State of Wisconsin\Government Accountability Board

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MEMORANDUM

DATE: For the May 21-22, 2014 Board Meeting

TO: Members, Wisconsin Government Accountability Board

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SUBJECT: Prime III Voting System

I. Introduction and Recommendation

This memorandum is intended to update the Board on the conclusion of the pilot of the Prime III voting system and to outline staff's recommendations regarding further development of the system.

Wis. Stat. 5.76 provides the following:

> The governing body or board of election commissioners of any municipality may by ordinance or resolution adopt, experiment with, or discontinue any electronic voting system authorized by this subchapter and approved under s. 5.91 for use in this state, and may purchase or lease materials or equipment for such system to be used in all or some of the wards within its jurisdiction, either exclusively in combination with mechanical voting machines, or in combination with paper ballots where such ballots are authorized to be used.

Both the Town of Kossuth and Town of Newton in Manitowoc County approved experimentation with the Prime III voting system at the April 1, 2014 election, and the Government Accountability Board (Board) affirmed its approval of the pilot program at its February 25, 2014 special teleconference. In order to assess the Prime III comprehensively,

Board staff with specializations in various aspects of election administration contributed to this project and analysis.

The Prime III pilot has demonstrated that the Prime III voting system is an improvement over existing technology in several key areas and is in line with recommendations released by the Presidential Commission on Election Administration. However, because this was the first opportunity for the Prime III to be tested in an in-person Election Day scenario, more input from election officials throughout the country will be needed to improve the system's functionality and customizability for use by election officials. There are a number of questions that will need to be addressed from an election administration perspective before this system can be deployed on a broader scale.

While the Prime III system is not yet an option for deployment, Board staff encourages the U.S. Election Assistance Commission (U.S. EAC) and the Clemson University Prime III research team (Clemson) to seek more input from election officials and states interested in this technology to customize it for election administration and in-person voting scenarios. This report is therefore focused on reviewing the pilot program and making recommendations regarding how to improve the system moving forward. Board staff will continue to provide feedback to the Clemson team and the U.S. EAC on the pilot program.

II. Background

As the Presidential Commission on Election Administration recently noted, by the end of the decade a large share of the nation's voting machines, which were purchased nearly 10 years ago with HAVA funds, will reach the end of their natural life and require replacement. To address this impending challenge and to usher in the next generation of voting machines, the Commission specifically recommended that the standards and certification process for new voting technology be reformed so as to encourage innovation and to facilitate the adoption of widely available, off-the-shelf technologies and "software-only" solutions.

The U.S. EAC has sought to address this issue, at least in part, by supporting research that will increase the accessibility of technological solutions incorporated into the design of voting systems that utilize open source technology. Its grant program was specifically targeted towards making such technology available to state election officials and voting equipment vendors. Prime III is the result of a three-year, $4.5 million U.S. EAC grant to Dr. Juan Gilbert and his team of researchers in the Human Centered Computing Laboratory at Clemson University to increase the accessibility of new, existing, and emerging technological solutions in the design of voting systems. This grant was aimed at supporting the development of a system that utilizes open source technology and resulted in the Prime III, a system that could potentially be made available to state election officials and voting equipment vendors. Though the system is designed as an accessible voting solution, it has a universal design interface that can be used by all voters.

In accordance with the Board directive from the February 25, 2014 meeting, Board staff implemented a pilot of the Prime III for use in the April 1, 2014 election. Board staff obtained an agreement from Manitowoc County Clerk Jamie Aulik to serve as the pilot location. Additionally, through the work of County Clerk Aulik, Board staff secured municipal participants for the pilot. County Clerk Aulik as well as municipal clerks Jolyn Schuh (Town of Kossuth) and Barbara Pankratz (Town of Newton) collaborated with the G.A.B. in piloting the Prime III in the April 1, 2014 Spring Election.

Board staff worked collaboratively with members of the Clemson team and local election officials from Manitowoc County to design the voting interface and tabulation components. Board staff held a full day working meeting on January 24, 2014 in Madison with members of the Clemson team, the Manitowoc County Clerk, municipal clerks, and several Board staff members. Leading up to the election, Board staff conducted multiple trainings both with local election officials and the public in Manitowoc County on how to use the Prime III.[1] Board staff was also present to assist with the required public testing of the tabulation equipment conducted in the Towns of Newton and Kossuth, on March 27 and 28, 2014, respectively.

III. System Overview and Description

The Clemson team provided a link to the Prime III software, which was housed on an encrypted server and delivered through a unidirectional connection with the server. The interface with the server is considered unidirectional because no voter selections are being transferred back to the server or being housed either on the server or on the local device. The only record of voter selections is the paper ballot that the voter prints at the conclusion of their voting session. The Clemson team also provided a local version of the Prime III that could be run from the computers' hard drive. Board staff elected to use the secured server based version because it offered a higher grade performance for the vote-by-voice software, one of the system's key innovations in the area of accessible voting technology. The local version of Prime III was installed on each voting station as a back-up, if Internet service was interrupted at the polling place. There were no Internet service outages on Election Day.[2]

Board staff provided the Clemson team with an XML file containing the contests and candidates for the Towns of Newton and Kossuth. In doing so, Board staff was able to determine that Prime III was able to receive input directly from the Statewide Voter Registration System (SVRS), if it were to be configured to do so. However, because staff transferred the XML file manually, Dr. Gilbert and his team in turn manually entered the data into Prime III and configured the software to reflect the available elections in both the Towns of Kossuth and Newton. In addition to providing Board staff with access to the Prime III software, the Clemson team provided the following equipment:

[1]The first training was held in the Town of Newton on February 13, 2014 and focused on introducing the system to the municipal clerks and election inspectors. Board staff returned to Manitowoc County and held two additional trainings on Election Day preparedness and solving potential issues with the voter interface. Trainings were held in the Town of Newton on March 27, 2014 and in the Town of Kossuth on March 28, 2014.

[2] Board staff opted to run the Internet based Prime III version using Google Chrome because this configuration proved to be most optimal for all components. The local version was set up to run using Firefox because pre-election testing found this configuration to be a suitable alternative to Google Chrome. Prime III is not configured to run using Internet Explorer.

Equipment	Hardware Version(s)	Type
(1) Dell Ultrabook	XPS 12	Polling Place Tabulator
(3) Canon Scanners	DR-2510C	Ballot Scanning Device
(14) HP All in One Computer	23" HP Envy (Touchscreen)	Ballot Selection Touchscreen Device
(14) HP Mobile Color Printer	OfficeJet H470	Printer for Ballot Marking
(14) Motorola Scanners	Motorola DS6707	QR Code Readers
(14) Logitech Headsets	Model A-00006	Headsets w/Microphones for Accessibility

The G.A.B. provided one HP Ultrabook laptop for use as a tabulator. The Clemson team provided the Board staff with the commercially available optical character recognition software, OmniPage Batch Manager, as well as the tally software, which had been constructed and developed by the Clemson team. Verizon Wireless also donated the use of an encrypted wireless router and a data plan to enable some of the system's functionality, including the voter interface and the vote-by-voice accessible feature. This device was used in the Town of Kossuth because no wireless Internet service existed at the town's polling place. An existing encrypted wireless network was used to access the Internet in the Town of Newton. Board staff in turn configured each of the voting station and tabulation station components for use in the April 1, 2014 election.[3]

The ability to integrate Prime III with commercial off-the-shelf (COTS) components allows election officials to pair the software with touchscreen monitors that have large displays. Currently available hardware-based voting systems have fixed-size screens that allow users to toggle between the standard font size and a single larger font size setting. With Prime III, election officials could choose to utilize larger screens that would improve the ability of voters with visual impairments to navigate their ballot without assistance. The touchscreen monitors utilized during the pilot each had "pinch to zoom" capability which allowed voters familiar with the technology to adjust the size of the font on the screen to meet their preferences.

