the unique documents exist only as long as the voter has the window open on his or her computer and no longer than five minutes, there is reduced risk that someone other than the voter can obtain the documents. The database is behind a secure firewall, and the website has an industry standard SSL security certificate. In addition to incorporating existing security measures, the re-written online absentee ballot delivery system and the proposed enhancements to the online absentee ballot delivery system will also meet the National Institute of Standards and Technology guidelines for distributing blank ballots.

The proposed online voter registration system and proposed enhancements to the online absentee ballot delivery system collectively address voter registration, ballot request, and ballot delivery. The impact of these systems will be significant as it will improve how UOCAVA voters interact with three critical aspects of the voting process.

1.2.1   Online Voter Registration System

In its 2011 Legislative Session, the Maryland General Assembly authorized online voter registration. Generally, an individual must have a Maryland driver's license number or Maryland identification card number to use the online registration system. A UOCAVA voter who does not have either number may use the system if he or she enters a social security number and consents to use this number as his or her signature. A paper signature will not be required.

Because users must provide an identifying number to use the online voter registration system, the application will query in real-time the Maryland Motor Vehicle Administration's database to validate the driver's license or identification number. For UOCAVA applicants who provide a social security number, the application will store the number and include it in the next file of social security numbers that is sent to the Social Security Administration for verification. Files are generally sent three times a week but increase to six times a week before an election.

The online voter registration system will not directly interface with the voter registration system. Instead, the online voter registration system will use a custom database schema with look-up tables for screen display and saving voter registration data, and it will use and then transfer the data to the production voter registration system database. This transfer eliminates the need for the local boards of elections to enter manually voter registration data, and the lack of direct interface with the statewide voter registration system will enable other jurisdictions to use SBE's system with limited code changes.

SBE's preferred method of data transmittal to the voter registration database is an XML file that complies with the EML standards currently being developed by the IEEE. If, however, IEEE's standards are not published in time for implementation, SBE will use a database table available for back-up and restore to production. A future modification will include changing the data transfer process to use an XML file. This is necessary for ease of use by other states.

SBE's online voter registration system will be written in ASP.Net using Visual Basic (VB) and will work with either Oracle or SQLServer. The system will be installed on a robust set of servers that will be both load balanced and configured, so additional servers can be added easily if needed.

Offering UOCAVA voters a way to register to vote and to request an absentee ballot online dramatically simplifies the registration process, eliminates the transit time that prevents some UOCAVA voters from participating in the election process, and reduces the likelihood of election officials' data entry processing errors, which can lead to misrouting of registration and voting materials. SBE, with OVF, proposes to evaluate whether an online voter registration system increases UOCAVA voter participation and satisfaction. One method of evaluating voter participation is to compare the number of untimely voter registration applications and requests for absentee ballots from the 2008 General Election to the number of untimely applications and requests in the 2012 General Election. A decrease in the number of untimely applications and requests for absentee ballots will be one measure of the proposed system's success.

1.2.2   Online Absentee Ballot Delivery System

In July 2012, SBE will maximize the cost-effectiveness of the State's existing online absentee ballot delivery system by transitioning from a vendor-supported system to an internally supported and managed system. SBE's internal technical expertise, supplemented with outside consulting services, will enable the State to have direct control over the system and more effectively manage current and future costs.

1.2.2.1   Overview of Existing Online Absentee Ballot Delivery System

The State's existing online absentee ballot delivery system is tightly integrated with the State's secure voter look-up website (www.elections.state.md.us). To access the voter look-up website, the user must enter his or her first and last name, date of birth, and zip code. If the information entered matches that of a registered voter, voter information is displayed.

When ballots are ready for transmission, SBE sends an email to each voter who requested an electronic absentee ballot. In this email, SBE gives the voter the link to the voter look-up website and a tracking number that is unique to the voter, the ballot, and the election. When the voter logs into the voter look-up website, he or she clicks on the link to the voter's absentee ballot for the requested election and is prompted to enter the unique tracking number.

After entering the correct tracking number, the voter views and prints the absentee ballot and all of the associated documents. The system seamlessly selects the correct ballot and auto-generates static documents that are unique to the voter.[5] The voter makes selections on the printed ballot and returns by mail the voted ballot, signed oath and other requested documents.

This system was first used in the 2010 elections and improved the efficiency and accuracy of distributing electronic absentee ballots. Prior to this system, election officials created individual emails and manually attached the appropriate documents for the voter. The system eliminated the risk of attaching the wrong ballot or documents and replaced the manual and time-consuming process of creating individual emails.

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[5] Under Maryland law, an absentee voter must submit a signed oath with his or her absentee ballot. The system creates a unique oath for each voter and auto-populates the voter's name and tracking number on the oath template.

For a variety of reasons, electronically delivered absentee ballots cannot be read by the State's optical scan voting system. First, timing marks on optically scanned ballots must be exact, and most printers cannot print to this exactness. Second, ballots must be of a certain paper weight (90 lb), and most voters do not have access to this weight of paper. Lastly, only paper of certain sizes can be read by these units. The standard paper size for overseas citizens (A4) is not scannable by an optical scan voting unit. As a result, electronically delivered absentee ballots must be duplicated when they are returned for canvassing. Under the current system, the process of duplicating ballots is manual, with bipartisan teams of election officials transferring votes from the electronically delivered absentee ballots to scannable ballots.

Since the 2006, 2008, and 2010 elections, SBE has tracked the number of UOCAVA ballots received by day. SBE will track this data for the 2012 elections to establish whether the number of timely UOCAVA ballots has increased. This is the expected outcome if UOCAVA voters receive their absentee ballots earlier and have more time to complete and return them. Comparing the 2012 data to the 2008 election will be most helpful as the elections are of the same type (presidential) and follow the same election calendar, but SBE will also compare 2012 data with the 2010 General Election as it was the first election after the passage of the Military and Overseas Voter Empowerment Act.

1.2.2.2 Proposed Enhancements to Existing System

To improve the voting experience for UOCAVA voters and the accuracy of their ballots, SBE proposes two enhancements for the 2012 General Election: (1) an online ballot marking wizard; and (2) printing a barcode on the voter's ballot that represents the voter's selections. These proposed enhancements will improve the accuracy and readability of the voter's ballot, reduce voter intent issues, and ease the administrative burden on local election officials of duplicating ballots during canvassing.

1.2.2.2.1 Online Ballot Marking Wizard

With this wizard, the voter will make his or her voting selections on a computer, review a summary screen showing the selections he or she made, and print a ballot with the voter's selections marked. This wizard will improve the accuracy and readability of the voter's voted ballot as it will be designed to prevent overvotes and other voter errors, decrease the likelihood that an election official has to determine the intent of the voter, and increase voter satisfaction with the voting process. These benefits will lead to increased ballot return and acceptance rates.

With voters using the ballot marking wizard, the accuracy of the ballot should improve and the error rate for voters using the wizard should decrease, including the number of "no votes[6]." SBE, with OVF, will compare 2012 error rates with rates from the 2008 General Election and error rates on ballots completed using the online ballot marking wizard with rates on ballots completed by hand. Additionally, SBE and OVF will evaluate voter satisfaction with the wizard.

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[6] A "no vote" is a ballot on which the voter did **not** cast a vote for the highest contest on the ballot.

1.2.2.2.2   Use of Barcodes on Voted Ballots

SBE proposes to integrate into its online absentee ballot delivery system innovative technology that will capture the voter's selections and other ballot information in a barcode printed on the voter's ballot. The voter will mail to the appropriate local board of elections his or her voted ballot with the barcode printed on it, and during canvassing, the local board of elections will use the barcode to produce a ballot that can be scanned by Maryland's current optical scan voting units used for absentee voting.

To implement this technology, each local board of elections will need:

1. At least one ballot-on-demand printer capable of printing up to 18" ballots with such precision that the State's optical scan voting system can scan and read the selections

2. At least one barcode scanner to read the barcode printed on the voters' ballots

3. Windows PC installed with the .Net 4.0 framework, a lightweight database system, and Adobe's Acrobat Reader

4. SBE's software, which will be written in ASP.Net using VB and use the free iTextSharp library for manipulating PDF documents

The software referenced above has two different functions. First, the software will convert the selections made with the online ballot marking wizard into a Quick Response (QR) barcode[7] and print the barcode on the voter's ballot. This functionality requires an enterprise database.

Second, the software will be used during canvassing to print a ballot with the voter's selections that can be read by an optical scan voting unit. For this function, the software requires a lightweight, single user database. Prior to each election, SBE will update the database with ballot display details (position of timing marks, etc.) and load onto the Windows PC PDF versions of each ballot. When a local election official scans the QR barcode, the software will use the information in the barcode (e.g., ballot style and precinct identifier) to locate the ballot details in the database, determine which PDF document is the correct ballot for that voter, and using the appropriate positions defined in the database, fill the selections onto the ballot (in memory). Finally, the software will display the filled in ballot in PDF form, and the local election official can print it on official ballot paper. This ballot can then be scanned and read by one of the State's optical scan voting units. Before scanning, a bipartisan team of sworn election officials will compare the two ballots to ensure that the voter's selections are accurately reflected on the scannable ballot.

This innovative enhancement has two significant benefits over the current process of manually duplicating ballots. First, it serves an important safeguard during the canvassing process and improves the accuracy of the counting process by reducing the risk of transcription error when manually duplicating a ballot. It also improves the efficiency of the canvasses

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[7] A QR barcode is a two-dimensional barcode that is readable by QR barcode readers and camera telephones. It consists of black modules arranged in a square pattern on a white background.

conducted by local election officials by replacing a manual process with a primarily automated process with a manual verification.

Second, the hardware associated with this enhancement can be used to print ballots that can be scanned by the optical scan voting unit. Due to the complexity of printing ballots, the State has only one certified ballot printer, and the proposed ballot-on-demand printers can be used to print ballots if Maryland's certified ballot printer is unable to provide absentee ballots on a timely basis. These printers provide a cost-effective, back-up solution to ensure that absentee ballots are transmitted to UOCAVA voters by the 45th day before an election.

1.2.3   Research and System Evaluation

SBE proposes to partner with OVF, a leader in research concerning overseas and military voters and voting, to evaluate the proposed systems' impact on UOCAVA voters' participation, satisfaction, and success. Research and system evaluation are important to establishing the long-term sustainability of a project. Through measurement and analysis, SBE will be able to identify those parts of the system with which voters had the most trouble (e.g., registration vs. balloting) and make adjustments for future elections.

