



Analysis of Travis County's Current Voting System and Recommendations for Future Systems

**2009 Travis County Clerk
Election Study Group
Final Report**

**2009 Travis County Clerk Election Study Group
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Acknowledgements

First, please permit me to say thank you to the voters of Travis County for allowing me the honor of conducting elections in this community for the last 24 years. Never has a person loved a job more than I love this one. This is our third study group and the approach of asking our voters what they think has served us well over the years.

My sincerest appreciation goes out to all the members of the County Clerk 2009 Elections Study Group who volunteered their time, energy, and thoughtfulness to the question of which voting method(s) Travis County should use in the future. The Study Group explored many issues and kept a keen focus on finding solutions that will meet the needs of voters as Travis County grows.

Also, this report could not have been produced without hours of research, help, and advice from Susan Bell, Gail Fisher, Michael Winn, the County Clerk Elections Division Staff, Denise Carter, and Jeff Hartman.

On behalf of all the Study Group members, we would like to acknowledge the many citizens and voters in Travis County who called us or that we visited with on so many occasions. In trying to do our very best, we have shared your words and carried your messages in our hearts.

Sincerely,
Dana DeBeauvoir
Travis County Clerk

2009 Travis County Clerk Elections Study Group

Executive Summary

In April 2009, Travis County Clerk Dana DeBeauvoir convened the 2009 Travis County Clerk Election Study Group to evaluate Travis County's current voting system and make recommendations for future systems. DeBeauvoir had determined that a study group was needed to address public concerns about electronic voting and to ensure ample time to plan for an upgrade or replacement of the existing system. DeBeauvoir outlined the scope of the study group and presented possible participants to the Travis County Commissioners Court as part of her effort to ensure broad public involvement.

Previous study groups had been convened throughout DeBeauvoir's tenure to give the community a voice in how its elections were conducted. Earlier groups had studied a range of issues, from methods for resolving voter intent on paper ballots and strategies for speeding up the release of election returns to redesign of ballot-handling procedures for election workers and protocols for improving voting system security.

The 2009 Travis County Clerk Study Group has concluded the initial phase of its mission and in this report presents information about its meetings and recommendations. Its most significant recommendation is that Travis County move away from an all-electronic voting system to one that offers electronically-counted paper ballots. The Group suggests that this migration should occur as soon as an alternative that meets Travis County's requirements is available. At this time, none of the systems currently on the market meet these requirements, but it is expected that products meeting these standards will be on the market in the near future.

Overview of Voting Systems

Meetings of the 45-member, community-based Study Group began with a comprehensive review of the voting systems used in Travis County during the past 20 years, from punch cards to optical scan machines to electronic voting. This review included a detailed overview of the legal mandates and security procedures required to conduct elections in Texas. The Group discussed some of the significant changes affecting election administration, such as the growing popularity of early voting in person and increased administrative duties associated with conducting elections for numerous local jurisdictions. While early voting offers convenience to voters, and combining the elections of different governmental entities reduces voter confusion and saves taxpayer money, these programs also require that hundreds of ballot styles be available to voters within a complex overlay of multiple jurisdictional boundaries.

Subsequent meetings analyzed the four main voting systems in use in the United States and the benefits and shortcomings associated with each system. The voting systems considered were:

- direct-recording electronic (DRE)
- DRE with voter-verifiable paper audit trail (VVPAT)
- optically- or digitally-scanned ballots, and
- hand-counted paper ballots.

A cost comparison of the four systems was conducted by a Study Group subcommittee and County Clerk Election staff using conditions present in the November 2006 general election. The subcommittee ranked the systems from least expensive (DRE) to most expensive (hand-counted paper ballot), with optically- or digitally-scanned ballot systems and DRE systems with voter-verifiable paper audit trails landing in the middle.

Concerns and Benefits of Current System

Most members expressed confidence in the way Travis County currently conducts elections and in the accuracy of the system, but members also had concerns that the all-electronic system has no paper backup. Members noted that the lack of a paper ballot decreased voter trust in the system, required recounts to be based solely on electronically-reproduced ballot images, and increased the risk of election equipment tampering. Furthermore, the Study Group considered that the current eSlate voting system will reach the end of its projected life span within the next few years and agreed that a replacement option should be identified soon to allow sufficient time for procurement and implementation.

The Group identified positive aspects of Travis County's current system. It offers fully-accessible voting to disabled voters (a high priority for all members). Substantially completed election returns can be completed by 10:00 p.m. on election night. The system can produce the proper ballot format for any voter, allowing voters to cast a single ballot at a single polling location and eliminating the need to maintain vast stores of paper ballots. Travis County has the ability to independently program the ballot without vendor intervention, and the County's use of a multitude of security protocols and testing measures far exceeds federal and state requirements.

Summary

The Group is concerned about the security risks associated with an all-electronic voting system and its effect on public trust in the election process; however, the Group is impressed by the Travis County Clerk's Office use of safeguards and procedures well beyond those required by law. The Study Group is reassured that these measures significantly reduce the possibility of tampering.

The Study Group finds that Travis County should migrate *as soon as is practical* to a voting system that combines a paper ballot record with an electronic count. Such a system would provide opportunities to enhance security, transparency, and accuracy, perform more verifiable recounts, and improve voter confidence. Although optical/digital-scan ballots systems are on the market now, they do not meet the Group's standards for security, software design, and cost-effectiveness.

The Group recommends moving to a new system in the near future; however, it also recommends that Travis County delay immediate action because voting systems are in a period of transition. Vendors are in the process of developing and releasing new generations of systems that promise better security, superior software design, improved accessibility for the disabled, and less paper waste. The Group has issued a set of minimum requirements to help guide vendors in product development.

Further influencing the recommendation to wait is the imminent possibility of new federal or state standards and legislation related to voting systems. A transition delay could allow the County to take advantage of stricter legal standards for vendors, whereas moving ahead too quickly could result in the County selecting a system that does not meet the newest guidelines, a situation which could affect the County's access to federal funds provided for new system purchases.

In the interim between this report and the purchase of a new voting system, the Group asks the County to carefully monitor government and vendor activities, work to influence the development of better systems, and continue to search for even higher standards of security, risk mitigation, and detection practices for the current DRE system. When more specific information on new election system products becomes available, the Group will reconvene to discuss further action.

An overwhelming majority of the Election Study Group supports the recommendations in this report. Two minority reports were submitted by members— one that supports hand-counting paper ballots and one that advocates the continuation of all-electronic voting— and can be found in the appendices.

2009 Travis County Clerk Elections Study Group

Mission Statement

1. Ensure that Travis County voters have an accurate, fair, secure, transparent to the public, and accessible voting system.
2. Determine a minimum and maximum time range as to when replacement of the current voting system is necessary. When the voting system was purchased in 2002, it was assumed that the life of this type of technology was at least ten years.
3. Evaluate concerns regarding the existing electronic voting system and any other type of system that may be under consideration. These concerns include, but are not limited to, security; ease of use for voters; intent of voter issues; accessibility; accuracy of count; transparency to the public, and efficient use of taxpayer money to purchase, operate, and maintain a system.
4. Make recommendations to Commissioners Court regarding options for upgrading or replacing the current election system.

The Format of This Report

This report begins with the story behind the formation of the 2009 Elections Study Group, followed by biographical information on the group members, and a short history of the different types of election systems used in Travis County for the past several decades.

The report then devotes a chapter to each Study Group meeting. The meeting chapters include a brief summary of each presentation and summaries of the group members' comments. (For more information, please visit <http://www.co.travis.tx.us>, where video recordings of the actual meetings and copies of the documents that were distributed are available.)

The report concludes with the Study Group's Findings and Final Recommendations to the Travis County Commissioners Court. Finally, the appendices provide additional information related to this process including:

- the document provided to Commissioners Court regarding the creation of the 2009 Elections Study Group,
- a comparison of different voting systems using the criteria discussed in Meeting 5,
- a paper entitled "Evaluating Security for Travis County Voting Systems" by Brent Waters
- a portion of the House Committee on Elections' 2008 Interim Report, specifically Charge No. 1 entitled "Study the general issue of electronic voting technology, including the issues of general benefits and risks, security and accuracy, paper trails, etc.," and
- two minority reports that were submitted by study group members.

Analysis of Travis County's Current Voting System and Recommendations for Future Systems

Introduction and Background

In 2009, the Travis County Clerk convened an Elections Study Group to examine Travis County's current voting system, evaluate concerns about the use of electronic voting, and make recommendations regarding upgrading or replacing the current voting system and the timing of any such changes. The decision to create this group started to take shape several years back when a variety of factors coalesced:

1. In 2007, the County Clerk informed the Travis County Planning and Budget Office and the Commissioners Court that decisions about a new or upgraded system were on the horizon for two reasons. First, new federal and state legislation and standards regarding voting systems were expected within the next few years. Secondly, the current system was obtained in 2002, and, at the time of purchase, it was estimated to have an approximate life span of 10 years. Since evaluating, purchasing, and implementing a new system had previously taken about three years, it was almost time to begin discussions about Travis County's next voting system.
2. The County Clerk's evaluation of electronic voting security included the prospect of adding a paper element, however, there were concerns over how that method could best be incorporated, its fiscal impact, and how to anticipate new federal or state requirements for voting systems.
3. The County Clerk had received comments from citizens concerned about electronic voting. She wanted more detailed input from a wide variety of persons throughout the community to gather the specifics of these concerns and to get a sense of what they envisioned for future voting in Travis County.
4. The Commissioners Court asked the Clerk to review additional information from the community organization VoteRescue following that organization's request that Travis County immediately abandon electronic voting and convert to a hand-counted paper ballot voting system.
5. The County Clerk has in the past successfully called together a citizens panel to seek advice on issues related to voting and to participate in the selection of new voting systems, and she believed this type of community involvement would again be valuable.

On February 3, 2009, the County Clerk brought an item to Commissioners Court requesting discussion of the formation of a new County Clerk Elections study group to examine current election issues and make recommendations for future Travis County voting systems. The request included a mission statement, information as to Travis County's current status, background issues, suggested meeting topics, ideas for possible participants, and proposed rules of conduct

for the meetings. Representatives from the organization VoteRescue also made suggestions regarding the content of these items. The document used to guide the formation of the Study Group may be found in the Appendix A.

After the presentation of this plan to Commissioners Court, the County Clerk's Office contacted representatives throughout the community to request their participation in this important project. The following is a list of the individuals who agreed to serve.

2009 Election Study Group Membership

Fidel Acevedo	Retired IBM Facility Engineering Installation Coordinator and retired member of the Texas Army National Guard; serving on the Study Group as a representative of LULAC
Annabelle Arteaga, Ph.D.	Organizational psychologist, business owner, and community activist
Stephen Berger	President of an engineer consulting firm, member of the IEEE Standards Board, and Chair of the IEEE EMC Society Standards Development Committee
Charles Betts	Executive Director of the Downtown Austin Alliance, Trustee Emeritus of St. Edward's University, and former Director of the Austin Chamber of Commerce and KLRU
Daniel Biering	Election Judge and Republican Party Precinct Chair
Garry Brown	Chief of Staff for County Commissioner Karen Huber and former Assistant Director of the Travis County Democratic Party
Celina Bley	Director of Communications for the Del Valle Independent School District and Executive Director for the District's Adopt-a-School Program
Honorable Nan Clayton	Former President of the Austin Independent School District Board of Trustees and a founder of the Community Action Network (CAN); serving on the Study Group as a representative of the League of Women Voters
Lori Clyde	Purchasing Agent for Travis County
Jim Collins	Executive Assistant to Travis County Attorney
Honorable Gerald Daugherty	Former Travis County Commissioner, restaurateur, and business owner
Honorable Wilhelmina Delco	Former Texas State Representative, former Austin Independent School Board Member, and current Adjunct Professor of Education at the University of Texas
Alicia Del Rio	Austin Community College Governmental and Community Relations Coordinator

Susan DeMarco	Writer, former radio talk-show host, and community activist
Arthur DiBianca	Treasurer of the Travis County Libertarian Party
Honorable Betty Dunkerley	Former City of Austin Mayor Pro Tem and Council Member, consultant for the public relations company Civic Interest
Loretta Farb	Officer Director for Commissioner Sarah Eckhardt
Jimmie Lou Ford	Presiding Judge, Travis County Democratic Party
Mike Garcia	President of the University Republicans of the University of Texas
Shirley Gentry	City Clerk of the City of Austin
Honorable Sherri Greenberg	Former Texas State Representative, Lecturer and Center for Politics and Governance Fellow, Max Sherman Fellow in State and Local Government
Zoe Griffith, Ph.D.	Director of Student Services and Records and Elections Officer for Austin Independent School District
Jim Henson, Ph.D.	Professor, University of Texas Government Department and College of Liberal Arts Instructional Technology Services
Jane Keene	Travis County Early Voting Election Judge
Bruce Leach	Presiding Judge, Travis County Republican Party
Rueben Leslie	Precinct Chair, Travis County Democratic Party
Nelson Linder	Executive Director, Austin Chapter of the NAACP
Dee Lopez	Director of Voter Registration, Travis County Tax Assessor-Collector's Office
Honorable Annette LoVoi	At-large Position 8 School Board Member, Austin Independent School District

Ron Lucey	City Commissioner and Chair of the Austin Mayor's Committee for People with Disabilities, Manager of the Texas Department of Assistive and Rehabilitative Services (DARS) Center for Policy and Innovation Policy Technical Assistance and Accessibility
Alicia Maldonado	Program Manager, Internet and Website communications for the Greater Austin Hispanic Chamber of Commerce
B. W. McClendon	Pastor, St. James Baptist Church
Jim McNabb	Journalist, author of News McNabb Blog
Jim Parish	Businessman and community leader
Ollie Pope	Travis County Veterans Affairs
Karen Renick	Representative, VoteRescue
Sabine Romero	Assistant City Attorney, City of Austin
Lorenzo Sadun, Ph.D.	Professor, University of Texas Department of Mathematics
May Schmidt	Election Judge, Travis County Democratic Party
Clint Smith	National Board Member of the Grey Panthers and former Co-Convener of the Austin Network of Gray Panthers
Veronica “Ronnye” Stidvent	Director, Center for Politics and Governance, Lyndon B. Johnson School of Public Affairs and Member of the Texas Human Rights Commission
Bill Stout	Legislative Liaison for the Green Party of Texas
Jimmy Talarico	President, University Democrats, University of Texas
Brent Waters, Ph.D.	Professor, University of Texas Department of Computer Science
Juanita Woods	Elections Division Information Security Manager, Texas Secretary of State

Rules of Conduct

To keep this size of a group on track and running smoothly, the following rules of conduct were suggested and approved at the first meeting of the Study Group.

1. County Clerk Dana DeBeauvoir is the chair of these meetings but may designate other members to serve as temporary chairs.
2. Members will work together to find solutions that are in the best interest of all citizens of Travis County.
3. Members will be flexible and keep an open mind while listening to information that is presented and to the comments of all members.
4. Members will act cordially, respectfully, and professionally. Members will disagree without engaging in personal attacks or name-calling.
5. Members will speak one at a time without interrupting one another. To facilitate this, the Chair or a designated representative will call on speakers who have their hand raised. Members will identify who they are before they speak.
6. Members will stay on topic, make their points concisely, and not repeat themselves during a discussion. To keep meetings moving forward, the Chair or designee may ask a speaker to summarize their comments.
7. Members will place their cell phones on silent or vibrate, so that you do not disturb the presenter or disrupt the meeting. Members will step outside if they need to answer a call.
8. Members will disclose any possible conflicts of interest (a conflict between your personal interests and your public duties) at the first meeting of the task force.
9. Decisions made by this group will be made by majority decision using a show of hands.
10. Members will attend all called meetings and work sessions to the best of their ability. In the case a member cannot attend, the member will notify the chair or designated staff contact as soon as possible. If a member cannot attend a meeting they may send another representative to attend as their spokesperson.
11. Persons outside the membership group (unless they are part of the program) may not speak during meetings. However, questions or comments may be submitted to the Chair and will be provided to the group at a later time.
12. All meetings will be recorded in the form of minutes and as a matter of record for informational purposes.
13. Formal communication between the Elections Study Group and other entities, including the media will be conducted by the Chair and/or representatives designated by the Chair.
14. Once the final recommendations are given to Commissioners Court, members who wish to do so may submit minority reports to the Commissioners Court.

A Brief History of Travis County Voting Issues During the Last Twenty Years

In 1987, when Dana DeBeauvoir first took office as Travis County Clerk, voters were predominantly casting their ballots on a punch card voting system that had been purchased in the 1960's or by using a paper ballot (or sometimes both). Punch card ballot systems had been the answer to an earlier generation's search for an automated counting system that could handle Travis County's burgeoning population, and it had served Travis County for two decades. However, as many local election veterans can attest, the aging system was plagued with problems.

Except for the actual counting of the punch cards, the system was anything but automated. Every election required the printing of ballot pages that were mounted on flimsy metal posts. Each ballot had a series of pages, and for every voting booth, the correct pages had to be hand fitted into a frame that attached over a plastic mask. The slot behind this frame was where the unmarked punch card would hopefully slide all the way in. Poll workers agonized over the difficult task of aligning the ballot pages, voting machine parts, and punch cards in such a way that when the voter's hand-held stylus punched a hole next to a candidate's name, the correct hole was in fact punched. Decades before Florida 2000 and the entry of "hanging chad" and "pregnant chad" into the public lexicon, Travis County was already well aware of problems with misalignment and the fragile punch cards that had chads which could become dislodged during transport or handling.

Faced with an aging inventory of equipment, concerns over accuracy, and slow election returns, Dana Debeauvoir assembled her first Election Study Group in 1988. The group launched an extensive review of possible alternatives. After two years of research, careful selection of the right vendor, and development of the implementation plan, Travis County conducted its first optical scan election in 1990.

The improvement over the punch-card system was immediate and dramatic. The optical scan system used a specially-printed paper ballot with bubbles next to each candidate or issue position. Voters colored in the bubbles next to their choices and placed the ballot into a ballot box. The ballots were then transported to a central station, reviewed by resolution teams who made sure the voters' intent would be properly read, and run through scanners. Ballots with write-in information were put aside after tabulation and the write-ins were hand-counted.

One downside of the system was the intensive effort needed when trying to confirm how a voter intended to vote. The scanning machines were able to read whether or not there was a mark in a particular bubble, but voters proved to be incredibly creative. Voters sometimes circled their bubbles instead of filling them in. Occasionally a voter would write a message to indicate his or her choice, for example, writing "no way" next to the name of an undesired candidate. Emphatic check marks over one candidate's bubble sometimes accidentally crossed over into the bubble of another candidate, or shaky hands left stray marks randomly on the ballot. Some voters confused the new system with the old and actually punched holes in the bubbles next to their choices. For

several Travis County elections, one eccentric man filled in the bubbles using *his own blood* and then signed his name at the bottom.

The Texas Legislature and Secretary of State, having a long history with paper ballots and even punch cards, apparently anticipated these types of problems and mandated that election officials also examine each optical scan ballot before it was counted to ensure the voter's intent was properly interpreted.

Other issues that presented a challenge were: securely and accurately managing hundreds of thousands of unvoted and voted paper ballots; having sufficient quantities of ballots in the correct format for every precinct at every location during early voting; ensuring availability of a large facility that could accommodate the scanners and hundreds of workers required to receive, sort, examine, scan, and store all of the paper; and working with scanners that would jam in humid weather when moisture in the air swelled the paper.

When the optical scan system was first introduced, Travis County followed a process that was longstanding and commonplace throughout the country: precinct election workers opened the ballot box and handled the ballots during the day. For hand-count paper elections, this practice was used to count ballots throughout the day; for punch card elections, workers uniformly stacked the punch cards for quick feeding into the machines at the counting station. For optical scan elections, workers turned all the ballots the same direction so they could be quickly fed through the scanners and audited the ballots to determine the intent of the voter.

In 1993 and 1994, the practice of opening the ballot boxes during Election Day came under fire from members of the community who believed this was a serious security risk. The County Clerk reconvened the Study Group to discuss this risk; the Study Group determined that sufficient safeguards could keep this practice secure and that the existing procedure offered greater efficiency and cost effectiveness. However, despite this finding (and although no incident of inappropriate ballot handling at the precinct was ever substantiated), the community remained deeply skeptical of the security of the voted ballots during a precinct audit.

In an effort to ensure public confidence in the election process, in 1996, Travis County changed its policy: ballot boxes were now locked, sealed, and opened only upon arrival to the central counting station for processing. This change in policy severely constrained the county's ability to quickly process the voted ballots, but the Clerk believed that the concerns about the precinct ballot audit were spreading fears that could ultimately undermine the community's trust in the conduct of its elections.

By 1998, the optical scanning system was fast approaching the end of its life. It had begun to fail on occasion, and the vendor planned to discontinue maintenance on the software and hardware. Meanwhile, the county had outgrown the system it purchased, having increased from about 306,000 registered voters in 1991 to about 500,000. The public had begun to apply intense pressure to speed the release of final returns on election night, demanding substantially completed returns by the 10:00 p.m. news broadcasts. The delay introduced by the sealed ballot box policy shift, combined with the over 60% increase in the number of registered voters, meant that election returns could not typically be completed until after 2:00 a.m. on election night.

Critics within the community felt that the county should have a faster system and that the dead-of-night final returns created worry about vote tampering at polling places and the central counting station.

On Monday, February 8, 1999, the County Clerk convened the 1999 Travis County Election Study Group to address local election issues. The study group was charged with improving the timeliness of final election results and selecting a voting system that met Travis County voters' and administrators' expectations of open, fair, and accurate elections conducted at a cost Commissioners Court could justify to taxpayers.

At that time, the systems that were available in the United States were optical scan and electronic voting. The prevailing public opinion was that Travis County should move to an upgraded optical scan system that had precinct ballot counters. Voters would continue using the optical scan ballots they were comfortable with, but instead of dropping their ballots into ballot boxes, they would feed them into precinct ballot counters which scanned the ballots, notified voters if a portion of the ballot could not be read, and recorded the vote total. At the end of the night, a download of the information from all of the precinct ballot counters was compiled for the final results.

However, three major events made this decision less feasible. First, in 1995 in El Paso County, a class of mobility- and vision-impaired voters filed a suit alleging they were discriminated against because they could only cast a ballot using third-party assistance. Although the ultimate ruling in the suit did not turn out in this group's favor, it brought to light a fundamental concept that changed the election landscape. Following this case, the Texas Secretary of State issued guidelines stating that any newly-purchased voting system had to allow mobility- and vision-impaired voters the opportunity to cast a ballot without third-party assistance. This immediately disqualified the use of new all-optical scan systems which only utilized paper ballots. It left open the possibility of either a hybrid system (one that predominantly used optical scan but also had one electronic voting unit in each polling place for impaired voters) or an all-electronic system (which allowed all voters to vote on the same system). The general opinion of electronic voting was very favorable, but because the purchase costs were much higher, the county initially focused on a review of hybrid systems. When the Group contacted entities throughout the nation who had purchased hybrid systems, many said that they regretted not choosing an all-electronic system. Almost every election administrator complained about the potential for human error that could occur when utilizing the complex programs for combining election night results from the two different types of systems.

The second major event was the issuance of further guidelines from the Texas Secretary of State stipulating that if an electronic voting system was newly adopted by a county it could only offer voters the opportunity to vote electronically. Paper could only be issued in ballot by mail or emergency situations. The Group began to consider that its best and possibly only alternative was electronic voting. (Incidentally, a couple of years later the Secretary of State altered its recommendation and now allows hybrid systems).

The third watershed event was the infamous Presidential election of 2000 and contested Florida recount. The ensuing national discussion about new federal election legislation eventually resulted in HAVA (the Help America Vote Act).

In light of all of the above considerations, the Study Group's final recommendation was to purchase an all-electronic system. Careful consultation from computer experts on the panel led Travis County to select a touch-button system instead of a touch-screen system. These same experts advised election staff on computer security.

Since that decision and implementation of an all-electronic voting system in 2003, Travis County has enjoyed seven years of successful elections using electronic voting. Worries about determining voter intent and the unlawful alteration of paper ballots are in the past, and election returns are substantially completed by the 10:00 news. Fewer problems are found in audits that compare the number of signatures on the poll list to the number of ballots cast. Additionally, the elections staff has sharpened its risk management skills during this time. The county goes well beyond the protocols required by law by performing multiple testing procedures, such as manual logic and accuracy testing, hash-code testing, and parallel monitoring, to test for a variety of potential problems. The intensity and scope of the county's elections testing program regularly receives national attention, and it received a national best practices award in 2005 from the Election Center for its testing procedures.

History has proven repeatedly that no voting system is perfect, and electronic voting is no exception. All voting systems age, and the expected longevity of Travis County's electronic voting system at the time of purchase was approximately 10-12 years. Additionally, electronic voting requires constant vigilance and testing to guard against software tampering; the County must always look for ways to improve software testing and tighten the security protocols. Ideally, the County would prefer a paper record that could be used in recounts, but the current state of such technology has serious drawbacks. Finally, and very importantly, the public is very concerned that electronic voting systems can be easily tampered with and some citizens and groups worry that electronic voting systems simply cannot be trusted. Bills pending in the US Congress and in the Texas Legislature could dictate what voting systems voter could choose in the future.

As a result, the County Clerk again asked for the public's input on what type of voting system they want for the future. To arm the 2009 Election Study Group members with ample information to make well-informed decisions, members were asked to learn a great deal about the many sides of elections including election law, procedure, security practices, ADA issues, and different types of voting systems. They were asked to be open to all information and to focus on facts over the heated rhetoric and emotion that often accompanies this issue. The Group was charged with reaching a consensus view and offering recommendations to Commissioners Court about future voting methods, costs, and timing. The Group allowed for minority opinions so that every voice could be heard. This report is the result of this Group's outstanding effort.

**Summaries of the Meetings of the
2009 Elections Study Group**

Meeting 1

Welcome and Overview of Election Administration

April 15, 2009

Opening Comments and Information

Travis County Clerk DeBeauvoir welcomed the members of the Study Group and thanked them for their willingness to serve. She spoke about Travis County's history of election administration and the mission of this Study Group. The rules of conduct (as seen on page 15) were offered and voted into acceptance.

Presentation: Elections 101

By Gail Fisher, Travis County Elections Division Manager

Objective

The purpose of this meeting was to provide members a detailed overview of what goes into conducting an election and to discuss the functions that must be performed no matter what type of voting system is used. The meeting served to broaden members' perspectives and enhance their ability to judge what is best for the future of Travis County elections.

Summary of Presenter's Comments

For a voting system to be successful, it must be compatible with the needs of all voters, a fiscally viable choice for the county, and efficiently administered within the mandates of the law.

Important questions to ask are:

- Is the system accurate and secure?
- Is the process of casting a vote easily understood by voters?
- Can elections be conducted in a fair and equal manner for both able-bodied and disabled voters?
- Is the elections process transparent, and is the conduct of the election handled in a way that is transparent to all voters?
- Will the system meet the needs of Travis County in the future?
- Is the system cost-effective?

Also important are the questions concerning the administration of an election. Although the scope of these questions are often the least publicly discussed, their answers are the bricks and mortar that comprise an accurate, secure, fair, and transparent voting system. Some examples of these questions are below.

- How does the system handle multiple ballot styles?
- How are ballots programmed?
- How are ballots printed?
- How are ballots proofed?
- How are ballots tested?

- How is ballot security handled?
- How does the system handle ballots by mail?
- How does the system handle early voting in person?
- How does the system handle election day voting?
- What is the voter interface and how does it operate?
- How are votes/ballots handled at the end of each voting day?
- How are votes/ballots transported?
- How are votes/ballots tabulated?
- How are results posted?
- How are post-election audits handled?
- How are results canvassed?
- How are recounts performed?

In rounding out this list of questions, it is important to assess the future direction that Travis County voters would like to take as voting systems evolve. Current emerging trends are:

- *Vote centers*
Vote centers allow voters to vote at any polling location on election day rather than having to vote at their neighborhood precincts, making election day like a typical day of early voting with over a hundred possible voting locations throughout the county. To implement this type of program, each polling location must be equipped with computers that can communicate with the voter registration database in real time and with a voting system that can supply the proper ballot face/style to any voter at any time.
- *Same-day registration*
Several states have implemented same-day registration with success. However, like vote centers, polling locations must possess the technology to communicate with the voter registration database in real time in order to register and properly qualify voters to vote.
- *Internet voting*
Some pilot programs of Internet voting for military and overseas voters have been conducted in some states on a very limited basis. Some European countries are looking closely at developing Internet systems that would meet the high standard of security necessary for voting.
- *Overseas electronic voting*
In 2008, the Texas legislature enacted a pilot program allowing an electronic version of a blank ballot to be emailed to a military voter in certain circumstances. Current law requires that the ballot be printed, marked, and returned by mail. This program will likely evolve and expand because of the continuing need to provide military servicemen and servicewomen working in dangerous, hard-to-reach areas, the opportunity to vote.
- *Open ballot-by-mail voting*
Currently, persons are eligible to vote by mail if they are over 65, disabled, out of the county during the voting period, or incarcerated but not yet convicted. One idea under

consideration by some in Texas is to remove these restrictions and open the process to all. Many states operate non-qualifying ballot-by-mail programs while continuing in-person voting. A small number of states have moved to conducting elections using *only* ballot-by-mail voting. These programs have been well received, but there is still debate as to whether this type of program would be a good fit for Texas.