A. Ballot Design

Board staff worked with the county and municipal clerks, as well as the Clemson team, to design two ballots: one ballot for use on Election Day that the Prime III tabulation system could count and one ballot for hand marking for absentee voters and for voters who requested a paper ballot at the polling place on Election Day. Though the Clemson team developed a tally function to tabulate the absentee ballots, Board staff did not utilize this functionality during the pilot. The consensus among the clerks, Board staff and Clemson team was that, given the low number of absentee voters in these communities in past Spring Elections and the fact that these towns are both traditional hand count municipalities, the absentee ballots could easily be counted by hand.

The ballots were printed on standard, white, 8 ½ by 11 in. sheets of paper in the offices of the G.A.B. and Manitowoc County Clerk. Because the tabulation equipment relies on

[3] Board staff spent three working days setting up and configuring the 14 Prime III voting stations and two tabulation stations at the G.A.B. office, secured the components, packed them, and transported them to the pilot polling places. Several more hours over the course of two days was spent at each polling place to ensure each voting station was operating as intended.

optical character recognition software, it was important that the ballot design allow voter selections to be printed on a blank page. Board staff met this requirement by printing voter instructions on one side of the ballot and directing voters to insert their ballot into the printer with the blank side facing them. Only one voter in one of the municipalities had problems with this instruction and printed their selections on top of the voter instructions. Each voter accessed their ballot by using a scanner to read a QR code that was printed on the ballot given to them by the election inspectors.

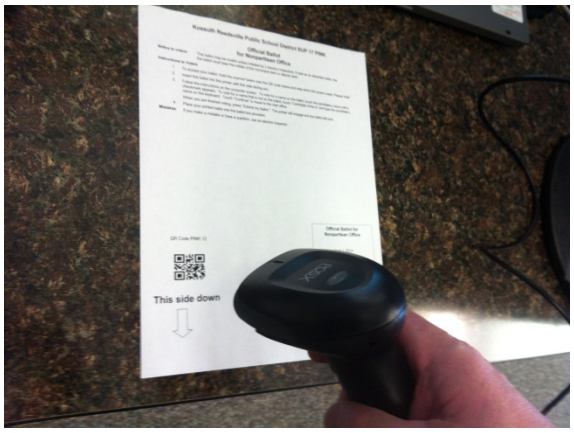

Fig. 1. Prime III Ballot with QR code printed at bottom left.

Each ballot style contained a unique QR code. When scanned, the QR codes input a two digit code into the system which took the voter directly to the screens listing the contests they were entitled to vote. Alternately, if necessary, an election inspector could also input the code provided on the ballot into the system using the touchscreen. This also was an option for voters, but voters were instructed to scan the QR code in an effort to avoid incorrect codes being entered presenting a situation where electors would access and vote the wrong ballot.

B. Voter station: HP All In One Computer, Printer, and Scanner

The voter interface ran on COTS hardware. Each voter station was comprised of the following components:

- (1) HP All in One Computer
- (1) HP Mobile Color Printer
- (1) Motorola Barcode/QR Scanner
- (1) Logitech Headset with Microphone (Accessibility Component)

HP All in One Computers are COTS touchscreen computers. The computers are so named because all components of the operating system are housed in a single unit. Each HP All in One Computer is comprised of a color touchscreen monitor with several USB ports to connect a printer, mouse, and keyboard. The mouse and keyboard were used by Board staff for setup prior to Election Day and by election inspectors for troubleshooting on Election Day. Voters did not have access to these components on Election Day.

For the April 1 Spring Election, the voter entered the voting booth and scanned the QR code on the ballot to begin voting. The voter then inserted their blank ballot initialed by election

inspectors into the printer. After the ballot was loaded in the printer, the monitor then displayed a series of menu-driven contests and candidates on the screen. The voter used the touchscreen, on screen key pad (for write-in votes), or vote-by-voice function to make selections. Overvotes cannot occur on this equipment because the system does not allow a voter to vote for more candidates than allowed for a contest and a voter is warned about undervotes with a notation of "No Selection" next to the contest name at the "Ballot Summary" screen prior to the completion of the ballot.

When the voter completed the voting process, Prime III provided a ballot summary report for the voter to review his or her choices. The voter then touched "Submit My Ballot" to send their selections to the printer. For voters with visual impairments using the vote-by-voice function, an audio summary of the voted ballot was provided before the ballot was printed. Once the ballot was marked and printed, Prime III cleared its internal memory and the paper ballot was the only lasting record of the selections made by the voter. The voter was then able to again visually confirm his or her selections on the printed ballot, if able to do so. The voter then proceeded to deposit the ballot into a secured ballot box to be tabulated by election inspectors after the polls were closed.

C. Dell Ultrabook and Canon Scanner

The Dell Ultrabook was paired with a Canon High Speed Document Scanner, a COTS digital scanner. In tandem, both components operated as a polling place counting system to tabulate Prime III generated ballots at the polling place. Each system was evaluated for its ability to process ballots for the wards or reporting units for which it was expected to provide results. After the voter completed their selections using the Prime III software and printed their ballot, the ballot was inserted into a secure ballot box. After the polls closed, the designated election inspector retrieved the ballots from the secured storage bin and fed them into the digital scanner. The digital scanner created a picture image of each ballot as it was scanned as well as a text file that was used to generate a results report. The images and results could be stored either on the equipment, transferred to an external USB flash drive, or printed. If the municipal clerk chose to do so, he or she could also email the results file to the county clerk on Election Night.

D. Accessibility Components

As designed, Prime III has at least two options for an accessible voter interface: the vote-by-voice functionality and the A/B switch. For this pilot, the A/B switch option was not employed. However, Board staff tested and utilized the vote-by-voice functionality during testing and the demonstration days in Manitowoc County. Board staff did not observe any voters using the accessible component on Election Day.

The vote-by-voice function creates an audio ballot which provides instructions, lists contest and candidate choices, allows for write-in options and provides a ballot summary prior to ballot printing. When using this functionality, the ballot is read to the voter through a headset with a built-in microphone. At each junction where a navigation decision or ballot choice can be made, the audio ballot creates a five-second window that allows a voter to use a verbal command to represent their intentions. Any verbal prompt made during this window will be recognized by the system, which allows the voter to preserve the privacy of their ballot choices. For example, a user can merely say the word "vote" to select a

candidate or ballot choice rather than stating the name of the candidate they intend to support.

The vote-by-voice functionality of Prime III represents an upgrade over the accessible options of the current voting systems approved for use in Wisconsin. All of those systems require physical, rather than verbal, interaction during the ballot marking process. Prime III eliminates this need, but does not allow for voters to interact with the voting process with complete independence. In order to use Prime III in its current configuration a voter with dexterity issues or limited use of their hands would need assistance loading their blank ballot in the printer, scanning the QR code to access their ballot, removing the ballot from the printer and placing it into the ballot box. Dr. Gilbert and his team have indicated that they are currently working on a hands-free balloting component for Prime III that may alleviate some of these concerns, but it was still in development at the time of the pilot.