OVF proposes to establish metrics to measure outcomes and the collection of accurate data. OVF's metrics for success include both micro-level individual data (such as voter satisfaction with the registration and balloting processes) as well as macro-level data (such as usage of the online absentee ballot delivery system and ballot return and acceptance rates). These metrics also provide a basis for comparisons across states and facilitate the collection of comparable data.

During both the registration and balloting phase, OVF, with SBE's assistance, will collect data important to measuring outcomes and track those intervening variables that would impact results. These variables include voter experience (e.g., new voters versus experienced voters), the type of voter (civilian or military), age, education, and gender. OVF proposes to measure voter satisfaction in an online post-election voter survey and collect from election officials aggregate data after the election.

Measuring the success of program implementation not only involves comparisons across elections but also comparisons across states. A comparison of the results from 2010 to 2012 may produce skewed results, due to the expected overall voter turnout increase for 2012, a presidential election year. Therefore, a more accurate comparison would be ballot return rates and ballot acceptance rates.

In partnership with SBE, OVF will help SBE:

1. Identify and define metrics for success, important variables to include in the study, and baselines for comparison with other states

2. Prepare monthly reports

3. Design, distribute, conduct and analyze the 2012 Post-Election Maryland voter survey

4. Prepare a final report analyzing the 2012 experience and final metrics. This final report will include comparisons across time and states and will use OVF's existing post-election research and access to data from other states

1.3   Schedule and Milestones   Please see amended Table on pages 29 and 30

Task	Project VR*	Project AB**	End Date
Hire technical consultants	√	√	30 days after award notice
Procure hardware & software	√	√	10/1/2011
Quarterly financial report	√	√	10/31/2011
Hardware delivery	√	√	11/1/2011
Software delivery	√	√	11/1/2011
Hardware installed	√	√	1/1/2012
Software installed	√	√	1/1/2012
Test printers		√	1/1/2012
Coding and development	√	√	1/1/2012
Data Access Layer	√	√	8/31/2011
Business Objects Layer	√	√	10/31/2011
Absentee Ballot Wizard Interface		√	11/30/2011
User Interface Layer	√	√	12/31/2011
Quarterly financial report	√	√	1/31/2012
"Go Live" Date	√		7/1/2012
Printer delivery to local boards of elections		√	7/1/2012
Quarterly financial report	√	√	4/30/2012
Code testing & review	√	√	3/1/2012
2012 Primary Election: Early Voting			3/24 – 3/29/2012
Security Audit	√	√	3/31/2012
2012 Primary Election: Election Day			4/3/2012
Mock Election testing	√	√	4/1 – 5/31/2012
Quarterly financial report	√	√	7/31/2012
"Go Live" Date		√	9/2012
2012 General Election: Early Voting			10/27 – 11/1/2012
Quarterly (annual) financial report	√	√	10/31/2012
2012 General Election: Election Day			11/6/2012
Post-election survey	√	√	11/6/2012 – 12/30/2012
Quarterly financial report	√	√	1/31/2013
Data collection & analysis	√	√	2/15/2013
Final report	√	√	3/31/2013

Table 1 - Proposed Schedule and Milestones

* VR is the online voter registration system.
** AB is the online absentee ballot delivery system and the proposed enhancements.

1.4   Reports

SBE proposes to provide performance, data and financial reports during the performance period of this project. Performance and data reports will be prepared monthly, and financial reports will be prepared quarterly. These reports will be submitted at the interval established by FVAP.   The final report will be provided by April 30, 2013.

SBE and OVF propose to provide monthly data reporting starting July 1, 2012, when the online voter registration system is scheduled for implementation. The monthly reports will incorporate data collection points, which will allow election officials to monitor usage and evaluate the impact of any outreach efforts. If outreach efforts do not have the desired effect, election officials can adjust their plans to distribute resources in an effective manner.

Reporting measurements will include:

1. A comparison of the submission and success of UOCAVA applicants using the online voter registration system to register to vote, update voter registration records, or request an absentee ballot against the submission and success of UOCAVA applicants using the Federal Post Card Application or other paper form

2. Data on the absentee ballot delivery methods requested by UOCAVA voters

3. A comparison of the success of UOCAVA voters using the online absentee ballot delivery system against the success of UOCAVA voters who received absentee ballots by mail

4. A comparison of the acceptance and error rate of UOCAVA ballots completed using the online absentee ballot delivery system against the acceptance and error rate of ballots completed manually

Upon request of FVAP, SBE will provide data reports after the grant performance period. Without on-going funding, however, SBE would not be able to conduct and analyze a post-election voter survey.

2   Management Approach

2.1   Strategic Goals

The goal of the proposed projects is to simplify the voter registration and ballot marking process for UOCAVA voters and to improve the accuracy and efficiency of the ballot canvassing process. The proposed systems offer UOCAVA voters a secure and efficient way to submit voter registration information, request absentee ballots, and mark absentee ballots. The expected outcome is that UOCAVA voters will have increased rates of voter participation and satisfaction and that the accuracy of the voted ballots will improve.

SBE's decision to use internal resources to develop and maintain the proposed systems is based on the hypothesis that these systems will be more cost-effective to maintain over the systems' life cycles and that modifications can be made quickly and efficiently. SBE staff members with extensive knowledge of existing systems can efficiently apply that knowledge when developing and maintaining the proposed systems.

2.2   Project Methodology

In all information technology (IT) projects and conducting elections, SBE uses the project management approach methodologies in accordance with the Project Management Institute's *Project Management Body of Knowledge*. These methodologies will also be applied to the proposed online voter registration system and the online absentee ballot delivery system. SBE has already conducted an extensive planning process for both of the proposed systems. Each project will follow a project schedule with milestones and tasks that will provide structure and a roadmap for completion in a timely, cost-effective manner. Each project team lead will drive the project schedule and maintain communication of project status through weekly team status meetings.

2.3   Personnel, Resources & Consultants

SBE's proposed systems take advantage of SBE's existing, in-house resources. Because the proposed systems are interrelated and under simultaneous development, there will be some overlap in the SBE's personnel roles. Between the two projects, no more than eight SBE employees will be required during the development period.

To supplement SBE's in-house resources, SBE proposes to contract with two individuals to provide short-term, technical support with completing and reviewing the initial technical development. Additionally, these projects will require four consultants to address aspects of the proposal that SBE does not have the capability to handle with internal resources.

For the two proposed systems' organizational charts, see Appendix A. Both projects will have the following personnel:

- Leading each project will be a **project sponsor,** who will work closely with the respective project manager to coordinate the technical staffing and consultants and collaborate on overall project direction and progress.

- The **project manager** will be the primary contact for the project, including staffing and consulting resources. The project manager will be responsible for the project's schedule and budget and will ensure that project tasks are timely completed and, if necessary, that changes are incorporated into the project plan and communicated to the project sponsor.

- The **technical specialist** will report directly to the project manager and will be primarily responsible for the technical development of the system and giving direction and scope to the technical consultants.

- The **webmaster** will work with the technical specialist and technical consultants to incorporate the online functionality into SBE's existing website and will ensure that the "look and feel" of SBE's website is easy to use and aesthetically pleasing.

- There will be two **technical consultants –** one for each of the proposed projects – to assist with technical development. Each consultant will be under the supervision of the SBE's technical specialist and will be expected to work approximately 660 hours.

- The proposed **research & reporting consultant** is OVF. OVF will develop research tools that meet FVAP's grant objective. OVF's liaison for both projects will be the project manager for the online absentee ballot delivery system project.

- The **website hosting consultant** will be a contractor, who will provide web-hosting services for the two proposed projects. This consultant will report to SBE's technical specialist.

- The **IT security consultant** will be a contractor, who will perform IT security testing, auditing, and reporting to ensure that SBE's proposed systems are secure for UOCAVA voters. The liaisons for this contractor will report to the project manager of each system.

Several consultants are proposed for only one of SBE's proposed systems:

- The **project management support specialist** will report directly to the project manager of the online absentee ballot delivery system and will be the secondary point of contact for staffing and consulting resources. This person will help the project manager keep the project on schedule and on budget.

- The **voting system subject matter expert (SME)** will provide voting system technical and subject matter expertise for the proposed enhancements to the online absentee ballot delivery system. This individual will report to the project manager for the online absentee ballot delivery system.

- The **technical support specialist** will report to the project manager for the online absentee ballot delivery system and will work closely with the technical specialist and technical consultant assigned to this project to provide additional technical direction and expertise for the proposed enhancements to the online absentee ballot delivery system.

- The **software development consultant** is The Canton Group, the vendor that maintains the State's statewide voter registration database. The Canton Group will make the necessary software changes so that the statewide voter registration system can accept data from the online voter registration system. The liaison for this company will report directly to the project manager of the online voter registration system.

The table below identifies SBE's employees assigned to the project and their respective roles.

SBE Employee	SBE Title	Voter Registration System Role	Absentee Ballot Delivery System Role
Ross Goldstein	Deputy Administrator	N/A	Project Sponsor
Mary Wagner	Voter Registration Director	Project Sponsor	N/A
Nikki Trella	Election Reform Director	N/A	Project Manager
Stacey Johnson	Voter Registration System Administrator	Project Manager	PM Support Specialist
Cheré Evans	Database Specialist	Technical Specialist	Technical Specialist
Natasha Walker	Webmaster	Webmaster	Webmaster
Paul Aumayr	Voting System Project Manager	N/A	Voting System SME
Andrew Johnson	Technical Specialist	N/A	Technical Support Specialist

Table 2 - SBE Resources

2.4   Existing Processes, Risks and Mitigation Strategies, and Performance Indicators

2.4.1   Voter Registration and Absentee Ballot Request Process

Currently, a UOCAVA voter is required to submit a voter registration application[8] by mail to register to vote in Maryland. The completed application is required by mail because State law requires an original signature when an individual registers to vote. This requirement increases the time needed to become a registered voter and increases the risk – especially for UOCAVA voters – that the completed application will not be timely received by the appropriate local board of elections.

If a UOCAVA voter who is already registered to vote wants to update his or her voter registration information or request an absentee ballot, s/he can submit the request via mail, fax, or email (scanned as an attachment). While a signature is required to make a change to a voter registration record or request an absentee ballot, the signature does not have to be an original

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[8]   To register to vote, update information, and/or request an absentee ballot, a UOCAVA voter can submit either a Federal Post Card Application or the State's voter registration application and the State's absentee ballot application.

signature. As a result, the local boards of elections can accept and process changes to voter registration records and requests for absentee ballots received by mail, fax, or email.