Most voters have experience with registering to vote, choosing to vote early or on election day, going through the qualification process at the polls, casting a ballot, and watching election returns. Some, especially those who have served as election workers, poll watchers, campaigners, or activists, have a broader understanding of the laws and processes associated with conducting an election. However, few individuals have a chance to see the entire scope of the people, processes, and procedures that are at work before and after votes are cast. This combination of people, processes, and procedures:

- makes certain the voter registration rolls are accurate;
- locates convenient early voting polling locations and neighborhood election day polling sites;
- staffs, trains, and pays poll workers;
- supplies polling locations with voting booths, voting equipment, supplies, forms, voter rosters, computers, tables, chairs, signage, and more;
- monitors voting activity and communicates with poll workers;
- interviews, hires, and trains support staff;
- collects ballot information from the entities under contract with the County to conduct its elections;
- programs the ballots;
- uses physical and electronic security practices to protect the voting process;
- tracks legislation and conducts elections within the mandates of detailed and complex election laws;
- accurately collects, tabulates, and canvasses votes;
- responsibly performs post-election audits and recounts; and
- safely and carefully maintains and stores all equipment and supplies.

During this presentation, these topics were discussed and the Group received an overview of what is involved in preparing for and conducting an election regardless of what type of voting system is used. With this foundation, the group could more thoroughly assess the four main voting systems in use in the United States—direct-recording electronic (DRE), DRE with voter-verifiable paper audit trail (VVPAT), optically or digitally scanned ballots using precinct ballot counters, and hand-count paper ballots— and consider what type of system is best for Travis County’s future.

Meeting 2

An Up-Close Look at Travis County's Current Voting System

April 22- 29, 2009

Presentation: Elections Division Tours

Tours conducted by Gail Fisher, Travis County Elections Division Manager and
Michael Winn, Elections Division Program Manager

Objective

While *Elections 101* looked at the individual components of conducting an election without being system-specific, the tours of the Elections Division served to inform the members of the many intricate steps laid out by the Travis County Clerk's Elections Division to ensure an efficient, secure implementation of the Hart InterCivic DRE voting system.

After brief visits to all of the departments of the division, the tour focused on a few major areas:

- training poll workers to process voters at the polls and using the eSlate to cast a ballot,
- physical security of the Elections Division, with emphasis on the Operations Area,
- security of the voting system as it is warehoused and prepared for dissemination to the polling locations,
- security of the system during voting and tabulation, and
- testing procedures used on the voting system's hardware and software before, during, and after an election.

Tours were organized into small groups of 6-8 Study Group members, and a post-tour question-and-answer session occurred at the request of each group.

Each group remarked that the tour gave them a great deal of new information, especially regarding Travis County's security program. They were impressed by the level of thought and procedural analysis that the County Clerk and her Elections Division has given to assisting the voter, training election workers, protecting and maintaining the equipment, and developing security practices.

Meeting 3

Group Discussion of Concerns with Travis County's Current Voting System

May 6, 2009

Opening Comments and Information

Dana DeBeauvoir encouraged all members to observe the election being held on Saturday, May 9, 2009. She also said that several members had requested that future meetings conclude at 4:30 p.m. instead of 5:00 p.m. and solicited input from the group.

DeBeauvoir discussed that one of the problems with the country's election structure is the lack of an independent investigative authority that can review complaints or incidents to determine their validity and, if appropriate, to recommend corrective actions to other election administrators. For instance, if there is a mishap with an airplane, the National Transportation and Safety Board investigates and provides a definitive ruling; if it turns out that there is something wrong with a plane's design or an airline practice, recommendations or preventative mandates can be applied across the industry. However, with an election complaint, there is no outside body to conduct an inquiry. As a result, rumors or legitimate complaints are often given the same weight. Hearsay becomes accepted as vague and unsubstantiated fact, usually offering little or no pathway toward a constructive remedy.

Discussion Groups

Objective

This meeting was designed to give members of the group time to freely discuss their perceptions and expectations for voting in Travis County.

DeBeauvoir began by stating that the purpose of the meeting was to define the problems with current voting systems and that the output of the meeting would provide the basis for how the group was to evaluate voting systems in the future. The members were then divided into five breakout groups and given questions as guidelines for discussion. The questions and a list of the most commonly shared topics and comments are below.

Question 1

- A. Generally, what is your impression regarding the way elections are conducted in Travis County? Did your view change after you received the introductory information at the first meeting or after the tour?**
- B. Please list at least three positive aspects and three negative aspects concerning the conduct of elections in Travis County.**

(Because the answers provided by all groups were similar, they have been combined into the summaries below.)

1. Most members were confident in the way Travis County conducts its elections, but many had concerns with an all-electronic voting system that had no paper backup.
2. Some were concerned about reports that electronic voting machines had been hacked in test environments, and members were made aware of reports by the California and Ohio Secretaries of State that studied the vulnerabilities of DRE systems.
3. After the *Elections 101* presentation and the Elections Division tour, the group had greater confidence in the way elections are conducted in Travis County. It was suggested that web tours or a citizen's academy could help close the gap between the public perception of questionable voting security and the reality of the way Travis County protects the vote. Group members said their trust in the County's election process was significantly increased when they learned of the extensive physical and electronic security procedures employed by the Clerk's Office. They also said they were impressed by the Elections Division's experienced, diverse, dedicated, and responsive staff. After the tours, group members reported having greater understanding of the complexity of administering elections and valued Travis County Elections efforts to reduce the possibilities of human error. They noted that there is a great deal of transparency of process and were appreciative of the fact that the County Clerk invites anyone with an interest to observe all election operations. Some Group members concluded that because of the myriad security measures practiced by Travis County, it would take a great deal of collusion to subvert the process. They also observed that Travis County Elections constantly looks to improve its systems, security, training, customer service, and all other aspects of the conduct of its elections.
4. Most members agreed that low voter confidence is a serious problem. They believed the primary doubts stem from the lack of a physical ballot, in the form of either a paper ballot or a paper record of an electronic vote.
5. Members discussed their confidence in the accuracy of the system, believing that the votes that are entered are the votes that are counted. The speed of counting and reporting were also seen positively, with the general caveat that quality should not be sacrificed for timeliness.
6. Every group remarked that having an accessible voting system was a priority. Members said that by giving voters with disabilities the opportunity to vote a private ballot without special assistance and on the same equipment as all voters, Travis County demonstrates that it values disabled voters and supports the conviction that all voters have equal voting rights under the system. Members also praised the fact that the system gives poll workers an easy way to offer curbside voting to a voter who is physically unable to enter a polling location.
7. Some members noted that the design of the current system makes it an efficient and

economical process to have the proper ballot format available for any voter of any precinct without wasting vast amounts of paper. The ability of the system to easily produce the required complex ballot combinations allows the county to consolidate elections from different entities onto a single ballot. This means voters only have to go to one polling place and vote on one ballot.

8. Group members said that the Travis County training program and training materials are thorough, but some stated that a new generation of poll workers is needed to replace the current aging population of workers. Other ideas included providing more technical help for the polling location judges, better system features for the voters and workers (such as larger fonts on the screens), and easier methods for setting up voting equipment.
9. Some had a negative opinion of the method the electronic system uses for recounts. The concern was that a manual recount uses ballot images printed from the electronic voting system, therefore a manual recount may not detect electronic tampering. It was also suggested that a computer screen visible to the public should show results as they are being calculated on election night.

Question 2

- A. Considering your findings in Question 1, along with the concerns you believe are important to Travis County voters, compile a list of issues that you think this study group needs to cover regarding the voting system used in Travis County.**
- B. Rank the items on your list in terms of importance on a scale from 1 to 5, with 1 being the most important.**

(These comments are sorted by group response and the wording taken from their exercise worksheets.)

GROUP 1

1. Accuracy, economy of time, and verification— is a paper trail necessary and how does it impact the efficiency and economy in the conduct of elections?
2. Usability of equipment and access for all not only for people with disabilities, but also those with dyslexia, those who can't read, or those who don't understand English.
3. Understanding security technology and risk management— understanding the risks throughout the system and how they are handled (request a review of the ballot by mail security procedures).

4. Voter communication and education— there is a need for young people to participate and older citizens to be comfortable with the system. There is a current need for more voter education.
5. Wise use of taxpayer money— if there is additional cost of a system, at what point does the cost become prohibitive?

GROUP 2

1. Verification and ability to audit with transparency and intent— there needs to be a method for people to verify that their vote is counted.
2. Usability of equipment and accessibility for all among different demographic groups as well as people with disabilities.
3. Understanding security technology— People need to be able to understand what the security, safeguards, and technology mean without being an expert.
4. Voter communication and education including the voter registration process.
5. Wise use of taxpayer's dollars and be as economical as possible.

GROUP 3

1. Do no harm (accuracy, accessibility, timeliness)— Travis County's system has performed well. It has been accurate, accessible, and provides timely results. The County should not take a step backward but should move forward from where they currently are.
2. Address voter distrust— there is an inherent distrust in the system. Sometimes, perception matters more than the truth. There must be an improvement in the comprehensive confidence in system (some voters perceive system to be hackable). Travis County needs to create options to change perception such as a citizens' academy). How does an auditable system mitigate the perception/reality divide?
3. Timing/technology change— When would new equipment/system be purchased? How long should we delay if we are currently doing no harm, and how much money do we spend? What is the right time to make the decision to change and move to technologies that will require new training, equipment, and possible increase in staff?
4. Accessibility and public education with a permanent staff to address these issues— Travis County must maintain and carry forward accessibility to keep our promise to the voters of Travis County.
5. Voter-verifiable paper trail system— Should we have a verifiable paper trail? There is a need to discuss the fiscal impact of this. Is the paper trail ever going to solve the problem of trust or perception of collusion?

GROUP 4

1. Accuracy, accessibility, ballot verification are top priorities.
2. Efficiency, clear set of rules, transparency of the system— There needs to be a clear set of rules that everyone understands such as how the process works, how the returns come in, and how the totals are reported.
3. Ability to perform a meaningful recount.
4. Ballot format issues, auditability— A voter may understand the ballot or not know how to use the equipment properly and could hit the Cast Ballot button too soon, resulting in unintentionally missing races on the ballot.
5. Economic feasibility and timing of returns were not at the top of the list because “at what cost democracy?”

GROUP 5

1. Increase public confidence; measure and quantify
 - a. How to quantify and increase public confidence in election results— Even if results are accurate, a serious civic problem exists if the public does not believe they are accurate. Do people believe the system *can* be hacked into, or do they believe their system *is* being hacked into? How many people distrust the results of any given election? It would be interesting to try and quantify these questions. The best way to increase public confidence is to be accurate and let the public know that you are.
 - b. Are there fundamental risks with electronic voting?
 - c. What are the advantages and disadvantages of paper ballots or records?
 - d. What are the complexities of hand recounts?
2. Independent verification of election results— Currently election audits are performed by Travis County. Could an outsider come in to audit instead?
3. Reduction of costs— Are we sacrificing anything to get 10 p.m. results, and what are some ways to reduce costs?
4. Are there procedural problems that depress voter turnout?— Are there problems at the polling place that cause people to not want to vote? Can procedures be reworked to improve turnout?
5. Achieving national standards for election systems

Question 3 (posed after members returned from groups)

What were the most contentious or controversial issues discussed in each group?

Below are sample comments (grouped by topic).

1. **Voter Education** — Does voter education work? — Voters may or may not want to be educated. What does voter education mean? — Is it values-based (which has to do with civic duty)? Is it cognitive (how to use the voting system)? Does it have to do with trust (do voters believe the system works)?
2. **Voter Participation and Outreach** — It is frustrating that people have easy access to voting but they don't turn out to vote. How do we get voters to take more responsibility for participating in the election of their leaders? — Voter registration education is also an important component. — These are social issues. We need to reach out more and address these concerns. We need to tell people they are important and their vote does matter. Why do people turn out? — Some reasons are personal and those reasons are hard to change. But providing more information about where, what, and when can help voter turnout.
3. **Skepticism about Electronic Voting** — People have justifiable reasons to question the reliability of electronic voting — Mistrust of voting predates electronic voting. No matter what system, electronic or paper, there will always be trust issues. So, no matter what direction we take, we need to take a proactive approach to providing information to the public. — Is the paper trail the answer to bringing the voters to a more trusting place?
4. **Cost Benefit for Move to Paper** — We need to weigh the benefits to the actual costs.
5. **Governmental Entities with Differing Boundaries Causes Confusion** — There is confusion sometimes about voters getting the wrong ballot. There may be different reasons for this but it needs to be made clear that the problem is not coming from the voting system.
6. **Vendor Independence for Operation and Testing Processes** — Travis County should have independent experts to test security technology issues so that they are not reliant on the vendors for information.
7. **Use of Common language and Terms** — What is the meaning of transparency, or ballot verification? Is everyone talking about the same thing? There must be care to use defined terms.
8. **Proprietary vs. Open Source Software** — In Australia they are using open source software. Getting away from proprietary software and using voting systems that are fully

verifiable can help bridge the transparency and public perception gaps. Having as many eyes as possible on the process could possibly help.

Question 4 (posed after members had returned from groups)

Given that ballots are verified as voters cast them (versus post-election audits and election administrator interpretation), should the voter be held responsible for verifying that their own vote, or should the administration be responsible for making sure the ballot is cast correctly?

Listed below are sample comments:

1. It depends on what the process looks like. Is the system accessible?
2. There needs to be responsibility on both sides. It should be accurate and verifiable by the voter, and it needs to be auditable and verifiable by a third party or the elections authority.
3. There are two different meanings of voter verification. On the eSlate, there is a summary screen where the voter sees what he or she intended and presses the Cast Ballot button. With paper ballot, there is a sheet of paper where the voter can confirm the vote, know it is safe, and know that in a recount the ballot will be cast properly. One method is trusting voters to aid in the accuracy of the vote by having them check the summary screen before they press the button, the other is reassuring to the voter. Reassurance and getting the voter to participate in the process are two separate things. They're both important, but not the same.
4. The system now is set up for the administrator to verify the number of voters against the number of votes cast, but the system is not currently set up for the administrator to really verify for a voter that his or her ballot was cast correctly.
5. Having an electronic system with a paper trail could create less confidence if the voter were allowed to personally put the paper into the ballot box. If a voter walked away with the paper, then the electronic count would not match the paper results. The system might be blamed in a case that would actually be voter error.

The Clerk opened the floor for comments. Sample comments grouped by topic are listed below.

- **Providing Voters with Correct Polling Location Information** — People are disappointed when they come into the wrong polling location on election day and cannot vote at that location; they must go to their precinct of registration. In early voting, they

are accustomed to going anywhere and don't understand why they can't do the same on election day.

- **Increasing Confidence in Electronic Voting** — When there were paper ballots, there was no voter verification that a person's ballot was counted, it was just anonymously dropped in the ballot box. But, computers can verify that each person's vote is counted and do so confidentially – like in banking. Voting systems should be able to meet this challenge. The demand from the voters is there.
- **Differences Between a Paper Trail and a Paper Ballot** — The two are not the same. With a paper trail there are too many problems with the voting system, and the paper trail cannot be relied upon as the official record. A paper ballot is the official ballot of record and is a much better system.
- **Voter Education Is the Key** — In order for the public to trust any system, we must be able to trust the system ourselves. We must take the system to the people, especially if there is a language barrier, and educate them.
- **Voting at Any Location on Election Day** — The technology exists to make a template of a voter's ballot available on the Internet for the voter to review. Eventually we need to have accurate printers available to print a ballot at a polling location so that a voter can go into any location on election day and vote.

The Clerk provided the group with the below list of criteria developed by past study groups.

1. One system for all voters regardless of disabilities or first language
2. System that efficiently provides ability to offer ballot by-mail, early voting, and election day services
3. System that provides accurate counts
4. Ability to determine the intent of the voter
5. System that provides clear, easy method for voters to cast ballot
6. System that has an accurate tabulation method
7. System that provides the ability to test the accuracy of methods used in the administration of the election
8. System that is auditable
9. System that provides timely results
10. System that allows for security and chain of custody procedures during key times of the by-mail, early voting, and election day processes:
 - a. Ballot preparation
 - b. Voted and non-voted ballots (equipment) prior to delivery
 - c. Voted and non-voted ballots (equipment) during delivery
 - d. Voted and non-voted ballots (equipment) while in use by voters
 - e. Voted and non-voted ballots (equipment) at polling location after polls close
 - f. Voted and non-voted ballots (equipment) during delivery to central location
 - g. Voted and non-voted ballots (equipment) at Central Count

11. System that gives poll watchers, observers, and members of the public the opportunity to view what is being done during high-risk points in the process
12. System that provides the ability to administer each election in a consistent manner
13. System that contains efficiencies that allow the best use of taxpayer money

Meeting 4

Understanding the Certification Process for Voting Systems

May 27, 2009

Opening Comments and Information

Dana DeBeauvoir announced that the group would next meet in September. She informed the group she was working with the County webmasters to make videos of the meetings available on the Internet. She also announced that she would be attending a conference in Minneapolis put on by the Hubert Humphrey Center and the University of Minnesota concerning the latest issues on election technology, including security. VoteRescue distributed their book, *Hacked*, at the end of the meeting.

Presentation: Voting System Security and Certification Procedures

By Juanita Woods (Information Security Manager for the Texas Secretary of State) and Stephen Berger (President of the General Partner of TEM Consulting, voting systems certification technical reviewer for US EAC, and examiner for Texas and other states)

Objective

To provide information and answer questions regarding voting system security standards and the certification process used in Texas.

Summary of Presenters' Comments

Stephen Berger discussed his experience with the Elections Assistance Commission (EAC) in supervising the labs that test voting systems on a national level. He said the EAC testing certification program is a new program that replaces and expands the previous program administered by the National Association of State Election Directors (NASD). The EAC is now certifying its first systems and their goal is to continue to improve and broaden current testing practices and set higher standards for each system to meet. The National Institute of Standards and Technology (NIST) is working with the EAC to help in the development of these standards. Currently, the EAC is making revisions to what is defined as the 2005 standard. Both previous requirements and ones now in use by the EAC require voting machine manufacturers to send their hardware and software to an independent lab for review.

The EAC process involves:

- developing technical standards
- accrediting the independent labs that can be used in the federal certification process
- engaging technical reviewers
- evaluating products (over 1,091 tests are performed in voting system certification)
- registering vendors (to be registered, vendors must allow the EAC complete access to their factories for audits at any time)

Berger also investigates voting system problems to help improve testing methods for the future. Investigators look at design requirements and periodically audit the manufacturing processes and

facilities. The federal certification process is continuously evolving to address new vulnerabilities as they are identified. If vulnerability is found in one system, tests are performed on all systems to determine if they also have like vulnerabilities.

The EAC is also involved in the development of best practices. A system analysis is performed during a voting system investigation. The finds may determine that human error was involved, equipment improvements are required, or the processes used by a jurisdiction need improvement. If election fraud is suspected, procedures to increase detection and improve defenses are recommended.

In addition to national certification, voting systems must also receive certification from each individual state before use in that state. Each state has separate criteria that conform to its own laws and requirements. Local officials can only consider purchase of systems that meet both the federal standards and the appropriate individual state's standards.

Berger listed some of the basic questions that are considered:

- What are the minimum standards required for accepting a system?
- Are the testing lab, testers, and lab assessors qualified?
- Will the election equipment received by election officials be identical (within manufacturing tolerances) to the ones that are being tested in the certification process?
- If an election official receives non-compliant equipment from the vendor, how will the election official know and what corrective actions can be taken?
- Will election officials and poll workers use the systems as intended?

Berger stated that the EAC is working with the testing labs to ensure that the best programs and procedures available are used to test software, that the contact between the labs and the vendors is documented, and that proper standards are followed in writing code.

Juanita Woods with the Texas Secretary of State's Office explained that while part of her job is related to the Texas certification process, many of her responsibilities focus on what happens after federal and Texas certification has occurred. She develops policies and standards for all Texas counties and watches to make certain that each county is performing the rigorous testing required by federal and state law and the Texas Secretary of State's Office.

For a voting system to be certified in the State of Texas, it must:

- preserve the secrecy of the ballot
- be suitable for the purpose for which it is intended
- operate safely, efficiently, and accurately
- be safe from fraudulent or unauthorized manipulation
- permit voting on all offices and measures to be voted on for an election
- prevent counting votes on offices and measures on which the voter is not entitled to vote
- prevent counting votes by the same voter for more than one candidate for the same office and prevent counting votes for more than the number of candidates for which the voter is entitled to vote
- prevent counting a vote on the same office or measure more than once

- permit write-in voting
- be capable of straight-party voting
- be capable of producing a summary screen to allow voters to review their choices before a ballot is cast
- be capable of providing records from which the operation of the voting system may be audited, and audit reports must be in human readable form
- undergo national testing and certification by the EAC
- undergo state testing and certification
- undergo local acceptance testing
- undergo assessment of suppliers' systems

To begin the Texas certification process, the vendor submits an application and pays a \$3,000 fee. The vendor must then submit operator, maintenance, and training manuals; final reports from the independent test lab; change logs detailing even the smallest modifications or changes to the system; hardware to be examined; and sample ballots that can be used to test the voting machines.

The Secretary of State requires the independent labs to provide them with the exact source code, software, and firmware that they tested. The State notifies and secures examiners for the examination date (there are six examiners for the state of Texas: 3 attorneys and 3 technical experts), prepares information packets for examiners, schedules examination dates, and prepares sample ballot templates for testing the voting system.

The state examiners review the voting systems to ensure state and federal standards are met. They conduct technical, procedural, and security testing; clarify questions with the vendors; and submit their reports of examination within 30 days of the exam.

The Secretary of State reviews the examiner reports, posts the reports to their website, and holds public hearings to receive public input before deciding to certify or deny certification.

During the discussion with the Study Group members, Stephen Berger described hash code testing, explaining that a hash code is a computational algorithm that uses all of the bits in a file to produce a long alphanumeric result. During hash code testing, a voting system's software code is translated to alphanumeric sequences. To determine if the software has been altered, the sequences produced by the software in use are compared to those generated from the same version of voting system software originally examined during the national certification process (and is held by NIST).

Meeting 5

Electronic Voting Systems (DREs) and Use of the Voter Verified Paper Trail (VVPAT)

June 24, 2009

Opening Comments and Information

The County Clerk reviewed the schedule of future meetings and announced the availability of the meetings on the Internet. She reminded members of the rules of conduct and that public observers can submit their questions in writing to the Group.

Michael Winn, Elections Division Program Manager responded to a request by the Group and provided a more in-depth discussion of the ballot-by-mail process – from the time a request for an application to vote by mail is received to the time the by-mail ballots are counted.

VoteRescue members handed out their organization's information about DREs.

Presentation: Direct Recording Electronic (DRE) Voting Systems and DRE with Voter Verifiable Paper Trail (VVPAT)

Presentation by Elections Division Manager Gail Fisher

Demonstration of the VVPAT System by Ken Trethewey of Hart Intercivic

Objective 1

Define key issues that can be used to compare all types of voting systems.

Summary

The Elections staff created a chart with fourteen different topics that should be considered when assessing any type of voting systems. The Group was encouraged to use this as a guide when looking at the different types of systems that were to be presented over the next few meetings. Listed below are the topics:

Voter Interface

Ease of Use for Voters ♦ Potential Problems for Voters ♦ Determining Intent of Voter

Accessibility Options: Same System as Other Voters, Ease of Use ♦ Voter Trust Pros and

Cons

In Field Use

Polling Place Set Up ♦ Operation of Polling Location ♦ . Closeout of Polling Place

Ease of Use for Poll Workers

Set Up ♦ Use During Voting ♦ Close Down ♦ . Return to Central Counting Station

Equipment, Ballots, and Supplies

♦ Quantity and Type ♦ Protection ♦ Preparation ♦ Transportation ♦ Post Election
Storage

Programming, Proofing, and Testing

Testing Retirement ♦ Ballot Design/Programming ♦ Proofing ♦ Pre-Election Tests

During Election Tests ♦ Post-Election Tests ♦ Third Party Testing Opportunities

Ballot Preparation and Distribution

Ballot Printing ♦ Ballot Allocation ♦ Ballot Distribution ♦ Inventory Control Pre Election

Inventory Control During Election ♦ Inventory Control Post Election

Poll workers and Training

Training Elections Workers ♦ Polling Location Staff

Tabulation and Returns

Preparation ♦ Operation ♦ Post-Election Requirements ♦ Accuracy ♦ Method ♦ Speed

Public Accessibility of Returns to the public, television stations, and the Internet

Backup, Audits, Recounts

Types of Backup Necessary ♦ Types of Audits Necessary ♦ Methods for Recount

Independence from Vendors

Election Preparation ♦ In Field ♦ Tabulation ♦ Post Election

Transparency in Process

Election Preparation ♦ In Field ♦ Return to CCS ♦ Tabulation ♦ Post Tabulation

Security Risks - Physical

Pre Election ♦ Ballot Creation ♦ Distribution to Field ♦ In Field ♦ At Close Out Delivery to CCS ♦ Tabulation of Returns ♦ Post Election Night

Security Risks - Electronic

Pre Election ♦ Ballot Creation ♦ Distribution to Field ♦ In Field ♦ At Close Out Delivery to CCS ♦ Tabulation of Returns ♦ Post Election Night

Costs

One-time Costs (Equipment and Other) ♦ Occasional Costs (Replacement Equipment, Other)

Ongoing Costs (Storage, Maintenance, Parts, Upgrades)

Per Election Costs (Ballots, Supplies, Parts)

Future Needs

Population Growth ♦ Does the system meet future needs?

Objective 2

Provide the Study Group the opportunity to see DRE and DRE with VVPAT voting systems in a polling place setting and to experience hands on testing of the equipment.

Simulated polling stations were set up so Group members could have first-hand experience as an election worker at a polling location using the County's electronic voting equipment. As poll

workers, the members performed poll-opening, voting, and poll close-out procedures. Those playing the roles of voters experimented with different selection options available on a general election ballot including voting in a single race, straight party, or as a provisional voter.

The presentation reviewed the main areas of responsibility associated in an electronic voting system, including ballot programming, software testing, poll worker training, voter education, tabulation, result preparation, auditing, recounts, and equipment acceptance testing, maintenance, storage, inventory control, transportation, and security.

Travis County has 2080 eSlate voting devices, 356 electronic ballot boxes, and 30 demonstration units.

The advantages offered by Travis County's electronic voting system include:

- the flexibility to efficiently accommodate the varied and intricate demands of a fast-growing urban community like Travis County that must simultaneously conduct multiple elections for multiple entities. These joint elections present unique challenges, such as the need for hundreds of ballot styles or unique ballot faces for a single election. The electronic voting system can be set up to provide easy access to any type of ballot style at any time that conforms to both the current needs of the County's extensive early voting program and the potential future needs of vote centers.
- the elimination of the need to print hundreds of thousands of paper ballots every year. This green aspect was an important reason the 1999 Study Group found DRE systems appealing.
- improved accessibility for disabled voters and the ability for disabled voters to use the same system as all other voters.
- no reliance on outside printers to produce paper ballots, even for by-mail ballots. The by-mail component of the system prints individual ballot styles on demand and in house. The ability to print only the exact number of ballots needed increases security, reduces cost, reduces paper usage, and allows a faster turnaround so that military ballots can be expedited.
- the ability to use the equipment with no vendor involvement in the process: all ballot programming, proofing, and testing is done by the Elections Division staff. Vendor assistance occurs only when equipment is sent to the manufacturer for repair or when Elections staff has general information requests.
- improved accuracy and accountability. The elimination of voter-intent errors—and errors that occur from either handling large quantities of paper or hand-counting the numbers of unvoted ballots—has reduced polling place error rates. For example, at the receiving substation, the Clerk's staff can quickly compare the number of votes cast on the system with the number of signatures on the poll list while the precinct judge is present. Any differences can be immediately reviewed and documented.
- fast and efficient tabulation of results. The 200-250 results cards (ballot box equivalents) are delivered to regional centers called receiving substations. From there, law enforcement officials transport the cards to the central counting area, and all cards are accounted for before final results are posted. Substantially completed results are almost always available by 10:00 p.m.

- reasonable operation costs. The cost to run and maintain a DRE system has proven to be equal to or slightly more cost-efficient than optical scan/precinct ballot counters and far more cost-efficient than hand-count paper ballot systems.

The weaknesses of a DRE system follow.

- Some poll workers not comfortable with computers find the set up of the polls difficult and may require more training.
- The possibility exists that a computer attacker may manipulate the outcome of an election.
- There is no original paper ballot to recount, although electronic recounts can be performed and data from the different memory backups reconciled. Manual recounts are done by hand-tallying printed ballot images from the system.
- The initial upfront cost of the equipment is high.

Ken Trethwey from Hart InterCivic demonstrated an electronic voting device with a voter-verifiable paper audit trail (VVPAT). The Hart InterCivic VVPAT is a closed box attached to the eSlate unit. Inside is a printer that prints voter choices on a rolling tape. Through a clear cover on the box, the voter can view the printed copy of the ballot selections for accuracy before pressing the Cast Ballot button. This type of system is used in many locations throughout the United States but is not currently certified for use in Texas. Group members asked questions about how it recorded and stored the paper, the reliability of the printers, the reaction it had received from voters, and whether VVPAT has answered voter concerns about the security of electronic voting.

The County Clerk reported this system was once thought to be the best answer to concerns about electronic voting security, disaster recovery, and recounts. However, mixed reviews from states using this system have made it a less popular alternative. For example, Congressman Rush Holt who originally championed such a system in his original voting reform legislation, has (according to his aide) moved his support away from these systems toward an optical/digital scan system.

The VVPAT option gives a community the advantages of a DRE system and adds a paper ballot element that can be confirmed by the voter.