IV. Overview of Pilot Program

A. Town of Kossuth and Town of Newton

Both the Town of Kossuth and Town of Newton are rural communities. The Town of Kossuth has 1,445 active voters and the Town of Newton has 1,469 active voters.[4] Each township uses a hand count, paper ballot voting system. For the Spring Election, the Town of Kossuth is divided among three school districts—Manitowoc, Mishicot, and Reedsville. It has one county supervisor district: 17. The Town of Newton is divided into two county supervisor districts: 11 and 12. Each county supervisory district is further divided into two school districts, Manitowoc and Valders. In each community there were four contests on each ballot style: Court of Appeals, County Executive, County Supervisor, and School Board Member.

B. Voter Education

Board staff provided voter education training and materials to each municipality in preparation for the pilot. Staff developed a voter education picture guide to visually illustrate voter interaction with the system. A picture guide was placed in each voting booth on Election Day. Staff also developed a training video that was designed to air throughout the day at a demonstration station setup at each polling place. Finally, staff, along with the county and municipal clerks, hosted demonstration days in both municipalities.

In the Town of Newton, the demonstration day was held on March 27, 2014 from 11 a.m. to 8 p.m. and provided residents an opportunity to test the system and ask questions about the pilot. More than 100 people attended the demonstration day. A similar event was held in the Town of Kossuth on March 28, 2014 from 11 a.m. to 8 p.m. Again, close to 100 people

[4] According to the Wisconsin Election Data Collection (WEDC) report filed for the Town of Kossuth for the April 1, 2014 election, the town had a total of 1,339 active voters twenty (20) days prior to the election. There were no late voter registrations. Six electors registered to vote on Election Day. Three Hundred and Fifty three (353) ballots were cast. Twelve (12) ballots were issued to absentee voters and all of these ballots were returned. The WEDC report for the Town of Newton shows the town had a total of 1,458 active voters twenty (20) days prior to the election. There were no late voter registrations. Eleven electors registered on Election Day. Three Hundred and Eighty four (384) ballots were cast. Nineteen (19) ballots were issued to absentee voters and 18 were returned.

attended. These demonstration days were promoted through community newsletters, e-mail communications to residents, public notices, and a press release to area media issued by the Manitowoc County Clerk. Many county and municipal clerks from throughout the state attended one of the demonstration days. Their comments and feedback are included in Appendix III.

C. Polling Place Set-up and Configuration

Board staff delivered the voting equipment to the Towns of Newton and Kossuth on March 26, 2014. Board staff ensured all equipment was functional on Election Day prior to the opening of the polls. Clemson team members also were on site in both towns on Election Day. During the day, municipal election inspectors were chiefly responsible for instructing voters on the use of the system and answering any questions. In both locations, election inspectors provided an exceptional level of voter assistance and were able and willing to provide hands on assistance to voters who were having difficulty. On Election Day, all voters in Town of Kossuth cast their ballots using Prime III. In the Town of Newton, only two voters (spouses) asked to vote a paper ballot.

Fig. 2. Kossuth Polling Place Set-Up with a Prime III Voting Station

There were no changes in the voter check-in process in either location. After stating their name and address and signing the poll book at the check-in table, voters were issued a voter number and ballot. Though voters were offered an opportunity to work with the Prime III system in a test environment prior to checking in and receiving a ballot, very few voters in each location visited the demonstration station prior to voting.

D. Voter Experience in the Town of Kossuth and Town of Newton

In the Town of Kossuth, 353 voters turned out on Election Day at the Town Hall, the only polling place in the community. Throughout the day, there were five election inspectors, with the municipal clerk and one Board staff member available to assist voters, as needed. Two members of the Clemson team also were present to address technical issues with the system. After receiving their ballots, voters were directed to an open voting station. There were six Prime III voting stations.

In the Town of Newton, 384 voters cast ballots on Election Day. Similar to the Town of Kossuth, Newton only has one polling place, its Town Hall. Throughout the day, there were

five election inspectors, in addition to the municipal clerk and one Board staff member available to assist voters. Dr. Gilbert also was in the polling place to provide technical support. After receiving their ballots, voters were directed to an open voting station. There were six Prime III voting stations.

In each location, voter turnout was steady throughout the day. Board staff observed low to no wait times for a Prime III voting station. At times voters had to wait in line during the check-in process in each location as election inspectors chose to provide a brief overview of the system as they issued ballots. Many voters were in and out of the polling place quickly and required no additional assistance. However, Board staff noticed the following challenges voters faced while using the Prime III:

- **Initial Activation.** The biggest challenge for all voters was accessing their ballot. Many voters struggled to use the QR code scanner, with most of them unaware of where to point the scanner on their ballot, how far to hold the scanner from the QR code, and how to operate the scanner. Election inspectors helped many voters through this step. Once the ballot was accessed, some voters also were confused with how to navigate through the Prime III system. Again, election inspectors helped many voters get to the first contest on the ballot. Board staff found that once electors voted one contest they required less assistance navigating the system.

- **Contest Skipping.** Board staff observed Prime III skipping the top contest on the ballot (Court of Appeals) and going directly to the second contest (County Executive) when the voter tapped the "Start Voting" button on the initial screen. This issue was observed on several voting stations in each location. The Clemson team had been made aware of the problem prior to Election Day and had attempted to repair it but was not successful by Election Day. The Clemson team has indicated that more research will have to be done to isolate a source of the problem.

  In all instances, including those where the system skipped a contest, the system's configuration enabled voters to correct any blank contests prior to printing and again prior to submitting their ballots. Voters were provided an opportunity to review their ballot selections at the "Ballot Summary" screen prior to printing. Polling place staff reminded all voters to review the printed ballot to make sure the choices that printed matched the choices the voter wanted to cast. Voters who had second thoughts about their ballot choices after the ballot was printed had the option of spoiling the ballot and getting a second ballot. No spoiled ballots were recorded in Kossuth. There were a small number of spoiled ballots in Newton, but the number was similar to past Spring Elections.

- **Touch Technique.** Some voters had difficulty touching the screen in a manner that Prime III would recognize. For instance, some voters tapped with their fingernail or tapped too softly. In these cases, election inspectors demonstrated how to properly touch the screen. It is unclear if the issues regarding the touch technique were due to the COTS hardware used for the pilot or to the Prime III system itself.

- **Ballot Printing.** There were several problems with Prime III connecting with the printer to print the ballot at the end of a voter's session. On several occasions, this required the system interface to be restarted and the voter to re-enter their selections. Since votes are not cast until the ballot is placed in the ballot box, no votes were "lost". The Clemson team was unable to identify a solution to this issue and has indicated that they will need to conduct further testing.

All voters were asked to complete a five question survey about their experience before leaving the polling place. The exit poll was developed by the Clemson team. A majority of respondents felt confident using the system and would like to use it again in the future. Likewise, a majority thought the system was easy to use and navigate. However, there were written comments that expressed concern over the cost of the system and the time it took to vote compared to a paper ballot. Generally, Board staff observed that those with negative comments about the system experienced technical difficulties while voting or required significant assistance to mark their ballot. Results of the survey are included in Appendices I and II.

E. Vote Tabulation

In both locations, ballots were collected in a standard hand count paper ballot box. After the polls closed, one election inspector opened the ballot boxes and collected the ballots. In the Town of Kossuth, the ballots were sorted by school district – Manitowoc, Mishicot, and Reedsville. The package of ballots for each school district was then scanned individually and counted using the tabulation equipment. Three results reports were printed, one for each school district. Each package of ballots then was counted by hand by the election inspectors.