While there are more transmission options for updating information and requesting an absentee ballot, challenges still exist for UOCAVA voters. If the UOCAVA voter obtains forms from a website, s/he must return the completed form and have access to certain technology (scanner and Internet or fax machine) to submit the form quickly.

An online voter registration system provides the UOCAVA voter with a streamlined and single point registration process. The UOCAVA voter will need only access to the Internet, and, recognizing UOCAVA voters' time constraints, SBE will design the system to minimize the time needed to register to vote or to update an existing voter registration record and request an absentee ballot.

The risks associated with the current processes for registering to vote and requesting an absentee ballot and the inability to mitigate these risks adequately with the current processes are well known and documented. Implementing an online voter registration system offers a solution to many of the risks with the current processes but introduces different risks to the voter registration and absentee request process. The risks and the associated mitigation strategies to the online voter registration system are:

1. The online voter registration system does not function properly, and UOCAVA voters are unable to access the system. If the system is not working properly and cannot be restored in the short-term, SBE's website will direct voters to the voter registration application posted on SBE's website or Federal Post Card Application to complete and return by mail (required for initial voter registration), fax, or email.

2. Information stored by the online voter registration system does not accurately reflect the information entered by the user. The system will include a screen summarizing the information the user provided. The system will display a summary screen showing all data provided by the user before the application is finalized. The user will be able to edit data if needed and only finalize when the data is accurate. In its planned internal testing and using the proposed security consultants, SBE will vigorously test the system and verify that the data entered via the website matches the data transferred to the database.

3. The connection between the online voter registration system and the Motor Vehicle Administration's database does not work. The system will be designed to continue accepting applications without verifying driver's license or State identification numbers against the Motor Vehicle Administration's database and queue those applications submitted while the connection was not working. Once the connection is restored, the verification checks will be conducted offline. SBE will develop procedures to notify applicants that their driver's license or State identification numbers did not subsequently verify.

4. The security of the online voter registration system is jeopardized (e.g., the system has been breached). In its planned internal testing and using the proposed security

consultants, SBE will vigorously test the system and strengthen any weaknesses identified in the penetration and other security testing. This testing will be conducted periodically over the life of the system to ensure the handling of any new threats.

SBE expects that the simplification of the registration, update, and ballot request processes will increase participation and satisfaction of UOCAVA voters. OVF's proposed post-election survey will measure voters' satisfaction, and OVF's prior post-election surveys and analyses can provide data against which to compare the results of the proposed 2012 Maryland post-election survey. SBE's voter registration records will be analyzed to establish UOCAVA voter participation. SBE can currently establish the number of UOCAVA voters whose initial voter registration and requests to update voter registration records and absentee ballots were not timely received, and this data will be used to measure the success of the proposed online voter registration system (e.g., how many more applications from UOCAVA voters are timely).

2.4.2   Absentee Voting Process

When requesting an absentee ballot, a UOCAVA voter can request to receive the ballot by mail, fax, or email. As described in detail in Section 1.2.2.1 of this proposal, a UOCAVA voter who requests to receive an absentee ballot by email receives an email when his or her ballot is ready for download from the State's existing online absentee ballot delivery system.

The current delivery system provides the voter with static PDF documents to print. The voter votes the printed ballot manually and returns by mail the voted ballot, signed oath, and any other required documents. Once the local board of canvassers votes to accept and count the ballot, a bipartisan team of election officials duplicates the voter's selections from the ballot marked by the voter onto a ballot that can be scanned and read by the State's optical scan voting system. The duplication process is time-consuming for the local boards of elections and introduces some level of risk of inaccurate duplication, although this risk is mitigated by the bipartisan team requirement and existing business procedures.

Transmitting blank absentee ballots electronically provides the voter with more time to vote the ballot and increases the likelihood that the voted ballot is timely received. SBE has data identifying the number of untimely absentee ballots from UOCAVA voters from the 2006 through 2010 elections and will collect and compare the data from the 2012 elections; the comparison between the 2008 and 2012 elections will be most useful as it compares similar election cycles and calendars, although the 2010 General Election will be reviewed as it was the first election since the passage of the Military and Overseas Voter Empowerment Act.

The local boards of elections will be surveyed to estimate the time and cost (if available) from the 2010 General Election attributable to duplicating ballots. This will enable SBE to compare the time attributable to duplicating ballots in 2010 to 2012, when SBE proposes to use barcodes and ballot-on-demand printers during the canvass process. SBE expects that the duplication time will decrease by up to five minutes per ballot with the proposed enhancements, and the decrease will be significant in those jurisdictions with a large number of voters who requested an electronic absentee ballot. Less duplication time equates to reduced costs as some local boards of elections pay the members of the local board of canvassers and staff by the day.

With the current online absentee ballot delivery system, the UOCAVA voter manually votes the ballot, and as a result, there are opportunities for voter error (e.g., voting for more than the maximum number of candidates), and voter intent can be difficult to decipher. The integration of the proposed online ballot marking wizard should reduce opportunities for error as it will prevent voters from "overvoting" and will provide voters with a summary screen to review before printing their ballots. SBE has data on error rates for the various methods of voting and will use this data as the baseline for measuring error rates on ballots completed using the proposed online ballot marking wizard against those completed manually. It is expected that the error rates on absentee ballots completed using the proposed online ballot marking wizard will be lower than those completed manually.

An online absentee ballot delivery system and SBE's proposed enhancements address many of the risks of the current process, but as with the online voter registration system, this approach introduces different risks that must be addressed. The risks and the associated mitigation strategies to the online absentee ballot delivery system are:

1. The online absentee ballot delivery system does not function properly, and UOCAVA voters are unable to access the system. When the current ballot delivery system was implemented for the 2010 Primary Election, the system became unavailable for two days when the connection with the database was interrupted. Once the connection was re-established, the system performed as expected through the 2010 Primary and General Elections. Starting with the 2011 elections, the current system will automatically send the network administrators alerts if the database connection goes down. If the system cannot be restored in the short-term, state and local election officials will return to the previous way electronic absentee ballots were delivered – via individual emails sent to voters – until the system is restored.

2. The online absentee ballot delivery system is available and works, but the online ballot marking wizard does not. SBE intends to offer voters the option of using the online absentee ballot marking wizard to complete the ballot or downloading and printing the ballot and marking it manually. If the online ballot marking wizard is not available for use, SBE will direct voters to download the ballot and other documents and vote the ballot manually.

3. The ballot printed by the online ballot marking wizard or the QR barcode on the printed ballot does not reflect the voter's selections. SBE will integrate a summary screen into the online ballot marking wizard to provide voters with the opportunity to review their selections before printing their ballot. In its planned testing and through its proposed security testing, SBE will vigorously test the system and verify that both the printed ballot and the content of the QR barcode accurately reflect the voter's selections. Ideally, a voter reviewing his or her printed ballot would notify SBE of any inaccurate marking. Until the system is restored, SBE will direct voters to download the ballot and vote the ballot manually.

4. The software used to read the QR barcode and generate a scannable ballot does not work. While the software will be thoroughly tested, in the event it does not work, the local boards of elections will utilize the 2010 strategy – that is, they will create bipartisan teams to duplicate manually the ballots.

5. The software used to read the QR barcode and generate a scannable ballot prints selections that are not the voter's selections. Because SBE will continue to require the local boards of elections to have bipartisan teams comparing the ballot the voter returned against the ballot generated by the ballot-on-demand printer, the bipartisan team will identify any incorrect selections. If any selections are inaccurate, the bipartisan team would manually duplicate the ballot.

6. The security of the online absentee ballot delivery system is jeopardized (e.g., the system is breached). In its planned internal testing and using the proposed security consultants, SBE will vigorously test the system and strengthen any weaknesses identified in the penetration and other security testing. This testing will be conducted periodically over the life of the system to ensure the handling of any new threats.

2.5   Financial Management and Cost-Effectiveness

Financial management will be the responsibility of the project managers of the proposed projects. For the named vendors, SBE has negotiated fixed-price-by-deliverable bids for this project and will negotiate the same types of bids as the remaining vendors are selected. The pricing structure will enable SBE to manage to the proposed budget.

To the extent possible, funds will be tracked by project and aggregated for any reporting required by the FVAP. Financial reports (e.g., SF-425) will be prepared quarterly and submitted at an interval established by FVAP.

When considering the various implementation and maintenance strategies for systems that will benefit UOCAVA voters, it became clear that the most cost-effective solution was to develop and maintain internally an online voter registration system and an online absentee ballot delivery system. This decision means a reduction in the current budget for the online absentee ballot delivery system and a reduction in the implementation and maintenance costs of the online voter registration system. These cost-saving measures include:

1. Transitioning the online absentee ballot delivery system from a vendor-supported system to an internally supported and managed system. As described in Section 1 of this proposal, SBE expects to save funds by using existing, in-house resources and eliminating overhead expenses usually associated with using external vendors.

2. Using innovative barcode technology in the absentee voting process that will reduce the staff time for canvassing. This means less wages and salary cost for the local boards of elections, which previously manually duplicated ballots.

3. Using in-house resources to develop, implement, and maintain the online voter registration system. This sustainable approach will require less funding than outsourcing to a third party vendor, even one selected through a competitive procurement process.

4. Reducing the need for local boards of elections to enter manually voter registration information submitted by UOCAVA voters into the statewide voter registration database.

5. Retaining ownership of the code base and data of both proposed systems, so SBE can maintain the systems at lower costs over their life cycles and make modifications quickly and cost-effectively.

2.6   Collaborative Activities

SBE regularly collaborates with Maryland's 24 local boards of elections. There are a variety of committees led by SBE and comprised of representatives of the local boards of elections that make recommendations and decisions on all aspects of election administration. It is rare that a decision is made by SBE that has not been vetted by local election officials.

SBE has previously collaborated with the Pew Charitable Trusts' Make Voting Work project to develop an election audit pilot program and is currently working with Pew and other states on its voter registration data exchange program (ERIC). SBE has not previously collaborated with federal agencies.