Of great concern for Travis County is the huge number of printers (over 2,000) needed to implement the VVPAT option, each of which would run the chance of jamming, running out of paper, or otherwise malfunctioning during voting. If a printer malfunctions, poll workers would either have to swap out the case that contains the sealed printer unit for another or remove the entire voting device from use. The cases that are removed would have to be properly secured and methodically accounted for at the end of the night. In any event, additional equipment will have to be purchased to ensure that voting is not disrupted. Additionally, if there were known occurrences of printer problems during an election, a serious policy question develops: how would the hand-counted results from the VVPAT tapes be reconciled against the electronic totals?

Users of VVPAT systems who have had to perform manual, post-election audits using the tapes have reported that it is very difficult to manage the literally miles of tape involved and that it takes extremely long to hand count the information from even a small sample of precincts.

Of interest is a CalTech/MIT Voting Technology Project Study from May 2005 entitled “An Active Approach to Voting Verification.” In this study, a sample of test voters who used VVPAT voting indicated that they— knowing that a paper audit trail existed— had greater confidence that their votes were accurately recorded; however, a significant number of those sampled did not catch the errors that the researchers had deliberately included on the tape.

The costs of either purchasing new equipment with VVPATs or retrofitting existing equipment are costly, and it is unknown whether new voting system standards will consider VVPAT systems acceptable.

Meeting 6

Optical Scan/Digital Scan

Precinct Ballot Counter Voting Systems

July 22, 2009

Opening Comments and Information

The County Clerk discussed Travis County's previous experience with optical scan ballots from the early 1990s through 2001. The ballots were not counted using precinct ballot counts but at a central counting station.

Presentation: Optical Scan/Digital Scan Precinct Ballot Counter Systems

By Travis County Clerk Dana DeBeauvoir and
Williamson County Election Administrator Rick Barron
Demonstration of the Digital Scan Precinct Ballot Counter System
by Eddie Perez of Hart InterCivic

Objective

This meeting introduced members to optical- and digital-scan precinct-ballot-counter voting systems and allowed them to explore equipment from two manufacturers, and learn the practical applications of the system in the field. Travis County's previous voting system was an optical-scan central-count system manufactured by AIS (now out of business). Hart Graphics was the certified ballot printer.

Summary of Presenters' Comments

Prior to the implementation of DRE voting, Travis County voters made selections on optical-scan paper ballots which were transported to a central station after polls closed and counted by high-volume scanners. The optical-scan ballot system employed technology that had been in use for years by standardized education testing companies. Voters made selections by coloring in bubbles next to candidate names or other ballot options. When polls closed the ballot boxes were sealed and transported to a large venue, like the City Coliseum or Auditorium, where hundreds of workers processed and tabulated the ballots in full view of the public. Returns were processed and distributed to candidate tables also in the same facility.

The system had many advantages. The ballot was easy for voters to use, and since many had experienced optical-scan test ballots in school, they were immediately familiar with the layout of the ballot. Folding booths that provided a private writing area and a light were transported to the polls for voter convenience. However, other than soft-leaded pencils that produced the marks most easily read by the machines and ballot boxes designed to securely hold the standardized paper ballots (boxes for both voted and unvoted ballots), no special equipment was needed at the polls. The process of counting the ballots was still time consuming, but because there were no longer issues with loose chads from punch-card ballots, the public showed more confidence in the accuracy of the returns.

However, the system did have drawbacks:

1. It was difficult and costly to keep a large enough venue available for several days during elections.
2. The law requires ballots to be examined before counting to ensure that machines will correctly record the intent of the voter. Multiple three-person teams hand-audited all ballots and resolved problem ballots before they were counted by a scanner. Workers at the central counting station, under supervision of a presiding judge, scrutinized hugely varied voters' marks to interpret their meaning. (To illustrate how these decisions were often simply best guesses, the Clerk showed examples of controversial ballots from the hotly contested 2008 Al Franken/Norm Coleman U.S. Senate race in Minnesota, which took eight months of controversy, recounts, and court action before a winner was declared and seated.
3. Since ballot counting could not begin until after ballots were delivered to the counting station and examined to determine voter intent, final returns were often not available until well after midnight. This caused controversy and complaints from candidates, the media, and the public, and slow returns were often equated with greater opportunity for tampering and fraud.
4. Disabled persons who had difficulty reading or marking a paper ballot could not vote without assistance.

Precinct ballot-counter systems resolve many of these issues. Voted ballots are scanned on machines at each precinct, eliminating the need for a large central tabulation area with hundreds of workers. When a voter places a ballot into a precinct ballot scanner, it reads the ballot and displays a message if it detects marks that indicate overvotes or undervotes, which could indicate a possible misinterpretation of the voter's intent. The scanner then gives the voter a chance to correct the ballot before it is accepted. In other words, the voter resolves issues with voter intent personally and on the spot.

One very significant problem with any system that uses a paper ballot is the need to have the correct ballot style available at the polling location. This is an especially difficult problem for a county like Travis County that serves a population of over 500,000 registered voters, conducts elections that combine entities with differing boundary lines, and offers a popular, large-scale early voting program. For each early voting location, all precincts and ballot formats in the county must be available. In Travis County, there are 20-30 early voting locations and 500-750 precinct/ballot style combinations for any given election. It is problematic to try to predict how many voters will vote on a specific ballot style at a certain location and provide adequate ballots of that style to ensure that no voter is affected by a shortage.

Allocating the correct number of ballots to each location and maintaining inventory by ballot serial number ranges (as required by law) during each day of early voting requires additional staffing centrally and in each polling location. Manually handling large quantities of paper increases the possibility that an incorrect ballot style will be given out. High expense and excessive paper waste also characterize this system. A possible solution would be to have a computer and printer at each early voting location that prints the correct ballot style for each signed-in voter; however, at this time, unresolved questions regarding the security, scalability, and reliability standards of this solution still need to be investigated.

Williamson County Elections Administrator Rick Baron brought in one of the precinct ballot counters used in his county. This equipment was made by ES&S and used the traditional optical scan technology. Also present was a representative from Hart InterCivic who demonstrated a product that used digital scanning technology. Both presenters set up simulated polling locations, showed members how the equipment worked, allowed members to vote ballots, and answered questions regarding the use of the equipment.

Rick Barron then discussed Williamson County's voting system, explaining that it is a hybrid system that only uses precinct ballot counters on election day. DREs are used for early voting (because of the problems with ballot allocation) and one DRE is provided in each polling location on election day to meet the American with Disabilities Act (ADA) requirements.

Precinct ballot counters have proven to be strong in the following respects.

- They offer the benefits of having both a paper ballot and an electronic count.
- Results can be produced in a timely manner since precinct-level tabulation is performed by the scanner at the polling location.
- Voters resolve voter intent issues themselves before ballots are cast.
- Well-designed paper ballots can be easily read and voted.
- Recounts can be done electronically by rerunning the memory cards or by rescanning the ballots, or ballots can be hand counted.
- They have a moderate purchase price and ongoing costs.

Drawbacks to the use of a precinct ballot-counter system include:

- Two types of voting systems must operate at the same time. Even if DREs are used only on election day to provide accessible voting, the election administrator must program, test, and perform all required administrative duties upon both the electronic system used to count the optical/digital scan ballots *and* the DREs. Hybrid systems require twice the security protocols. In addition, extensive proofing of the many different formats of paper ballots must be performed to ensure accuracy. Producing a single set of election returns with these types of hybrid systems can be labor-intensive and problematic.
- Systems that scan paper ballots can be affected by external factors such as humidity and faulty printing, and some voter intent problems may not be caught by the precinct ballot scanner. Because of the large number of ballots needed, in-house printing becomes impractical, and external, certified printing companies must be used. The use of paper ballots, especially in counties with large early-voting programs, creates massive quantities of ballots at the early voting polling locations as well as hundreds of thousands of unvoted ballots that must be accounted for and retained for the full twenty-two-month retention period.
- In any paper-based system, ballot costs are a major cost factor. With an early-voting program, ballot costs are high, making additional per-election costs higher than non-paper systems.

Meeting 7

Conducting Hand Count Paper Ballot Elections

September 23, 2009

Opening Comments and Information

The County Clerk announced she had just learned that Hart Intercivic and Sequoia were developing new voting systems. Hart Intercivic will be discontinuing the manufacture of the eSlate system. Their new system will include a paper ballot element and have higher security standards. A new prototype should be available soon. Sequoia has indicated that they are following suit and an announcement is expected soon.

It was also announced that an anti-trust lawsuit had been filed by Hart InterCivic against Election Systems and Software (ES&S). ES&S recently purchased the voting company Premier (previously known as Diebold). ES&S is the largest voting system in the United States and Premier was at or near the second largest. Additionally, following the urging of Senator Charles Schumer, the U.S. Department of Justice is conducting a review of this sale. Several elections administrators around the country, including the Travis County Clerk, have submitted affidavits expressing concern that the consolidation or restriction of the market is not conducive to the development of new products and innovation.

The Clerk played a short video prepared by computer security expert Hovav Shacham with the University of California, San Diego, showing a new type of software attack method called return-oriented programming.

Presentation: Hand-Counted Paper Ballot Voting Systems

By Vickie Karp, Co-Director of VoteRescue and Co-Editor of Hacked

Karen Renick, Founder and Co-Director of Vote Rescue

Abbe Waldman DeLozier, Council of Election Defense Alliance and Co-Editor of Hacked

Objective

The Travis County Clerk invited VoteRescue to familiarize the Group with the process of conducting elections using hand-counted paper ballots.

Summary of Presenter's Comments

Vickie Karp opened with a discussion about election transparency, pointing out that there is a difference between the transparency of the elections process (which she feels is very well achieved in Travis County) and transparency of vote counting. Any time a machine or computer is involved in counting votes, it is essentially counting votes in secret. While trust in our election officials does exist, hand-counting paper ballots is the only safe way to handle the votes of Travis County citizens.

VoteRescue presented a series of videos, including:

- a clip from the HBO documentary *Hacking Democracy* with Blackbox Voting's Bev Harris, who has investigated electronic voting machines since 2002.
- footage from the 2000 Florida recount wherein negative votes were discovered on a Global voting system in Balusha County in the Bush/Gore race. (Global was later bought by Diebold and then by Premier.) The narrator stated that a second memory card may have been loaded onto the computer, though a second was never found and the origin of the negative votes has never been proven.
- a partial interview done by Vickie Karp with Dan Wallach, Associate Professor at Rice University's Computer Science Department. He has been examining electronic voting systems since 2001 and believes the Hart, Sequoia, and Diebold systems have significant vulnerabilities. Wallach maintains that only one voting machine would need to be compromised to have a virus spread from one machine to the next through regular use. Wallach states that the tests Travis County uses to prevent software attacks do not provide sufficient protection. He states that hash code testing does not prevent viral attacks, logic and accuracy testing is problematic because the machine can tell when a test is being performed, and parallel monitoring may raise the bar for attackers but can still be defeated. According to Wallach, it is possible for the manipulation of an election to go undetected until it is over, at which point it would be too late.

Note: When a Study Group member later asked Karp if Dr. Wallach supported the use of hand-counted paper ballots, she said he did not..

- A clip from the movie *Uncounted: The New Math of American Elections* which showed a Florida computer programmer, later a whistle-blower, designing vote-flipping software for electronic voting machines in October 2000 for Florida Congressman Tom Feeney.
- A clip from *Hacking Democracy* showing that tests performed by Ciber, an independent testing authority, on Diebold equipment did not thoroughly test security features. Karp said Ciber also tested Hart Intercivic machines.
- A clip showing 2008 testimony to the Texas House Elections Committee by Jim March, a technology expert and Black Box Voting member, about problems he found with the Texas certification process for ES&S equipment.

Vickie Karp took the floor and played a video clip from *Hacking Democracy* showing a Diebold optical scan machine being manipulated to change vote totals via a memory card that had been programmed to flip votes.

Karen Renick took the floor to discuss how hand-counted paper-ballot elections are conducted. She said she wanted to address several myths: 1) hand-counted paper-ballot elections are illegal, 2) the counting process takes too long, 3) not enough people can be recruited to do the counting, 4) it costs too much, 5) it is not important to have results by the 10:00 p.m. news, and 6) comparisons to the infamous Duval County election were not founded.

Renick played the following:

- A clip taken from a Texas Secretary of State video showing Texas procedures for hand-counting paper ballots. Renick stated that she had issues with the state's guidelines for pulling the ballot box out of full public view to begin counting and not posting a summary return sheet instead of the multiple tally sheets.
- A video clip of the County Clerk of Glasscock County, Texas, talking about the County's hand-count elections and its use of the ES&S Automark machine to address the needs of the disabled voter. Glasscock County has 764 registered voters in 4 precincts. In a presidential election, 500 people may turn out to vote; in a constitutional election, the turnout might number about 100. (Note: Travis County has 581,000 registered voters, 210 precincts, and had a turnout of 402,832 voters in the 2008 Presidential election.
- A video clip of a paper-ballot hand count in a 2004 Lyndeborough, New Hampshire, election (population approximately 1,700 in one precinct). The video showed the hand count of the ballots as performed by local volunteers of all ages.

Renick presented VoteRescue's vision for hand-counted paper-ballot elections in the 21st century. It included:

- an unbroken flow of ballots from printing to tally, fully observable by the public,
- voting for the disabled voter on a regular ballot using an electronic device such as the Automark machine,
- starting the hand counting of ballots only after the polls close,
- new teams of poll workers coming to count the ballots after the polls have closed,
- counting teams with four members, one to read the vote, one to record the vote on the tally sheet, and two observers (one to watch the person reading the vote and one to watch the person marking the tally sheet),
- video recorders continuously recording the ballot box and the counting teams, and
- tally sheets (not just totals) posted at the polling location in full public view.

Renick stated that the keys to the success of this method are:

- reducing maximum precinct sizes from 5,000 to 2,000 registered voters,
- getting the count correct on election night before the chain of custody is broken, and
- the elimination of early voting in person (ballots by mail would be allowed).

VoteRescue presented a cost-study report prepared by the consulting firm MGT.

Meeting 8

Cost Comparison of Voting Systems with Review and Discussion

October 21, 2009

Opening Comments and Information

VoteRescue distributed a report and provided written answers to questions generated by their presentation during Meeting 7.

Morgan Little, Chairman of the Texas Coalition of Veterans Organizations, provided information on overseas and military voting by mail.

Juanita Woods from the Texas Secretary State's Office provided a handout of a fiscal impact study conducted by the Texas Secretary of State on hand-counted paper-ballot elections for House Bill 4653.

The County Clerk passed out a draft of topics for use in the discussion of the final report.

Presentation: Cost Comparison of Voting Systems

By: Shirley Gentry, City Clerk, City of Austin

Note: The numbers provided in the cost report submitted by VoteRescue (and prepared by the consulting firm MGT) were not used in the comparison cost analysis provided to the study group. The County Clerk with support of the Election Study Group subcommittee reviewing the data, determined the report could not be used because it contained significant calculation errors, incomplete information, and recommended certain practices not currently allowed by federal, state, and local laws. VoteRescue declined the County Clerk's offer to submit a revised cost report. A more detailed list of the concerns of the County Clerk's Office with VoteRescue's cost report can be found at the end of this chapter.

Objective

To present a comparative cost analysis between the four types of voting systems reviewed in the previous meetings: DRE, DRE with VVPAT, precinct ballot counter, and hand-counted paper ballot systems.

Summary of Presenter's Comments

Shirley Gentry presented a cost comparison prepared by the Travis County Elections staff with guidance from a Study Group sub-committee consisting of Shirley Gentry, Zoe Griffith, Juanita Woods, and Sherri Greenberg.

Methods for Determining Costs

Cost estimates of the four systems were made using conditions present in the November 2006 Election since this was representative of an average sized election. In assessing costs for the DRE system, actual costs were used. Since the non-system-specific cost of the November 2006 Election (\$770,141) remains approximately the same for all systems, the costs analysis for each system assume this base operational cost plus any additional costs exclusive to each system.

All system costs were divided into the following categories:

- *One-time*: the cost for the initial purchase of the system.
- *Occasional*: those costs, such as replacement costs, that occur at least once during the life of the system.
- *Ongoing per year*: planned costs that occur regularly each year, such as maintenance fees.
- *Per-election*: all costs that are specific to the operation of an election (cost analyses for all systems were based on the November 2006 Election).

A final November 2006 total election cost per system was calculated using the following methods:

- Costs were prorated over a 10-year period of *one-time*, *occasional*, and *ongoing per year*. costs using a model of 40 elections over the 10-year period.
- For each system, the total of each of the above three cost categories was divided by 40. Those results were added to the *per-election* cost to obtain the final total cost.

Costs for a Hand-Counted Paper-Ballot System

To determine the additional costs for conducting a hand-counted paper-ballot election, the subcommittee used the following procedure.

- A. Define normal operating costs (for example, technical support, warehouse operations, inventory control, supply workers, van drivers, technical trouble shooters, personnel and recruiting, site management, public information, ballot by mail, call center, training, van rental, and voting booth delivery and pick up) and consider the following questions:
 1. Which areas of the Elections Division would operate with no changes despite a change to the voting system?
 2. Which areas of the Elections Division would change functions but have no appreciable changes in personnel, time, and cost?
 3. Which areas could produce a cost savings with a change in voting system?
- B. Define additional costs
 1. Determine the number of ballots to order.
 2. Consider the purchase of ballot boxes and voting booths in equipment costs.
 3. Consider the purchase of accessibility units (250 minimum).
 4. Determine the number of contests to use as a model for the costs analysis.
 5. Determine the average number of seconds to count a contest.
 6. Decide if a validating second count is necessary to consider in the calculations.

7. Determine a mechanism for calculating additional time necessary to plan for re-tallying when tally totals conflict, re-tallying when totals do not match the number of voters who appear on the poll list, and resolving intent-of-voter questions.
8. Determine the number of election day workers needed and the cost for the counting teams.
9. Determine the number of workers needed and the cost for sorting and counting ballots by precinct for early voting.
10. Determine training costs for the counting managers.
11. Determine administrative cost of recruiting additional people for hand-counting teams.
12. Consider cost of expanding office facilities to accommodate the increase in the workforce that will be required to manage the above additional personnel. Telephone service, computer equipment, and network costs will also have to be added.
13. Consider the costs for processing timesheets, performing payroll functions (to keep IRS information), and preparing checks for all of these workers.
14. Consider the costs of a location that can accommodate the large number of counting teams (especially during primaries or elections like November 2008 when precinct conventions take over polling locations).
15. Consider table and chair rental for the counting teams.
16. Consider the methods for compiling data into a final canvass and cumulative totals.
17. Consider storage costs for voted and unvoted ballots (currently 22 months).

Assumptions Used for Cost Estimates

It is assumed that the cost comparisons will:

- represent programs that adhere to current federal, Texas, jurisdictional, and local laws, guidelines established by the Texas Secretary of State, and legal opinions issued by the United States and Texas Attorneys General (e.g, inclusion of early voting, no cameras in the polling location, and authorized practices for hand-counting ballots),
- use conditions represented by the November 2006 Election, including replicating the early and mobile voting programs that were used,
- apply the same conditions uniformly to all voting systems,
- use the number of contests that appeared on the November 2006 ballot (54 contests),
- assume that all workers are paid current wages and include time for training classes,
- use a counting time of six seconds per contest unless other viable estimates can be presented
- use historical information to determine ballot costs,
- include costs of significant administrative program increases (for example, the additional staff members needed to recruit large numbers of workers and process payroll).
- include costs for additional facilities, equipment, and furniture,
- include costs for ballot boxes, voting booths, specialized equipment for disabled voters, and records management of ballots after an election,
- include all costs or at least footnotes indicating what costs were not included (for example, sort time, resolution time, time to compile the canvass, office expansion to accommodate need for additional work force to manage increased personnel, or additional polling place counting teams).

Final Costs

The final total costs according to the cost analysis for the November 2006 Election follow:

- DRE voting system: \$1,003,298
- DRE with VVPAT voting system: \$1,169,698
- Precinct ballot counter system: \$ 1,175,505
- Hand-counted paper-ballot system: \$2,217,930.

For each system, the calculated total cost per registered voter for the November 2006 Election is:

- DRE voting system: \$1.80
- DRE with VVPAT voting system: \$2.10
- Precinct ballot counter system: \$ 2.11
- Hand-count paper ballot system: \$3.99.

The 2006 General Election calculations for each system include prorated costs over a 10 year period of One-time, Occasional, and Ongoing Costs Per Year

This assumes 5 elections in even years and 3 elections in odd years = 40 elections over a 10 year period

1. All 2006 General Election One time costs are based on Total One Time Costs divided by 40
2. All 2006 General Election Occasional costs are based on Total Occasional Costs divided by 40
3. All 2006 General Election Ongoing Costs are based on Total Ongoing Costs Per Year multiplied by 10 and divided by 40

Hand Count Paper Ballot System only:

*Does not include sort time, resolution, or compilation of canvass

**Does not include office expansion to accommodate need for additional work force to manage increased personnel, or additional polling place costs and/or availability to handle counting teams.

Review and Discussion

The floor was opened and members began voicing their opinions and developing agreement on what should be recommended to Commissioners Court. These comments included:

- For the short term, no better options exist for Travis County than are currently in use or are on the market.
- The County should continue to use the current voting system and employ the current safeguards.
- For a medium-range goal, the County should keep a diligent watch on voting system security issues and guard against threats to the system. The County Clerk should continue to evaluate any advances in voting technology.
- For the long term, as significant changes in voting systems occur— especially in the areas of security and auditability—the Group should reconvene to assess new systems and make recommendations.
- By remaining informed and responsive to the needs of the voters, Travis County and other election administrators around the country could have a positive effect on the vendors and policy-makers who will develop the next generation of voting systems.

Other topics of discussion included:

- accessible voting and all voters voting on the same system,
- vendors providing systems that meet the toughest security standards,
- governments regulating the systems to make them more secure,
- implementing systems that are not only more secure but that are perceived as more secure,
- conducting recounts that experts and non-experts can verify as accurate,
- regaining voter trust (which may entail providing voters with a paper ballot),
- providing transparency in a way that assures voters that their votes are counted,
- economy,
- the future of voting and vote centers,
- employing systems that can utilize the limited adequacy of resources in polling locations (such as old and weak electrical wiring and lack of space),
- using recycled materials, considering end-of-life recycling, and other sustainability issues,
- using a system that is not only easily understood by voters but is also easily operated by poll workers, and
- using a system that is realistic in the number of workers it requires.

The County Clerk asked members to prepare for the next meeting by thinking about short-, medium-, and long-range goals for Travis County's elections and considering what guidelines they would like to put forth to the Commissioners Court in the final recommendations.

Travis County Clerk's Concerns with the VoteRescue Cost Analysis

At the end of their presentation on September 23, 2010, VoteRescue submitted to the Study Group a cost analysis comparing the cost of conducting a hand-counted paper-ballot election to the costs of elections using the other three voting systems reviewed by the Group. VoteRescue commissioned the consulting firm MGT to perform the cost analysis. The County Clerk and the subcommittee that reviewed the cost analysis data decided not to use the cost information provided by this report because it had significant flaws. Some flaws were related to procedural issues and assumptions proposed by the report which are currently not legal in Texas or are not practical to implement. Others inadequacies of the report dealt with incorrect cost figures (or cost omissions) given to MGT by VoteRescue. The following list outlines the issues that the Travis County Clerk found in the report.

1. Several of the assumptions proposed in the VoteRescue report are not permitted by the Texas Election Code and may be in violation of the Voting Rights Act and other federal election laws. These include the elimination of early voting, the recommendation of an alternate method for counting ballots, and the use of video cameras in polling places. Furthermore, Vote Rescue did not explain why it advocates these changes or what benefits they might have for voters, and the issues VoteRescue raised may be outside the current purview of the Study Group.
2. The report's side-by-side summary chart of the cost comparisons of the different voting systems did not equally apply the same conditions to each system. For instance, in the graph of costs, over \$462,000 is omitted from the hand-count system by excluding early voting, while costs for early voting are applied to all other systems. There is no indication on the chart, through the use of footnotes or other means, that different conditions were applied to the hand-count system.
3. Some of the data used to determine costs is either in error or is unsubstantiated. For example, the VoteRescue cost comparison claims to use November 2006 actual election data; in that election, 54 races appeared on the ballot. However, when VoteRescue calculated the number of persons just needed to hand count the paper ballots, the assumed number of ballot races was 29. This disparity dramatically affected the total cost (by over \$300,000).

Additionally, the VoteRescue report assumes an average of three seconds to count each ballot race. The County Clerk can find no information to justify that figure, and the information that *is* available, based on the times reported by jurisdictions around the nation as well as other organizations that support hand-counting paper ballots, consistently indicates an average time of at least six seconds per race. To help support this estimate, the Clerk performed a time and motion study which validated that six seconds is a very conservative estimate.

4. The report does not mention the feasibility of or additional costs which would be associated with the dramatic scale of the hand-count program VoteRescue proposes. For example, no mention is included of where the thousands of additional hand-counters

would work (over 9,000 additional workers for some elections), nor are provisions made for seating or tables. The report does not explain how the County should alter its manpower accommodation strategy during primary elections when precinct conventions are traditionally held in polling places shortly after the polls close.

5. The report does not factor in training costs for hand-count supervisors. This cost would include additional pay to supervisors for time spent in training as well as the expenditures involved in running the training program.
6. The report proposes a reduction of maximum precinct size to 2,000 registered voters but, does not account for the resulting increase in the number of precincts or the costs associated with that increase. (Note: A recent Texas law *increased* the maximum size of a precinct to 5,000 registered voters from 3,000 to save money and to address the lack of facilities available for use as polling places, especially in urban areas with increasing population densities.
7. For voters with disabilities, the report recommends the use of an electronic ballot-marking device such as the Automark by ES&S, but the report fails to include the upfront costs associated with the purchase of the hardware and software to program the Automark system. It also underestimates the number of voting devices needed by 92 units: currently, Travis County has 355 voting units for disabled voters; the VoteRescue report allows for a total of only 263. (Note: The Study Group has stressed that all voters, able-bodied or disabled, should be able to vote in the same manner.)
8. The costs of initial purchases of ballot boxes and voting booths, and their replacement costs over the life of the system, are omitted.
9. The report does not include costs of significant administrative program increases (such as the cost of additional staff members needed to recruit, process payroll for, or manage the 5,000 to 10,000 additional workers needed for *each election*. It also does not consider costs for facilities, equipment, and furniture needed to accommodate additional administrative staff.
10. The report contains no consideration for the records management of ballots for the 22-month retention period after an election.
11. There is no mention, even in footnotes, of other categories of costs not factored into the report, such as ballot sort time, ballot resolution time, time to compile the canvass, and time to verify the accuracy of the count.

Travis County Elections met with VoteRescue, at VoteRescue's request, in an attempt to reconcile the differences between the two cost analyses. The Travis County Clerk's Office agreed to use the VoteRescue cost analysis for a hand-counted paper-ballot election if VoteRescue provided an estimate that followed the same assumptions that were used in preparing the cost estimates for the other voting systems. Additionally, Travis County Elections informed VoteRescue that even without a cost comparison using these assumptions (which as of

the publication of this report has not been provided), they were welcome to submit their perspectives in a minority report (See their minority report at the end of the Study Group Final Report).

Meeting 9

Developing Recommendations for Presentation to Commissioners Court

October 28, 2009

Opening Comments and Information

Dana DeBeauvoir announced that Sequoia had issued a press release announcing a new voting system that will have an open architecture design. She passed out a new draft of the recommendations report entitled “Findings” that synthesized the comments received from Study Group members. She also distributed extra comments from Study Group members Lorenzo Sadun, Reuben Leslie, and VoteRescue.

A revised cost-comparison sheet of the four voting systems was distributed with changes suggested by Group members.

Dana announced Study Group member Ron Lucey’s receipt of a lifetime achievement award, the Martha Arbuckle Meritorious Award, from the City of Austin Mayor’s Committee for People with Disabilities.

Group Discussion

Objective

The final meeting of the Group continued discussions from the prior meeting, went over the basic outline for the final report, and arrived at a list of recommendations for the future of voting in Travis County. The resulting final recommendations and comments follow.

Travis County Clerk's 2009 Election Study Group COMMENTS AND RECOMMENDATIONS

The Study Group expresses appreciation for the opportunity to participate in this 2009 study of election systems and processes. The Group commends the Travis County Clerk for her inclusive and open process in leading this study and in the administration of Travis County elections in general.

During this year, the Study Group received a thorough review of Travis County's election processes. We were impressed with the operation of this office and particularly with the emphasis that is placed on voting security. While many of us have concerns about all-electronic voting in general, the extensive information and demonstrations we received show that the Travis County Clerk's Office provides safeguards beyond those provided by law and incorporates numerous practices that minimize risk. Due to the manner in which Travis County has implemented electronic voting, the Group believes that it is at least as secure from most risks as other systems currently in use, even those that incorporate a paper ballot.

The Study Group does recommend moving away from an all-electronic voting system because of these systems' potential vulnerability to computer attack and the public's concern that an attack might be possible. We believe this move should be done as soon as an acceptable alternative is available on the market. After reviewing available alternatives, we find a change at this time would be premature. The market does not currently offer a voting system that meets the approval of this Group. This is particularly relevant because election equipment vendors are now entering a stage where they are actively developing and/or preparing to release new generations of voting systems.

A priority of the Group is to ensure that any system Travis County adopts offers the same or better advantages to the disabled community as does the existing system. We recognize the importance of allowing all voters, including those who have a disability, the right to use the same voting method as all other voters, the right to a secret ballot, and the opportunity to vote independently without the help of another person.