In the Town of Newton, the ballots were divided by County Supervisory District—11 and 12—and then scanned and counted. Two results reports were printed, one for each supervisory district. After scanning, the ballots were subdivided into the two school districts—Manitowoc and Valders. The package of ballots for each subdivided supervisory district was counted by hand by the election inspectors.

In Kossuth, G.A.B. staff managed the electronic tabulation of the ballots. In Newton, the municipal clerk conducted the electronic tabulation. In both places, the results of the electronic tabulation were compared to the results of the hand count of each ballot set. Each ballot style was hand counted as a condition of the pilot to ensure an accurate and complete tally of all votes.

Challenges with Vote Tabulation

In each location, the voting tabulation by the tally machine was producing an erroneous vote total for the School Board Member—Manitowoc Public School District contest. The Clemson team was asked to determine a cause for the discrepancy. Upon review of the ballot images, the text files from the scanned ballots, and the hand count tally, it was determined that the OCR software was reading a special character on four ballots, which resulted in four votes that were not cast being attributed to one candidate. In each location,

the electronic tabulation of all other contests matched the hand count on the first attempt to tally the votes.

The Clemson team was onsite in the Town of Kossuth and was able to manually program the OCR software to not read this character. Once this fix was in place, the ballots were scanned again and the electronic tally and hand count tally matched. These ballots were scanned a second time and again the electronic tally and hand count tally matched.

On Election Night, Board staff dispatched the Clemson team to the Town of Kossuth; hence, they were not onsite in the Town of Newton during the reconciliation process and could not apply the same fix that had been administered in Kossuth. Following the election, the Clemson team performed the same analysis on the Newton election as had been performed on Election Night in Kossuth and determined that the OCR error in the software had been the cause of four votes being recorded for a candidate where those votes had not been cast.

Strengths for Vote Tabulation

The Prime III system evidenced some benefits to the voter tabulation process that were noteworthy.

- The format of the ballot, with its clarity and lack of ambiguity, aided election inspectors in counting the ballots quickly and efficiently.

- The pilot provides strong evidence for paper ballots that eliminate stray marks and ambiguity about the voter's intent. Deciding who a voter voted for was not an issue because the printed ballot listed only candidates who received votes.

- The tally system converts the ballot scans into searchable text files. This feature could be useful in identifying problem ballots in the case of recount, an audit or when reconciling results if there are clear discrepancies in the vote totals.

V. Lessons Learned and Recommendations

In assessing whether there was adequate justification to explore the use of Prime III, Board staff identified a number of potential benefits to the implementation of the Prime III voting system to the State of Wisconsin. Most significantly, exploring the Prime III system could potentially allow municipalities the opportunity to replace aging equipment (should the Board ultimately approve an Application for Approval) with more flexible and up-to-date technology.

Specifically, Board staff explored whether the Prime III was able to make advancements in several key areas.

1. ***Providing access to up-to-date technology***. Because the system utilizes open source rather than proprietary software, it can be updated easily without requiring extensive upgrades. The software also has the benefit of being hardware agnostic, such that it can run on a wide array of COTS products.

   Discussion:

   Unlike voting systems that use proprietary software, the Prime III software, along with its source code, would be available to election officials. Hence, election officials who

possessed the expertise and wished to customize the Prime III system could do so in-house without having to purchase an upgraded product. Similarly, because Prime III is a software based election management solution, it is not required to be run on dedicated hardware products. By contrast, current software is embedded into dedicated operating systems that require updates to operating programs (such as Windows). As Board staff has noted, many of the currently certified systems have reached their end of life, with Microsoft no longer supporting, providing updates, or security patches to the Windows versions that drive many of the voting systems used in Wisconsin. Software based systems, such as Prime III, have the potential to alleviate this problem.

The benefits of adopting such an option would be experienced most acutely by county and municipal clerks. Chief among the benefits to such an approach is the potential cost savings. Clerks would no longer have the cost of purchasing proprietary software and service agreements. Clerks also could potentially save money by purchasing licensing agreements for commercially available software in conjunction with other county or municipal purchases. Because systems such as Prime III are hardware agnostic, this option would also allow clerks to purchase commercially available hardware that suited their particular budget. Such an option could also increase the amount of control clerks have over their voting equipment, enabling them to program contest and candidate information without the assistance of a private vendor.

Recommendations:

While there are benefits that can be derived from utilizing open source software, there are a number of challenges that would have to be addressed prior to implementation. The purchasing locality would need to have a plan in place for updating the software and maintaining the hardware. It would be recommended that the locality arrange to have access to an Information Technology (IT) professional to assist.

The Board, or other state authority in charge of certification and approval in other states, would need to develop or implement standards related to purchasing and operating specifications in order to ensure that the system is being utilized in the most secure and effective manner.

2. ***Accessibility.*** Prime III offers the G.A.B. the ability to explore and clerks to acquire innovative technology that could improve the voting experience of Wisconsin voters. The current generation of voting equipment has increased voter accessibility, but many voters continue to report difficulties with casting a private and independent ballot utilizing these systems.

   Discussion:

   Prime III has the potential to improve the manner by which voters with disabilities and elderly voters cast ballots. The vote-by-voice functionality of the system allows voters to make ballot choices without having to physically mark a ballot or use a touchscreen interface. Voters who choose to use the Prime III touchscreen interface find that it is intuitive, easy to navigate and clearly presents contests and candidates on the screen. The Prime III system also produces an unambiguous voted ballot whose format makes it easier for voters to verify their selections before casting their ballot.

The voter interface and ballot format of Prime III represent a simplification of the voter interaction that should benefit voters with cognitive disabilities and voters with visual impairments. The system allows for the use of ballot screens which present candidate and contest information in a clear format, with large touch screen buttons for ballot choices and concise instructions. The interface also allows voters the flexibility to navigate their ballot a variety of ways and choose the order in which they vote contests. The system also produces a printed ballot in a format that lists all candidate and ballot choices in an unambiguous manner, with undervoted contests clearly identified on the printout with the notation of "No Selection" listed next to the contest name. This simplified voted ballot format should increase confidence for all voters as there is minimal ambiguity in determining voter intent.

Recommendations:

The vote-by-voice functionality of Prime III should continue to be developed and refined. This innovation represents a significant upgrade over the accessibility options of voting equipment currently in use in Wisconsin. This functionality, however, also is emblematic of the challenges faced by Board staff when Prime III was configured for use on the COTS hardware used during the pilot. While the adaptability of Prime III offers many benefits, properly customizing its features would be an additional task of local clerks which they do not currently undertake.

During both pre-election testing conducted in preparation for the pilot and during the actual election, Board staff encountered difficulties with the reliability of the vote-by-voice option. Effective use of this option requires configuring several volume and microphone settings for several components of the COTS hardware, including the monitor, operating software, and microphone headset. Board staff and representatives from the Clemson team had difficulties identifying the most effective settings for the equipment used for the pilot. Without proper configuration, the vote-by-voice option will not reliably mark the ballot in accordance with voter intent.

Board staff did not observe anyone utilizing this functionality on Election Day. Several users, however, attempted to use the vote-by-voice option during public demonstration events and reported reliability problems. The problems that were reported were consistent with problems encountered by Board staff during pre-election testing and equipment set up.

It is recommended that the Clemson team continue to explore the interaction between Prime III and various COTS hardware components. When problems with the vote-by-voice option were referred to Dr. Gilbert, he was unable to recreate those issues on his Prime III setup and he suggested that the problems were related to the settings on the COTS equipment. Since the interaction between COTS hardware and the Prime III software is essential to the effective functioning of the system, Prime III should be tested on a variety of COTS components and configured so that a standard, or default, hardware settings protocol can be developed and implemented. This standardization could alleviate reliability issues with the system.