2.7   Current and Pending Project Proposal Submissions

In its 2011 Legislative Session, the Maryland General Assembly allocated $250,000 of State funds for the development and implementation of an online voter registration system. These funds are currently budgeted for software modifications to the statewide voter registration system and web hosting expenses, and SBE has funds to pay the salaries and associated fringe benefits of SBE staff members who will develop and maintain the online voter registration system. SBE does not have any current or pending funding for the proposed security review or the research consultant. If SBE's proposal is funded, any unallocated State funds will be used in the following fiscal year for operations and maintenance of the online voter registration system.

Because SBE proposes to use in-house resources to develop and maintain the online absentee ballot delivery system, the salaries and associated fringe benefits of these employees are funded in both the current and next fiscal year. SBE does not, however, have current or pending funding for the QR barcode scanners, ballot-on-demand printers, associated supplies, the proposed security review, the technical consultant for the online absentee ballot delivery system to supplement in-house resources, or the research consultant.

Since the webhosting costs apply to both proposed systems as well as other SBE projects, SBE proposes to share the costs of webhosting services between State funds and grant funds. SBE has allocated 50% of the costs for web hosting and software development costs to State funds and 50% to FVAP grant funds. Software development costs were likewise shared between the two funding sources.

SBE has no current or pending proposals requesting funds for the proposed projects.

2.8   Qualifications of Key Personnel

Qualifications of key personnel are provided below. A complete curriculum vitae for Dr. Claire M. Smith, Research Director for OVF, is included in Appendix B.

Ross Goldstein is the Deputy Administrator for SBE. Ross has worked in elections for over 12 years in both policy and administrative capacities. He began his career in elections when he became staff attorney to the Florida House Committee on Ethics and Elections. Next, he served as a staff attorney for the Maryland General Assembly, where he was assigned to draft election laws and serve as counsel to the Task Force to Revise the Election Code. The task force led to a position with the Maryland State Board of Elections. As deputy administrator for the State Board, Ross works closely with local election officials to develop guidelines, policies, and procedures that ensure efficient administration of election laws. Ross is a graduate of the University of Florida and the Temple University College of Law.

Mary Cramer Wagner joined SBE in 2001 as the Deputy Director of Election Management. Her primary duties included assessing polling place accessibility for disabled voters, managing petitions, preparing ballots, and monitoring legislation. With the passage of the Help America Vote Act in 2003, Mary became the Director of Voter Registration and oversaw the successful implementation of a live, statewide voter registration database as required by the act. Since implementation in 2006, Mary has overseen the customization of the software application to meet federal and Maryland law. Under Mary's guidance, future projects for the Voter Registration Division include online voter registration, electronic interface with Maryland's Motor Vehicle Administration, and participation in an information data exchange program spearheaded by the Pew Charitable Trusts. Prior to joining SBE, Mary was the legislative aid to the Maryland General Assembly's Washington County Delegation.

Nikki Baines Trella is currently SBE's Election Reform Director and joined SBE in 2003. Nikki has been involved with implementing the requirements of the federal Help America Vote Act of 2002 and other election reform activities. As the Election Reform Director, she is involved in projects ranging from the implementation of a HAVA-compliant voting system and voter registration system to education of election officials and the public to the improvement of accessibility to the electoral process for individuals with disabilities. Prior to joining the SBE, Nikki worked in various positions in the Maryland Office of the Secretary of State. She served as legal staff to the Governor's Special Committee on Voting Systems and Election Procedures, assisted an interagency working group on the implementation of the National Voter Registration Act, provided staff assistance to the Committee to Revise the Election Code, and monitored federal and state election reforms efforts. She is a graduate of Loyola University Maryland and the University of Baltimore School of Law.

Stacey M. Johnson began working at SBE in August 2005. She has been the Deputy Project Manager and now Project Manager for the implementation of MDVOTERS, Maryland's statewide voter registration system, since inception. MDVOTERS fulfills federal and state

statutory requirement to provide a single, centralized list of persons registered and eligible to vote in Maryland. She is involved in the continuous system development from conducting the design sessions to approving every functional specification to testing issues before they are moved to production use. She manages contracts for the development of software, daily production operations, server site upgrades, field support, and security testing. She is responsible for managing IT projects in accordance with the PMI *Project Management Body of Knowledge* and State standards for the system development life cycle. As MDVOTERS System Administrator, she is responsible for ensuring that all MDVOTERS voter registration business processes work correctly; for properly setting all MDVOTERS system parameters; and for maintaining system administrative functions, including application security functions. She provides leadership to voter registration supervisors in 24 local boards of elections statewide on the use of MDVOTERS functions, and detailed guidance to over 300 system users on MDVOTERS procedures. Prior to working at SBE, she was Chief Executive Officer of her own business, Johnson Systems, a computer and networking support organization; a developer and data conversion programmer for Blackbaud in Charleston, SC; and a systems engineer and support specialist for Data Business Systems in Virginia Beach, VA.   Stacey earned her Project Management Professional certification in April 2009 and her B.S. in Electrical Engineering from University of Maryland, College Park in 1991.

Cheré Evans, currently SBE's Database Specialist, has nearly seven years' experience working as technical support for government agencies. She has been employed by SBE for nearly three years and has worked in Oracle Database, Crystal Reports, ASP.Net and Visual Basic.Net and provided support for the voter registration division. Her experience includes writing functional specifications, performing user acceptance testing, troubleshooting the voter registration system (MDVOTERS) code, and developing and maintaining the MDVOTERS data warehouse. She is currently developing the Online Voter Registration System, the Voter and Polling Place Lookup site, and the Online Ballot Delivery System. Prior to working for the State Board, Cheré worked in Visual Basic.Net, ASP.Net, Microsoft SQL Server, and Microsoft Access for the Supreme Court of Ohio in the Information Technology Department. Her experience included gathering functional requirements; performing data conversion; designing, developing, documenting, and maintaining systems for small offices in the Court; training users; and working on teams to develop the data access layer of new applications. Cheré has a B.A. in English and a B.S. in Computer Science and is currently working toward a M.S. in Information Systems.

Natasha Walker, currently SBE's Webmaster, started working at SBE in June 2003 as an Elections Management Assistant. In addition to managing the agency's website, Natasha works closely with the campaign finance division to test and troubleshoot its software and acts as a liaison to the Computer Sciences Corporation for changes to Election Management Software and web applications. Most important, she manages the ballot production process for the State of Maryland. Prior to joining the Maryland State Board of Elections, Natasha worked as an intern for many government organizations, including the United States Army Corps of Engineers in Baltimore, Maryland and the United States Embassy in Moscow, Russia. While in Russia, she interned for the Human Resources division and the following summer interned for the United States Agency for International Development (USAID).

Initially joining Maryland's voting system team in 2003, **Paul Aumayr** has served as SBE's Voting System Project Manager since 2007.   In this role, Paul has been responsible for most of the overall direction and implementation of voting system activities in the state, including testing, research, certification, and the implementation of voting systems process and procedures.   A graduate of Computer Engineering from the University of Brighton (UK), Paul's diverse technological background has included positions in the oil and gas industry, healthcare, and mass transit, both in the United States and abroad.

Andrew Johnson came to SBE in January 2011 with 13 years of technical experience. He currently supports the voting systems, the electronic pollbooks, and the election results consolidation processes using ASP.Net, VB.Net, C#, Javascript, Ruby, SQL Server, Oracle Database, SQLite, and Microsoft Access. Also, during elections, he monitors the early voting sites to ensure network connectivity continues. Prior to coming to SBE, Andrew worked for private industry both as systems support and lead programmer. His technical expertise includes support for Windows and Linux, as well as programming in SQL, C++, Delphi, Java, and more.

Appendix A: Proposed Organization Chart

FVAP EASE GRANT PROPOSAL ORG CHARTS

ONLINE VOTER REGISTRATION PROJECT

ONLINE ABSENTEE BALLOT DELIVERY PROJECT

SBE FTEs   On-Site Consultants   Off-Site Consultants

Appendix B: Curriculum Vitae for Dr. Claire M. Smith, Research Director for OVF

DR. CLAIRE M. SMITH

Krandelstr. 5 | Wildeshausen, 27794 GERMANY | +49 4431 946 6914 | claire@overseasvotefoundation.org

RESEARCH AND ACADEMIC EXPERIENCE
Overseas Vote Foundation, September 2008 – Present
Research Program Director
- Oversaw analysis of 2008 and 2010 voter and local election official post-election surveys
- Conducted original research on the impact of state UOCAVA policies on voters. This paper created an UOCAVA State Policy Index in order to determine which states have been the most progressive in implementing federal standards. I then tested hypotheses about the effect of these laws on ballot return rates, ballot rejection rates, and voter satisfaction using EAC aggregate data and OVF survey data.
- Editor and contributor to monthly research newsletter, including articles on indentifying the correct number of UOCAVA voters and evaluating available data sets
- Organized academic panels for UOCAVA Summit 2010 and Summit 2011, including theme development and speaker recruitment
- Prepared materials for research and outreach grant proposals for the Carnegie Corporation, Pew Center on the States
- Prepared testimony for congressional hearings, as well as answering questions from congressional staff regarding the impact of policy
- Answered questions from the "Voter Help Desk," communicating to voters around the world

Carl von Ossietzky Universität, Oldenburg, Germany, 2005 - 2006
Adjunct Professor, Department of Political Science
- Classes Taught: Federalism in the U.S., Voting and Participation in the U.S., Parties and Organizations in Germany

University of Notre Dame, South Bend, IN, 2000 - 2002
Teaching Assistant and Research Assistant
- TA for: Introduction to American Politics, Introduction to Comparative Politics
- Collected data for projects investigating the impact of women's suffrage (with Prof. Christina Wolbrecht), social capital and state policy outcomes (with Prof. Rodney Hero)

MANUSCRIPTS
"It's in the Mail: The Military and Overseas Voting Experience," (with Judith Murray), book manuscript in progress

"Barriers to Overseas Voting and Satisfaction with the Voting Process," (with Thad Hall) Journal article

EDUCATION
University of Notre Dame, South Bend, IN
PhD Political Science, May 2005

- First Field: Comparative Politics; Second Field: American Politics
- Subspecialties: political parties, party systems, federalism, electoral systems
- Dissertation: "Money to Burn: Party Finance and Party Organization in Federal Countries"

University of Notre Dame, South Bend, IN
MA Political Science, January 2002
- Master's Thesis: "Dimensions of Political Finance Legislation in the U.S. States: An Institutional Exploration"

Radford University, Radford, VA
BA Political Science and German (magna cum laude), May 1999

ADDITIONAL CERTIFICATIONS AND QUALIFICATIONS
ICPSR Training Program in Quantitative Methods of Social Research, University of Michigan
Summer 2000

Cambridge Certificate in English Language Teaching to Adults (CELTA), Hamburg, Germany
July 2006

ENGLISH TEACHING EXPERIENCE
Bildungswerk Cloppenburg, Cloppenburg, Germany, 2009
Consultant and English Teacher
- Created and implemented new certificate course in Business English, including syllabus design, literature selection and setting end of course standards

CNC Language Network, Cloppenburg, Germany, 2006 –2008
Owner, English Teacher
- Sales responsibilities included identifying, visiting and making presentations to clients
- Negotiated prices and terms of payment with clients
- Conducted needs analysis for customers and designed courses to meet customer needs
- Organized teachers, work schedules, and other personnel issues
- Management duties included planning and implementing marketing strategy, accounting, and customer service relations

inlingua Sprachschule, Oldenburg and Cloppenburg, Germany, 2004 – 2005
English Teacher

CONFERENCE PAPERS
"When No One Can Knock on Your Door: Getting Out The Vote to Overseas Americans." Presented with Paul Herrnson and Michael Hanmer. Annual Meeting of the American Political Science Association, September 2011.