To help positively influence the development of new technology, legislation, and standards, we ask that the County Clerk immediately inform vendors, legislators active in policies regarding election administration, appropriate government agencies, and other relevant parties of the basic requirements Travis County has outlined for its next voting system.

Until a change in voting systems can occur, we urge the County Clerk to maintain her focus on and search for even higher standards of security, stronger methods for mitigating risk, and better detection practices and technology. We encourage the Clerk to continue seeking out the expertise of computer security professionals to assist her in this task. To sustain or increase a high level of security, we ask that the Commissioners Court continue to work with the Clerk to keep the current system maintained and functioning at top performance until a new system can be implemented.

So that we may continue operating with the best information possible, the Study Group requests that the Clerk continue carefully monitoring new federal and state legislation, regulations, and litigation that could potentially impose new requirements for voting systems and/or may provide full or partial funding for new system purchases. The Study Group also recommends that the Travis County Commissioners Court determine if any state or federal legislative changes are necessary in order to implement the voting system described in the requirements set forth by this Group and that the Commissioners Court take action to pursue those changes if needed.

We recognize that elections are a community responsibility, and we encourage the political parties, candidate and issue representatives, activist organizations, and interested members of the public to continue to participate in and observe the process of voting to ensure that it is fair and secure.

The Study Group recommends the Clerk reconvene the Study Group with the purpose of considering and preparing for the purchase of a new voting system when new products meeting this Group's basic requirements become available on the market. Included in this effort will be the creation of a detailed list of specifications that this Group wants included in a request for proposal for a new system.

Minimum Requirements for Travis County's Next Voting System

The Study Group finds that no voting system is 100% tamper proof, but it believes the best level of security could be obtained by combining the advantages of both a paper ballot and an electronic count.

At this initial stage, the requirements put forth are broad because new ideas and technologies could supersede any specific requirements that we can imagine at this time. We recommend that flexibility and openness be maintained so that a wide variety of solutions can be considered.

Travis County's next voting system must be certified under the latest standards set forth by the Federal Election Assistance Commission and by the State of Texas and should meet each of the following requirements.

1. It must produce a paper voting record that is verified by the voter and can be used to independently, transparently, and efficiently reconcile an electronic tally in an audit or recount.
2. It must feature an electronic tallying system that offers an accurate count of voters' choices.
3. It must efficiently manage intent-of-the-voter issues.
4. It must offer a voter, who is disabled and/or needs assistance, the opportunity to vote a secret ballot using a system that is the same as that used by other voters.

5. It must offer a voter, who is a Spanish speaker (or uses another language that legally must be provided), the opportunity to vote a secret ballot using a system that is the same as that used by other voters.
6. It must offer a secure, easy-to-manage, cost-efficient, and environmentally friendly means of handling ballot distribution during early voting and in the possible future use of vote centers.
7. It must be easy and convenient for the voter and must efficiently process voters quickly enough to prevent long wait times.
8. All equipment must be reliable and durable.
9. It must have methods for setting up, operating, and taking down the system in the field that are easily and safely managed by election workers.
10. It must have equipment that is designed, manufactured, and able to be operated in an environmentally responsible manner. Examples are hardware built using recycled materials, systems requiring minimal amounts of paper and electricity to operate, and equipment that can be recycled or disposed of in an environmentally friendly manner at the end of its life.
11. It must have software robust enough to manage the different types of elections and high number of ballot formats that are required in Travis County.
12. It must have reasonable purchase, operational, and maintenance/system upgrade costs.
13. It must offer a voter/education outreach program.

Specific security requirements for the next system are as follows.

1. Travis County must be able to independently prepare the system for each election without vendor access to any part of the system.
2. The system must demonstrate methods for securing the paper element of the system and detecting security attacks. Given the difficulty of protecting against all software attacks, a new system must include a paper ballot component. This will allow voters to determine that a paper ballot of record was marked correctly, even in the presence of malicious voting software. However, a paper system is also vulnerable to tampering and must employ equally stringent security measures.
3. The system must have hardware, firmware, and software that have been evaluated by independent computer security and engineering experts who can substantiate that the system is well-designed, durable, reliable, and meets high security standards. The experts must confirm that proper measures were taken to minimize the risk of tampering. They

must also ensure that efficient and reliable methods exist to test or audit the system before, during, and after an election to confirm that the counts are accurate and that the system has not been altered.

4. The system must feature strong protection against software compromise during updates. Testing on electronic equipment has shown that an attacker could swap legitimate voting software with malicious code. This code could have the ability to propagate to other machines virally and potentially without detection. To protect against such attacks, there must be a method for authenticating software updates to ensure that legitimate voting software and not malicious code are being presented. An existing known cryptography technology called “digital signatures” can help resolve this problem. These security techniques are applied in almost all modern software update systems but are not currently in use by all voting systems.
5. The system must feature resistance to viral propagation of malicious software. It must demonstrate that if malicious software is introduced, it has mechanisms to detect and alert the user that such an attack has occurred and prevent the spread of this malicious software to other equipment.
6. The system must use software that can be openly reviewed. Currently, vendor software is not open to the general public or security experts for examination. Opening up election system software to expert scrutiny will result in a more secure system and add a new level of transparency to voting administration. It was previously believed that limiting a review of software code would make the system more secure. However, it has recently been shown that an attacker can compromise a voting machine without having access to the source code.

While the Travis County Clerk’s Elections Study Group has concluded its business at this time, we welcome any comments from the public. Please email any ideas or opinions you may have to election@co.travis.tx.us, and they will be distributed to the Group’s members.

APPENDICES

Appendix A

Outline of Study Group Mission, Background Issues, and Process

Outline of Study Group Mission, Background Issues, and Process

Mission for Study Group

1. Ensure that Travis County voters have an accurate, fair, secure, transparent to the public, and accessible voting system.
2. Determine a minimum and maximum time range as to when replacement of the current voting system is necessary. When the voting system was purchased in 2003, it was assumed that the life of this type of technology was at least ten years.
3. Evaluate concerns regarding the existing electronic voting system and any other type of system that may be under consideration. These concerns include, but are not limited to, security; ease of use for voters; intent of voter issues; accessibility; accuracy of count; transparency to the public, and efficient use of taxpayer money to purchase, operate, and maintain a system.
4. Make recommendations to Commissioners Court regarding options for upgrading or replacing the current election system.

Travis County Is in a Strong Position to Work From

1. Travis County has had a six-year history of success with the current system.
2. No system failures have occurred or are imminent and require emergency action.
3. Travis County is a national leader in security testing protocols for electronic voting systems.
4. The use of a Study Group for election administration has a history of success. This will be the third time this method has been used within the last twenty years to examine voting systems.

Background Issues

1. Confidence in elections was severely damaged during the 2000 Presidential Election and continues to be an issue. Issues of recent concern to voters include, but are not limited to, potential for software tampering, lack of voter-verifiable paper receipts, questions of interpretation of voter intent, and problems with proper administrative handling of optical scan or paper ballots.
2. There is a high potential for new federal or state legislation on regulations for voting systems. This includes possible additional federal funds being made available for systems meeting federal standards. There are also several outstanding lawsuits that could affect requirements for voting systems.
3. The economic situation may make it difficult for Travis County to make a large purchase within the next few years. Many unknowns exist as to how hard the economic downturn will affect Travis County. It may be necessary for Commissioners to know the consequences of delaying a purchase, have creative alternatives for purchase, and/or options for a phased-in approach.

4. Plans for implementing a new voting system must address the challenges of bringing on a new or upgraded system, especially during a Primary or November candidate election. Ample time and opportunity must exist for communicating any significant voting changes to the appropriate entities (such as the Department of Justice) and most importantly to voters.
5. Travis County purchased the current system with the assistance and cooperation of other local entities. This investment must be properly protected and potential changes carefully communicated to the other entities and their feedback considered as part of any decision. Federal funds reimbursed a substantial portion of the purchase of the current system. Research will need to be done regarding how this affects any changes that are proposed.

A Careful Review of the Different Voting Systems will be Required

A major responsibility of this Study Group will be to develop a working knowledge of the different voting systems that have been certified at the state and federal level. This includes systems that have met full ADA compliance. With this background, the committee can develop a list of the pros and cons of each system and determine where additional research is needed. A risk analysis of key negative aspects of each system will be required. The main categories of systems that will be reviewed are hand-counted paper ballots, optical scan systems (with and without precinct ballot counters), and electronic voting (with and without a voter-verified paper trail). We will also want to review new technologies in development for the future.

Possible Meeting Topics

These are not in a particular order, and some of the items may take more than one meeting.

1. Planning meeting to discuss the goals, format, and schedule for the Study Group.
2. Review of why Travis County's previous community Elections Task Force recommended the purchase of the Hart Intercivic Electronic Voting System.
3. A tour of the Clerk's Elections facility and demonstration of the current system.
4. Discussion of the pros and cons of the current system including specific security concerns and an examination as to how those risks are being mitigated.
5. Current and future technologies that assist voters with disabilities.
6. Presentation of the real-life practicalities of a large-scale hand-count paper ballot system with examples from like-size counties that use this method.
7. Presentation of the real-life practicalities of using a voter-verifiable paper trail system and the different post election audit strategies that are used in like-sized counties.
8. Presentation of the real-life practicalities of using a precinct ballot count optical scan system with examples from like-size counties that use this method.
9. Update on new products that address improvements to voter-verifiable paper ballot systems, accessibility features, ballot-on-demand technology, and security.
10. Pros and cons of operating a hybrid voting system.
11. Presentations by vendors and others of systems that are of interest to the committee.
12. Cost estimates of purchase and operation of systems.

13. Presentations to inform the Study Group on Federal Elections Assistance Committee and Texas Secretary of State responsibilities to ensure election integrity.
14. Presentations by Federal and State Representatives on potential new legislation.
15. Review of relevant studies, especially those conducted by governmental entities and educational institutions.
16. Suggestions for implementation schedules and cost saving ideas.
17. Compilation of Study Group Findings.
18. Recommendations for final report submitted to Commissioners Court.

Committee Structure, Timeline, and Rules of Conduct

Travis County Clerk Dana DeBeauvoir will serve as the Chair of these meetings and will provide Commissioners Court progress reports and the final report with recommendations.

The County Clerk will develop a committee that represents a wide variety of interests and our diverse community. Among the membership, the County Clerk will seek to include representatives from the following areas:

- Representatives from Democratic, Republican, Libertarian, and Green Parties
- Representatives from other governmental entities who will be using system, especially City of Austin, AISD, and ACC
- Representatives from Disability Community
- Representatives from League of Women Voters
- Representatives from groups including, but not limited to, VoteRescue, People for the American Way, NAACP, LULAC, and/or Common Cause
- Representatives with Computer security expertise
- Representative from the Secretary of State
- Representatives of Presiding, Election Day, and Early Voting Judges
- Representative from the media
- Representative from the Voter Registrar's Office of the County Tax Assessor-Collector
- Representatives from the Purchasing Office and ITS

Appendix B

Voting Systems Comparisons

DRE and VVPAT

I. Voter Interface

A. Ease of Use for Voters

1. Travis County uses a mechanical wheel (similar to a rotary-dial phone) and button system as opposed to a touch-screen system (the calibration of a touch screen is often an issue with DREs). Travis County has found that the button system is very rugged and dependable, and voters have adapted quickly to it.
2. The ballot format is straightforward and easy to read, the buttons are clearly labeled, and instructions are easy to follow.
3. Voters have become increasingly comfortable with operating the equipment as time has passed.
4. The summary screen at the end of the electronic ballot is an important and convenient tool for voters to double-check their ballot choices.

B. Potential Problems for Voters

1. Some voters who are not comfortable with computers, especially older voters, are initially intimidated by the system.
2. Some voters are concerned that electronic voting is vulnerable to computer attack.
3. Travis County's current DRE system has limits on ballot design and font size. While the design is good, improvements could be made.
4. For some, VVPAT helps address voting security concerns; however, it requires voters to check a paper receipt that does not have large print.

C. Determining Intent of Voter

Determining voter intent is not an issue for an electronic voting system.

D. Accessibility Options

1. One System for All Voters

DRE has revolutionized voting for voters with disabilities. For the first time, voters with disabilities or voters who have difficulty reading can cast a vote in privacy without assistance. If a county uses an all DRE system, as Travis County does, all voters cast their ballots using the same system regardless of disability.

2. Ease of Use

The voting unit with accessibility features includes an audio ballot in English and Spanish. It also has jelly switches and hookups for sip-and-puff devices so that voters without limbs or the full use of their limbs can vote a ballot without assistance.

E. Voter Trust

1. Pros

Many voters solidly trust electronic voting. Voter confidence with the system has increased over time because Travis County has conducted numerous elections without major problems and with quickly completed results.

2. Cons

Computers of all types are vulnerable to attack. As computer experts develop new methods for preventing attacks, other computer experts find new ways to get around safeguards currently in place. This endless vulnerability loop — which affects any computer-driven enterprise — creates a built-in doubt with voters, who wonder if any electronic voting system can ever really be safe, especially in negative political environments.

II. In Field Use

A. Polling Place Setup

Setup requires unlocking the voting booths (which are cable-locked together), setting up the booth legs, verifying the seals that lock the booths, unlocking the seals, opening the booths, hooking the data and electric cables to the booths and to the electronic ballot box, turning the electronic ballot box on, assigning the booths (a process that identifies the booth so the electronic ballot box can recognize it), printing a zero report, and opening the polls.

B. Operation of Polling Location

Typically, a few issues with equipment setup occur at the start of an election day. The problems are usually resolved with a phone call to call center workers. Once these matters are resolved, few other problems occur during the rest of the day. If a problem does occur, help for the judges is available over the phone, and a trained troubleshooter is sent to the site. If a VVPAT system is used, the experiences of other entities suggests that Travis County should anticipate more issues throughout the day involving printers running out of paper or malfunctioning. Troubleshooters may be required to assist workers replace the VVPAT units.

C. Closeout of Polling Place

Closing down the polls at the end of voting is a relatively easy operation to perform and is described in the poll worker interface section below. If poll workers do not wish to fully break down their booths, they may seal them and cable-lock them together. Elections staff then breaks them down and delivers them to the Elections operation center. Most locked and sealed booths are picked up within 24 hours of closeout.

III. Poll Worker Interface

A. Ease of Use for Poll Workers

1. Setup

Poll workers that are comfortable with computers find polling location setup relatively easy. Those that aren't may require extra training. The weight of the booth and voting device (which together weigh 25lbs) is an issue for some poll workers. In most cases it takes two workers for booth setup.

2. Use During Voting

To select the proper ballot style for a voter, the electronic ballot box operator presses a button next to the corresponding number on the ballot box screen, which generates a printed access code for the voter to enter into the eSlate voting machine. The poll worker requests that the voter confirms his or her precinct and ballot style and directs the voter to choose any open machine. If there is an issue with a ballot (such as a wrong ballot style or the voter decides he or she does not want to vote), the poll worker can cancel the ballot before it is cast by following the "cancel booth" procedure. The cancellation of the booth is documented by the poll worker. The poll worker may also issue an electronic provisional ballot to a voter that must vote provisionally. The system creates a provisional ballot stub that the voter must sign. This stub has a retrieval code that is documented by the poll worker on the provisional envelope (prescribed by the Secretary of State); the stub is placed in the envelope, which is then sealed, and the voter is given an access code to vote. If the provisional voter is found to be eligible to vote by the Early Voting Ballot Board, the retrieval code is entered into the tabulation system, and the votes on that ballot are added into the vote totals.

3. Close Down

Closing down is generally easy. The poll worker must push the Close Polls button on the machine, print out a full report of results to post in the polling location, document the number of signatures on the signature roster, document the number of votes cast on the machines, and deliver all paperwork and the electronic ballot box to a satellite station where the supplies are officially surrendered. The worker also closes, seals, and locks all voting booths which are then picked up by the Elections staff.

4. Return to Central Counting Station

The election judge and alternate judge deliver all paperwork and the electronic ballot box to a satellite station (Receiving Substation or RSS) where the ballot box is officially surrendered. RSS workers perform several audits on the materials before the judge and alternate judge leave. The flash cards are removed from the ballot box after verifying all seal numbers, and the cards are carried by law enforcement to the central counting station.

IV. Equipment, Ballots, and Supplies

A. Equipment

1. Quantity and Type

The system equipment is as follows: 2,080 eSlate units (including 355 disability units), 356 JBCs (electronic ballot boxes), 30 demonstration units (that are not used for actual voting), a programming computer, backup programming computer, results printer, audit log printer, 2 laptops for resetting and backing up equipment, 3 ballot-by-mail computers, 2 ballot-by-mail printers, 2 ballot-by-mail digital scanners, 8 flash card readers, and 600 or more flash cards.

2. Protection

Equipment is stored in a high-security area with overlapping methods of security.

3. Preparation

Each voting device goes through a functionality test before each election in which all mechanical functions of each device (the dial and all buttons) are tested and documented.

4. Transportation

The eSlate voting machines and booths are delivered to the polling location by the Elections staff, and the process is documented using chain-of-custody forms. The ballot box is handed over to the polling location judge at polling location setup (for early voting) or at supply pickup (for election day). After the end of each day of early voting, the ballot box is triple-sealed and transported by law enforcement to a locked storage area (within the high-security area of the Elections Division). The Sheriff's Deputy returns the box to the polling place at the start of the next early voting day. The Sheriff possesses the key to the locked storage area. Neither the County Clerk nor the Elections staff has access to this key. When the Sheriff is on the ballot, the County Judge takes possession of the key. On election night, the polling location judge and the alternate judge transport the ballot box containing votes to the satellite station to officially surrender the box. All transactions are documented through chain-of-custody forms.

5. Post Election

All equipment is backed up and the following audits may be performed: the mandatory recount as directed by the Secretary of State, the comparison of the election night results printed from each ballot box (the same print out that is posted at each polling location) to the actual results as tabulated by the central count computer, the verification of all signatures from the signature rosters against the number of votes cast on the machines, the comparison of the number of votes cast on the individual eSlate units at a location to the number of votes recorded on the electronic ballot box, and the collective results from all eSlate units to the results tabulated by the central count computer. Any equipment needing a repair that cannot be

performed by the Elections staff is sent to either the vendor (for minor repairs) or the manufacturer. The history of each device is recorded.

6. Storage

All equipment is stored in a high security area.

B. Ballots and Supplies

1. Type and Quantity

Ballots are electronic and are digitally written to a flash card. There is one flash card per electronic ballot box. One electronic ballot box can hold up to 10,000 votes. Ballots by mail are printed as needed (required quantities can range from several hundred to over 20,000).

2. Protection

All flash cards are stored in the ballot programming room within the high security area.

3. Preparation

Once the flash card is digitally written, it is inserted into the ballot box, the ballot boxed is electronically assigned to a location, the box is triple-sealed, and all barcode numbers are recorded.

4. Transportation

The flash cards with the ballot information are secured within the electronic ballot box at all times. Every evening during early voting, law enforcement transports the triple-sealed electronic ballot box to a secure storage area and returns the box to the polling location the following morning. On election night, the cards containing the returns are removed from the ballot box at the satellite station. Law enforcement transports the cards in locked and sealed cases to the central counting station where the seals are verified and the cases opened in full public view.

5. Post Election

The ballot images are backed up onto electronic media and may be printed out for a recount if necessary. Since the ballots are electronic, there are no extra ballots to account for at the end of the election.

6. Storage

Paper ballots by mail, digital ballots (stored on electronic media) and supporting documentation are stored offsite for the required 22-month period. Extra copies of the electronic backup are also stored within the ballot programming area.

V. Programming, Proofing, and Testing

A. Testing Requirements

Texas law only requires logic and accuracy (L&A) testing before and after an election and before late mail tabulation.

B. Ballot Creation or Programming

Ballot creation is referred to as “ballot programming” by elections officials. Ballot formats for each election are created using a software application. The Clerk’s Elections Division does not have the access required to alter the system’s hard coding. The vendor does not participate in any way in the ballot creation process.

C. Proofing

Once a ballot is programmed, the Elections staff uses reports printed from the system to check for proper assignments within the system (such as jurisdictions/districts set up properly, races/contests assigned to the correct jurisdiction, ballot styles properly set up, and ballot styles assigned to the correct locations). The staff conducts a full, manual proofing test to make sure that the software is programmed correctly, content is spelled correctly, the audio ballot is recorded correctly, straight party votes function correctly, each place on the ballot responds correctly when voted, and all votes tabulate correctly.

D. Pre-Election Tests

In public view, Election officials run both hash code testing (to check that the system is using the original, certified software and to ensure that the system software has not been tampered with) and logic and accuracy (L&A) testing (a test which ensures that each place on the ballot responds correctly when manually voted and that the system tabulates all manually cast votes accurately). L&A is run on the live election database in test mode. The flash cards voted in the L&A test are stored in the secured programming area. By law, the cards containing the manually-cast votes of the L&A tests must be rerun through the tabulation system multiple times (before election night tabulation, after election night tabulation, and before late mail ballot tabulation).

E. During-Election Tests

Parallel testing is designed to test the system in live election mode as opposed to test mode. For parallel testing, the DREs “think” they are accepting random votes in a real polling place, when in fact they are being test-voted under surveillance. Random votes are recorded onto voting devices intended for use in a live polling location. Votes are recorded throughout the actual live voting period (early voting and election day), and the results are tabulated at the end of the voting period. The physical act of voting on each voting device in use is recorded by a surveillance camera in order to determine — if there is an error in the final results — whether the error was human or machine .

On election night, before and after tabulation, the L&A cards from the pre-election tests are read into the tabulation system to ensure that the system is still tabulating correctly, and hash-code tests are run.

F. Post-Election Tests

On election night, before and after tabulation, the L&A cards from the pre-election tests are read into the tabulation system to ensure that the system is still tabulating correctly, and hash-code tests are run.

G. Third-Party Testing Opportunities

The above tests could be run by third parties, however, criteria for selecting these third parties has not yet been established.

VI. Ballot Preparation and Distribution

A. Ballot Printing

DRE ballots are printed to electronic media. Paper ballots by mail are printed in-house on demand.

B. Ballot Allocation

No ballot allocation is necessary.

C. Ballot Distribution

Since ballots are electronically written to the flash cards, they are distributed within the electronic ballot boxes. The chain of custody of the boxes and their contents is fully documented. This process also applies to the VVPAT printer/ballot box.

D. Pre-Election Inventory Control

Flash cards are assigned unique ID numbers which are inventoried and tracked. With VVPAT, all printer/ballot boxes are inventoried and tracked.

E. Inventory Control During Election

The location of all machines is tracked by a unique ID number assigned to every unit. The retirement of any machine from the field during an election is documented and the activity history of that machine is tracked.

F. Post-Election Inventory Control

All equipment is numbered for identification and is checked into and out of the Elections high-security area in much the same way a book is checked in and out of a library. A voting machine is given a tracking number, the booth containing it is given a tracking number, and even the cart it is stored in is given a number.

VII. Poll Workers and Training

A. Training Election Workers

All early voting workers and election day judges and alternates must go through training before each election (3-4 hours for most elections). Election day clerks may either go through in-person training or an online poll-worker training that generally takes 2-3

hours. Training includes lecture as well as hands-on drills which simulate situations in the polling location. It includes DRE booth and system setup and break down, canceling a booth, provisional voting, accessibility and curbside voting procedures, and all closeout procedures. Much of the training deals with procedures for processing voters.

B. Polling Location Staff

The minimum number of workers required at a polling location is four. The judge runs the location, handles special voter situations such as processing failsafe and provisional voters, and provides assistance to voters. One poll worker checks voters in and validates the voter's registration status, another poll worker oversees the signature roster, and another poll worker runs the electronic ballot box.

VIII. Tabulation and Returns

A. Tabulation System

1. Preparation

The tabulation software is separate from the ballot programming software. When preparing the tabulation software for an election, the data from a programmed ballot is imported into the tabulation software. Using that data, results reports are set up.

2. Operation

Flash cards are delivered to the central counting station by law enforcement and are inserted and read into the tabulation system. This is performed in an area that is visible to the public. Periodically throughout election night, returns are posted on hard copy and on the Internet.

3. Post-Election Requirements

All data is backed up to electronic media and stored offsite. A mandatory recount is performed.

4. Accuracy

The results from an electronic election are extremely accurate. Voting data is stored in three locations (a chip in the voting unit, a chip in the ballot box, and the flash card). The data in these three locations can be compared. Results are printed and posted at each polling location and can be verified against the centrally tabulated results. The accuracy of electronic voting can be affected if the system has been tampered with, if such tampering goes undetected, or as a result of human error. The likelihood of a tabulation error in a machine that has not been compromised is exceptionally remote; to date, no machine in Travis County has been suspected of such an error.

5. Method

Tabulation occurs in two places: on a tabulation system run by a centrally-located computer and (once the polls are closed) on the ballot box device located in each polling location.

6. Speed

Because there is generally only one card per polling location, the actual tabulation of the cards occurs very quickly, so the speed of returns depends mostly upon the arrival of the election judge at the satellite station. Returns are substantially complete by the 10 p.m. news broadcasts on election night.

B. Public Accessibility of Returns

Hard copy or Internet returns are immediately available to the public as they are published throughout election night.

1. Transfer to TV

TV stations report results through an Associated Press (AP) transfer or using internet returns.

2. Transfer to Public

The public has immediate access to Internet returns. They may also request an electronic spreadsheet of the precinct breakdown of all races.

3. Internet

Current and archived results are available on the website of the Travis County Clerk.

IX. Backup, Audits, Recounts

A. Types of Backup Necessary

The data chips in all devices (voting devices and electronic ballot boxes) are backed up. All election data from the ballot programming and tabulation software is backed up.

B. Types of Audits Necessary

The mandatory recount is performed as directed by the Secretary of State. In addition, after each day of early voting and on election night prior to the release of election night results, all signatures from the signature rosters are verified against the number votes cast on the machines. Additional audits that may be performed include: the comparison of the election night results printed from each ballot box (the same print out that is posted at each polling location) to the actual results as tabulated by the central count computer; the comparison of the number of votes cast on the individual eSlate voting machines at a location to the number of votes recorded on the electronic ballot box; the collective results from all voting machines to the results tabulated by the central count computer.

C. Methods for Recount

Methods for recounts are: printing and manually counting cast vote records (CVRs), reading all flash cards into the tabulation computer and tabulating the results, and running results from the backup of any or all voting devices or electronic ballot boxes. Once tabulation is complete and canvass results are released, a recount is only conducted upon request by the losing candidate.

X. Independence

A. Reliance on Outside Vendors

System questions may be addressed via the vendor help desk. Travis County rarely uses the vendor help desk.

B. Election Preparation

No vendor assistance is required in election preparation.

C. In Field

No vendor assistance is required in the field.

D. Tabulation

No vendor assistance is required for tabulation.

E. Post Election

No post-election vendor assistance is required.

XI. Transparency

Some members of the Study Group argue that no process performed by a computer can be considered transparent because witnesses cannot actually *see* the computer performing an operation. Others argue that processes used to test system software and the ability to openly view the actions of the computer operator and the computer processes on the computer screen are at least somewhat equivalent to transparency in the computer operation component of the system. Additionally, some members question what level of transparency can be feasibly claimed for any voting system. For example, in a paper voting system, thousands of people are handling hundreds of thousands of paper ballots in varying ways, in different facilities, and with varying opinions as to how voter intent should be interpreted. Such questions are beyond the scope of this comparison.

What can be stated is that the Travis County Elections Division has transparent *operational processes* that allow public viewing of preparation and testing of election equipment. The Division eagerly demonstrates and explains the procedures that are used and encourages participation by anyone interested in the election process. Regardless what type of voting system Travis County uses, now or in the future, the Elections Division will keep its elections-related information and activities open and accessible to the public.

XII. Security Risks

A. Physical

1. Pre Election

Safeguards are in place to physically secure equipment and software kept in the Elections Division.

2. Ballot Creation

Safeguards are in place to guard against malicious tampering during ballot creation (such as using encryption keys, passwords, and segregation of duties).

3. Distribution to Field

Safeguards are in place to prevent loss of or tampering with the equipment during distribution to polling locations (such as inventory control for tracking, timeliness of delivery, and documentation of all chain-of-custody activity).

4. In Field

Safeguards are in place to prevent physical damage, theft, or tampering of the equipment at the polling locations.

5. At Closeout

Safeguards are in place to ensure that all equipment is surrendered properly and all documentation of the surrender is thorough and accurate.

6. Delivery to CCS

Safeguards are in place to ensure that all votes are safely transported to the central counting station (such as tracking times of precinct arrival to the satellite station, flash card departure from the satellite station, and card arrival time to the central counting station).

7. Tabulation of Returns

System testing and safeguards are in place to ensure that votes are tabulated correctly (such as comparing each set of results released throughout election night to the previous set of results, proofing each set prior to its release, and comparing the number of votes cast to number of signatures acquired in each precinct).

8. Post-Election Night

Safeguards are in place to ensure that all equipment is securely returned, documented, and inventoried and that tabulation systems continue to operate accurately in order to process late by-mail ballots.

B. Electronic

1. Pre Election

Tests and safeguards are in place to protect against malicious programming of and tampering with ballot programming software and equipment firmware and software.

2. Ballot Creation

Tests and safeguards are in place to protect against malicious programming of and tampering with ballot programming software

3. Distribution to Field

Tests and safeguards are in place to protect against malicious programming of and tampering with equipment firmware and software.

4. In Field

Tests and safeguards are in place to protect against malicious programming of and tampering with equipment firmware and software.

5. At Closeout

Tests and safeguards are in place to protect against malicious programming of and tampering with equipment firmware and software.

6. Delivery to CCS

Procedures are in place to ensure that the delivery of the flashcard is witnessed and secure.