The hands-free balloting component that is currently under development would ease concerns over the amount of assistance a voter with a disability needs to use the system. The Prime III set-up used during the pilot required all voters to insert their

ballot into a printer to begin the voting process. Once finished voting, each user would have to remove the printed ballot from the printer and place it in the ballot box. A voter with dexterity issues could require assistance that would limit their ability to cast a private and independent ballot. The implementation of a hands-free addition to the system would increase the usability and accessibility of the system for voters with disabilities.

3. ***Transparency*.** Because the system has been developed using open source software it could provide a level of increased transparency in the voting process.

   Discussion:

   Open source software is software that can be freely used, changed, and shared (in modified or unmodified form). The Prime III software, along with its source code, could potentially be transferred to the G.A.B., which could in turn change or modify the code to reflect state-specific requirements. Currently, voting equipment vendors do not disclose the source code that is used to program voting equipment. That code is reviewed by federal testing laboratories but is not reviewed or maintained on the state level. Vendors are required to place the source code in an escrow account. By allowing open source software to be acquired for use in Wisconsin, potentially the Board, or by extension the clerks could maintain greater control over the voting equipment software that is in use in the State.

   Recommendations:

   If the Board were to allow the use of open source software within the State, testing standards would have to be put in place to ensure the effective operation of voting systems. Currently, the U.S. EAC, which has not approved voting equipment guidelines since 2005, has not promulgated up to date standards that can accommodate an open source framework. One potential option would be to require developers of open source software, such as the Prime III, to submit to testing by a voting system testing laboratory for compliance with state-developed testing standards.

4. ***Increased Efficiency*.** A system that has been configured specifically to interface with existing G.A.B. applications could reduce the amount of time clerks and Board staff must dedicate to ballot design, data input, etc., since this information could potentially be transferred via system interchanges.

   Discussion:

   At present, Prime III is able to interact with SVRS. Board staff determined that the Prime III interface could be configured to accept an XML file containing candidate names and contest information for each jurisdiction. This functionality is essential and is a considerable improvement over currently existing technology operating within the state. This functionality could reduce the possibility of human error since clerks would only have to enter the candidate information into one central database, SVRS. Currently, election officials need to enter local contests and candidates into SVRS and then must separately report this same information to voting equipment programmers and ballot producers. Data entered into SVRS could then be drawn directly into Prime III, which would in turn be loaded onto each voter kiosk. This step alone could save

clerks a considerable amount of time, especially in elections with numerous contests and referenda on the ballot. Likewise, there is evidence that Prime III may be able to interface with the Canvass Reporting System for reporting returns. This also has the potential to reduce human error in the reporting of results while streamlining the process and providing more timely results to the public.

Recommendations:

Prime III has an election management interface that allows clerks to enter contest information manually and program the Prime III. However, since Board staff transferred the XML file to the Clemson team for entry into Prime III, staff did not test the election management software that would typically be used to enter contests manually. Staff did review the system used to program the ballots, however, which revealed a simple interface that could be navigated with some instructions from the developers. Given the parameters of the pilot, Board staff did not test an export of the results data to the Canvass Reporting System. Hence, it is not clear how this process would work for local election officials. As the system continues to be developed, the Clemson team is encouraged to create an interface that allows for easy export of common data formats into election results reporting applications.

This is one example of how Prime III would benefit from more work on the side of the system used by election administrators. Currently, Prime III has a voter interface supported by the results of usability studies. The side of the system used by election administrators is not as intuitive.

5. ***Reduced Costs to Clerks*.** In general, open source technology has many benefits including the potential to reduce costs which clerks incur for purchase, maintenance, programming, and replacement of election equipment. The Prime III software in particular could be made available to clerks at a reduced cost, reducing the substantial financial costs associated with administering elections.

   Discussion:

   As previously noted, clerks incur considerable election administration costs associated with the purchase, maintenance, and programming of election equipment. Purchasing and maintenance agreements with voting equipment vendors can range from several thousand to tens of thousands of dollars per year, depending on the individual negotiations, the size of the municipality, and the level of support they require. If clerks were allowed to utilize Prime III, they could potentially bypass some of the currently incurred costs associated with programming and ballot printing.

   Recommendations:

   If the Board were to allow Prime III to be implemented, Board staff would likely have to work with local jurisdictions to coordinate updates to the software and to maintain the interface between Prime III and existing G.A.B. applications such as SVRS and the Canvass Reporting System.

6. ***Voter Confidence.*** Prime III is a printed paper ballot program that enables the voter to clearly review selections multiple times before casting a ballot. Votes are not recorded on a device, but rather are retained on paper ballots.

   Discussion:

   Prime III affords voters multiple opportunities to verify their selections. Prior to printing their ballot, voters first have the opportunity to review their vote on the screen within the contest. A checkmark appears next to the voter's choice when the system recognizes the voter's touch or voice command. Secondly, voters have the opportunity to review all of their selections on the "Ballot Summary" screen, which is the final step before printing. The selections can be reviewed again after the ballot is printed. Once the ballot is printed, the selections are cleared and the next voter has a blank slate.

   Unlike Direct Record Electronic (DRE) voting systems, no information regarding the voter's selections is stored by Prime III. The tabulation component of Prime III scans an image of each ballot and also creates a text file of the data read by the scanner. Together, these files provide an added check on the vote counting process. Moreover, because voters are able to cast a paper ballot, that they are easily able to verify, Prime III's configuration has an advantage over both DRE and optical scan systems. The design of Prime III's ballot eliminates ambiguity and stray marks, and therefore has the potential to increase the accuracy of vote tabulation.

   Recommendations:

   Voters at the pilot locations generally were receptive to the configuration of Prime III. Many were pleased to learn that the system allowed them to mark a ballot according to their intentions, while not retaining their selections or tabulating votes. The separation of ballot marking from tabulation is a key strength of the system in terms of security and should remain in order to inspire voter confidence.

   The ballot design also lends itself to a vote tabulation system that not only eases the process of counting votes, but supports the ability of election officials to search for problematic ballots. The tabulation software is able to not only scan ballot images similar to existing technology, but also convert those images into searchable text. Board staff was able to search the results files in order to identity ballots that might have been misplaced by voters or counted incorrectly during the hand count or tabulation. The results, along with the ballot scans and text files are saved as part of the tabulation process. This information could be vitally useful to election officials in the event of a recount and could simplify the procedure significantly.

7. ***Enabling use of COTS products.*** Because the system operates using COTS products, clerks have the ability to purchase equipment through standard purchasing agreements at reduced costs, and potentially use a greater diversity of components in the election process.

Discussion:

Integrating COTS products into the voting experience has a number of advantages for both the voter and the clerk. By utilizing products that are readily available in the mainstream, voters have a greater likelihood of being familiar with the technology they are using. Particularly for voters with dexterity issues or accessibility needs, the introduction of a COTS-based interface could allow them to cast their ballots with equipment that they have specifically configured for their use.

For clerks, COTS products offer several tangible benefits. Clerks will have the option of utilizing computers, or printers, for other duties prior to Election Day for other official business, and then lock them down for use during the election. COTS equipment can also be more easily replaced, repaired, or modified, given the fact that COTS products are by definition available to clerks off the shelf. This could potentially enable clerks, whether county or municipal, to more effectively mitigate the financial costs of handling elections.