"Time to MOVE: Overseas and Military Voter State Policy Innovation." Midwest Political Science Association Conference, April 2011.

"Overseas Voter Satisfaction in 2010." Presented with Thad Hall. Midwest Political Science Association Conference, April 2011.

"Defending Votes: Legislative Policy and Military Voting." Midwest Political Science Association Conference, April 2010.

"It's in the Mail: Surveying UOCAVA Voters and Barriers to Voting." Annual Meeting of the American Political Science Association, September 2009.

"Ask and then Ask Again: Party Finance Laws and the Rise of Fundraising in Canada and the U.S." Midwest Political Science Association Conference, April 2005.

"The Ties that Bind: Party Finance and Party Organization in Canada and the U.S." Northeastern Political Science Association Conference, November 2004.

"Money to Burn: Party Finance and Party Organization in Germany and Austria." Midwestern Political Science Association Conference, April 2004.

"Dimensions of Political Finance Legislation in the U.S. States: An Institutional Exploration." Midwestern Political Science Association Conference, April 2002.

"Where's the Party? Federalism and Political Finance in the United States and Germany." Annual Meeting of the American Political Science Association, August 2001.

"Democracy's Dilemma: The Role of Political Culture in Democratic Consolidation." Presented with Karrie Koesel at the Midwestern Political Science Association Conference, April 2001.

"Adapting Consociationalism: Viable Democratic Structures in Burma." International Studies Association – Midwest Conference, October 2000.

AWARDS
Kaneb Center Outstanding Graduate Student Teacher Award, *University of Notre Dame*, April 2002
Outstanding Student of the Year, *Radford University*, 1999

SCHOLARSHIPS AND FELLOWSHIPS
Kellogg Institute Dissertation Year Fellowship, *University of Notre Dame*, 2003-2004
Friedrich Ebert Stiftung Dissertation Support, *Germany*, 2002-2003
Nanovic Institute Dissertation Fellowship, *University of Notre Dame*, 2002 - 2003
Kellogg Institute Seed Money for Graduate Students, *University of Notre Dame*, Summer 2002
Downs Summer Training Travel Grant, *University of Notre Dame*, Summer 2000
Zeta Tau Alpha Foundation Achievement Scholarship, 1999

PROFESSIONAL MEMBERSHIPS AND SERVICE

American Political Science Association (APSA)

Midwest Political Science Association (MWPSA)

American Citizens Abroad (ACA), Country Contact for Americans in Germany

- Participated in Overseas Americans Week 2009, 2010 (OAW) in which representatives of three major overseas citizen advocacy organizations meet with legislators, staffers, and key government agencies

ADDITIONAL SKILLS

Foreign Languages   German (fluent), French (some spoken)

REFERENCES AVAILABLE UPON REQUEST

Volume 2 – Budget Proposal

1   Direct Labor

The proposed direct labor costs for this grant proposal are zero. Maryland State Board of Elections (SBE) employees will perform the necessary tasks as their normal course of work, so no additional funds will be required over their State-funded salaries. State salaries are funded via the State's budget process through fiscal year 2012 (July 2011 – June 2012), and it is expected that the positions will be funded in fiscal year 2013.

2   Administrative and Clerical Labor

The proposed administrative and clerical labor costs are zero. SBE employees providing administrative and clerical support will perform the necessary tasks as their normal course of work, and no additional funds will be required over their State-funded salaries. While administrative and clerical support for this proposal is expected to be nominal, the salaries of the employees who will provide this support are funded via the State's budget process through fiscal year 2012, and it is expected that the positions will be funded in fiscal year 2013.

3   Fringe Benefits and Indirect Costs (F&A, Overhead, G&A, etc.)

SBE did not include in this proposal any fringe benefits because SBE is not proposing any direct labor costs.

SBE does not currently have an indirect cost agreement with its cognizant government agency. SBE has asked the State's Department of Budget and Management (DBM) whether SBE will be required – under State policy – to establish an indirect cost agreement. At the time of submission, SBE has not received an answer from DBM.

4   Travel

SBE does not expect to incur any travel costs for this proposal. SBE will require any proposed consultants requiring travel to include travel costs in their proposed cost estimates.

5   Subcontracts/sub awards

SBE is not proposing subcontracts or sub awards in this proposal, and as a result, this budget line item is zero.

6   Consultants

Under State procurement law, SBE is generally prohibited from entering into a contractual agreement without first obtaining the necessary funding. As a result, SBE cannot provide at the time of this submission signed consulting agreements for the proposed consultants. If SBE's proposal is selected for award, SBE will submit to the Federal Voting Assistance Program (FVAP) signed consulting agreements with all consultants as the agreements are signed.

SBE is proposing to hire consultants to address five specific aspects of this proposal. The five areas in which the consultants will work are: (1) technical development; (2) information technology (IT) security and audits; (3) website hosting; (4) software development; and (5) research and reporting.

Two **technical consultants** are proposed to assist with the technical development of the online voter registration system and the online absentee ballot delivery system. SBE estimates that these consultants will be required for approximately four months (660 hours) and will be billed at approximately $135/hour. The hourly rate is based on estimates provided by SBE's software development consultant currently maintaining the State's statewide voter registration system. The estimated budget for these consultants is $178,200.

SBE proposes to retain the services of an **IT security & audit** consultant or consulting firm that specializes in IT testing and auditing for web-based environments and can perform code review and security penetration for the proposed systems. These services will be needed throughout the development, testing, and implementation of the proposed systems – approximately 14 months. Based on estimates from several firms and SBE's prior contracts for similar services, SBE has budgeted $35,000 for these services.

Both proposed projects require the services of a **web hosting consultant** to provide web hosting services for each site. The proposed budget for these services includes hosting starting January 2012 (when the proposed hardware and software are installed) for 14 months. Because SBE's estimates for web hosting include other, unrelated SBE projects, SBE proposes to allocate 50% of the total monthly cost of web hosting to the proposed projects. The prorated amount is $4,500 per month for web hosting – a total of $63,000 over 14 months.

The online voter registration system will require a **software development consultant**. The proposed consultant, The Canton Group, currently maintains the State's statewide voter registration system. The Canton Group will make changes to the statewide voter registration system to enable it to accept data from the online voter registration system. As noted in the Current and Pending Project Proposal Submissions, Section 2.7 of the *Volume 1 – Technical Proposal*, SBE is proposing to share the cost between State funds and federal grant funds. SBE has budgeted $108,000, which represents a portion of the cost for those tasks directly related to the proposed online voter registration system. State funds will cover the remainder of the software development costs for the proposed online voter registration system. See Appendix A, the proposal for accepting voter registration information, and Appendix B, the proposal for accepting absentee ballot requests.

SBE proposes the services of the Overseas Vote Foundation (OVF) as the **research and reporting consultant**. Based on a proposal provided by OVF, the proposed cost of these services is $23,000.

See Appendix C for a spreadsheet of the proposed costs for the consultants.

7   Materials and Supplies[1]

Because the proposed enhancement to the online absentee ballot delivery system is printing intensive, the majority of the proposed supply costs relate to printing. Black and color ink cartridge replacements as well as ballot printer drumhead replacements are included. For the proposed ballot-on-demand printers, SBE estimates 25 black and 12 color ink cartridges will be required for the 2012 elections.[2] According to the manufacturer's website, black ink cartridges are $155, and color ink cartridges are $464, for a total cost of $9,443. The drumhead replacements are $160 each for the black ink drumheads and $219 each for the color ink drumheads. The expected life span of the drumheads is one drumhead for every two ink cartridges. As a result, SBE estimates that 13 black ink drumheads ($2,080) and 6 color ink drumheads ($1,314) are required for the 2012 elections.

Ballot paper is also needed for the ballot-on-demand printers. Based on the number of electronically delivered absentee ballots in prior elections and the expected increase for the 2012 elections, SBE estimates that 50,000 electronically delivered ballots will be printed using the proposed printer, the vast majority of which will be printed on one sheet of 8½" by 18," 90 pound paper.   Based on a quote from a paper company in Maryland, the estimated cost of this custom-cut paper is $60.55 for 1,000 sheets or $0.06055 per sheet, for a total cost of $3,028.

See Appendix D for a spreadsheet of the proposed costs for materials and supplies.

8   Other Direct Costs

SBE proposes to purchase several servers that will support different aspects of each project; this is a one time purchase. The proposed servers are:

1. 3 web servers (Dell R610) at $9,100 each, for a total cost of $27,300

2. 1 Vcenter server (Dell R410) for $10,804

3. 1 website load balancing server (Web LB) for $15,000

4. 1 web server network storage (SAN VMW) for $18,000

SBE proposes to purchase 30 ballot-on-demand printers and 30 QR barcode scanners. Maryland has 24 jurisdictions, and the proposed quantity allows SBE to allocate at least one printer and barcode scanner to each jurisdiction. The remaining quantities will be allocated to those jurisdictions with the highest number of UOCAVA voters receiving electronic absentee ballots.

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[1] SBE will follow State procurement rules when purchasing the proposed materials, supplies, hardware and software. As a result, it is possible that the actual cost of the supplies may vary from the estimates provided.

[2] Although the proposed enhancement to the online absentee ballot delivery systems will not be live for the primary election, SBE plans to conduct election-scale testing during the primary election. As a result, supplies required for the testing are included in the proposal.