7. Tabulation of Returns

Tests and safeguards are in place to protect against malicious programming of and tampering with ballot programming and tabulation software. The central counting station has procedures in place for disaster recovery and business resumption.

8. Post-Election Night

Tests and safeguards are in place to protect all ballot and equipment inventory from tampering.

XIII. Costs – See Cost Analysis

XIV. Future Needs

A. Population Growth

DRE voting easily handles the key issues associated with a growing population: ballot complexity, joint elections, early voting issues, and potential vote center implementation.

B. Does the system meet future needs?

See Study Group Recommendations

Optical/Digital Scan Precinct Ballot Counters

I. Voter Interface

A. Ease of Use for Voters

1. Voters are comfortable using paper ballots, but as with any system, proper layout and design are important in making information and choices clear.
2. The system uses a “fill-in-the-bubble” method and many voters have been exposed to this selection method in other environments.
3. Sliding the ballot into the precinct ballot counter is easy, and Study Group demonstrations showed that the equipment is forgiving as to how accurately the ballot is placed into the feeder.

B. Potential Problems for Voters

1. First-time users to the precinct ballot counter system may require election worker assistance. Voters may need basic instructions on how to insert their ballots. They may need additional help if the ballot counters display messages that undervotes or overvotes have been detected.
2. Ironically, one of the problems with voters quickly assuming mastery of a paper ballot is that they often do not read the instructions on how to mark the ballot. As a result, voters may not fill in the bubbles as necessary but instead use checks, x's, circles, etc. Although the ballot scanner can alert the voter that stray marks may be causing generating undervotes or overvotes, the possibility still exists that exact voter intent will not be accurately determined.

C. Determining Intent of Voter

1. The precinct ballot counter is designed to resolve voter-intent issues at the polling location within limited parameters (alerting the voter of detected undervotes or overvotes). There are instances when the scanner could accept a ballot and misread it (for example, a stray mark made in a bubble where the voter intended that no selection for any candidate to be made in that race).
2. In the event of a recount, there is a greater possibility that results could change when voter intent is scrutinized.

D. Accessibility Options

1. Same System as Other Voters

Considering the equipment that was demonstrated to the Study Group, all voters would not be able to use the same system. To meet federal laws, some type of electronic voting system must also be incorporated to ensure that voters with disabilities can cast a vote without assistance. Typically this would mean at least one electronic unit (adapted with special features for the disabled) per early voting and election day polling location. Many election observers have posed ethical objections to requiring certain voters to use a different kind of voting system. One logistical problem is that since some voting results information will come from a separate

source that may be comprised of a small number of voters, the secrecy of the ballot may be compromised.

Study Group members are interested in learning if it would be possible for all voters to use an electronic voter interface that produced a machine-marked paper ballot. This has the potential to resolve both of these issues (the right of all voters to use the same voting system and the right to secrecy) as well as the intent-of-voter dilemma.

2. Ease of Use

The accessible unit includes an audio ballot in English and Spanish. It also has jelly switches and hookups for sip-and-puff devices so that voters without limbs or full use of their limbs can vote a ballot without assistance.

E. Voter Trust

1. Pros

- a. Voters are reassured by the physical paper ballot and generally trust a paper-based voting system.
- b. Historically, paper-ballot voting has been seen by many as inherently inaccurate because of the likelihood of human error and high vulnerability to tampering. Numerous claims (both true and unfounded) of deliberate altering of individual ballots or misrepresentation of ballot counts have compelled individuals to search for better means of voting and counting ballots. The added benefit of the precinct ballot counting system is that the paper ballots are electronically counted immediately after the voter inserts the ballot into the box. As a result, highly accurate electronic counts are made before anyone other than the voter can come into contact with the ballot. Additionally, the paper ballots are still available in the event of a recount. This dual approach will likely increase voter confidence.

2. Cons

Precinct ballot counting systems are electronic and so are susceptible to computer attack, although having separate paper ballots that can be audited and recounted helps mitigate risk. Since results will still rely heavily on electronic counting, many of the same steps used to secure DREs will also need to be used in this setting.

Because of the need for electronic voting devices for voters with disabilities (which has all the risks associated with DREs), voters may continue to worry about the security of these votes.

II. In Field Use

A. Polling Place Setup

Setup requires: setting up voting booths and boxes of paper ballots (during early voting, the number of ballot boxes is quite significant because ballots for every precinct and

ballot style must be available at all times), preparing the precinct ballot counter by verifying the seals that lock the machine, setting up the electronic disability unit, unlocking the seals, turning the counter and electronic disability unit on, printing a zero report, and opening the polls.

B. Operation of Polling Location

Poll workers will typically have questions at the beginning of the day as they set up both the precinct ballot counters and the electronic disability units. Once these questions are resolved, voting would likely run smoothly. Call center workers and troubleshooters would be available if needed. On election day and especially for early voting, constant monitoring is required to ensure that ballot inventories are adequate to prevent a location from running out of a particular style of ballot. This is an especially complex task since one precinct alone can have up to 11 ballot styles.

C. Closeout of Polling Place

Closeout is a fairly basic operation described in the poll worker interface section below. If poll workers do not wish to fully break down their booths, the Elections staff breaks them down and delivers them to the Elections operation center. Most booths are picked up within 24 hours of closeout.

III. Poll Worker Interface

A Ease of Use for Poll Workers

1. Setup

Setup requires assembling the booths, plugging in the booth lights, turning the lights on, and organizing the boxes of paper ballots. Seals on the precinct ballot counter are checked and the system is activated. Workers must also set up the electronic disability unit. Poll workers that are comfortable with computers find the precinct ballot counter and electronic disability unit setup relatively easy. Those less comfortable with computers may require extra training.

2. Use During Voting

Every polling location must operate two systems, a precinct ballot counter and an electronic disability unit. For the precinct ballot counter system, a poll worker selects three ballots of the proper ballot style for a voter and lets the voter choose one of them. The poll worker asks the voter to confirm that the precinct and ballot style are correct and directs the voter to any open voting booth. If there is an issue with a ballot (such as a wrong ballot style or a mistake in marking the ballot), the poll worker can “spoil” the ballot and give the voter a new one. One voter can “spoil” up to three ballots, but each time the voter gets a new ballot, the poll worker must present the voter with an array of three ballots to choose from. The spoiled ballots are placed in an envelope and documented by the poll worker. The poll worker may also issue a provisional ballot to a voter that must vote provisionally. The voter and election judge fill out all of the information on the provisional envelope prescribed by the Secretary of State.

The voter votes the ballot, places it in a privacy envelope, and places the privacy envelope in the provisional envelope, which is then sealed. If the provisional voter is found to be eligible to vote by the Early Voting Ballot Board, the envelope is later opened and the vote is counted.

For the electronic disability unit, the procedures are similar to those used in a DRE system.

3. Close Down

Closing down the polls at the end of voting is generally easy. For the precinct ballot counter system, the poll worker must push the Close Polls button on the machine, print out a full report of results to post in the polling location, document the number of signatures on the signature rosters, document the number of votes cast on the machine, and deliver all paperwork, the flash card, and all unvoted ballots to a satellite station where the supplies are officially surrendered. Workers also close, seal, and lock the precinct ballot counter.

For the electronic disability unit, the procedures are similar to those used in a DRE system.

4. Return to Central Counting Station

The election judge and alternate judge deliver all the paperwork, unvoted ballots, and flash cards with voted-ballot data retrieved from both the precinct ballot counter and electronic disability unit to a satellite station (the Receiving Substation or RSS). RSS workers perform several audits on the materials before the judge and alternate leave. The flash cards are transported to the central counting station by law enforcement.

IV. Equipment, Ballots, and Supplies

A. Equipment

1. Quantity and Type

Travis County would need about 270 precinct ballot counters, 355 electronic disability units, a programming computer, a backup programming computer, a results printer, an audit log printer, two laptops for resetting and backing up equipment, three ballot-by-mail computers, two ballot-by-mail printers, two ballot-by-mail digital scanners, eight flash card readers, and 600 or more flash cards.

2. Protection

Equipment is stored in a high-security area with overlapping methods of security similar to that used with DRE equipment.

3. Preparation

Each counter goes through logic and accuracy testing before each election. Each electronic disability unit goes through functionality testing before each election (similar to DRE equipment testing). Each unit is reset and cleared before an election, and all information contained in the machine is backed up after each election.

4. Transportation

Because of the size and weight of a precinct ballot counter, Travis County is unsure if the counters can be delivered to polling locations by Elections staff. A third party moving company might be needed. The transportation of the counters and electronic disability units would be documented by chain-of-custody forms. Generally, procedures would need to be similar to those used for DREs.

5. Post Election

All equipment is backed up and the following audits may be performed: the mandatory manual recount as directed by the Secretary of State, the comparison of the election night results printed from each precinct counter (the same print out that is posted at each polling location) to the actual results as tabulated by the central count computer, and the verification of all signatures from the signature rosters against the number votes cast on the machines. Any equipment needing a repair that cannot be performed by the Elections staff is sent to either the vendor (for minor repairs) or the manufacturer. The history of each device is recorded.

6. Storage

All equipment and ballots are stored in a high security area of the Elections Division.

B. Ballots and Supplies

1. Type and Quantity

Because of the quantity needed, ballots must be printed by a professional certified printer. Sufficient numbers must be ordered to maintain proper inventory levels at early voting and election day locations (approximately 800,000 for a general election). All ballots must carry a unique serial number. There is generally a two-week lead time needed for the printer to fulfill a ballot order. Most Travis County ballots would be tabloid-size (11" x 17"), and most runoff ballots either letter or legal size. It would not be unusual for ballots to have more than one page.

2. Protection

Protection for unvoted ballots at early voting locations during the hours when the polls are not open is a significant problem. Methods to reduce risk will need to be developed.

All flash cards are stored in the ballot-programming room within the high-security area of the Elections Division. Each card is marked with a barcode, and the barcodes are tracked.

3. Preparation

Once the flash card is digitally written, it is inserted into the counter, the counter is electronically assigned to a location, the counter is locked and sealed, and all barcode numbers are recorded. Cards are also written for the electronic disability units. The electronic disability units and the paper ballots are allocated to every early voting and election day location, and all serial numbers are recorded and verified by the poll workers at pickup.

4. Transportation

The ballots are secured within locked and sealed containers during transportation and storage at the polling location. The empty ballot box (which is locked and sealed) and the ballots (whose serial numbers are documented) are handed over to the polling location judge at polling location setup (for early voting) or at supply pickup (for election day). Every evening during early voting, law enforcement transports the ballot box with voted ballots to a secure storage area and returns the box to the polling location the following morning. On election night, the polling location judge and the alternate judge transport the ballot box containing votes to the satellite station to officially surrender it. All transactions are documented through chain-of-custody forms. Procedures to separate the flash cards (sealed within the counters) from the voted ballots (stored inside the counter) nightly during early voting would have to be developed.

5. Post Election

All voted and unvoted ballots are documented and accounted for, and audits are performed. All equipment is backed up.

6. Storage

Voted ballots, unvoted ballots, supporting documentation, and electronic back up from the counters are stored offsite for the required 22 months. Extra copies of backup are also stored within the ballot programming area.

V. Programming, Proofing, and Testing

A. Testing Requirements

Texas law only requires logic and accuracy (L&A) testing before and after an election and before late mail tabulation.

B. Ballot Creation or Programming

Ballot creation is referred to as “ballot programming” by elections officials. Ballot formats for each election are created using a software application. The Clerk’s Elections Division would not have the access required to alter the system’s hard coding. The Travis County Clerk would want to ensure that it is not necessary for the vendor to participate in any way in the ballot definition process.

C. Proofing

Once a ballot is programmed, the Elections staff uses reports printed from the system to check for proper assignments within the system (such as jurisdictions/districts set up properly, races/contests assigned to the correct jurisdiction, ballot styles properly set up, and ballot styles assigned to the correct locations). The staff would conduct a full, manual proofing test to make sure that the software is programmed correctly, content is spelled correctly, the audio ballot is recorded correctly, straight party votes vote correctly, each place on the ballot responds correctly when voted, and all votes tabulate correctly. The staff performs visual proofing of all paper ballot styles.

D. Pre-Election Tests

Election officials run hash code testing (to check that the system is using the original, certified software, and to ensure that the system has not been tampered with) and logic and accuracy (L&A) testing (a manual test which ensures that each place on the ballot responds correctly when voted and that the system tabulates all manually cast votes accurately) in public view. L&A is run on the live election database in test mode. The flash cards voted in the L&A test are stored in the secured programming area. By law, the results cards of the L&A tests must be rerun through the tabulation system multiple times (before election night tabulation, after election night tabulation, and before late mail ballot tabulation).

E. During-Election Tests

Parallel testing is designed to test the system in live election mode as opposed to test mode. For parallel testing, the DREs “think” they are accepting random votes in a real polling place, when in fact they are being test-voted under surveillance. Random votes are recorded onto voting devices intended for use in a live polling location. Votes are recorded throughout the actual live voting period (early voting and election day), and the results are tabulated at the end of the voting period. The physical act of voting on each voting device in use is recorded by a surveillance camera in order to determine — if there is an error in the final results — whether the error was human or machine. Parallel testing is designed to test the system in live mode as opposed to test mode. For parallel testing, the DREs “think” they are accepting random votes in a real polling place.

On election night before and after tabulation, the L&A cards from the pre-election tests are read into the tabulation system to ensure that the system is still tabulating correctly; hash code tests are also performed.

F. Post-Election Tests

L&A cards and hash codes are run.

G. Third-Party Testing Opportunities

The above tests could be run by third parties, however, criteria for selecting these third parties has not yet been established.

VI. Ballot Preparation and Distribution

A. Ballot Printing

Ballots for the electronic disability unit are printed to electronic media. All paper ballots must be printed by a certified printer. Printing usually requires a two-week lead time.

B. Ballot Allocation

There may be up to 700 precincts and ballot styles for one election. During early voting, each precinct and ballot style must be properly allocated to each polling location (between 20 and 35 locations for a single election). For early voting, all locations must have enough of each precinct and ballot style to ensure that any voter from any precinct voting at that location will always be able to choose from an array of three ballots. If a location runs out of a particular ballot, the serial numbers of the extra ballots allocated to the voting location must be documented and chain-of-custody forms completed. On election day, all ballot styles for a precinct (up to 11 ballot styles) must be allocated proportionately and correctly.

C. Ballot Distribution

Since ballots are digitally written to flash cards and stored in the electronic disability units, they are distributed with the precinct counters. Chain of custody of the counters and their contents is fully documented. When unvoted ballots are picked up by the election judges, serial numbers for each precinct and ballot style are confirmed, and chain-of-custody documents signed.

D. Inventory Control Pre Election

Flash card are assigned unique ID numbers which are inventoried and tracked. All ballot serial numbers are inventoried and tracked.

E. Inventory Control During Election

The activity of all machines is tracked by a unique ID number assigned to each unit. The retirement of any machine from the field during an election is documented and the activity history of that machine is tracked. All ballot activity (delivery of new ballots to a location that has run out) is tracked and documented by serial number and chain-of-custody forms.

F. Post-Election Inventory Control

All equipment is numbered for identification and is checked into and out of the Elections high-security area in much the same way a book is checked in and out of a library. A voting machine is given a tracking number, the booth containing it is given a tracking number, and even the cart it is stored in is given a number.

VII. Poll Workers and Training

A. Training Elections Workers

All early voting workers and election day judges and alternate judges must go through training before each election (3-4 hours for most elections). They must be trained on paper ballot and electronic ballot procedures. Election day clerks may either go through in-person training or online poll worker training that generally takes 2-3 hours. Training includes lectures as well as hands-on drills which simulate situations in the polling location. Training includes booth, precinct ballot counter, and electronic disability unit system setup and break down, accessibility and curbside voting procedures, and all closeout procedures. Much of the training deals with procedures for processing voters.

B. Polling Location Staff

The minimum number of workers required at a polling location is four. The judge runs the location, handles special voter situations such as processing failsafe and provisional voters, and provides assistance to voters. One poll worker checks in voters and validates the voter's registration status, another poll worker oversees the signature roster, and another poll worker runs the electronic ballot box or distributes paper ballots. Because of the large number of paper ballots needed to supply an early voting location, more than one person would be needed to distribute ballots during early voting.

VIII. Tabulation and Returns

A. Tabulation System – Ideally the precinct ballot counting system and the vote-marking device system would be from the same manufacturer, enabling just one tabulation system to be used. If this is not possible, the DRE results of the vote-marking device and the electronic results from the precinct ballot counters must be merged using some kind of fusion software.

1. Preparation

The tabulation software is separate from the ballot-programming software. When preparing the tabulation software for an election, the data from a programmed ballot is imported into the tabulation software. Using that information, reports for results are set up.

2. Operation

Flash cards are read into the tabulation software as they are delivered to the central counting station by law enforcement. The tabulation area is visible to the public. Periodically throughout election night, returns are posted as hard copies at the central counting station and on the Internet.

3. Post-Election Requirements

All data is backed up to electronic media and stored offsite. Mandatory recount is performed

4. Accuracy

The results of a precinct counter election are fairly accurate. Some intent-of-voter issues may go undetected unless a hand audit of all ballots is performed (see Determining Intent of Voter above). Voting data is stored in three locations: a chip in

the counter, the flash card, and the paper ballots. The data from these three locations can be compared. Results are printed and posted at each polling location and can be verified against the centrally tabulated results. The accuracy of electronic voting can be affected if the system has been tampered with and if such tampering goes undetected.

5. Method

Tabulation occurs in two places: on a tabulation system run by a centrally-located computer and (once the polls are closed) on the ballot box device located in each polling location.

6. Speed

Because there is generally only one card per polling location, the actual tabulation of the cards occurs very quickly, so the speed of returns depends mostly upon the arrival of the election judge at the satellite station. Returns are substantially complete by the 10 p.m. news broadcasts on election night

B. Public Accessibility of Returns

Hard copy or Internet returns are immediately available to the public as they are published throughout election night.

1. Transfer to TV

TV stations report results through an AP transfer or using internet returns.

2. Transfer to Public

The public has immediate access to Internet returns. They may also request an electronic spreadsheet of the precinct breakdown of all races.

3. Internet

Current and archived results are available on the website of the Travis County Clerk.

IX. Backup, Audits, Recounts

A. Types of Backup Necessary

All flashcards and memory chips in all devices are backed up. All elections data from the ballot programming and tabulation software is backed up.

B. Types of Audits Necessary

The mandatory recount is performed as directed by the Secretary of State. In addition, after each day of early voting and on election night prior to the release of election night results, all signatures from the signature rosters are verified against the number of votes cast on the machines. An additional audit that may be performed is the comparison of the election night results printed from each precinct counter (the same print out that is posted at each polling location) to the actual results as tabulated by the central count computer.

C. Methods for Recount

Methods for recounts are: manually counting the paper ballots and carefully managing against human error, reading all flash cards into the tabulation computer and tabulating the results, and running results from the backup of any or all precinct ballot counters. Once tabulation is complete and canvass results are released, a recount is only conducted upon request by the losing candidate.

X. Independence

A. Reliance on Outside Vendor

With the exception of using certified printers to print paper ballots, the same vendor independence can be achieved with precinct ballot scanners as with DREs.

B. Election Preparation

No vendor assistance is required for programming. Ballot printing must be performed by a certified printer.

C. In Field

No vendor assistance is required in the field.

D. Tabulation

No vendor assistance is required in tabulation.

E. Post Election

No post-election vendor assistance is required.

XI. Transparency

See this section under DRE voting.

XII. Security Risks

A. Physical

1. Pre Election

The following safeguards must be in place. All equipment must be physically secured and protected at all times against malicious tampering and environmental mishaps (such as water damage). The ballot programming equipment must be guarded at all times against malicious tampering, machine failure, and environmental mishaps. All paper ballots must be physically secured and protected at all times against malicious tampering, theft, illegal duplication, and environmental mishaps.

2. Ballot Creation

Safeguards must be in place to guard against malicious tampering during ballot creation (such as using encryption keys, passwords, and segregation of duties). The paper ballots must be protected against theft, illegal duplication, and environmental mishaps.

3. Distribution to Field

Safeguards must be in place to prevent loss of or tampering with equipment during distribution to polling locations. The paper ballots must be protected against theft, malicious tampering, illegal duplication, and environmental mishaps. Effective safeguards include inventory control for tracking, timely delivery, and strict documentation through chain-of-custody forms.

4. In Field

Safeguards must be in place to prevent theft of, physical damage to, or tampering with equipment and paper ballots at polling locations. A security protocol must be developed to securely store large quantities of unvoted ballots at early voting locations.

5. At Closeout

Safeguards must be in place to ensure that all equipment and paper ballots are surrendered properly and all surrendered documentation is thorough and accurate. In addition, ballots within the precinct ballot counters must be locked and secured at the polling location. (Voted ballots are not removed from the precinct ballot counters at the end of election day. Because of the size of the counters, they cannot be transported to the satellite station at the end of the night by poll workers. Ballots remain secured inside the scanners at the polling locations until the scanners are picked up by the elections staff or a third-party moving company).

6. Delivery to CCS

Safeguards must be in place to ensure that all votes are safely transported to the central counting station (such as tracking times of precinct arrival to the satellite station, flash card departure from the satellite station, and card arrival time to the central counting station). All voted ballots that remain stored in the precinct ballot counter must be protected. Because of the size of the precinct ballot counter (and the voted ballots secured inside), it cannot be delivered to the central counting station. Once the counters are delivered back to the elections center, the ballots are removed and secured inside sealed boxes.

7. Tabulation of Returns

System testing and safeguards must be in place to ensure that votes are tabulated correctly (such as comparing each set of results released throughout election night to the previous set of results, proofing each set prior to its release, and comparing the number of votes cast to number of signatures acquired in each precinct).

8. Post Election Night

Safeguards must be in place to ensure that all equipment and paper ballots are securely returned, documented, and inventoried and that tabulation systems continue to operate accurately in order to process late by-mail ballots.

B. Electronic

1. Pre Election

Tests and safeguards must be in place to protect against malicious programming of and tampering with ballot programming software and equipment firmware and software.

2. Ballot Creation

Tests and safeguards must be in place to protect against malicious programming of and tampering with ballot programming software.

3. Distribution to Field

Tests and safeguards must be in place to protect against malicious programming of and tampering with equipment firmware and software.

4. In Field

Tests and safeguards must be in place to protect against malicious programming of and tampering with equipment firmware and software.

5. At Closeout

Tests and safeguards must be in place to protect against malicious programming of and tampering with equipment firmware and software.

6. Delivery to CCS

Procedures must be in place to insure that the delivery of the flashcard is witnessed and secure.

7. Tabulation of Returns

Tests and safeguards must be in place to protect against malicious programming of and tampering with tabulation software. The central counting station must have procedures in place for disaster recover/business resumption.

8. Post Election

Tests and safeguards must be in place to protect all ballot and equipment inventory from tampering.

XIII. Costs – See Cost Analysis

XIV. Future Needs

A. Population Growth

The electronic component of this system appears easily able to handle the issues associated with a growing population, ballot complexity, joint elections, early voting, and vote center implementation.

As population growth creates greater ballot complexity, new features (such as the ability to print ballots on demand) must be included if voters want to preserve paper ballots.

B. Does the system meet future needs?

See Study Group Recommendations

Hand-Counted Paper Ballots

I. Voter Interface

A. Ease of Use for Voters

Voters are comfortable using paper ballots, however, as with any system, proper layout and design are critical to making ballot information and choices clear.

B. Potential Problems for Voters

Ironically, one major issue stems from voters' widespread comfort with paper ballots: they often do not read the instructions on how to mark them. As a result, some voters use unorthodox or problematic methods to indicate their selections.

C. Determining Intent of Voter

1. The marks made on most paper ballots are easy to interpret, however some voters' marks are not easily deciphered by the election workers counting the ballots. As a consequence, the final reading of some ballots may not accurately depict voters' intents.
2. When ballot scrutiny intensifies, as in the event of a recount, the final results are much more likely to change from the initial counts.

D. Accessibility Options

1. Same System as Other Voters

To comply with federal law, some type of electronic voting system must accompany a paper ballot system to ensure that voters with disabilities can cast a vote without assistance. Typically this would mean at least one electronic voting unit (with special features for the disabled) must be used at each early voting and election day polling location. Many election observers have posed ethical objections to requiring certain voters to use a different kind of voting system. One logistical problem is that since some voting result information will come from a separate source that may be comprised of a small number of voters, the secrecy of the ballot may be compromised.

2. Ease of Use

The accessible unit includes an audio ballot in English and Spanish. It also has jelly switches and hook ups for sip-and-puff devices so that voters without limbs or full use of their limbs can vote a ballot without assistance.

E. Voter Trust

1. Pros

Voters are reassured by physical ballots and generally trust a paper-based voting system that can be verified and recounted. Hand-count supporters prefer the absence of computers, whose calculations are unwatchable and therefore

considered unverifiable. These supporters believe that a concrete counting method coupled with neighborhood-driven vote counting would increase voter confidence in elections and in democracy.

2. Cons

Historically, paper-ballot voting has been seen by many as inherently inaccurate because of the likelihood of human error and high vulnerability to tampering. Numerous claims (both true and unfounded) of deliberate altering of individual ballots or misrepresentation of ballot counts have compelled individuals to search for better means of voting and counting ballots.

The public perception of an election is as important as the validity of the election itself. A system which relies on great numbers of individuals handling ballots across large regions is likely to generate controversy. An innocent but slightly significant tabulating error in just one precinct could cast doubt upon an entire election. Because of human error and the questionable accuracy of the count, recounts are commonplace, and those recounts often produce differing results (especially given voter intent questions). These variances in election accuracy could increase doubt about the voting system and erode voter confidence.

II. In Field Use

A. Polling Place Setup

Setup requires: setting up voting booths and boxes of ballots (during early voting the number of ballot boxes is quite significant because ballots for every precinct and ballot style must be available at all times), setting up the electronic disability units, setting up the locked and sealed ballot box, and opening the polls.

B. Operation of Polling Location

Paper ballot voting is relatively troublefree. Call center workers and troubleshooters would be available if questions occurred with the electronic disability units. On election day and especially for early voting, constant monitoring is required to ensure that ballot inventories are adequate to prevent a location from running out of a particular style of ballot. This is an especially complex task since one precinct alone can have up to 11 ballot styles.

C. Closeout of Polling Place

Closeout is a fairly basic operation described in the poll worker interface section below. If poll workers do not wish to fully break down their booths, the Elections staff breaks them down and delivers them to the Elections operation center. Most booths are picked up within 24 hours of closeout.

III. Poll Worker Interface

A. Ease of Use for Poll Workers

1. Setup

Setup entails putting together the booths, plugging in the booth lights, turning the lights on, and organizing the boxes of paper ballots.

For the electronic disability unit, the procedures are similar to those used in a DRE system.

2. Use During Voting

The process for voting a paper ballot is the same as using precinct ballot counters except that the ballots are deposited in a locked and sealed ballot box. For hand counting on election day, two ballot boxes can be rotated. Once the polling place has been open for an hour and more than 10 voters have voted, the ballot box with voted ballots can be taken aside and the votes manually counted. The second ballot box is used to collect voted ballots. The boxes are rotated so that tallying and voting can continue throughout the day (see the previous study group report for the pros and cons of opening the ballot box and counting at the polling location on election day).

For the electronic disability unit, the procedures are similar to those used in a DRE system, however the unit may be one that electronically marks a paper ballot that is later hand counted.

3. Close Down

Once polls are closed, the manual counting continues until all ballots are counted and accounted for. Results sheets — showing the combined totals of votes for each race from both the hand count ballots and the electronic disability unit — are compiled and posted at the polling location. Poll workers count the signatures on the signature roster and verify the number against the number of ballots cast. They also note the quantity and serial numbers of the remaining unvoted ballots.

For the electronic disability unit, the procedures are similar to those used in a DRE system, however if a system is used that electronically marks a paper ballot, no votes are stored in the voting unit.

4. Return to Central Counting Station

Once all votes are hand tallied, the election judge and alternate judge deliver the paperwork, voted and unvoted ballots, tally sheets, and results sheets to a satellite station (the Receiving Substation or RSS). The electronic disability unit's flash card may also be delivered if it is the type of system that stores votes on the card. RSS workers perform several audits on the materials before the judge and alternate leave (such as comparing the number of signatures to the number of votes cast).

IV. Equipment, Ballots, and Supplies

A. Equipment

1. Quantity and Type

Travis County needs about 355 electronic disability units, a programming computer, a backup programming computer, and an audit log printer.

2. Protection

The electronic disability units and paper ballots are stored in a high-security area with overlapping methods of security.

3. Preparation

Each electronic disability unit goes through functionality testing before each election.

4. Transportation

Transportation of the electronic disability units are performed by Travis County and would be documented by chain-of-custody forms.

5. Post Election

Any equipment needing a repair that cannot be performed by the Elections staff is sent to either the vendor (for minor repairs) or the manufacturer. The history of each device is recorded.

6. Storage

All equipment and ballots are stored in a high security area.

B. Ballots and Supplies

1. Type and Quantity

Because of the quantity needed, ballots must be printed by a professional certified printer. Sufficient numbers must be ordered to maintain proper inventory levels at early voting and election day locations (approximately 800,000 for a general election). All ballots must carry a unique serial number. There is generally a two-week lead time needed for the printer to fulfill a ballot order. Most Travis County ballots are tabloid-sized (11" x 17") and most runoff ballots either letter or legal size. It would not be unusual for ballots to have more than one page.

2. Protection

Protection for unvoted ballots at early voting locations during the hours when the polls are not open is a significant problem; methods to reduce risk will need to be developed.