In preparation for the pilot, Board staff acquired and utilized only COTS components for the interface. Staff noted that, while significant time and resources were necessary to learn the individual settings that needed to be configured to make the components work as a system, configuring each kiosk once those settings were determined was not particularly laborious. Staff was able to utilize a variety of COTS products, ranging from office printers available in-house, to tablets, to monitors, to smart phones. Prime III operated without fail on each of these devices. These interactions engendered a significant amount of confidence in the ability of the system to operate on a number of platforms.

With the assistance of the Clemson team, Board staff acquired top-of-the-line equipment including new monitors, printers, QR code scanners, and headphones for the Manitowoc County pilot. Large 23" all-in-one touch screen monitors were selected in order to provide voters with the most comfortable voting experience. In communities with different requirements, monitors of a different size could also have been chosen. Though Clemson University supplied Board staff the equipment through a computer rental company, the estimated cost of each kiosk was under $1,500. Fourteen voting kiosks were set up—six voting stations, the minimum number required by the number of voters in each municipality in the last General Election, and one demonstration station at each polling place. If the system is utilized as a universally accessible voting solution on Election Day, while also enabling the clerks to utilize it throughout the year for other duties, there could be some cost savings over the current hardware dedicated solely for elections.

Recommendations:

While COTS products have significant potential benefits in terms of offering greater flexibility, ease of use, and transparency from a voter perspective, there are a number of potential obstacles to a full scale implementation in in-person voting scenarios. COTS require a significant investment on the part of election officials; the use of COTS hardware requires election officials to configure settings for each individual machine, which can be very time consuming. Election officials may not be used to the additional time and internal resources needed to set up Prime III as current systems are

able to be operated immediately once programmed. Board staff would recommend that clerks who utilized COTS products would likely need to either employ or have access to IT personnel.

More research and Election Day pilots must be conducted using COTS equipment. Board staff found that while it is incredibly flexible, that flexibility also increased the number of configuration variables that have to be analyzed and resolved. Board staff would recommend that the Clemson team, or any entity incorporating the technology, make efforts to standardize the configurations.

Security concerns associated with allowing the use of COTS equipment beyond election season would also have to be addressed. Most of the security concerns raised are associated with concerns over viruses or malware that could tamper with the voting process. Those concerns do not, however, specifically apply to Prime III. Prime III does not record votes on the computer, and only records votes through the printed paper ballot, which is verified by the voter before being scanned by another piece of equipment or hand counted. Rather than raising security concerns, the configuration of Prime III provides an answer to many common security questions. The particular interface of the Prime III combines technology with paper ballot voting in a useable way that may be just as reliable, if not more, than traditional paper ballots which leave room for voter ambiguity in selections.

VI. Conclusion and General Feedback

There were many positive outcomes from the Prime III pilot and the Clemson team will continue to work on improving the system. Board staff has encouraged the team to implement some of the feedback it received during the pilot and to bring the Prime III back for consideration as it is developed in the future.

Moving forward, the Clemson team has indicated that it will address the following challenges:

- Create a graphical user interface on top of the tabulation interface to make it more usable for election officials.
- Create a seamless COTS implementation so that election officials have fewer variables to configure.
- Modify the identified issues with the tabulation software and implement additional safeguards for the tabulation.

Finally, Board staff would like to commend Dr. Gilbert and the Clemson team, Manitowoc County Clerk Jamie Aulik, and municipal clerks Barb Pankratz and Joyln Schuh for their contribution to this project. Their leadership in this endeavor has enabled Board staff, the Clemson team, and the U.S. EAC an invaluable opportunity to assess the viability of open source COTS-based systems for use in U.S. elections. In addition, election inspectors in both Kossuth and Newton are to be commended for their efforts in managing this new technology and introducing it to voters, as are the voters for being open to participating in the pilot.

Recommended Motion:

The Board accepts staff's analysis of the Prime III pilot program and endorses the staff recommendations as outlined in this memorandum.

Attachments:

- ✓ Appendix I: Feedback from participants in the Town of Kossuth
- ✓ Appendix II: Feedback from participants in the Town of Newton
- ✓ Appendix III: Feedback from Clerks

APPENDIX I: Feedback from Participants in the Town of Kossuth, Manitowoc County. These comments were provided via a structured feedback form.

Demographic

Gender

Female	**153**
Male	**171**
Decline	**1**

Age

18-29	**10**
30-39	**29**
40-49	**44**
50-54	**46**
55 and older	**184**
Decline	**12**

Experience with the Voting System- Evaluation Rubric

Voters were asked to rate their experience with the following statements with 1 indicating that the voter *strongly disagreed* and 5 indicating that the voter *strongly agreed*.

1. **I think that I would like to use this voting system again in future elections.**

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
25	**17**	**31**	**56**	**196**

2. **I felt confident using this voting machine.**

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
24	**15**	**42**	**55**	**189**

3. **I thought the voting system was easy to use and navigate.**

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
19	**13**	**26**	**66**	**201**

Optional General Feedback:

- Any electronic system can be compromised.
- Once you receive training, it was easy.
- Too modern - I don't feel like I'm voting.
- I don't like it.
- I think it is a waste of my money.
- Something to get used to. Older generation will hate it. I like it!!
- Nice progress.
- I had no problem with the traditional pencil/bubble ballot.
- The old way was better and safer!
- Staff was very helpful.
- Old people may still insist on using a booth.
- No opinion, would be better to eliminate the paper, other than that it was ok.
- Party affiliation listing would be helpful.
- Glad to see presence of paper ballot in addition to the computer.
- I prefer paper voting for the reason of lower cost.
- Concern about time and access when there are a lot of people voting at once.
- Ballots did not show party affiliation. I think this is important.

APPENDIX II: Feedback from Participants in the Town of Newton, Manitowoc County. These comments were provided via a structured feedback form.

Demographic

Gender

Female	**171**
Male	**180**
Decline	**5**

Age

18-29	**10**
30-39	**14**
40-49	**46**
50-54	**48**
55 and older	**230**
Decline	**8**

Experience with the Voting System- Evaluation Rubric

Voters were asked to rate their experience with the following statements with 1 indicating that the voter *strongly disagreed* and 5 indicating that the voter *strongly agreed*.

1. **I think that I would like to use this voting system again in future elections.**

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
25	**23**	**38**	**87**	**183**

2. **I felt confident using this voting machine.**

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
29	**19**	**48**	**93**	**167**

3. **I thought the voting system was easy to use and navigate.**

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
18	**22**	**44**	**100**	**172**

Optional General Feedback:

- Don't think this system is any easier… Especially for the elderly.
- Great as long as there is assistance.
- Had to "swipe" the screen to get started and that was not mentioned in the instructions.
- Tell people not to fold ballot prior to putting in box.
- Thank you Jamie Aulik for supporting this new voting system! It was very easy to understand/use. You rock!
- I like the way it was, like voting in the 1800s.
- A lot of extra cost to get the same result and it takes longer than it did.
- It seemed pretty simple to me.
- More unnecessary cost and difficult to use.
- Thanks to poll workers for your help.
- I liked the old way.
- Will become comfortable with repetition.
- It's OK.

APPENDIX III: Feedback from county and municipal clerks who attended one of the Prime III Demonstration Days in Manitowoc County. These comments were provided in response to e-mail from G.A.B. staff to all local election officials who attended one of the events.