SBE recently bought a ballot-on-demand printer for $3,700 and has budgeted $111,000 for 30 printers. The manufacturer offers a 2-year warranty for $885, and SBE proposes $26,550 for warranties. SBE estimates – based on an online search - $200 for each QR barcode scanner, for a total of $6,000.

Additionally, software will be required for the servers to allow the website to scale easily. This software has been identified as Software for Vcenter Server (VMware), and the estimated cost to purchase is $16,000. The cost estimates for the servers, network storage, and software were provided by SBE's current web hosting consultant.

See Appendix E for a spreadsheet of the proposed, remaining direct costs.

9   Return on Investment (ROI) Analysis

The proposed online voter registration system and the proposed enhancements to the online absentee ballot delivery system systems offer a favorable and diversified return on investment. The factors used to assess the return for these projects were the cost savings associated with the:

1. In-house development and maintenance of the systems

2. Designing and implementing two scalable, sustainable, and portable solutions

3. Increased rates of UOCAVA voter participation in and satisfaction with various stages of the voting process

4. Automating many aspects of the UOCAVA voting and counting process

Both the online voter registration system and the online absentee ballot delivery system will require one-time hardware costs and software development costs to facilitate the initial implementation. After those cost outlays, however, the only ongoing costs will be in-house management and maintenance of the systems, monthly web hosting costs, hardware maintenance, supplies, and end-of-life and any unforeseen replacement costs.

Both proposed systems offer tangible and intangible benefits that result in a favorable return on investment. The expected tangible, measureable returns will be the cost savings associated with using in-house State resources to develop and maintain both systems, instead of relying on a third party vendor and paying for its overhead and other associated costs. SBE anticipates that after the initial investment in hardware costs and software development, the costs of maintaining **both** systems will be similar to the current cost of maintaining **only** the online absentee ballot delivery system.

Another expected tangible and measurable benefit of the online absentee ballot delivery system will be the savings realized by the local boards of elections by automating the ballot duplication process. This transition will reduce the local boards of elections' time and costs associated with counting (i.e., payments to canvassing board members and staff). This savings

will come directly off of the bottom line and for some jurisdictions, will be immediate, significant, and recurring each election.

In addition to the tangible returns described above, both projects offer non-financial, intangible benefits that are critical to improving the voting process for UOCAVA voters and the election administration process. While these benefits are not always quantifiable, they have a positive impact on the election process.

One intangible return on this investment results from SBE's decision to develop two scalable, sustainable systems that address three significant components of the voting process – registering to vote, requesting a ballot, and voting the ballot. With its proposed generic, system-neutral design, these two systems are portable solutions and can have significant but minimal cost impact on the voting process in other jurisdictions.
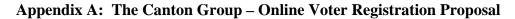
With an online voter registration system, SBE expects that satisfaction with the registration and ballot request process will improve and will translate into more UOCAVA voters completing the process and returning a timely absentee ballot. SBE anticipates that a simple, online process to register to vote will result in an increase in registration because the process removes the existing obstacles related to completing and submitting paper forms. SBE expects the number of timely changes to voter registration records and absentee ballot requests will likewise increase, since the associated information is transmitted electronically and immediately.

Lastly, SBE expects that the quality of voter registration data will improve, as local election officials will no longer be deciphering handwritten forms and manually entering voter registration data into the statewide voter registration system. Improved data quality increases the likelihood that registrations are completed without follow-up with the voter, and ballots and other election notices are directed to the voter at the correct address.

Similarly, there are several intangible benefits to the proposed enhancements to the online absentee ballot delivery system. The online ballot marking wizard enhancement will simplify the voting process for UOCAVA voters, decrease the error rate, and result in more ballots being counted – a goal of election officials everywhere. SBE expects that a simple voting process will increase the number of absentee ballots returned and counted by UOCAVA voters. Developing an automated ballot duplication process will improve the accuracy of the counting process by reducing the risk of transcription error when manually duplicating ballots.

In summary, SBE expects both systems to provide an immediate return on investment both from a financial and a qualitative perspective and will track the rates of return and improvement throughout the process with the measures of ROI outlined above.

Appendix A: The Canton Group – Online Voter Registration Proposal

DRAFT MDVOTERS ON-LINE VOTER REGISTRATION

Projected Cost of MDVOTERS Implementation

The Maryland State Legislature is considering implementation of an On-Line Voter Registration (OLVR) System so the electors can go on-line to web site to register to vote. If properly qualified by reasons of Citizenship, Residency, Age, Felon Status, and Identification Requirements, the electors can fill out a registration form instead of a paper based voter registration application. The OLVR registrant data will transfer to the MDVOTERS production environment, and wait in a queue of temporary voter records until the digital signature image of the voter is appended to the record at which time the registrant's voter data will be transferred to the voter table for election purposes. OLVR registrants will be able to register to vote or make changes to their voter registration via this Web Interface. This cost estimate includes the cost for developing the MDVOTERS interface but does not include the costs of the Web Interface or hosting services

MDVOTERS OLVR System
For On-Line Voter Registration

Projected Cost of MDVOTERS Implementation

Contents

Create the Web Interface

Basics

1. Prequalify registrants with citizenship, residency, and age questions
   a. If MVA digital signatures are required then require the MVA identification number
2. Only upon prequalification then collect registrant data
   a. name,
   b. gender,
   c. birth date,
   d. identification number,
   e. residence address,
   f. mailing address,
   g. party,
   h. contact information,
   i. ancillary survey questions,
   j. signature,
   k. date,
   l. prior registration information

Suggestions

1. MVA License Required to get the signature from MVA
   a. How else will we collect the digital signature?
2. Make the web form look similar to the VRA
   a. If an electronic signature is not available then the ink signature will have to be affixed to the paper form.
3. CASS Web Service Integration In-Lieu-Of sending the MDVOTERS Street Segments up to OLVR
   a. Instead of sending the MDVOTERS Address Library to the On-Line Voter Registration System and writing code around address library data, consider using CASS Web Services which require no software or data hosted by the state
   b. Standardized address information is returned to the web site
   c. County name is part of the data returned
4. Create unique id number and Timestamp
   a. Sequentially numbered transactions will give us control
   b. Timestamp may be useful to resolve disputes (or may become the cause of disputes)
5. Confirmation of Registration
   a. A confirmation page that can be printed might be useful
6. Print the Registration information
   a. But only if the MVA signature is unavailable
7. Hold the data in the database allowing MDVOTERS to extract the data as a web service
   a. This method would require no exports or imports
   b. The WSDL would incorporate all of the information harvested by the web site

c. If a sequential number is part of the design MDVOTERS could select all incoming registrants with an id number greater than "n" where "n" is the greatest number previously harvested

Transfer the On-Line Voter Registration Data to MDVOTERS

A web service is preferred but an export file is another good option

If the On-Line Voter Registration (OLVR) system included a web service for collecting the registrant data then the file transfers could be easily automated. A Web Service would eliminate the need for an export file. Web Services Security (WSS) can include any number of security features making this a flexible and secure method to transfer the data. A Web Services Design Language document (WSDL) would provide the information needed for programming the service requirements.

If a Web Service is not an option then an export file from the OLVR system is acceptable. The transfer file could be XML based for greatest flexibility or delimited for a more traditional approach. Either approach will require as many XML tags or delimited columns as is needed for the data harvested from the registrant. If the delimited transfer file option is selected then the file should contain a header row.

The export file will have as many rows as is needed for the number of registrants who submitted their OLVR application.

The signature image of the voter must come from the Maryland Motor Vehicle Administration (MVA) or from a paper voter registration application.

Full and Incremental Transactional Data Transfers

Regardless of the transfer method above (WS, XML, delimited file), the web data export should feature a transactional update dump. In other words, we only want the most recent registrant records to appear in the file, and we don't want a full database dump each time there is a transfer.

The transactional update dump could require a baseline id number, and then export only those transactions where the id number is of greater than "n" (where n is the previous highest number exported).

Import the OLVR System Registrant Data into MDVOTERS

Importing the registrant data should be an on-demand event, or a schedulable event using the current menu and scheduler for MDVOTERS. In either case (on demand vs. scheduled) the system should process the incoming data, post the number of records processed, perform some basic validation, categorize the incoming records, preserve the raw data, and store the incoming records in a new table. The new table of data can be processed into production later downstream after the signature image data is collected and certain reports are run.

Import the data into a new table in MDVOTERS

1. Categorize the incoming data into 8 broad categories

   When records come from the OLVR system the software should make basic decisions about the incoming records and begin to categorize the records.

   > Code 1 – Out of county move
   > Code 2 – In County Move
   > Code 3 – Mailing Address Change
   > Code 4 – Party Change
   > Code 5 – Name Change
   > Code 6 – Incoming (new registration)
   > Code 7 – Exact Match
   > Code 8 – No address library match

   a. Registrant record matching

      One of the first decisions about each record is whether or not the record is new. In other words, the software should decide if the name of the registrant already appears within MDVOTERS. Non-matching registrant data is considered to be a new registration. Matching registrant data is considered to be a reregistration.

      The most positive match is based on the driver's license number. Softer matches are based on the voter's name, date of birth, and the SSN 4 digit number. Very soft matches should not be made leaving these soft matches to the user to decide.

      i. By exact driver's license number match
      ii. Name, DOB, SSN 4
          1. Probability ratings can be applied to anything less than a hard match
          2. Soft matches can be categorized as Not Sure or can be probability rated matches

   b. Reregistration – Change codes 1 through 5

      i. Residence Address change –

         This type of record will contain an apparent residence address change. The change of address might be so significant that the voter's county of record is changed, or it might be within the same county, and it could be as simple as an apartment number change. Every change of address will be categorized as precinctable or not.

         1. Precinctable address
            a. Out of County – Code 1
            b. Within County – Code 2

      ii. Mailing Address change – Code 3

         Certain OLVR records will merely be for mailing purposes. These records will be obvious because the name, residence, and other details will match exactly except for the mailing address.

      iii. Party change – Code 4
      iv. Name change – Code 5

     c. New registration – code 6

New registrants are always missing the voter's signature and the system will need to hold these registrations in a pending status until the signature image arrives. In addition to the voter's signature image, some records will contain a precinct assignment based on the residence address while other records cannot be assigned a precinct.