All flash cards used with the electronic disability units are stored in the ballot programming room within the high security area. Each card is marked with a barcode, and the barcodes are tracked.

3. Preparation

Flash cards are digitally written for the electronic disability system. An electronic disability unit and paper ballots are allocated to every early voting and election day location and all serial numbers are recorded and verified by the poll worker at pickup.

4. Transportation

The ballots are secured within locked and sealed containers during transportation and storage at the polling location. The empty ballot box (which is locked and sealed) and the ballots (whose serial numbers are documented) are handed over to the polling location judge at polling location setup (for early voting) or at supply pickup (for election day). Every evening during early voting, law enforcement transports the ballot box with voted ballots to a secure storage area and returns the box to the polling location the following morning. On election night after all votes are hand counted, the polling location judge and the alternate judge officially surrender the ballot box containing voted ballots, all unvoted ballots, and all paperwork at the satellite station. All transactions are documented through chain-of-custody forms.

5. Post Election

All voted and unvoted ballots are documented and accounted for and audits are performed. All equipment is backed up.

6. Storage

Voted ballots, unvoted ballots, and supporting documentation are stored offsite for the required 22 months. Electronic disability units are stored in the high security area of the Elections offices.

V. Programming, Proofing, and Testing

A. Testing Requirements

For the electronic accessibility units, Texas law only requires logic and accuracy (L&A) testing before and after an election and before late mail tabulation.

B. Ballot Creation or Programming

Ballot programming software is necessary for creating hand-counted paper ballots and electronic accessibility unit ballots. The Clerk's Elections Division would not have the access required to alter the system's hard coding. The Travis County Clerk would want to ensure that it is not necessary for the vendor to participate in any way in the ballot definition process.

C. Proofing

Each ballot style is proofed for accuracy. Testing on the electronic disability unit is performed to make certain the software has programmed all ballot styles correctly.

D. Pre-Election Tests

Electronic disability units must be tested in the same manner as a DRE system. Since the counting system used is hand counting, no tests can be performed to verify that the counting will be correct.

E. During-Election Tests

Since the counting system used is hand counting, there are no tests that can be performed to verify that the counting is correct during an election.

F. Post-Election Tests

Since the counting system used is hand counting, there are no post-election tests that can be performed to verify that the counting was correct.

G. 3rd-Party Testing Opportunities

There are no known third-party testing opportunities.

VI. Ballot Preparation and Distribution

A. Ballot Printing

Ballots for the electronic disability unit are printed to electronic media. All paper ballots must be printed by a certified printer. Printing usually requires a two-week lead time.

B. Ballot Allocation

There may be up to 700 precincts and ballot styles for one election. During early voting, each precinct and ballot style must be properly allocated to each polling location (between 20 and 35 locations for a single election). For early voting, all locations must have enough of each precinct and ballot style to ensure that any voter from any precinct voting at that location will be able to choose from an array of three ballots. If a location runs out of a particular ballot, the serial numbers of the extra ballots allocated must be documented and chain-of-custody forms completed. On election day, all ballot styles for a precinct (up to 11 ballot styles) must be allocated proportionately and correctly.

C. Ballot Distribution

When ballots are picked up by the election judges, serial numbers for each precinct and ballot style are confirmed and chain-of-custody documents are signed.

D. Inventory Control Pre Election

All ballot serial numbers are inventoried and tracked.

E. Inventory Control During Election

All ballot activity (including delivery of new ballots to locations that run out) is tracked and documented by serial number and chain-of-custody forms.

F. Inventory Control Post Election

All equipment is numbered for identification and is checked into and out of the Elections high-security area in much the same way a book is checked in and out of a library. An electronic disability unit is given a tracking number, the booth containing the electronic disability unit is given a tracking number, and even the cart the booth is stored to is given a number.

VII. Poll workers and Training

A. Training Elections Workers

All early voting workers and election day judges and alternates must go through training before each election (3-4 hours for most elections). They must be trained on paper ballot and electronic disability unit procedures. Election day clerks may either go through in-person training or online poll worker training (2-3 hours). Training includes lectures as well as hands-on drills which simulate situations in the polling location. Training includes booth and electronic disability unit setup and breakdown and procedures for distributing paper ballots. Much of the training deals with procedures for processing voters. Special training is given to vote-count supervisors, but vote counters are typically not trained until the beginning of the vote-counting process.

B. Polling Location Staff

The minimum number of workers at a polling location is four. The judge runs the location, handles special voter situations such as processing failsafe and provisional voters, and provides assistance to voters. One poll worker checks voters in and validates the voter's registration status, another oversees the signature roster, and another poll worker distributes paper ballots. Because of the large number of paper ballots needed to supply an early voting location, more than one person is needed to distribute ballots during early voting. Special teams of vote counters are needed to tally the votes. The number of vote counters per precinct can range from 4 to 80, depending on the number of votes cast in a precinct, the number of contests on the ballot, and the amount of time needed to produce timely returns.

VIII. Tabulation and Returns

A. Tabulation System

All ballots (electronically marked and hand marked) are counted by hand. Some type of software would be required to provide accumulated return information.

1. Preparation

The county predetermines the number of vote counters necessary for counting early voting ballots and the number of counters per precinct required on election day. This number could exceed 8,000 additional workers *per election*. Additional staff must be hired to recruit the workers, and sites must be surveyed to ensure that vote counters can be accommodated. Alternate sites must be rented for those precincts that cannot

accommodate the counting teams. Table and chair rental and delivery for all vote counting teams must be booked. Tally sheets must be printed.

2. Operation

Tabulation teams consist of four people: one person to call the vote and three people to independently record the vote on a tally sheet. The three vote counters continually cross-check with each other to ensure that their counts agree. If all three counts do not match, the count must begin over. One trained supervisor oversees four teams, answering questions, and settling disputes. During early voting, ballots are sorted by precinct (in the November 2008 election, 302,000 ballots were cast in early voting), after which the counting teams begin counting.

On election day, if the precinct can accommodate the number of counting teams needed, vote counting can begin during the day. If the polling location cannot accommodate the counting teams, counters must wait until the polls close, move the ballots to the alternate counting location, and begin counting. Once vote counting begins it must continue until all votes are counted. When counting is complete, the results from the counting teams are compiled into precinct results. The number of signatures on signature rosters is verified against the number of votes cast. The judge and alternate judge deliver the precinct results and surrender their ballots to the satellite station. Law enforcement then transports the results and ballots to the central counting station where all results are compiled.

For early voting and on election day, each counting team in a precinct may report results for as many as 150 candidates or propositions (depending on the number of races and the number of selections per race). All counting teams' results are compiled into a total for each candidate or proposition for the precinct. Early voting and election day results for each race in each precinct are combined, then cumulative totals for all races in all precincts are calculated. When results from all 210 Travis County precincts are tabulated, there can be more than 90,000 individual results compiled into the final totals. .

3. Post-Election Requirements

Hand recounts mandated by the Secretary of State are performed.

4. Accuracy

The hand-count method has a very high probability of error. Human vote-counters have historically been inaccurate when counting large quantities of ballots with a large number of races. The probability of 90,000 computations being perfectly entered for the record by hand is low. The probability of 90,000 computations being accurately condensed into cumulative totals is low.

5. Method

All tabulation is manual. Calculations can be performed by computers, but totals must first be hand-entered. Methods for confirming the count vary.

6. Speed

Manual tabulation of ballots is a slow process. Speed depends on the number of counters, the number of ballots, the number of races on the ballot, and the number of disputes and ballot resolutions to be resolved. It also depends on the time it takes to compile the results into a format that can be distributed to the public. The time required to release final returns would be measured in days.

7. Public Accessibility of Returns

Once results are handed to central count, they are compiled into a format that may be distributed to the public. This can be through the Internet or via hard copies.

8. Transfer to TV

TV stations report results through an AP transfer or using Internet returns.

9. Transfer to Public

The public has immediate access to returns once they are posted online. Members of the public may also request a spreadsheet of the precinct breakdown of all races once the spreadsheets are available.

10. Internet

Current and archived results are available on the Internet.

IX. Backup, Audits, Recounts

A. Types of Backup Necessary

Voted paper ballots would not be backed up.

B. Types of Audits Necessary

The mandatory recount as directed by the Secretary of State and the verification of the signature rosters against the number votes cast on the machines are performed.

C. Methods for Recount

Recounts are performed manually.

X. Independence

A. Reliance on Outside Vendors

Other than using a certified printer, no vendor participation is necessary.

B Election Preparation

No vendor assistance is required in election preparation.

C. In Field

No vendor assistance is required in the field.

D. Tabulation

No vendor assistance is required for tabulation.

E. Post Election

No post-election vendor assistance is required.

XI. Transparency

See this section under DRE voting.

XII. Security Risks

A. Physical

1. Pre Election

The following safeguards must be in place. All equipment must be physically secured and protected at all times against malicious tampering and environmental mishaps (such as water damage). The ballot programming equipment must be guarded at all times against malicious tampering, machine failure, and environmental mishaps. All paper ballots must be physically secured and protected at all times against malicious tampering, theft, illegal duplication, and environmental mishaps.

2. Ballot Creation

Safeguards must be in place to guard against malicious tampering during ballot creation (such as using encryption keys, passwords, and segregation of duties). The paper ballots must be protected against theft, and environmental mishaps.

3. Distribution to Field

Safeguards must be in place to prevent loss of or tampering with equipment during distribution to polling locations. The paper ballots must be protected against theft, malicious tampering, illegal duplication, and environmental mishaps. These goals can be achieved through inventory control for tracking, timely delivery, and strict documentation through chain-of-custody forms.

4. In Field

Safeguards must be in place to prevent theft of, physical damage to, or tampering with equipment and paper ballots at polling locations. The paper ballots must be protected against theft, illegal duplication, and environmental mishaps. A security

protocol must be developed to securely store large quantities of unvoted ballots at early voting locations.

5. At Closeout

Safeguards must be in place to ensure that all paper ballots are surrendered properly and all surrendered documentation is thorough and accurate. At early voting closeout, all unvoted ballots must be thoroughly inventoried.

6. Delivery to CCS

Safeguards must be in place to ensure that all votes are safely transported to the central counting station and that all voted ballots and unvoted ballots are accounted for and protected.

7. Tabulation of Returns

Procedures must exist to control the flow and tracking of ballots as they pass to counting teams throughout the polling/counting location.

8. Post-Election Night

Safeguards must be in place to ensure that all paper ballots are securely returned, documented, and inventoried.

B. Electronic

1. Pre Election

Tests and safeguards must be in place to protect against malicious programming of and tampering with ballot programming software and equipment firmware and software.

2. Ballot Creation

Tests and safeguards must be in place to protect against malicious programming of and tampering with ballot programming software.

3. Distribution to Field

Tests and safeguards must be in place to protect against malicious programming of and tampering with equipment firmware and software.

4. In Field

Tests and safeguards must be in place to protect against malicious programming of and tampering with equipment firmware and software.

5. At Closeout

Tests and safeguards must be in place to protect against malicious programming of and tampering with equipment firmware and software.

6. Delivery to CCS

Delivery to CCS will vary depending on the type of electronic accessibility unit chosen.

7. Tabulation of Returns

Tabulation of returns will vary depending on the type of electronic accessibility unit chosen.

8. Post Election

Tests and safeguards must be in place to protect all ballot and equipment inventory from tampering.

XIII. Costs – See Cost Analysis (Exhibit A)

XIV. Future Needs

A. Population Growth

As population growth creates greater ballot complexity, new features (such as the ability to print ballots on demand) must be included if voters want to preserve paper ballots. The hand counting of ballots presents enormous challenges for large urban areas.

B. Does the system meet future needs?

See Study Group Recommendations

Appendix C

Evaluating Security for Travis County Voting Systems By Brent Waters

Evaluating Security for Travis County Voting Systems

Brent Waters

May 5, 2009

Issues Facing Us

Dana DeBeauvoir has asked us to evaluate the Travis County voting system. The goals outlined were to look for a system that was accurate, reliable, and maintained voter privacy. In addition, we would like to have a system that is transparent — in that it is easy to evaluate and determine if there are issues.

In addition to evaluating the current systems, one goal of the study group is to be forward-looking. That is we should look for solutions and not just problems.

Difficulty of Evaluation Determining and quantifying the security of systems is notoriously difficult. While risks from natural occurrences can often be quantified and tested, it is very hard to predict what strategies a determined and creative attacker might take.

This makes our job difficult in several ways. First, the benefits of “testing” the security of a system is limited, since we might be testing for attacks we thought of, but not the ones an attacker has. Second, the fact that a system has (apparently) not had issues in the past does not give strong guarantees for the future. It could be just that no one has attempted to attack it yet.

Worst-Case Protection and Transparency In comparing different systems, it is helpful to define what the goals are. No voting system is perfect and we will likely find that different systems have tradeoffs.

With electronic voting systems it is important to look at two main criteria: worst-case failure and transparency. All voting systems face reliability issues. For instance, people are well aware of “hanging-chad” issues in punch card voting systems. In some systems, reliability issues might be more localized or limited (e.g. a lost ballot box or a small percentage of poorly marked ballots). One concern about electronic voting systems is the possibility of a large system wide failure. This might happen if one voting machine becomes corrupted and infects others. This viral propagation of malicious software is the largest concern of this nature. In evaluating voting systems, there might be tradeoffs between average convenience and protecting against worst case scenarios.

Another important issue is transparency. In simpler voting systems, one can observe how they work. For example, one can visually inspect a punch card lever. When working with DRE machines, it is impossible to visually discern anything about what the machine is doing. Hash integrity checks are also unreliable. In addition, we would like to be able to conduct an analysis in the case of strange behavior.

The Importance of Defense in Depth One important term in evaluating security systems is “defense in depth”. This generally refers to having a system with robust security that remains secure even if certain safeguards are bypassed.

For instance, the Travis County voting system is a complex process that helps to ensure security in part by specifying procedures and protecting equipment with tamper-resistant seals. Instead of asking ourselves “What is the security if these procedures are followed perfectly 100% of the time?”, we should ask “What is the security if these procedures are followed 99% of the time, but 1% they are subverted?”.

Hart System and Leveraging Prior Inspections The current system uses the Hart DRE voting with no paper trail. Two years ago, a review of this system was performed in California [2] by Inguva et. al. and independently by Butler et. al. [1] The review (as noted to the authors) was limited to inspecting the source code of the both the front-end (JBC, eSlate) and back-end software. In addition, the authors had interaction with a team that had physical access to the machine that verified some of their attacks.

One important point is that the review team limited itself to the narrow scope of evaluating the security of the voting system in isolation. In particular, they did not evaluate the system in a larger context that includes voting procedures and tamper-resistant seals. We might derive two somewhat conflicting conclusions from this. First, it is possible that some of the attacks might be hard to mount in the context of a real voting systems. On the other hand, it is entirely possible that if a larger system wide review was actually done, the team would have discovered attacks on the whole systems (even when procedural safeguards were in place).

While the report was quite extensive, high-level issues included:

1. No authentication for managing devices: Several devices can be updated with potentially malicious software, with no authentication checks.
2. The internal checks can be spoofed: The Hart system provides checks for hashing the code and comparing it to a hash value of the correct code. The problem is that the potentially corrupted software performs its own test. This is analogous to letting a prisoner pat themselves down for a weapons check.
3. Cryptography is misapplied: The system designers do not use cryptography in the correct way. For example, the Hart system uses symmetric key cryptography where public key digital signatures should be clearly be applied.
4. Attacks may spread virally: If one component is compromised it might spread to others

From reading (portions) of the report, the overall perspective one receives is that if an attacker gets access to the machines or voting storage cards he could subvert the entire system. Moreover, this could be potentially be very difficult to detect.

Where to Go? As Dana noted above, she would like this study to be forward looking and look for solutions. There are several different avenues to explore with different costs and security benefits. Potential solutions might include:

- Changes to procedures. In particular, discarding some equipment after one use in order to sanitize the system.

- Adding on a Voter-Verified Paper Trail
- Replacing the direct recored equipment with an op-scan marker.

“Frequently Asked Questions”

Can electronic voting be securely used? This is not a yes or no question. Computers can be leveraged for many different parts of a voting system. For example, one might use electronic ballot preparation and an op-scan reader, but have ballots marked by hand. It is hard to categorize such a mixed system as electronic or not electronic.

Also, it is important to note that there is a large distinction between whether it is possible to build a secure electronic voting system and whether the current Hart DRE system is secure.

Are these theoretical attacks or are they done in practice? The red-team actually did implement the attack to change the voting machine software.

What about the firmware and software hash checks? These do not appear adequate to test the correctness of the software as noted above.

Are there any known attacks if somehow everyone follows procedures correctly? During the tour, I found an attack on the procedure of handling a JBC machine. According to procedure, if a seal is broken, then the JBC machine is moved out of circulation for that voting period. However, after the machine is inspected with the self-tests (which are unreliable) it is put back into circulation. One possible attack is for someone to corrupt a machine during early voting, but then it will be put back into circulation for election day.

How could we address this attack? Would things be okay then? One might simply discard, any machine that was suspected to be tampered with.

This is just one attack, an attacker could very well find several other vulnerability paths.

Key Points

- Evaluating security is a difficult problem.
- The core Hart DRE system was investigated in prior studies [2, 1]. These studies found several security issues.
- Studying the core Hart system further might be redundant. Our efforts might be better spent performing a review of Travis county procedures and how they relate to Hart system vulnerabilities.
- When going forward there are many different options with different cost-benefit tradeoffs. There are also gradual changes we might look at.

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- [1] Kevin R. B. Butler, William Enck, Harri Hursti, Stephen McLaughlin, Patrick Traynor, and Patrick McDaniel. Systemic issues in the hart intercivic and premier voting systems: Reflections on project everest. In *EVT*, 2008.
- [2] Srinivas Inguva, Eric Rescorla, Hovav Shacham, and Dan Wallach. Source code review of the Hart InterCivic voting system. Part of California Secretary of State Debra Bowen's "Top-to-Bottom" Review of the voting machines used in California, August 2007. Online: http://www.sos.ca.gov/elections/elections_vsr.htm.

Appendix D

Pages 5 - 30 of the Texas House Committee on Elections Texas House of Representatives 2008 Interim Report

A Report to the House of Representative 81st Texas Legislature

Charge No. 1

Travis County Note: Travis County noted a conflict between a statement by Dan Wallace paraphrased on page 22 of the interim report (which says, “His suggestions to the committee were to limit DREs to one per precinct and to manually hand count paper ballots.”) and the testimony of Dan Wallace as documented on his website at <http://www.cs.rice.edu/~dwallach/pub/texas-house-elections25june08.pdf>. (in which he recommends counting paper ballots using electronic tabulators). He posts his entire testimony entitled Testimony of Dr. Dan S. Wallace, Texas House Committee on Elections, June 25, 2008. It reads, “California has taken the step of limiting DREs to one per precinct, to ensure accessible voting, while having most voters using paper ballots. That would be a prudent step to take here as well.

He continues, “Electronic tabulation of paper ballots still has its security risks, but these can be mitigated with hand audits of the paper ballots, which can be conducted between the completion of the election and the certification of the final election results. Such audits involve randomly sampling ballots, by hand, and comparing them statistically to the electronic results. These

audits can be made more accurate if the ballot tabulator were to stamp a serial number on the ballot (i.e., a number which the voter cannot see, but which is recorded both electronically and on paper). This would allow for one-to-one audits of electronic and paper records, greatly reducing the amount of effort necessary to conduct an audit.”

**Texas House Committee on Elections
2008 Interim Report**

Charge No.1

Study the general issue of electronic voting technology, including the issues of general benefits and risks, security and accuracy, paper trails, etc.

Background:

Where did the current voting process originate from? Many probably do not stop to think about the rich history encompassing today's voting methods, the technology used, or the everyday vocabulary society uses referencing elections. Many Americans take for granted the current process and idea of a secret ballot. It is generally assumed voting by secret ballot has existed since the birth of the United States. Despite what is thought, the way Americans have cast their ballots has changed many times throughout the course of 200 years.

Today there are questions and some skepticism among some Americans in regards to current voting methods. Electronic voting machines, within the last 6 years, have taken over at polling places. Questions regarding the security, accuracy, and reliability of these machines enter into the minds of concerned citizens across the country, but are Direct Recording Electronic voting machines (DRE's) really a new idea or are they a thing from the past? Looking at history, one finds these questions and concerns are not new and have been asked with the advent of each new voting method. This does not mean questions of concern have no validity, in fact quite the opposite. All concerns should be looked at carefully. However, before one delves into the problems of today and tomorrow, it is important to look into the past, only then can one have a true and balanced understanding of what may come and what needs to be altered.

In ancient Rome, citizens would cast white or black "ballottas" in an urn, meaning a vote of affirmation or refutation, respectively. The number of white or black "ballottas" would determine who the winner of an election was. The term "ballotta" is the root for the modern word "ballot" and is the Italian word for small ball. This is also where the term "blackballed" originated and today is used to describe rejection or loss of an election. This term having come from when a candidate received a majority of black "ballottas" in their urn, losing the race.¹

The first actual use of paper ballots to conduct an election appears to have been in 139 B.c., and the first use of paper ballots in what is now the United States was in 1629 to select a pastor for the Salem Church.² However, before the late 1800's there was no secret ballot, and campaigning at the polling place was a common and legal practice. Early paper ballots, if used by states, were no more than slips of paper provided by the voters themselves. As time went on, political parties or candidates provided preprinted ballots. These ballots made it very difficult for one to have the right to a private vote. In addition, it created difficulties in keeping voters from putting a number of ballots in the ballot box.

Parties themselves became adept at printing the ballots in such a way that any voter could easily distinguish the ballots from one party or the other. Still, not all states used paper ballots; Missouri, for instance, used the practice of voice voting until 1863. The voice vote provided only modest protection of a contest. There was no ballot box to stuff, however the lack of privacy meant voters were open to bribery and intimidation.³

Despite serious problems with the partisan form of voting, these paper ballots remained the rule until the late 1800's.⁴ It wasn't until 1888 that the Australian Secret Ballot (the ballot Americans know today) was brought to and used in the United States. The Australian Secret Ballot was designed in Victoria, Australia in response to the concern of voter fraud and voter privacy in Australia. In 1858 an election was held using a standardized secret ballot, printed at the expense of the Australian government, listing all candidates for office. These ballots were distributed to the voters at the polling place, one per voter.⁵

The Australian Secret Ballot was first used in New York and Massachusetts in 1888, but the move to the Australian Secret Ballot was slow in the United States. Texas and Connecticut moved by gradual reform from the partisan ballot and did not complete changes until 1905 and 1906. Missouri experimented with the Australian Secret Ballot, but went back to the partisan ballot until 1921. New Mexico did not fully adopt the new balloting method until 1927. North Carolina only required that all counties use the Australian ballot in 1929. By 1940, Delaware still used a mixed system where partisan ballots were still allowed outside the polling place, and while size, color, and typography were strictly regulated, South Carolina still used partisan ballots. The weakness easily found within the Australian ballot system was the subjective interpretation of each mark when ballots were counted. If administered properly, this ballot does make it difficult to cast multiple ballots, however, dishonest election officials can manipulate the counting process.⁶

Throughout the accession of the Australian Secret Ballot (and even before), innovators sought ways to perfect a fair, infallible, yet simple way to vote and to tally votes by machine. In fact, many of the more recent voting methods received an earlier start than some may think.

Direct Recording Election voting machines (DRE's) have an old history. The first proposals for electrical vote recording date back to the mid-1800s. Albert Henderson patented an electrochemical vote recorder for legislative roll-call votes (U.S. Patent 7,521) in 1850. Legislators could vote by holding down an aye or nay telegraph key on their desk and it would remotely print their name in either the aye or nay column on a piece of damp blotter paper kept as the official vote record. Thomas A. Edison refined this idea in his 1869 patent by adding electrochemical counters to count the votes. In 1898 Frank S. Wood proposed a push button paperless electrical voting machine for use in polling places (U.S. Patent 616,174). It wasn't until 1975 that the machine commercially known as the "Video Voter" was used in real elections in Streamwood and Woodstock, Illinois.⁷

Lever machines were on the cutting edge of technology in the 1890's, and were considered the high tech solution for running an honest election as computer-tabulated punch cards would be in the 1960's. Although lever machines were first used in 1888, the Myers Automatic Booth lever machines were first used in 1892 in Lockport, New York. After this use, lever machines were slowly adopted throughout the country. By the 1930's essentially all of the nation's larger urban centers had adopted lever voting machines.⁸

Optical Scanners has its roots in standardized testing. The Type 805 Test Scoring Machine was introduced in 1937 by IBM and performed by sensing graphite pencil marks on paper by their electrical conductivity. These devices were the first generation of machine scored educational tests. The optical scan was developed as an alternative to the electrical sensing system and was first used in the mid-1950's. The first use of marksensed ballots was in 1962 in Kern City, California and was developed by the Norden Division of United Aircraft and the city of Los Angeles. Development of the 15,000 pound system began in 1958 and saw over a decade of use in Orange County California, and was also utilized in Oregon, Ohio, and North Carolina.⁹

There have been many changes since the days of partisan printed ballots and the "cutting edge" lever machines. With the advent of the Help America Vote Act (HAVA), electronic voting machines are utilized by U.S. citizens in every election. Currently, explicit state and federal standards have been established to preserve the secrecy of the ballot, ensure electronic voting machines operate safely, efficiently, and accurately and verify the methods are safe from fraudulent or unauthorized manipulation. Methods such as certification processes, examiners assessing voting machines, different levels of testing, required standards met by manufacturers, and standards and processes county governments must go through when machines are purchased and are set up at the polls are all established to ensure accurate counting of ballots cast. This does not mean these methods are flawless or that they can not be manipulated. There are a number of citizens that distrust the use of electronic voting. Individual concerns lie with the lack of a voter verified paper trail, the possibilities of an internal or external hack which could be executed on one or multiple machines, and the lack of accuracy the machines might have.

Some believe a Voter Verified Paper Audit Trail (VVPAT) is the solution to creating confidence and more secure elections. However, recently it has been discovered the VVPAT may not be the ultimate solution, but potentially will be a waste of government dollars and offers a false sense of security.

Charge No. 1 covers the general aspects of electronic voting. In addition, the charge looks in depth at the use of VVPATs and determines whether or not these forms of paper trails are a good solution for the State of Texas. Once these issues have been covered within the report, the committee will make recommendations to the 81st Legislature on what it believes the best course of action should be.

Security, Accuracy, Benefits and Risks:

History has shown with every voting method comes risks of fraudulent behavior. Electronic voting technology is no different. Are these risks mitigated by the security procedures and certification processes established by federal and state governments? The committee took testimony from the United States Election Assistance Commission (EAC), the Texas Secretary of State's Office (SOS), manufacturers, advocacy groups, computer scientists, and county election officials who use electronic voting technology. The testimony was taken in order to learn exactly how an electronic voting machine is certified, the security procedures and measures taken, and the benefits and risks encompassing the technology.

Matthew Masterson, Testing Certification Analyst from the EAC, testified on the current federal certification program developed and being evaluated. The Help America Vote Act (HAVA) established the EAC and gave it three tasks. The first was the responsibility to distribute and manage \$3 billion in funds set aside for states to purchase voting equipment. The second task was to create and adopt the Voluntary Voting System Guidelines (VVSG) used by non-federal independent testing authorities in assessing and certifying voting systems. Finally, the commission was to accredit voting system test labs and to certify and decertify voting equipment. This was the first time the federal government has been responsible for certifying, decertifying, and testing voting equipment. Before the EAC was commissioned with this responsibility, the National Association of State Election Directors (NASD), a non-profit organization made up of State Election Directors across the United States, certified and decertified voting equipment. Of significance to note, state participation in the EAC program is voluntary, so states may use as little or as much of the program as deemed necessary.

Masterson said the EAC is currently in the process of creating a new set of VVSG, which are being modified to be more user friendly, accommodate the next generation of voting systems, to promote innovation and is a total rewrite of the previous 2005 VVSG. In 2007, the EAC was commissioned to create a testing and certification program independently verifying voting systems in compliance with the necessary requirements established in the VVSGs. Manufacturers became active in complying with HAVA once test labs were accredited under the EAC and submitted voting systems to be tested under the new certification process.

Currently, there are 11 manufacturers registered with the EAC program and 9 machines have been submitted for testing; the first system was submitted in February 2007. To date, as of this hearing, none have been certified. When questioned about the validity of the voting machine certifications in use today, Masterson gave detailed information to the committee. There are different regulations within each state determining which machines are certified to be used. Masterson assured the committee, voting machines currently in use have been certified by NASD.

The EAC does have a quality assurance program in its guidelines, so a state will know individual voting machines have been certified under the program. Additionally, the commission provides a quality monitoring program allowing for investigations on voting equipment when a member of the public brings evidence against a voting system's validity. However, since there have not been any EAC certified voting machines, there have been no investigations. Because this is a voluntary program, the EAC can only regulate those machines registered. Consequently, if a member of the public provides the EAC with evidence of a possible non compliant machine, the commission does not have jurisdiction to investigate said allegations if the machine in question is not registered with the program.

There were questions among committee members of when the first voting machine would be EAC certified. Masterson assured the committee the commission is actively working with vendors and testing labs to get a system out in an efficient manner; however the EAC was not going to compromise the quality of the testing for the need of expediency.