Barb Pankrantz, Clerk, Town of Newton (Manitowoc County)

It was a pleasure hosting what should be a very nice system of voting when the bugs are ironed out. I was a little disappointed with the tallying part of the program but felt that the actual voting went very well. It is like anything - people don't normally like change but I do believe that once they acclimated themselves to using the system that it would be as easy as using paper ballots. In speaking to my poll workers they felt that the system was very good also and once a system is developed it will be a great way of voting. I also thought that either the ballot should be scanned or a number should be entered and the people should not have been given an either/or way to start the ballot voting process. I think entering a number would have been a lot easier than picking up the scanner and doing it that way because so many people were not sure how to "work" the scanner. I will be interested in seeing how this program develops.

Lori O'Bright, Outagamie County Clerk

Both my deputy Sara Hickey and I attended the Prime III Voting System Demonstration in the Town of Newton on March 27. As an election administrator for Outagamie County, I've been very interested in this developed system. A particular concern of mine is the aging of current election equipment and the fact that now only one system has now been certified by the State.

At the demonstration, both Manitowoc County Clerk Jamie Aulik and Newton Clerk Barbara Pankratz were enthusiastic about the Prime III system and its benefits.

The Prime III voting system would provide benefits as follows:

- Handicapped voting:
  - Provides voters opportunity to vote easily by several methods (seeing, hearing, or reading-larger print).
  - Touch screen voting is intuitive and used in many different applications (voter familiarity).
  - Ballot summary provided for the voter to review.
  - QR coding could possibly provide handicapped voters an easier method to predetermine their ballot from home and then cast it at the polling place.
- Election inspector (EI) benefits:
  - As standard equipment would be utilized, election inspectors would have the benefit of familiarity with the equipment. As standard computers, printers, and other peripheral devices are generally easier for the EI's to use, they most likely would have more common knowledge of those types of devices.

- Future possible interfaces with SVRS and electronic poll books could eliminate human errors with ballot mix-ups when voters from different reporting units are voting within one polling location.
- QR coding could provide handicapped voters quicker voting at the polls if those voters were allowed to pre-determine their ballots from home and then cast at the polls.
- Often EI's are intimidated by the current Edge machines, particularly relative to resetting the machine for time changes and in changing paper rolls. The new system was much easier to utilize.

➢ Equipment benefits:
- Standard equipment could be used providing municipalities and counties significant cost savings with programming and ballot printing
- QR coding provides for quicker voting for handicapped voters
- Voter verified printed ballot uses standard paper
- Printed ballot for later verification (recount)

➢ Election administration benefits:
- Ballot printing errors could be significantly reduced as equipment could be interfaced with SVRS.
- System security – as each ballot is stored both as a .pdf and paper, verifiable information would be provided. Video recordings provide for a record of screen interactions.
- Ballot counting is provided quickly at the end of the evening.

➢ Potential significant costs savings:
- Standard Equipment vs. Vendor Specific Equipment - Utilizing standard equipment would provide municipalities an opportunity to utilize that equipment between elections for other needs. Even if the equipment possibly could not be utilized in another manner, standard equipment would be much less costly than maintaining current election equipment. Standard equipment could also be more easily updated by municipalities/counties on a regularly scheduled basis.
- Programming – As it is my understanding that the equipment could interface with SVRS, the State's database would provide needed information to enable voting on election day and print ballots for absentee voting. This eliminates another layer of possible errors with programming and provides for greater accuracy for elections. Programming costs are significant and a statewide interface could ensure uniformity and quick changes if necessary due to election law changes.
- Ballot Printing – Currently, because coding is required on electronically scanned ballots, specialty printers are needed to provide the coding and properly print ballots to be read by that equipment. This equipment would eliminate the need for those costs as the system utilizes standard paper.
- Error Reductions – Errors in misprinting ballots have required costly reprinting of ballots. In addition, Outagamie County – City of Kaukauna just had an error with the Spring election requiring a costly recount due to

ballots crossing in reporting units where the voters voted in a similar polling location. Additionally in this last election, the City of Appleton has a costly mistake in their ballot printing relative to the Appleton Area School District race. GAB could probably provide additional examples of costly errors. Computerizing and interfacing the election process through SVRS provides that once the information regarding candidates is accurately placed into SVRS, down line information that would be provided to ballots, electronic poll books, etc. would be correct. Even if an error was found, the error could most likely quickly be corrected at a significantly lesser cost.

- Training – As noted above, standard equipment would provide for ease in learning. Training election inspectors and newer municipal clerks on standard equipment allows for a familiarity that has been established previously with their use of computers, printers, scanners that are utilized in business, government and nonprofit organizations. Training costs likely would be less. Retention of information by those being trained would more readily occur.

In discussions at the demonstration, it is my understanding that the likelihood of the Prime III system moving forward for approval may be limited due to the fact that the EAC has no protocols for approving a system utilizing standard equipment. In addition, the GAB was not receptive to moving forward with electronic poll books, which is most unfortunate.

Having now been county clerk since 2011 and reviewing, experiencing several different issues with human error in the election process, my recommendation is that the GAB reconsider their approach to technology. Technology does and would improve the election process, providing for significant cost-savings for counties and municipalities, which are continually strained for resources. An additional overriding benefit with the Prime III system would be integration with SVRS that could provide for error reductions, which are not only embarrassing and costly for officials, but damaging to the public's perception with the election process. My hope is that careful consideration is given to these issues.

Kim Bushey, Walworth County Clerk

I enjoyed the opportunity to view this new concept in voting equipment. Below is list of updates to the software which I believe would need to be incorporated into the program in order for it to be a good fit for Wisconsin Elections.

1) The software would need to be able generate a zero report to prove definitely that the counters started at zero on Election Day.

2) There needs to be some way for the number of cards cast on the units to be displayed through out the day. Many times voters on the optical scan machines compare their voter

number to the number that appears in the LED on the optical scan unit.

Another important reason to make sure the cards cast are shown on the device through out the day is to insure that the number of voters and ballots reconcile through out the day. Election Inspectors routinely check the counters on the optical scan devices to insure that the number of ballots exactly matches the number of the last voter in the poll book

3) In my demo, I do not believe that the software gave us the number of ballot cards cast on the final results from the unit. It gave the total votes for the offices but I do not believe it listed the cards cast. In order for us to conduct the County Canvass/Recount, we need the number of cards cast to compare against the number of voters.

4) The software would need to be able to transmit the results electronically to the County. Manual entry of results at the County level are **not an option.** The problems that occurred in Waukesha County clearly illustrate the problems that manual entry of results can cause.

Currently, all of our results are transmitted by municipalities electronically so if the software did not have the ability to do this it would be a significant step backward.

The above concerns are all items which I believe can be rectified via software updates. Below is a list of other concerns that I have about the system which are more difficult questions which need to be addressed.

1) To use this system there would need to be a computer/tablet/laptop, a printer and hand held scanner in each voting booth. I think that sheer number of units would make this system prohibitively expensive in municipalities with more than just a few voting booths.

2) Currently Election Inspectors/Municipal Clerks would need to provide tech support to the voting devices in the County. There are generally 2-4 pieces of voting equipment per polling place. I am concerned that with the new system the Election Inspectors/Municipal Clerk would be vested with the responsibility to insure that numerous laptop/tablets, printers and scanners are working properly in each voting booth.

3) Voting system security is my next concern. Over the last few years the security of our voting devices has been a significant issue. To respond to this issue the then Elections Board developed new standards to secure our systems including the requirement to use tamper evident seals to secure the memory devices and the requirement to record and initial these seals to prove that no one has had access to the memory devices after the public test is conducted.