        1. Precinct the address
        2. No address match

     d. No change – Code 7

It is likely that some voters will register to vote on-line for no apparent reason. These duplicate registrations should be tracked but no action should take place against the voter table.

     e. No precinct can be assigned –Code 8

Some voter records might come from the OLVR system that cannot be matched to the street address library in MDVOTERS. These records will require manual inspection and actions to make the address acceptable.

     f. Post the number of records processed

        i. On demand will post the total number of records processed directly to the screen. The total number of records will be further broken down into counts by code number.
        ii. If the scheduler is used then the counts will be reviewable in the batch job associated with each scheduled event.

2. Preserve the raw data to resolve issues downstream

     a. Store the raw data for each OLVR registrant in a single column in the table to give users the ability to view the raw data in the event there are some discrepancies.

Collect the signature image data

There is no other known source for the signature image, and the digital image of the voter's signature must come from the Maryland Motor Vehicle Administration. We plan to hold the voter's OLVR data until the signature is transferred.

Signature images can be transferred as a web service (preferred) or by an export from the MVA. If we included a web service for collecting the signature image data then the file transfers could be easily automated. A Web Service would eliminate the need for an export file. Web Services Security (WSS) can include any number of security features making this a flexible and secure method to transfer the data. A Web Services Design Language document (WSDL) would provide the information needed for the transfer of the image and the related service requirements.

If a Web Service is not an option then an export file from the MVA is acceptable. The transfer file could be a TIFF file with the MVA identification number as the name of the file. We could get periodic dumps of MVA signature images and marry these with the OLVR records at the time of the export.

We need to develop a way to handle widowed OLVR records without a signature image. We could make a request that the MVA provide the signature via the Web Service or export. However, prior to a OLVR

record moving into the voter table the signature image of the voter must come from the Maryland Motor Vehicle Administration (MVA) or from a paper voter registration application.

Process the Registrant Data

Periodically the OLVR data will move from the temporary voter table into the production voter table but only when:

1. A signature image has been married to the OLVR registrant data; and,
2. Only when the Categories are 1 through 6.
3. Code 7 is an exact match and currently there is no plan to update the voter's record.
4. Code 8 requires manual inspection and correction to make the OLVR record change to one of the six action categories.

Reports

1. Statistics
2. Detailed Reports by category
3. Aging report
4. A Missing Signature Report

Cost of Implementation

Assumptions

1. The On-Line Voter Registration (OLVR) web interface will not be developed by the Canton Group and this will be developed by another agency or another contractor separate from the Canton Group

2. The OLVR web interface will be hosted on some system other than MDVOTERS and therefore not included in this estimate are costs for the Web Interface, Usability Studies, Web Hosting, Domain registration, CASS web services, server backend for the Web registration data, maintenance or troubleshooting of the Web interface, or bandwidth fees

3. OLVR registrant data will be available by Web Services, XML or Delimited File export

4. Incoming OLVR data will consist of the latest transactions and no duplicate transactions from a previous transfer will be included

5. The incoming data will be imported into a temporary voter table

6. The Web design or hosting contractor will provide a sandbox for developing and testing the data transfer

7. The system will categorize the incoming data into eight categories including Code 1 – Out of county move; Code 2 – In County Move; Code 3 – Mailing Address Change; Code 4 – Party Change; Code 5 – Name Change; Code 6 – Incoming (new registration); Code 7 – Exact Match; Code 8 – No address library match

8. A voter name matching process will have to be written from scratch

9. A residence address lookup will have to be written from scratch

10. A street alias system will have to be written from scratch

11. The incoming data import routine will have to be schedulable

12. A search screen will be needed to manage the temporary voter storage table

13. The OLVR web registrant's digital signature image will be supplied by the MVA and if not supplied by the MVA, then OLVR Registrants will have to print their registration form and sign the form, mailing the form to the LBE in the traditional way

14. The incoming signature image data import routine will have to be schedulable

15. The MVA will provide a sandbox for developing and testing the digital signature image data

16. Three reports will have to be provided to manage the process including: Statistics; Detailed Reports by category; Aging report; A Missing Signature Report

17. The Canton Group will perform unit, pre-UAT, pre-Mock Election Testing on the software, and the SBE will perform UAT and Mock Election.

Cost Estimate

CATEGORY	ITEM	Project Manager	Senior Subject Matter Expert	Applications Programmer	Advanced Technology Senior Application Developer	Senior Database Management Specialist	Testing Specialist	Documentation Specialist	HOURS	COST
		$70	$105	$63	$70	$125	$63	$40		
DESIGN	Project Plan	40	0	0	0	0	0	4	44	$ 2,956.73
	Full Systems Design	4	60	0	20	0	0	8	92	$ 8,270.19
	DESIGN	44	60	0	20	0	0	12	136	$ 11,226.92
DATA TRANSFER	Transactional Data Acquisition	2	0	40	4	0	40	20	106	$ 6,232.21
	TRANSFER	2	0	40	4	0	40	20	106	$ 6,232.21
PROCESS TO TEMP	Code 1 – Out of county move	2.4	0	48	4.8	0	48	24	127.2	$ 7,478.65
	Code 2 – In County Move	0.4	0	8	0.8	0	8	4	21.2	$ 1,246.44
	Code 3 – Mailing Address Change	0.8	0	16	1.6	0	16	8	42.4	$ 2,492.88
	Code 4 – Party Change	0.8	0	16	1.6	0	16	8	42.4	$ 2,492.88
	Code 5 – Name Change	0.8	0	16	1.6	0	16	8	42.4	$ 2,492.88
	Code 6 – Incoming (new registration)	1.2	0	24	2.4	0	24	12	63.6	$ 3,739.33
	Code 7 – Exact Match	1.8	0	36	3.6	0	36	18	95.4	$ 5,608.99
	Code 8 – No address library match	1.2	0	24	2.4	0	24	12	63.6	$ 3,739.33
	Scheduler	0.8	0	16	1.6	0	16	8	42.4	$ 2,492.88
	PROCESS	10.2	0	204	20.4	0	204	102	540.6	$ 31,784.28
SIGNATURES	Request Signature Images	2	0	40	4	0	40	20	106	$ 6,232.21
	Collect Signature Images	3	0	60	6	0	60	30	159	$ 9,348.32
	Assign Signature Images	4	0	80	8	0	80	40	212	$ 12,464.42
	SIGNATURES	9	0	180	18	0	180	90	477	$ 28,044.95
PROCESS TO PRODUCTION	Insert	0.8	0	16	1.6	0	16	8	42.4	$ 2,492.88
	Update	0.8	0	16	1.6	0	16	8	42.4	$ 2,492.88
	TO PRODUCTION	1.6	0	32	3.2	0	32	16	84.8	$ 4,985.77
REPORTS	1. Statistics	2	0	40	4	0	40	20	106	$ 6,232.21
	2. Detailed Reports by category	2	0	40	4	0	40	20	106	$ 6,232.21
	3. Aging report	2	0	40	4	0	40	20	106	$ 6,232.21
	4. Missing Signature report	2	0	40	4	0	40	20	106	$ 6,232.21
	REPORTS	8	0	160	16	0	160	80	424	$ 24,928.85
IMPLEMENT	Promote to Production	0	0	0	0	32	0	0	32	$ 4,000.00
	IMPLEMENT	0	0	0	0	32	0	0	32	$ 4,000.00
TOTAL		74.8	60	616	81.6	32	616	320	1800.4	$ 111,202.98

Appendix B: The Canton Group – Online Absentee Ballot Request Proposal

DRAFT MDVOTERS ON-LINE ABSENT VOTER BALLOT APPLICATION

Projected Cost of MDVOTERS Implementation

The Maryland State Board of Elections (SBE) is considering applying for a grant from the Federal Voting Assistance Program to improve services to UOCAVA Voters. The UOCAVA Voters could go online to a website to apply for a ballot. (Eventually, all voters and not just the UOCAVA voters might make use of this site.) If properly qualified, the voters could fill out an application form online instead of a paper-based application. The AV application data will transfer to the MDVOTERS production environment, and either land in the election file of AV voters or in the date range table of mailing addresses for future absent voter ballots. Currently, there is no plan for further 2-way communication between the online application system and MDVOTERS, such as the current status of the ballot or the receipt and disposition of the ballot. This cost estimate includes the cost for developing the MDVOTERS interface but does not include the costs of the Web Interface or hosting services.

MDVOTERS OLAVAPP System
For On-Line Absentee Voter Applications

Projected Cost of MDVOTERS Implementation

Contents

MDVOTERS OLAVAPP System Cost Estimate

Transfer the On-Line Absentee Voter Application Data to MDVOTERS

A web service is preferred, but an export file is another good option

If the On-Line Absentee Voter Application (OLAVAPP) system included a web service for collecting the application data, the file transfers could be easily automated. A Web Service would eliminate the need for an export file. Web Services Security (WSS) can include any number of security features making this a flexible and secure method to transfer the data. A Web Services Design Language document (WSDL) would provide the information needed for programming the service requirements.

If a Web Service is not an option, then an export file from the OLAVAPP system is acceptable. The transfer file could be XML-based for greatest flexibility or delimited for a more traditional approach. Either approach will require as many XML tags or delimited columns as needed for the data harvested from the registrant. If the delimited transfer file option is selected then the file should contain a header row.

The export file will have as many rows as needed for the number of registrants who submitted their OLAVAPP applications.

Full and Incremental Transactional Data Transfers

Regardless of the transfer method above (WS, XML, delimited file), the web data export should feature a transactional update dump. In other words, we only want the most recent registrant records to appear in the file, and we do not want a full database dump each time there is a transfer.

The transactional update dump could require a baseline id number, and then export only those transactions where the id number is of greater than "n" (where n is the previous highest number exported).

Import the OLAVAPP System Registrant Data into MDVOTERS

Importing the application data should be an on-demand event, or a schedulable event using the current menu and scheduler for MDVOTERS. In either case (on demand vs. scheduled), the system should process the incoming data, post the number of records processed, perform some basic validation, categorize the incoming records, preserve the raw data, and store the incoming applications, whether in the election or in the date range absentee voter application table. Errors in the process should be stored in a table and a report of errors should be made available to the users.

Import the data into a new table in MDVOTERS

1. Categorize the incoming data into 2 categories
   When records come from the OLAVAPP system the software should make basic decisions about the incoming records and begin to categorize the records.