There have been five voting system testing labs accredited by the EAC. These labs are initially reviewed by the National Institute of Standards and Technology (NIST) through its National Voluntary Laboratory Accreditation Program (NVLAP) and then provides a recommendation to the EAC on laboratory accreditation. To date Wyle Laboratories, Info Guard Labs, iBeta Quality Assurance, Systest Labs, and the newest addition of accredited labs CIBER, Inc. have all been successfully accredited voting system laboratories under the commission's Voting System Certification and Testing program.¹⁰

Systest Labs has been providing Independent Software Test Engineering and Quality Assurance since 1996 and has its roots in testing and verification of technology rich complex systems developed by the Department of Defense. It was one of the first Companies accredited by NIST under NVLAP and sponsored by the EAC as a Voting System Test Lab (VSTL). Before it was accredited by the EAC, Systest Labs was accredited by NASED and is currently engaged in or has numerous consulting and certification projects directly for Secretaries of States, Attorney Generals, and/or County Election Directors and Officials, which are separate from work performed for the EAC. Representatives from Systest Labs testified before the committee regarding the process manufacturers must go through to receive certification.

Many tasks go into electronic voting system risk reduction. Each project starts by determining the scope of the project or how much testing is needed to qualify, certify, or accept a voting machine. The manufacturer seeking certification submits a Total Data Package (TDA) including detailed documentation, source codes, and hardware specifications of the products being tested. After a review of completeness, detailed test planning is performed. A Physical Configuration Audit (PCA) is performed on the product to test for any discrepancies between documentation, source codes, physical configuration, and the manufacture's prior testing results. All discrepancies are reported to the manufacturers for resolution and reexamination.

All hardware, software, and firmware are tested during the Functional Configuration Audit in environmental chambers and test labs to make sure all standards are met. This is followed by security testing directed at the effectiveness of physical and electronic controls employed to protect critical voting system elements. Penetration vulnerabilities of network and internal origin are also tested and verified.

The committee was informed the thorough testing performed resulted in identified discrepancies within most voting systems. These discrepancies are sent to the manufacturers to be analyzed, corrected, and retested. As test programs progress additional discrepancies will continue to be found only to be fixed and retested for the benefit of the public. The representatives at Systest believe this is a solid test program helping reduce risk and improve product security and accuracy. These tests are taken seriously with the manufacturers. As Peter Lichtenheld of Hart Intercivic said, "It is like taking a test; you don't take the test until you are prepared. Our machines go through internal testing then to an independent test lab, and then it goes on for the real test for review before the Federal process. We want them to work."

*The committee would like to note that on October 29, 2008 the EAC notified Systest Laboratories Inc. with intent to suspend its accreditation as an EAC certified test lab. This decision was based on an earlier suspension of accreditation by NIST. The suspension came after an on site review conducted by NVLAP with EAC and NIST representatives present discovered non-conformities with accreditation regulations. Nonconformities included failure to create and validate test methods, improper documentation of testing and unqualified personnel. The EAC requires that all test labs must hold a valid accreditation from NIST/NVLAP.¹¹

Systest responded to the EAC within its three day deadline to refute the NIST suspension. A letter to the EAC from Systest Labs. Inc. Vice-President of Compliance Services, Mark Phillips, indicated that all staff conducting voting system testing are degreed and experienced testing professionals who have passed Systest's audited and approved internal training and testing curriculum. Systest believed during the stressful conditions imposed by close observation, which included questioning and interviewing by up to eight NVLAP representatives, some of their staff may have not provided complete responses but does not believe this constitutes a reason to suspend accreditation.

In regards to the validation of testing methods Systest Labs argued while NIST required observation of actual testing of a voting system, the only testing available that day were initial trial tests being run for the first time. Due to the newness of these tests faults were uncovered. Systest agreed with recommendations given by NIST and submitted a package to NVLAP outlining the procedural changes Systest plans to make in response to the recommendations. Discussion revealed the requirements for testing methods and readiness testing have been interpreted differently even between NVLAP members. Systest also asked if there was a more effective or clearer test method documentation and validation process. NVLAP representatives' response to this question was other labs have had issues in this area as well. Based on their constructive response and ability to rapidly

remedy this area, Systest believes suspension of their accreditation was not warranted.

Systest Laboratories Inc. was suspended the day Mark Phillip's letter was received by the EAC and is not allowed to perform any testing on voting machines for the EAC until the situation is remedied. Under EAC rule Systest Labs. may request an opportunity to cure its non-compliance issues within 20 days of suspension. Committee staff spoke with Vice President of Compliance Services, Mark Phillips, on November 12, 2008 to receive updated information on the subject. Mr. Phillips assured the committee this was a minor set back. He stated Systest is currently executing a cure plan in concert with NVLAP and will rectify all identified areas by Dec 8th. The next step will be for NIST and the EAC to verify that they have actually made these changes. Systest Labs is asking they do this not later than Dec 15th.*

Once these systems are certified federally they must then become certified through the State of Texas before being put on the market. The Secretary of State (SOS) requires new systems and modifications to previously-certified systems to be qualified by the EAC with the 2002 version of the VVSG or newer. The Texas Election Code requires all voting systems be approved by the SOS before any electronic voting machine is used in any election. Texas uses three major manufacturers to supply its voting needs: Premier Election Solutions (formerly Diebold), Elections Systems and Software (ES&S), and Austin based Hart InterCivic. As heard from the manufactures Hart Intercivic serves 104 counties within the state with a total of 30,000 pieces of voting equipment, ES&S does business with 183 election entities including 146 county jurisdictions for a total of 11,000 pieces of voting equipment, while Premier services 7 counties. All of these machines must not only go through the federal process of certification, but the state process of certification in order to make it to any polling place.

Former General Counsel to the SOS, Jay Dyer, explained to the committee the process the SOS uses to certify these electronic voting machines. He also informed the committee on the follow up procedures in place keeping these machines secure once they are deployed. Before a machine is even considered by the SOS it must demonstrate it can essentially pass the tests of two outside entities, independent testing authorities, and the EAC guidelines. If it does not meet the seals of approval by anyone of these entities it does not come through. Once the machines are received by the SOS they are reviewed by six examiners, three appointed by the Attorney General's office and three appointed by the SOS. These examiners review the systems to make sure they comply with the statutory requirements set out in Chapter 122 of the Texas Election Code.

After the review each examiner files a report with recommendations on whether or not a system should be certified, which may be public ally viewed on the SOS website. Once the reports are submitted the SOS holds public hearings and takes public testimony. (Each testing date and public hearing date may also be accessed by the public through the SOS website). After all information is considered the SOS will make a determination of whether or not the system should be certified. What will occasionally happen is voting machines will be conditionally certified meaning if a concern has been raised with a

machine, the SOS will only certify it if the concerns brought up are resolved. If those concerns have not been resolved then that machine is not certified.

Mr. Dyer pointed out to the committee after a machine is certified it only means it has met statutory requirements. What it does not mean is the voting machine standing alone has a 0% chance of having any kind of problem under any circumstances. The security of the voting method is not in the machine alone, but in the entire process making up the voting method.

What is done to minimize those risks of having a machine's security breached has a multifaceted answer the SOS believes is training and awareness. The SOS spends significant amounts of energy in training county election officials the ins and outs of these voting systems and assists them with security plans. Staff within the SOS is constantly thinking of "what if" scenarios that could happen within an election, so those possible "what-ifs" may be mitigated before they occur.

The SOS has developed best practices or a series of advisories for all county election officials in regards to the security procedures running an election. Mr. Dyer made an important observation, "To say that you have an SOS certified system and I don't have to be careful or worry about any other process, I think would reveal a serious level of misguidance on what it took to run a safe and secure election. To say we can completely eliminate the risks with this medium by using another medium would also be misguided, because whatever medium you are using you have to surround it with processes, seals, tapes, security, whatever, because you are dealing with a human endeavor. You minimize the risks of human error whether deliberate or accidental. "

It was the view of the SOS if the right protocols, structure, and training are in place; the electronic voting method is more accurate because it does remove the human factor in the counting process. The SOS did warn the committee that if or when the legislature decides to layout standards for electronic voting machines, that it is mindful of current processes at the time and is careful not to adopt a standard applying to a machine not yet created.

Throughout the hearing the issue of the time it takes to certify these machines was brought up, not only by manufacturers, but by election officials as well. David Beirne, Executive Director of Election Technology Council (ETC), spoke on this issue. The ETC is a 501 (c) 6 trade company whose membership represents over 90% of the voting technology in the market place today. His testimony illustrated one example of the challenges manufacturers must deal with. He said earlier in the United States Session, Congress was proposing a bill which would have legislated technology not even in existence at the time and would not have been for the anticipated deadline. The entire life cycle for new development of an electronic voting system is 54 months. New product certification lasts alone up to 12 months, with an additional period for state certification.

Mr. Beirne stated the federal certification process still has not yielded a single

certification, but has increased cost by 300%. The challenge with certification is it directly affects the industry's ability to respond quickly to the growing and changing customer demands. Many increased costs regarding the certification process affects the entire industry. Manufacturers must recoup certification costs in some way, and more than likely do so at a county level. Dallas County's manufacturer took one and a half years to become certified for a version of the software which is now two versions old. Bruce Sherbet (Dallas County Elections Administrator) believed the counties could receive newer and better software if the certification process was completed quicker.

Once a machine is certified it is up to the counties to decide which manufactures they would like to purchase from and which machines they wish to purchase. After those machines are purchased another level of security procedures are put in effect. Dana Debeauvoir (Travis County Clerk) expressed her sincerity when she said to the committee, "Virtually all of us take the viewpoint that the only way we can sleep at night and say to our voters yes I'm certain that your vote is being counted correctly and say that to them and mean it is if you do extensive testing." Dana took the committee through the security process counties implement when handling the machines.

Before elections are even considered and machines are bought, all county election officials must perform acceptance testing from manufactures before a county claims a product. Acceptance testing is done so counties may verify the product they are receiving is legitimate and all components within that system are performing to their required specifications. This testing is not done just once when machines are bought, but also when upgrades are in progress. All testing information is then retained on record.

After purchasing the machines every county goes through security procedures in order to properly carry out an election. The basic testing all counties are required to perform under state law is Logic and Accuracy Testing (L&A testing). This form of testing is done manually and is recommended to be done as much as possible. If a mistake is made during L&A testing the county must start over and repeat the process.

After all candidates are set up in the proper precincts etc. and are in a spread sheet a known stack of data is entered into the machines covering all possibilities of blank votes, over votes, under votes etc. Once the machine goes through all of the data, the results taken from the machine is compared to the data entered. This testing verifies all candidates are in the proper place on the ballots and everything is in the correct precinct.

The second kind of testing recommended, but not required is hash code testing. This test compares programs being used by the county to those programs on file with the SOS and at the NIST library. Hash code testing assures the software county election officials are using is the correct software and assures it has had nothing added or subtracted from the program.

A third form of testing catching on is parallel testing. This form of testing is more expensive, time consuming, and tedious so it is not done within all counties. Parallel

testing deceives the voting system into thinking it is in a real voting environment and not a test environment. Ms. Debeauvoir explained if anything has been planted in a machine and has not been found by previous testing methods it will show up during this test.

To perform parallel monitoring, machines are pulled out randomly from a precinct and are set up in a secure room, preferably under surveillance. Throughout the day, as done in Travis County, staff is asked to enter "votes" from a test deck into the system as if it were Election Day. At the end of the day the results are tabulated and taken from the machine and then compared with the test deck. This technique allows the machines to be used as if it were Election Day uncovering any possible "hacks" that could have been imbedded into the software. This not only proves the correct software is being used, but proves the voting machine has performed as it would have in the field.

Currently L&A testing is the only required testing in the State of Texas, while both hash code testing and parallel testing are only recommended. What can be done in Travis or Dallas County may not be able to be done in smaller counties due to lack of resources. Ms. Debeauvoir said all test processes are necessary and if all are done properly she believes the confidence level in machines could be 95%. Bruce Sherbet, with the support of other county officials, believed it would be wise when talking about parallel testing and hash code testing that the state had a standardized system in place for all counties, and finds it troubling Dallas County might be doing it different than Tarrant County, who may be doing it differently than Bexar. Standardizing the system would benefit the counties as well as the state so when advocacy groups ask what is being done, the answer among the counties will be the same. Sharon Rowe, of Collin County, explained she would like to go to parallel testing, but said party chairs in her county have told her they are not interested in parallel testing and do not believe it is necessary.

Testing is not the only form of security procedures done on a county level. Ms. Debeauvoir gave the committee a handout on the security procedures Travis County goes through. New, enhanced, or continued security practices in Travis County are:

- Provide public invitation to attend all programming and testing activities
- Maintain written procedures and initialed tracking sheets
- Maintain independence from vendors
- Recruit, screen, and train skilled and trusted employees
- Coordinate emergency management plans with other relevant agencies
- Use Sheriff and Constable Officers to secure early voting electronic ballot boxes
- Improve security for the building where election activities occur
- Implement employee procedures that lower risk
- Conduct extensive pre-purchase testing of new equipment or software
- Provide continuous functionality testing of equipment
- Conduct Hash Code Testing on software
- Perform High Volume Testing of ballot programming
- Perform Parallel Testing
- Conduct Early Voting and Election Day audits by matching counts of voters by

location as reported by the electronic voting system to the number of names on signature rosters

- Conduct post-election verification using the three redundant electronic sources, paper results printed from the electronic ballot boxes, and precinct-by-precinct election results

All election officials agreed all voting systems have risks whether someone is voting by machine or by paper ballot and these systems are parts of a larger process. The security measures are not just in one step, but in many steps. It was pointed out by the election officials with the passing of time and with the experience and knowledge they have gained the less dependent on the manufactures they have become. These officials take extra precautions they feel are necessary so elections may be run in a safe and secure manner.

County election officials have developed risk assessment models or lists of real risk scenarios threatening elections and then develop lists of ways to prevent, mitigate, or recover from those risks. Counties through out the state go to extra lengths to protect their elections. Galveston County conducts a minimum of three L&A tests and invites the public to attend these tests. They also do not use a vendor to program ballots. Even printing and tabulating ballots are all done within Galveston County.

According to Steve Raborn (Tarrant County Election Administrator) Tarrant County is taking more and more security precautions on their own accord. They have added physical security in their own buildings, controlling access, increasing the changing of custody procedures, and have improved the inventory system so they can tell at any moment where a machine is located. Sharon Rowe, Collin County Election Administrator, testified that all coding is done in house and everything is managed on a county level. She said Collin County has security logs on everyone who enters the polling place who is not a voter.

Another security measure in place through the SOS is the mandatory partial recount done after each major election. As Elizabeth Hanshaw-Winn, the Director of the SOS Elections Legal Division stated the SOS does not reveal to the precincts or counties who will be chosen to be audited, leaving the process very secretive. This audit has been done for a number of years and was put in place during the eighties. The SOS uses the paper audit trails all machines are required to have under HA V A. HA V A prescribes in code all systems being used in an election must have a permanent paper record for the purpose of a manual audit.¹²

Dana Debeauvoir proposed a system akin to the one implemented in Georgia that would support all counties and allow, among many things, all methods of testing within every county, small and large. Individually, it is almost impossible to implement all procedures and tests because of funding, but through a Texas Election Center she believes it could be accomplished. The Election Center would be a clearing house for all election officials. It would perform research, train staff and volunteers, train and employ trouble shooters for

voting equipment, assist with ballot design, provide parallel testing (along with other forms of testing), and address many other issues. For example, if Texas wanted to parallel test voting equipment across the state, they would have the opportunity to do so through the center. This center could be housed or run by one of Texas's own universities and would be funded by the state.

Manufactures testifying before the committee agreed with county election officials. David Beirne of ETC stressed the integrity of all elections comes down to a balance of prevention versus detection. The ETC, in an effort to assist election officials with providing security measures released "Safe Guarding the Vote" a document outlining the various procedures that can be incorporated by state and local election officials for the 2008 Election. Mr. Beirne referred back to a statement made in a report done by the Government Accountability Office on a contested United States Congressional Election in Sarasota County Florida; election integrity comes down to a system of people, process, and technology. Mr. Beirne and the manufactures he represents believe the Texas Legislature and the SOS should use these three components as a guide when assessing the election integrity and reliability of voting technology in Texas.

What happens, Mr. Beirne pointed out, is the complex mixture of personnel, procedures, and technology can result in straight forward human errors and when this happens unfortunately the media inaccurately and automatically attributes these errors to technology.

Edward Perez is the Manager of Election Services for Hart InterCivic. He has worked in the public sector for six years as a professor, worked in the Texas House, has been a trainer in the field, has been in the trenches, and has personal knowledge of the dedication that counties put into their elections. Mr. Perez testified that some trouble the industry does have is putting their hands around standards and being able to get through a certification process that is not so costly. The issue is developing a product which does not price them out of the market and can still move fast enough the machines can actually serve their customers.

An issue vendors must overcome is the mosaic of standards in place across the nation, because every state's standards are different. The important issue which must be weighed by the vendors according to Mr. Perez is security, usability and cost. This combination makes it very complex to fulfill. A vender does not want to make a machine so secure it is unusable or unaffordable, but they do not want to make a machine so affordable and so usable it is completely unsecure. Vendors want to develop a product hitting all three marks: security, usability, and affordability. Mr. Perez stated, "There is a valid and significant citizen concern about the vote, which absolutely needs to be addressed. The absence of information means the absence of innovation and serving our customers, and addressing those concerns is also hampered because we don't have clear standards."

Hart Intercivic representatives shared with the committee the issues they see with their customers during election events and described the most common issues they see with

voting systems today along with solutions to these issues.

These issues are:

- Public perception that the process is not transparent - This can be resolved by opening up our elections offices and their processes to the public. Let those who are interested watch as ballots are laid out, equipment is prepared, and votes are counted. Hart can also do things, as a voting system provider, to be more transparent and we are working on those solutions. Currently, we routinely escrow our voting system code with State and Federal authorities, so we do have a form of disclosed source code in place.
- Issuing an incorrect ballot style to a voter - This human error has been the bane of elections for many years, especially in complex jurisdictions, no matter what the voting method. To avoid this error in Travis County, for example, poll workers repeat the precinct number as displayed on the voter record and again on the Access Code when handing the Access Code to the voter; Harris County poll workers write the precinct number on a slip of paper and compare it to the printed Access Code; during Early Voting Tarrant and Montgomery counties use an electronic poll book to print the precinct number to a bar code and scan the bar code to generate the voter Access Code (thus avoiding human error).
- Inadequate electrical supply at a polling place in combination with weak batteries or no batteries installed - Jurisdictions should test electrical outlets when qualifying polling places for use and use battery back up and/or Uninterruptable Power Supplies wherever possible.
- User training-related errors - Often jurisdiction staffs are too busy and/or have too little county funding to pay for new employee or review training. Because they don't run elections everyday, the forgetfulness curve kicks in. Of course, the same is true of poll workers. Poll worker training needs to be hands-on, taught by staff members who know what they are talking about and reinforced with practice as well as clear and consistent documentation. Poll workers have a LOT of responsibilities on Election Day, and they deserve excellent hands-on training and support.

After security the next issue most commonly brought up is the accuracy and trustworthiness of voting equipment. Are they accurate? Can the public trust the equipment? Testimony from all county election officials assured the committee they would not be able to stand behind the machines they use if they did not think they were accurate, secure, and trustworthy.

Steve Raborn believes the systems Tarrant County offers are secure, trustworthy and accurate and thinks the 41 % turnout rate during the 2008 Primary Election speaks for itself. Bruce Sherbet has been an Election Administrator for 21 years. In that time he has

seen Dallas go from lever machine to punch card, to pc based punch card, and then in 1998 to optical scan with punch screen. He believes through electronic voting the state has taken 3, 4, or 5 steps forward and the State of Texas is much better off with the technology. He added this did not mean the technology did not need to be improved upon, but it is better than what Texas has had in the past. Mr. Sherbet stated the most inaccurate form of counting method he has seen is the hand counted paper ballot.

Joy Streater (Comal County Clerk) spoke on the accuracy of electronic voting machines vs. paper ballots, "If you give me 999 votes being counted out to 9 people making hash marks, I will give you 999 different tallies maybe 4 or 5 times". As Ms. Streater pointed out once poll workers arrive at 4:00 a.m. at the polling place, work through out the day, by nine p.m. they are brain dead. This human element is what county election officials agreed to be what causes the most errors in elections.

In fact what concerns Steve Raborn is the call to move to hand counted paper ballots. Mr. Raborn, who has had 25 years of experience, can not think of a method that has the potential for causing problems than the hand counted paper ballot. The error rate he believes would exceed what is found in electronic voting. Allison Harbison (Shelby County Clerk) stated she has had a recount nearly each election since HAVA and none of them have ever changed the outcome of a race. Galveston County Election Coordinator, Douglas Godinich, believed with the 36 or 50 different ballot styles being used it would not be possible to go back to paper. The simple logistics of conducting elections in this day and age he explained would not make it possible. He also informed the committee he does not believe Galveston County would have been able to produce the kind of turnout if not for the machines they use in conjunction with the paper ballots.

Other benefits shared by county election officials were the efficiency of counting ballots and being able to provide easier access to the disabled population. More access for the disabled was an important benefit brought up during the hearing. Bryson Smith, who represents Adaptive Texas and is disabled himself, shared his testimony with the committee. He believes with the advent of the DRE he has been able to vote much easier and more privately as compared to the past. Machines, he believes, has helped voter turn out within the disabled community.

Dennis Borel, the Executive Director of the Coalition of Texans with Disabilities (CTD), agrees with Bryson. Since HAVA was adopted the CTD has been working with the SOS, presenting at election law seminars and conducting surveys to the disabled. As Mr. Borel pointed out Texas has a history of the disabled community not participating in its elections and should focus on the disabled. He stated in 2003 there were 3.2 million disabled people in the State of Texas. Not all required assessable voting machines, but with the voting age getting older the number is only going to rise. Both Mr. Smith and Mr. Borel agreed the use of voting machines has given the disabled a much more private voting experience than what was available before.

Mr. Borel was part of a focus group dealing with the disabled communities' involvement

with elections and said the question amongst the disabled that got the most attention was: How much do you value the private ballot? A secret ballot was very important to all who answered. Another important question asked was whether or not the machines they voted on were accessible. Of the Texans that responded 87% with blindness said the machines were easier than prior methods. Eighty-three percent who were mobility impaired and 86% who were hearing impaired said the machines were more accessible than before.

When asked whether or not the disabled community believed the voting machines were secure, Mr. Borel cited a study done by the American Association of People with Disabilities. In this study they surveyed the disabled community on what their expressed confidence was on security and accuracy of the different types of voting methods. Sixty seven percent had confidence in the DREs, 64 % had confidence in precinct county scan, 36 % expressed confidence in the vote by mail method, and 28 % had confidence in internet voting.

He stated he did not doubt there was some "technical evolution" that needed to happen, but the fact was machines were a better process than what was in place before. The number one complaint Mr. Borel presented to the committee from the disabled community was poll worker training and explained there needed to be more emphasis on demonstration accessibility features or avoiding setting up machines in difficult areas for the disabled to get to.

While the testimony among our own county election officials commended the use of DREs some states have gone to extra lengths to make sure their certified machines are in fact what they say they are. There have been reexaminations of state and federally certified voting systems across the United States which has led to decertification and questions open to the actual security of DREs. California is one of the most well known instances of a reexamination of voting machines.

The California Secretary of State contracted with the University of California to conduct a top to bottom review of all the voting machines being used in California. The goal of the review was to test the security of the three electronic voting systems, two of which are used in Texas. Matt Bishop a University of California at Davis computer science professor led a team on assessing vulnerabilities and said he was surprised how easy it was for his team to break into the voting machines and added that if given more time they would have been able to find more problems.

Each "red team" was to try to compromise the accuracy, security, and integrity of the voting systems with out making assumptions about compensating controls or procedural mitigation measures that vendors, the Secretary of State, or individual counties may have adopted. Under those conditions each "red team" was able to breach the security of all three systems.¹³ The summary states when developing scenarios "red teams" made no assumptions about constraints on the attackers. As taken from the review, "The results of the study must be evaluated in light of the context in which these election systems are used. This emphasizes a key point often overlooked in the discussion of the benefits and

drawbacks of electronic voting systems: those systems are part of a process, the election process; and the key question is whether the election process taken as a whole, meets the requirements of an election as defined by the body politic." ¹⁴

The reviewers stressed no computer system or computer based system are made completely secure and the managers of these information technology systems must develop sufficient controls within the process in order for the system to meet specific standards and requirements. An information technology security plan they believed included three issues of interest in the field of electronic voting systems: physical security, security training of staff, and contingency planning. It was further pointed out any security system when dealing with technology traditionally relies on layers of mechanisms, not just one layer. ¹⁵

Red teams of the Top to Bottom study in California did mention issues regarding the capability of the review. One was lack of time, they believed if they had more time they would have been able to uncover several more vulnerabilities, but because of time constraints teams had to discontinue studies for the purpose of preparing reports. Another issue was the lack of information. Some documents were submitted too late to be of any value to the research. ¹⁶

Red teams identified several vulnerabilities and presented several scenarios' in which these weaknesses could be exploited to affect the correct recording, reporting, and tallying of votes. The study pointed out vendors should assume the components of their machines will be used in un-trusted environments and should therefore place mechanisms within the machines withstanding determined attacks. ¹⁷

All manufacturers testifying before the committee rebutted the reviews by agreeing even though the reviews have varied they have lacked the important components always considered during federal and state certification testing, i.e. election equipment and technology designed to be used, not in isolation, but in an environment of people and processes.

Representatives from Premier informed the committee while they may not have agreed with the methods used in these different reviews, they do take them seriously and are always working on developing new ways to increase the reliability, functionality, and security of their voting systems. Again, because of the time it takes to get certified manufactures believe they are unable to provide the new innovations to the county election officials in an up to date manner. The problem being security enhancements designed for new systems are still in the certification process. They have, however, included additional layers of defense in the new machines and believe if states can be patient they will benefit from the extensive testing being done.

While these reviews may provide important information about system architecture in a way that casts light on questions of security, it should not be mistaken as a realistic environment. This realistic environment is filled with election professionals, safeguarded

equipment, pass words and physical barriers which inhibit corruption. David Beirne, with ETC, said since the reviews neglected to include current election administration security guidelines and the machines were tested within an operational vacuum they have damaged the public perception of electronic voting equipment.

Even with the increased security procedures there are still those who believe voting machines should not be trusted. The committee took testimony from both local and out of state witnesses stating their cases against electronic voting machines.

Clint Curtis, a programmer who worked for Yang Enterprises in 2000, shared with the committee how easy it is to install an internal hack in a voting system. Mr. Curtis flew in from Florida to share with the committee his concern and experience. His concern was not an external hack, but an internal hack. An internal hack involves someone, who from within a company, programs the hack within the actual code of the program. There are millions of lines of code within a program defining what is seen on screen. One line of code amongst millions of lines of code can be built within the program "hacking internally" to disrupt the program and can be activated by anything such as a date, time, etc. Once it is turned on, the voting machine is merely following the directions that were programmed in it.

According to Mr. Curtis's testimony while working for Yang Enterprises he was approached by, among others, the incoming speaker of the Florida House of Representatives with a request to create a touch screen based program with hidden "buttons" planted inside the programs code. This program would be designed to flip votes during an election. Believing this was a project to learn how to mitigate electronic vote tampering, Mr. Curtis built the program. He wrote an additional program counter acting the vote flipping program. Upon delivering the program he was told the program was not built to stop potential flips, but to actually flip votes.

He delivered the program, but is unaware if it was used. Florida's law, he states, allows one to build a machine with the capability to flip votes, it is just illegal to implement such a program. The point Mr. Curtis made to the committee was the entire method of voting electronically is based on trust. Trust in the manufactures; trust in manufactures' employees and so on. He stated it would not take much to flip an election, and with a program he designed he showed the committee how it could be done. The Secretary of State's Office pointed out the problem with such a program is the current rate of time it takes to certify a voting machine. A person who were to write such a code would have to know years in advance who was going to be on the ballot before the actual election. Only then could the program be effectively carried out.

Dr. Dan Wallach is a professor at Rice University whose research focuses on computer security and has been researching electronic voting systems since 2001. He also worked for the California Secretary of State during the 2007 Top to Bottom review. He disagrees with the talk in regards to what was done in the reviews in California and Ohio.

Statements negating threat models, or that the study did not consider how poll workers operate he says are incorrect and all were considered. While all voting systems do have flaws, he believes electronic voting systems have a variety of security flaws enabling fraud of a scale and simplicity previously unknown.

Dr. Wallach cited practical voting machine errors he believes plagues voting technology. Human error is one main cause of failures with voting machines. While investigating a race in Webb County involving an incumbent and challenger, Dr. Wallach was unable to produce any evidence of actual fraud but was able to produce procedural errors on a county level.

He additionally cited findings from a report put together by Rice. For this study Rice created a DRE system that would lie on screen. The purpose of this project was to find out how many people would actually notice if a vote was changed or not. They discovered 60% of the test subjects did not notice when the review screen was manipulated. Still 95% reported they felt the review screen was useful and preferred the DRE to other methods of voting.

Dr. Wallach also brought up the issue of security vulnerabilities. When working for the Secretary of State of California he was on the team examining the Hart Intercivic systems. His team found an attacker could plug into any Hart eSlate machine and send it a variety of commands. What was worse they found was a single corrupted machine, when connected to the "tally" machine (used for inventory control, among other things) could possibly corrupt the tally system and subsequently attack other machines.

His conclusions are every electronic voting system used in Texas is unacceptably vulnerable to very simple yet staggeringly effective security attacks. Dr. Wallach said the same vulnerabilities he and others found could be exploited without leaving any evidence behind and cautioned just because no one is aware of any attacks does not mean attacks have not occurred. His suggestions to the committee were to limit DREs to one per precinct and to manually hand count paper ballots (*See Travis County note at the beginning of this report*). He additionally suggested eliminating straight party ticket voting, which would reduce confusion among voters.