Since I know one of the selling points of this system is that these laptops/tablets can be used for other purposes throughout the year when voting is not occurring, I am concerned that utilization of these devices could reopen the issue of the security of the counting

software. I am not certain how we would "seal" these devices after the public test and have the ability to prove that they have not been tampered with following the public test. I have attended GAB meetings where certain constituents expressed significant discussion regarding the security of the equipment and the ability to prove that the devices are secure and have not been tampered with.

Brenda Jaszewski, Washington County Clerk:

I did attend the demonstration of the Prime III Voting System in Manitowoc County and have several concerns relating to the system in general, and also specifically to Washington County.

Generally, one of my first concerns is that there is no way to print out a "zero" report if using the software that would accumulate results if ballots were inserted into a scanner to be read (counted). I believe it is imperative that the software would need to be changed to allow some type of report to print out that shows that the accumulation software was starting at "zero".

Another concern of the general system is that if a municipality wanted to use a scanner to "count" ballots, there is no secure ballot box in which the ballot would automatically fall into once read by the scanner.

When asking about the software that accumulates the votes cast when using a scanner to "count" ballots, we were told that at any time during the day, a person could check the accumulation software to see how the votes were cast. As you may guess, I was extremely concerned about someone having the ability to know what actual accumulating results of the races were throughout election day. After questioning this further, I was told that only someone with proper authority to the accumulating software would have the ability to do this, such as a Chief Inspector or Municipal Clerk. Again, this was very concerning because no one, including Chief Inspectors or Municipal Clerks, should have any access to accumulating results until the election is over and the polls close at 8:00 p.m. Eventually, I was told that no one would have the ability to review accumulating results throughout election day. This must be addressed since I received conflicting information at the demonstration and it must be absolutely clear that no one has the ability to view any accumulated results of any races throughout election day and that results could only be provided after the polls close.

The idea that the "equipment", meaning the laptop, tablet, PC, or whatever device the voter uses to mark their ballot, could be used by the municipality for non-election related purposes will be a security issue with certain people in the general public. You will hear concerns that some type of "program" or "virus" could be put on that equipment prior to election day that could interfere with the election software. Basically, the equipment would not be secure since it could be used by a variety of individuals within that municipality and any number of software programs could be installed on that equipment.

With the rapid changes in technology, you could expect municipalities to have different voting devices every few years. If a municipality upgrades some of their devices (PC, tablet, or laptop), but not all, will the printers used for printing the ballot also need to be upgraded? Will the hand-held scanner work with new upgraded PCs, tablets, or laptops? What about those municipalities who purchase a $4,000 scanner to count ballots and then need to upgrade the device that the voters use? Will their scanner be compatible with their new devices? Who upgrades the software so that it runs on all types of operating systems? Devices may need to be upgraded due to manufacturers no longer supporting operating systems of those devices.

Many polling locations are staffed by individuals who are not comfortable using electronic devices. What happens on election day when poll workers have to troubleshoot these devices, even something as simple as a printer jam? If numerous devices, printers, or hand-held scanners were to have issues during election day, that reduces the number of voting booths available to voters.

Some of my concerns specific to Washington County are:

1. Cost would be a significant factor, especially in our larger municipalities. Some municipalities have up to 20 voting booths set up for their voters during November elections. At the demonstration, we were informed that a typical cost with the Prime III system for each voting "booth" would be approximately $1,000 because each booth would need a device (PC, laptop, tablet, etc.), a printer, and a hand-held scanner. This would equate to $20,000 worth of voting equipment for some Washington County polling locations, and that would be without the added cost of a $4,000 scanner to count the ballots.

2. Our voters are used to seeing their ballot "counted" (the number of ballots advances by one on the display of the optical scan machine) when they place their ballot into the optical scan unit. It then drops into a secure, locked ballot box. In any municipality that currently has optical scan machines, these voters would definitely have an issue with just placing their ballot into a ballot box for poll workers to count later that day or for poll workers to run through a scanner to be counted later that day. Voters want to know when they leave the building that their ballot has been "counted".

3. In many locations, there would not be sufficient room to set up enough voting booths with all of the required equipment (device, printer, hand-held scanner).

4. I was informed that currently, there is no way for the Prime III software to provide results electronically to Counties on election night. I was told that eventually, the GAB would like to be able to upload results from the Prime III software to the GAB Canvass Reporting System website, but until that software were to be written, counties would need to manually enter results on election night. Because Washington County currently

has accumulation software, this a major concern. Several years ago, we all witnessed what can happen when election night results are manually entered and there is an error.

5. If large counties, such as Washington County, had to manually enter results on election night, getting the results to the public will be delayed significantly. I've been working in the County Clerk's office for 23 years and I recall when November election results were not available until early morning hours (5:00 a.m. - 6:00 a.m.) on Wednesday, the day after the election. If we have to manually enter election night results, most County Clerks (if not all) would require verification by double checking every manual entry prior to releasing the results. This will add numerous hours to the time when results would be released to the general public.

Basically, I left the demonstration feeling that for those municipalities who currently hand count ballots, this system would definitely be an improvement; however, for municipalities currently utilizing optical scan machines, this would be several steps backwards and in almost all instances, be more costly.

Julie Winkelhorst, Ozaukee County Clerk

My only response would be that I agree with Brenda's comments and concerns.

Sara Hickey, Deputy Clerk, Outagamie County

I was able to attend the Prime III Voting System demonstration at the Newton Town Hall in Manitowoc County and was very impressed with the system. One feature that impressed me most about Prime III was that all voters will vote privately, securely and independently with equal access. I think the voters will like how Prime III is incorporated into the current voting process being used. The large fonts and neutral colors add ease to voting for certain populations.

The only concern I have is processing absentee ballots on election day at the polling location. At the demonstration I attended it was reported that absentee ballots would be processed through the Prime III machine on election day after the polls close. This may be fine for a small municipality and/or a small voter turnout. How much time will this process take for a larger municipality and/or large voter turnout (i.e. Governor's Election or Presidential Election)?

Thank you for the invitation to attend the demonstration.

Mari Born, Clerk, Town of Mitchell (Sheboygan County)

I attended the seminar in Newton in March 2014 before the April election. I presented the information to our town board and the residents at our Annual Town Meeting on April 15. I think it would be a great asset to the election system. I hope that it goes

forward and more municipalities will have the opportunity to try it out. I wanted to be part of the trial, I hope that I can if they do it again.

Jo Ann Lesser, Clerk, Village of Howards Grove (Sheboygan County)

My Deputy and I attended the demonstration in the Town of Newton, we were very impressed with the system and the functionality of it. The system was very user friendly with or without the scanning capabilities. I was lucky enough to slip away on Election Day to visit the Town of Newton to see the system being used live and to hear of any comments for or against it, I was pleasantly surprised that there wasn't anything negative. I was able to talk with the Election Inspectors as I chose a slower time to visit and heard many compliments.

My only concern in using the system is of course the cost and will there be any funding available to municipalities to help offset the cost of the required equipment. According to the requirements the Village of Howards Grove would need 11 equipped stations, with having 2,117 eligible voters and one machine per 200 voters. That could be quite an expense.

I definitely prefer this system over the current system of having the Edge and Insight. The Edge is cumbersome and slow, and I know that there were other options offered in 2006, and the municipality I was working for at the time didn't opt for the Edge for that simple reason, but it appears that many chose it and now regret that. I do for sure, since I have worked with them for the past 6 years.

I am very interested in seeing more on this system and would be willing to do what I can to help further the inquiry into using the Prime III Voting System.