   - AV Application for a specific election
   - AV Application for a date range

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MDVOTERS OLAVAPP System Cost Estimate

a. Registrant record matching

The match is based on the voter id number and the first decision about each record is whether or not the voter record is on file and eligible for an election. In other words, the software should decide if the voter id is for a voter that is still qualified to apply for an AV Ballot and/or date range ballot. Qualifications include date registered, status of the voter record, precinct, and eligibility based on any requests already on file. Non-matching application data must be stored and reported to the election official for further investigation.

b. Post the number of records processed
   i. On demand will post the total number of records processed directly to the screen. The total number of records will be further broken down into counts by code number.
   ii. If the scheduler is used then the counts will be reviewable in the batch job associated with each scheduled event.

2. Preserve the raw data to resolve issues downstream
   a. Store the raw data for each OLAVAPP registrant in a single column in the table to give users the ability to view the raw data in the event there are some discrepancies.

Reports
1. Statistics
2. Missing Data Report or Error Report

MDVOTERS OLAVAPP System Cost Estimate

Cost of Implementation

Assumptions

1. The State has opted to perform the work related to the Online Absentee Voter Application (OLAVAPP) Web Interface.
2. The OLAVAPP Web Interface will be hosted on a system other than MDVOTERS; therefore, not included in this estimate are costs for the Web Interface, Usability Studies, Web Hosting, Domain registration, server backend for the Web registration data, maintenance or troubleshooting of the Web interface, or bandwidth fees.
3. OLAVAPP registrant data will be available by Web Services, XML or Delimited File export.
4. Incoming OLAVAPP data will consist of the latest transactions and no duplicate transactions from a previous transfer will be included.
5. The incoming data will be imported into a temporary voter table.
6. The Web design or hosting contractor will provide a sandbox for developing and testing the data transfer.
7. The system will categorize the incoming data into two categories, including an AV application for a specific election or an AV Application for a date range.
8. A voter match will be made by the voter id number.
9. An applicant will have to undergo a validation process before the applicant is added to the election AV table or date range table.
10. The incoming data import routine will have to be schedulable.
11. Errors in the process will have to be stored and reported to the user.
12. Two reports will have to be provided to manage the process, including a Statistics report on the incoming data, and an error report.
13. The Canton Group will perform unit, pre-UAT, pre-Mock Election Testing on the software, and the SBE will perform UAT and Mock Election Testing.

MDVOTERS OLAVAPP System Cost Estimate

Cost Estimate

CATEGORY	ITEM	Project Manager	Senior Subject Matter Expert	Applications Programmer	Advanced Technology Senior Application Developer	Senior Database Management Specialist	Testing Specialist	Documentation Specialist	HOURS	COST
		$140	$125	$69	$126	$140	$69	$48		
DESIGN	Project Plan	40	0	0	0	0	0	4	44	$ 5,792.00
	Full Systems Design	4	60	0	20	0	0	8	92	$ 10,964.00
	DESIGN	44	60	0	20	0	0	12	136	$ 16,756.00
DATA TRANSFER	Transactional Data Acquisition	2	0	40	4	0	40	20	106	$ 7,264.00
	TRANSFER	2	0	40	4	0	40	20	106	$ 7,264.00
PROCESS AV APPLICATION	To a Specific Election	2.4	0	48	4.8	0	48	24	127.2	$ 8,716.80
	To a Date Range Application	1.2	0	24	2.4	0	24	12	63.6	$ 4,358.40
	Scheduler	0.8	0	16	1.6	0	16	8	42.4	$ 2,905.60
	PROCESS	4.4	0	88	8.8	0	88	44	233.2	$ 15,980.80
PROCESS TO PRODUCTION	Insert	0.8	0	16	1.6	0	16	8	42.4	$ 2,905.60
	Update	0.8	0	16	1.6	0	16	8	42.4	$ 2,905.60
	TO PRODUCTION	1.6	0	32	3.2	0	32	16	84.8	$ 5,811.20
REPORTS	1. Statistics	1	0	20	2	0	20	10	53	$ 3,632.00
	2. Missing Data Report	1	0	20	2	0	20	10	53	$ 3,632.00
	REPORTS	2	0	40	4	0	40	20	106	$ 7,264.00
IMPLEMENT	Promote to Production	0	0		0	32	0	0	32	$ 4,480.00
	IMPLEMENT	0	0	0	0	32	0	0	32	$ 4,480.00
TOTAL		54	60	200	40	32	200	112	698	$ 57,556.00

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Appendix C: Proposed Budget for Consultants

Consultants	Est. Rate	Est. Hrs/Mth	Estimated Cost	Total Costs
Describe Services Required				
Voter Registration System Software Vendor (The Canton Grou	$ 1	1	$108,000	$108,000
Online Voter Registration System	$ 1	1	$50,000	$50,000
Online Absentee Ballot Request	$ 1	1	$58,000	$58,000
Server Hosting (TBD)	$ 4,500	14	$63,000	$63,000
Research, Reporting & Analytics (Overseas Vote Foundation)	$ 1	1	$23,000	$23,000
IT Security Consultants (TBD)	$ 1	1	$35,000	$35,000
Technical Consultant (TBD)	$ 135	660	$89,100	$89,100
Technical Consultant (TBD)	$ 135	660	$89,100	$89,100
Total Consultants Costs				**$407,200**

Appendix D: Proposed Budget for Materials and Supplies

Materials & Supplies (Office supplies, copying, postage, etc.)	# of Units	Units/Est Cost	Est. Cost/Unit	Total Costs
Itemize				
Black Ink Cartridges	25	155	$155	$3,875
Color Ink Cartridges	12	464	$464	$5,568
Ballot Paper (90# 8.5 x 18 inch paper)	50,000	60.55	$60.55	$3,028
Ballot Printer Drumhead Replacement - Black	13	160	$160	$2,080
Ballot Printer Drumhead Replacement - Color	6	219	$219	$1,314
Total Materials & Supplies Costs				**$15,865**

Appendix E: Proposed Budget for Other Direct Costs

Other Direct Costs	# of Units	Est. Cost/Unit	Total Costs
Hardware, Licensing & Warranties			
Web Server (Dell R610) (includes basic warranty)	3	$9,100	$27,300
Vcenter Server (Dell R410) (includes basic warranty)	1	$10,804	$10,804
Website Load Balancing Server (Web LB) (includes basic warranty)	1	$15,000	$15,000
Web Server Network Storage (SAN VMW) (includes basic warranty)	1	$18,000	$18,000
Ballot Printer Hardware (TBD)	30	$3,700	$111,000
2 year Warranty - Ballot-on-Demand Printer Hardware (TBD)	30	$885	$26,550
QR Barcode Scanner	30	$200	$6,000
Warranty & Service Contract- QR Barcode Scanner		$0	$0
Subtotal Hardware, Licensing & Warranties			**$214,654**
Software			
Software for Vcenter Server (VMWare)	1	$16,000	$16,000
Subtotal Software			**$16,000**
Total Other Direct Costs			**$230,654**

Modifications to Original Technical Proposal are listed in the following pages

The Maryland State Board of Elections (SBE) proposes two amendments to Volume 1 – Technical Proposal.

Amendment #1: SBE proposes to amend the second, non-numbered paragraph on page 4 to:

> After thorough internal testing, SBE proposes to consult with outside security auditors to review the code base and conduct a security audit and penetration testing for both systems.[1] Once the code base has been reviewed and found to be secure, the code will be licensed as open source under the GPL-3.0 license[2] and subsequently released <u>to any requesting jurisdiction that wishes to use the code for election purposes</u>. ~~At that point, any individual can review the code base for security flaws, and SBE will establish a process to receive and review any feedback. It will also allow another jurisdiction or vendor to use the code and modify it as needed on the condition that the code continues to be open source.~~

This amendment reflects SBE's original intent to provide other jurisdictions with the source code to the online registration and online ballot delivery systems.

Amendment #2: SBE proposes to amend Table 1 – Proposed Schedule and Milestones in §1.3 Schedule and Milestones (page 10) to reflect SBE's plan to conduct surveys related to the 2014 and 2016 General Elections. SBE amends Table 1 as follows:

Task	Project		End Date
	VR[*]	AB[**]	
Hire technical consultants	√	√	30 days after award notice
Procure software	√	√	10/1/2011
Quarterly financial report	√	√	10/31/2011
Software delivery	√	√	11/1/2011
Hosting Environment Set Up	√	√	1/1/2012
Software installed	√	√	1/1/2012
Test printers		√	1/1/2012
Coding and development	√	√	1/1/2012
Data Access Layer	√	√	8/31/2011
Business Objects Layer	√	√	10/31/2011
Absentee Ballot Wizard Interface		√	11/30/2011
User Interface Layer	√	√	12/31/2011
Quarterly financial report	√	√	1/31/2012
"Go Live" Date	√		7/1/2012
Printer delivery to local boards of elections		√	7/1/2012
Quarterly financial report	√	√	4/30/2012
Code testing & review	√	√	3/1/2012
2012 Primary Election: Early Voting			3/24 – 3/29/2012

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[1] The proposed security audit will include physical access testing, software and server hacking, and a review of the code for security holes.
[2] http://www.opensource.org/licenses/gpl-3.0.html

Milestone	VR	AB	Date
Security Audit	√	√	3/31/2012
2012 Primary Election: Election Day			4/3/2012
Mock Election testing	√	√	4/1 – 5/31/2012
Quarterly financial report	√	√	7/31/2012
"Go Live" Date		√	9/2012
2012 General Election: Early Voting			10/27 – 11/1/2012
Quarterly (annual) financial report	√	√	10/31/2012
2012 General Election: Election Day			11/6/2012
Post-election survey	√	√	11/6/2012 – 12/30/2012
Quarterly financial report	√	√	1/31/2013
Data collection & analysis	√	√	2/15/2013
Final report	√	√	3/31/2013
2014 General Election: Early Voting			10/23 – 10/30/2014
2014 General Election: Election Day			11/4/2014
Post-election survey	√	√	11/4/2014 – 12/30/2014
Data collection & analysis	√	√	1/2015 – 3/2015
Final report of 2014 General Election survey			4/30/2015
2016 General Election			11/8/2016
Post-election survey (tentative)	√	√	11/5/2016 – 12/30/2016
Data collection & analysis (tentative)	√	√	1/2017 – 3/2017
Final report of the 2016 General Election survey (tentative)	√	√	4/30/2017

Table 1 - Proposed Schedule and Milestones

[*] VR is the online voter registration system.
[**] AB is the online absentee ballot delivery system and the proposed enhancements.