Bruce Funk, former election official of Emery County Utah, testified before the committee as well. He served for 23 years working in elections in Utah. After HA V A came into effect he was invited by the State of Utah to be on a selection committee to select the type of machines Utah was to buy. Being partial to the optical scan units in use in Emery County, he felt he would have a biased opinion and did not want to be on the committee.

Mr. Funk stayed on the committee and was opposed to DREs. He saw numerous calibration problems during testing. Upon initial acceptance testing in Emery County six DREs were rejected, two more would later have to be replaced. Mr. Funk felt as if he was being set up to fail and called in independent investigators. He called the organization Black Box Voting, who brought in computer programming expert Harri

Hursti from Finland. Mr. Hursti was given nothing more than a voting machine and found serious concerns. He in turn called in security expert Hugh Thompson of Security Innovations. Together they found password security holes or security holes only accessible by password, which were later deciphered. According to Mr. Funk Emery County entered into a contract with Diebold, the manufacturer of the DRE in question, to remove what Mr. Funk and the investigators found. He offered to pay for damages, but was denied the opportunity and was later locked out of his office and removed from his job.

Debra Medina, Wharton County Texas Republican Party Chair, does not agree with the success the county election officials have had. Her experience with voting machines has not been as pleasant and believes no amount of training is going to fix a technically flawed machine. She has a well documented case from November 2007 where a DRE changed a voter's vote on the screen in front of them and could not correct it. She has also had machines fail after public testing due to calibration issues, only later to find out one of the Attorney General's Examiners found and reported on the same issue when reviewing the machine.

Expert witness Jim March, a board director for Black Box Voting, believes the state certification process has failed at some level and showed the committee a pair of expert reports on machines from Wharton County Texas dated January 2007. He quoted James Sweringer PhD. an examiner for the State of Texas in regards to machines like the ones used in Wharton County. "We agreed in advance to divide up the tasks between the engineers. This allowed us to go into great depth of each, but it also meant that most results were not personally observed by every examiner." This statement, Mr. March believes is why some examiners report some issues and others do not. While assisting Debra Medina in Wharton County, Mr. March found vote total discrepancies very much akin to those found by another examiner a year earlier. The complexity of the electronic voting technology was best illustrated by Rep. Lon Burnam's statement, "The concern is that you have convinced me of the oversight problems, but the elections administrators convinced me they can't physically handle a paper ballot system."

Karen Renick, founder of Vote Rescue, is an advocate of the hand counted paper ballot. She believes there has been much misrepresentation and misinterpretation of the Help America Vote Act when it comes to electronic voting machines. She indicated HAVA does not require hand counted ballots be replaced by DREs, but only requires individuals who are disabled be able to vote independently and privately. This is verified in SECTION 301. **Voting System Standards** of the Help America Vote Act.

Ms. Renick believes the costs related to the electronic voting machines were not stressed enough during the transition of voting methods and the money spent itself is a reason to go back to paper. The first of this money spent being the 3.8 billion dollars given to the states from HAVA to acquire voting machines. Along with these machines, she explained, came additional unmentioned costs of storing the machines in environmentally controlled storage facilities, keeping the batteries, charged, transporting the machines,

insurance costs, yearly renewal of software licenses and the technical support accompanying the machines are all costs burdening the counties.

Through phone interviews with county election officials, according to Vote Rescue, they found that Hays County's maintenance cost was reported to go from \$4,000 to \$40,000. El Paso was said to lease a building for \$30,000 a year for machine storage. She believes these costs should be redirected to the communities by way of increasing pay for poll workers and investing in more poll worker training, not on electronic voting equipment.

Alison Harbison, Shelby County Clerk, expressed her concerns of the costs attributed by the voting machines. Shelby County has 14,485 registered voters with 14 county precincts and 6 school districts. Even when city and school elections are held jointly to assist in costs for entities, the cost increase has been over 50%. Ms. Harbison believes the election software companies have exclusive control of the costs. By adding political subdivisions under a population of 2,000 to the exemption of electronic voting requirements, she believes, would give the smaller counties needed fiscal relief.

All manufacturers testifying urged the legislature to look closely at federal guidelines if it considers changing certification procedures. Doing so would minimize duplication, save state resources, efficiently allocate staff time, and minimize the time it takes to certify a voting system effectively. In turn reducing the costs made up on a county level.

Advocacy groups like Vote Rescue believe going back to manual hand counted paper ballots is the only way to stay away from stolen elections. They believe the idea could effectively work if all precincts were smaller in order to make the manual count process more manageable. However, in regards to smaller precincts Representative Burnam pointed out, from practical experience, one does not know how many voters will show up in one precinct to the next. All the state would be doing is creating a practical need to have more people working at precincts, because the number of precincts has increased.

Abbe Waldman-DeLozier of Vote Rescue stated, "If it takes days to count the votes then that is what needs to happen, because what we have now is what I call fake elections." She said in doing their own surveys, 80% of the people approached in their citizens exit poll were willing to tell them how they voted because they were concerned with the voting machines.

May Schmidt has been an election judge in Travis County since 1970 and has worked with every form of voting from manual hand counted paper ballots to the DREs. She reported to the committee she hears lots of complaints from her precinct because of electronic voting. She believes in some cases paper ballots can handle problems like massive power outages and not being able to be let into a building on time, better than the machines can.

Chairman Berman was honest with those in attendance, "You are asking us to tell 254 counties to forget what you are doing, get rid of all the machines and go back to paper

ballots. This legislature is very reluctant to have a mandate of any kind on our counties, county commissioners, and our county judges. I understand what you are saying, we all do, but I have to be perfectly honest with you even if such a bill came out of this committee, I doubt it could pass in the legislature." Representative Bohac followed the paper ballot argument by pointing out the reason why there was a move from paper was because there were many types of problems and fraud with paper.

Voter Verified Paper Audit Trails (VVPATs):

Even though all DREs are required to have a paper audit trail, there is still concern with the lack of verification of the ballot by the voter. To meet public concern the manufacturers provided the Voter Verified Paper Audit Trail or VVPAT. California was the pioneer in requiring VVPATs. Voting systems without VVPATs in California after July 2006 could not be used.¹⁸ Currently there are 16 states (or at least some jurisdictions in these states) using DREs requiring VVPATs: AK, AZ, CA, CO, HI, IA, MO, NV, NY, NC, OH, UT, WA, WV, WI. Three states (or at least some jurisdictions in these states) use DREs with VVPATs, but have no official VVPAT requirement: MA, MS and WY. Seventeen states use or will use paper-based voting systems (the vast majority are counted on optical-scan systems): AL, CT, FL, ID, ME, MI, MN, MT, NE, NH, NM, ND, OK, OR (vote-by-mail), RI, SD, VT. Fourteen states and the District of Columbia currently use DREs in at least some jurisdictions (in DE, GA, LA, MD and SC they are the only system in use statewide) and do not use nor require VVPATs: AR, DE, DC, GA, IN, KS, KY, LA, MD, NJ, PA, SC, TN, TX, VA.¹⁹

In the most recent congressional session there were a number of bills mandating the use of VVPATs. However, due to the large outcry from computer scientists, Secretary of States, and county election officials from across the United States these bills did not become law. Would VVPATs help increase voter confidence and security? While some believe it would, others contest VVPATs would not assist in the voting process would be a waste of government dollars and a false sense of security.

Every county official testifying before the committee agreed the VVPAT in itself is not a security measure and believes it would not be a good idea to require VVPATs in the State of Texas. Dana Debeauvoir told the committee, "Many of us believe that there is no roll that the voter can play in electronic security, and where the only security features is hoping that a voter will catch an error. That's not security. A VVPAT will give them an opportunity to see what they have entered in, but VVPAT is not security at all."

Joy Streater went to a demonstration of the VVPATs. She recounted three times the machines jammed. She explained what she saw was a roll of thermal paper able to hold 100 ballots. As she illustrated if a precinct has 20 machines and 4,000 ballots it will take many small rolls of paper and a worker whose job will be to watch paper. The paper she stated would be one more thing to lose and would be an additional cost. Bruce Sherbet of Dallas County cautioned the committee stating Texas should really pause and consider the VVPAT and not make it a knee jerk reaction as he has seen other states do.

Dennis Borel (CTD) stated most disability groups are opposed to VVPATs, because at the time he believes the technology does not exist so voters would have an equal footing on verifying the ballot, especially those with disabilities. He believed there could be a time when the technology is there, but is not here now.

Even advocacy groups originally who were proponents of the VVPAT have changed their position. Vicki Karp, of Vote Rescue, gave reasons why their organization has changed their position on VVPATs. She cited 20% of the paper trails turn out to be illegible or unusable due to double printing or paper jams. Numbers from Caltech/MIT studies, she reported, show up to 80% of voters not checking the trail before casting their votes. Ms. Karp cited a study done in Cuyahoga County Ohio where 10% of the paper trails did not match up with a voters vote.

One report studied came from Georgia. This report studied what resources were used when using a verifiable paper trail and whether or not it was a good option for Georgia to use. Cobb County Georgia participated in a pilot program in which one precinct of three counties in Georgia would produce a VVPAT for the 2006 November General Election and any runoff elections following. This pilot program was established to assist the Georgia legislature decide whether or not a VVPAT requirement was a viable solution.²⁰

What Cobb County found was the precinct chosen to have machines with paper trails had constant lines of 1 and 2 hours long during Election Day where other precincts had only occasional lines not more than 20 minutes, but sometimes as long as 50 minutes.²¹ An issue thoroughly covered within the Cobb County report was the large amounts of extra paper having to be handled and stored. A paper tape contained around one and a half feet per voter. With 976 voters in that precinct alone the paper accumulated was approximately 1,464 feet of paper tape proving to be very unwieldy and hard to handle. Much of the time spent by Cobb County election officials was unwinding and adjusting paper tapes.²²

To audit the VVPATs it was necessary to staff 18 people each day for 5 days. Cobb County started with four counting teams of three workers. However, at the end of the first day election officials believed they had not progressed sufficiently enough for the time span given and added two more teams of three.

There were two recorders and one caller to each team. Each time the caller said the name of a candidate the recorders made a vertical mark. Once there were four vertical marks a fifth mark was hashed through the vertical marks. As soon as this occurred the two recorders would call out "Tally". If "tally" was not called by both recorders at the same time, they were required to start the process all over again and find the error before going on.

It was also necessary to expand the space utilized for auditing ballots as well. Cobb County started out with an auditing room containing around 400 square feet, but ended up having to acquire a second auditing room containing 155 square feet to adequately

accommodate the process.

What were the results? Cobb County Election officials found all manual tallies matched the machine counts, proving the machine counts were correct. However, cost as measured in both time and money was high. There were 24 different employees, three managers, and a Diebold technician that were used in a course of five days. Their total cost for the one precinct was \$2,937.45, which did not include the three managers and Diebold technician (whose salary was paid by Diebold). The total hours between teams were 312.25 hours in five days.²³ The time it took for the teams to count one ballot varied from three to eleven minutes averaging at five minutes a ballot. A total of 11 hours were spent on "recounts" caused by human error.²⁴

The Cobb County election officials concluded, "The manual audit proved the touch screens did count the votes accurately, however, it also proved having humans count by hand is not an efficient method of counting. Humans make lots of errors and have to go through the steps many times in order to get the right answers. Humans take a very long time to do what machines can do instantaneously."²⁵ They suggested in their report if VVPATs were mandated, the manual audit process should only be used for selected races.

The time required to count ballots by hand would prevent the election officials from even being able to conduct the next election. For example, the Cobb County election officials calculated how long it would have taken them to count the General Election of 2004 in Cobb County alone. There were 229,231 ballots cast in Cobb County, if they averaged 5 minutes a ballot as they did in the manual audit then it would have taken them 19,102 hours to manually count the ballots. They calculated if they had 20 teams working 40 hour weeks the manual count would take 24 weeks. The price tag for such a project, Cobb County estimated, would be \$520,000.²⁶ Incidentally, Georgia is a state not requiring VVPAT machines. How many combined hours would it take for a state the size of Texas to manually count ballots? Using Cobb County's average of 5 minutes per ballot and multiplying it by the 4,399,116 votes cast in the 2006 Gubernatorial Race (as found on the SOS website) then dividing that total by 60 in order to extract the time, it would take 366,593 hours or roughly 42 years to manually count those ballots.

The committee also made contact with Nevada, a state requiring VVPATs, to get a balanced look at states that do not use VVPATs vs. the ones who do. Committee staff contacted Clark County Clerk, Harvard Lomax, in North Las Vegas, Nevada in regards to the states' policy on VVPATs.

In Nevada the electronically recorded results are considered the voter's ballot and the paper tape or voter trail is only used for auditing the accuracy of the electronically recorded results. These paper tapes are not used for recounts, but are only used for auditing. Voters are not allowed to keep the paper tapes. When asked about machine failure Mr. Lomax stated since the VVPATs are mechanical devices they do experience

paper jams. However, all in all failures have been few and far between. Most jams are the result of workers improperly installing the paper. Since the VVPA T mandate Clark County has been able to reduce the number of human induced errors by improving training and quality control when threading the paper.

In regards to costs associated with VVP A Ts, he stated because the rolls of paper are thermal paper there is no cost for ink. However, because of the hot climate in Nevada they must store the thermal rolls in water cooled ware houses. The thermal paper itself is \$1.25 a roll and he estimated they would use about 10,000 rolls of paper in the 2008 Presidential Election. He believed in comparison to the over all Presidential Election the cost of paper would not be significant.

When asked if he believed the benefits of the VVPATs outweighed the problems and costs associated with them Mr. Lomax stated, "This is a difficult question in that it is very subjective. We have 5,000 VVPATs that would now cost the county \$5,000,000. Since the VVPATs were added to our electronic voting machines, the complaints I used to hear about 'paper trails' have essentially disappeared. I very much appreciate that. On the other hand as County Registrar, I know that the machines are accurate and that the entire cost of operating and maintaining the VVPATs is simply to maintain public confidence in our election process. Obviously, one can argue that no price is too high to ensure the public has faith in its elections, but \$5,000,000 is quite a bit to quiet what amounts to a very, very small but very, very vocal portion of the electorate."

Mr. Lomax gave this advice to the committee before considering enacting legislation mandating VVPATs, "Don't rush into anything. Pay close attention to what the Election Assistance Commission is doing in regards to federal standards for voting equipment. The EAC moves very slowly and you don't want to spend a lot of money into voting equipment that in a year or two may no longer meet federal standards."

The committee was also fortunate to receive written testimony from Michael Shamos. Michael Shamos has been a faculty member in the School of Computer Science at Carnegie Mellon University in Pittsburgh since 1975, an attorney admitted to practice in Pennsylvania and before the United States Patent and Trademark Office, an examiner for Pennsylvania and has performed 121 voting system examinations and recently was on the task force of the Florida Secretary of State that examined the source code used in voting machines in Sarasota County during the disputed Buchanan-Jennings congressional election. He testified before the U.S. Senate Committee on Rules and Administration on July 25, 2007 regarding the proposed bill mandating VVPATs. In his testimony he argued even though the bill makes repeated reference to verification it does not come close to providing it. The VVPATs may show the voters their choices are correct but does not verify the ballot will even be counted, or that it will even be present for a recount or a later audit. He argued a VVPAT does not provide privacy, because a simple comparison between the VVPAT and the poll list gives away everyone's vote in violation to the SECTION 201 requirement of a secret ballot.²⁷

During the time the legislation in question was heard there were no commercially manufactured DREs meeting the requirements in the legislation. This legislation would have effectively outlawed DREs in the U.S., despite the fact they have been used in the U.S. for 28 years with out a single demonstrated incident of tampering in an election. Conversely, in the same period he continued, there have been hundreds of people who have gone to jail for tampering with paper ballots. Mr. Shamos pointed out the main problem with DREs is reliability, stating 10% of machines fail on Election Day. He continued by saying it should be obvious that adding one more mechanical item like a printer only would reduce reliability. Conducting audits would be lengthy he testified, counting 2% of ballots in a state with five million voter would require approximately 16,000 hours or eight man years. This would require the service of over 100 people full time for three weeks just in one state.

Michael Shamos believes end to end verification is the holy grail of voting systems; however, no such verification is now possible with any commercially available system. He urged the Senate Committee not to require anything essentially mandating some existing system and discouraging research and development into voter verifiable systems. He also believed there is no reason why election-dedicated software should be confidential. As long as codes in voting systems remain secret, he believes the public will never trust it. He left the Senate Committee with these words, "The very idea that a paper record is secure at all continues to be refuted in every election. It is folly to mandate nation wide changes to our voting systems each time a problem manifests itself. Voters and election workers need time to adjust to such changes which used to occur approximately every few decades, not every four years."

Recommendations:

The committee would like the 81st Legislature to understand the issue regarding electronic voting equipment is a complex topic and no solution is as easy as it may appear. There are many variables to reflect on when considering changing standards or the Election Code. No decision should be based on emotional reactions but educated decisions. The 81st Legislature should not dismiss concerns presented, it is through these concerns the Legislature may be able to pinpoint actual problems and be able to assist with the development and security of Texas's current and future voting methods. The committee also advises the Legislature to be mindful of those officials carrying out any changes made to law and realize county election officials require sufficient amounts of time to properly follow through with those changes. The following are the recommendations to the 81st legislature.

1. After listening to testimony and researching the current VVP AT process the committee has serious concerns about the implementation of Voter Verified Paper Audit Trail technology. As Michael Shamos stated mandating this medium would only discourage the development of perhaps a newer and better medium. The costs associated with VVPA Ts would be large not only monitorial but in time as well. The committee believes it would not be an efficient process at this time. While the committee believes

providing a secure method of auditing elections is a worthy policy goal and is a high priority, the committee believes the VVPATs may not be an adequate source of security. The committee asks this legislature to be patient while working with the SOS, manufacturers, county election officials and advocacy groups as a more innovative and secure voter verifiable audit system is developed.

2. While the committee realizes all counties work diligently to properly execute security procedures during election time, it does find it disconcerting that all 254 counties may have different testing standards. The committee believes it would be healthy to look into a standardized testing method for the state. With the help of the SOS and the county election officials, the Legislature may be able to come up with a solution allowing all counties to participate.

3. The committee believes the Legislature should review the current certification process with the Secretary of States Office to make sure Texas does not "double up" on certification processes carried out on a Federal level. Expediting the certification process, while not jeopardizing the integrity of the process, would lower costs to the manufacturers. This in turn would lower costs on a county level. Additionally the committee believes the SOS should review all procedures within their certification process in order to make sure there are no oversights when certifying a DRE.

4. Through out the hearing the committee heard of instances of voting machine failures, which were the cause of human or procedural error. The committee recommends working with the SOS and county election officials to increase training in the procedures surrounding the electronic voting machines in order to reduce the number of procedural errors.

5. In regards to voter confidence the committee believes all counties should publicize all examination dates of electronic voting machines and keep the public well informed of the processes being used during and after election dates.

6. In response to the idea of a Texas Election Center, the committee believes this idea should be thoroughly looked into during the 2009 interim. A Texas Election Center could be responsible for technical support currently depended upon the manufactures. Testing, consultation, ballot design, and a number of benefits could be provided by such a center.

Appendix E

Minority Report #1
Submitted by Jim McNabb

Alternative or Minority Report

Of The

2009 Travis County Election Study Group

The mission of the 2009 Travis County Election Study Group was as follows:

1. Ensure that Travis County voters have an accurate, fair, secure, transparent, and accessible voting system.
2. Determine a minimum and maximum time range for *possible* replacement of the existing e-Slate DRE system.
3. Evaluate concerns regarding the existing system alongside other alternative election systems, if any.

Having done a seven-month, exhaustive review of currently available DRE, paper balloting, optical scan, and other systems, there was **no agreement** rising from the 2009 Travis County Election Study Group. I and others cannot endorse the official report for many reasons. What follows is, I believe, a more realistic assessment.

Summary

The majority is apparently recommending adoption of election voting equipment that does not exist. Even if it did exist it would not be any more secure and efficient than the equipment and procedures now in place in Travis County. Further, **the costs of equipment and paper supplies would be prohibitive**. The 2003 Study Group and Commission selected the Hart-Intercivic e-Slate based on the best available science and information, and it still stands up to the tests. Further, County Clerk Dana DeBeauvoir has created stringent safeguards beyond those envisioned by the manufacturer. Voter fraud **is not** a real and present threat.

Study Group Background

The previous Study Group and resulting Commission deliberated in the aftermath of the “hanging chads”. We also planned ahead with the promise of federal funding to buy the best possible voting system for our citizens. Our 2003 goals were slightly different, and—I believe—more realistic:

1. Security and accuracy of the vote count.
2. Accessibility to voting for all citizens.
3. Reduced costs to the County.
4. Earlier results leading to voter confidence and trust.

The Study Group and resulting Commission reached a **unanimous decision** when we chose the Hart Intercivic e-Slate.

One possible reason that the 2003 Study Group/Commission were of one mind may be a result of its composition. There were about 24 members, most of whom had election experience of one kind or another. They were poll workers, candidates, media, political party leaders, and experts. The most important factor, perhaps, was that it was a smaller group.

As mentioned earlier, there was no consensus in the 2009 Study Group. One reason may have been its size. There were 45 members. Many were incumbents from the 1993 panels, but there were also activists and other citizens in the mix representing diverse groups and special interests some with no election experience. While diversity is very important, it is nearly impossible to reach consensus in these group dynamics.

The second reason for disagreement may have been the political environment. The 2009 Election Study Group was deliberating during a politically charged time punctuated by inflammatory language, distrust, misinformation, and outright lies. Some Study Group members may have been motivated by preconceived notions spawned in this toxic ethos.

DeBeauvoir worked hard to keep the group on schedule and on task while some special interest members were working from a different agenda.

Options Using Paper

There was throughout a constant push by some members for paper ballots. Paper ballots are not an option if for no other reason that paper ballots do not provide for early voting as required by law.

That notwithstanding, the persistence of those who fear voter fraud by any method other than paper ballots seemed to have an effect on the deliberations, resulting in either non-existent or potentially expensive alternatives through the re-introduction of paper to the process—one of the provisions the 2003 Study Group and Commission sought to avoid. Even with polling place ballot printing and precinct ballot counters, paper costs for elections would be enormous. The County Clerk's office estimated \$304,000 for each countywide election.

Further, the latest census data for Travis County puts the population at more than one million. Ballot costs are bound to soar. Voters will not be pleased to see exploding paper expense in local jurisdiction budgets as revenue remains below budgetary expectations.

The E-Slate Choice

This 2009 study was a result of concerns by some that the e-Slate lacked transparency due to a lack of a so-called "paper trail". It should be noted that one of the reasons that the e-Slate was selected in 2003, is that *it did not need paper, saving the county and other jurisdictions*

thousands of dollars in paper costs. The e-Slate has three levels of security preserving the intent of the voter. It was thought at the time of purchase that voter education would result in voter confidence in the system. Perhaps more voter education is needed.

Travis County has enjoyed six years of success with the current e-Slate system with no system failures. It is accurate. We have had no problems. In fact, Travis County under the direction of County Clerk Dana DeBeauvoir, is a model for the rest of the nation. County Clerk DeBeauvoir was honored by her peers in 2009 for her election night voter security practices. The system is transparent and secure, and it is the most accessible single system this and the prior study groups have seen.

The e-Slate also produces accurate results quickly, resulting in voter confidence.

The e-Slate has a projected three-to-five more years of “life”. *There is no urgent need for change.* It makes little sense to toss a system that accomplishes the goals of the county, especially in the absence of any good alternatives. Further, how will the County fund a totally new system? Consideration of alternative systems should continue during next three-to-five years as there could be new state-of-the-art voting systems in development. I see no reason to step backwards into the past where all you’ll find are paper jams, mismarked ballots, and hanging chads. We have the technology. We should continue using it until there is something better.

Therefore, I recommend the following:

- **Continue using the e-Slate while constantly monitoring its reliability and efficiency.**
- **Continue monitoring the market for new paperless products.**
- **Make recommendations to vendors for features Travis County would consider important in a new system to possibly include vote verification and accessibility.**
- **Continue monitoring federal guidelines and possible funding for voting equipment.**
- **Resume voter education in the e-Slate system, perhaps with the assistance of its maker, Hart Intercivic.**

Jim McNabb, 2003 Election Study Group and Commission and 2009 Election Study Group

Appendix F

Minority Report #2
Submitted by Karen Renick

2009 Election Study Group
Travis County, TX

Report
of
ALTERNATE
Findings and Recommendations

April 2, 2010
Revised July 1, 2010

Prepared by VoteRescue,
Member of the 2009 Travis County Election Study Group

and

Supported by the following Election Study Group Members:
Gray Panthers of Austin
Travis County Green Party
League of United Latin American Citizens (LULAC), District 12

2009 Election Study Group
Travis County

Report of ALTERNATE Findings and Recommendations
April 2, 2010
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I. INTRODUCTION

This Report of *ALTERNATE Findings and Recommendations of the 2009 Election Study Group in Travis County, TX* is respectfully presented to not only the members of the Travis County Commissioners Court, but to the citizens and voters of Travis County. Our subgroup of the 2009 Election Study Group may be small in number, but together we represent significant segments of the voting electorate and stand in distinct contrast to the other study group members who were invited as government entity representatives, computer experts, election judges and the media. The electorate segments we represent include seniors, minorities and the broad coalition of citizens knowledgeable of the constitutionality of their right to vote and of their civil liberties. As increasing numbers of citizens realize the serious consequences of the *deaf ear syndrome* that elected officials now seem to exhibit more blatantly than ever, the number of voices supporting the recommendations of this report will only continue to grow.

We are fully aware that this report will not be well liked by the Travis County Clerk or her Election Division management team because it not only presents a very different course of action than the one they envision for future elections in Travis County, but it takes a critical look at the study group format and process itself. Nonetheless, we expect this document to still be linked with the other findings and recommendations, as previously promised, in order for them both to become part of the important public discourse about the future course of our elections here in Travis County.

II. EXECUTIVE SUMMARY

There are a number of disturbing trends occurring with the fundamental electoral process in this country that have been developing over the course of many years: near-impossible ballot access by third parties or independents, stricter voter ID legislation, the dismantling of voting rights protections at the federal level and more insidious versions of minority voter disenfranchisement, to name a few. But the sophisticated persuasion of the American voters to buy into electronic voting is the worst by far.

The fundamental basis of this report is the irrefutable truth that the counting of votes should be done in full public view, not in secret, so that all individuals and groups who have a vested interest in the outcome of an election will know for certain that all the votes were counted and that they were counted correctly. It is only with this sense of confirmed certainty that public confidence in the election results can be achieved.

The most serious problem with the way we vote in Travis County is that our votes are, in fact, being counted in secret – not in some locked back room but, nonetheless, out of sight inside desktop-size electronic devices that run on trademark-protected computer software created and controlled exclusively by a large private corporation. It would

make no difference if the counting software were to become “open source” as some envision the solution to the corporate control of election software because it is simply a clever sleight-of-hand and will *not* alter the basic truth that votes would still be counted out of public view. Some will also argue that it is a vast improvement on the way elections are administered today, when *no one* is allowed to readily review election software, but even open source will still keep the average voter having to rely on computer experts to assess the security of the software on their behalf.

If our votes are counted out of sight, how can we know that the persons (or measures) that are declared the winners have received the true consent of the governed? Instead, we are now made to simply “trust” those who tell us that the reported results are correct. But elections should not be about TRUST or a perception that everything is fine. For the same reasons the structure of our government was established with important checks and balances, elections must be built on implicit DISTRUST. As Benjamin Franklin once said: *“Distrust and caution are the parents of security.”*



Justices of the German Federal Constitutional Court.

Last year, the German equivalent of the U.S. Supreme Court found electronic voting to be unconstitutional and banned all electronic voting in their country’s public elections. In an article by Michael Collins published on dailycensored.com found at <http://dailycensored.com/2009/10/19/a-censored-headline-and-why-it-matters/>, he wrote, “[The Court] reasoned that electronic voting is not verifiable because citizen votes are counted in secret. It obscured a technology inaccessible to all but a very few initiates. Most importantly, the German high court noted, electronic voting machines don’t allow citizens to ‘reliably examine, when the vote is cast, whether the vote has been recorded in an unadulterated manner’”. This European democratic republic, the fourth largest economy in the world, has set an incredible example for the U.S. to now follow.

As Germany is demonstrating, the only time-tested solution still used by nearly all the democratic nations in the world that provides voters with “an accurate, fair, secure, transparent [i.e., viewable and understandable to the public] and accessible voting system” is the use of voter-marked* hand-counted paper ballots. To ensure an uninterrupted, publicly observable chain of custody, the paper ballots must be cast and kept secured in a publicly viewable ballot box until they are publicly hand counted at

the precinct level immediately after the close of the polls on Election Day with the results publicly posted at the precinct before any election-related information or documents are conveyed in any manner to any other location. From this “bottom rung” public display of the results at the precinct level, on up to the final tabulation of county, state or nationwide totals, it is just a matter of using simple addition...by anyone, citizens and election officials alike. This system of building up from a publicly-confirmed base of precinct totals is the great equalizer of access to election results that are *known*, not *trusted*, to be correct.

**In order for voters with a broad range of visual or dexterity impairments to mark a ballot privately and independently as required by the Help America Vote Act of 2002 (HAVA), an electronic ballot-marking device, such as the AutoMARK, or a non-electronic voting-assist device, such as the Vote-PAD (now discontinued), which allow the disabled voter's ballot to be publicly hand counted could be used. Only one of these marking devices per polling place is required by HAVA. Some states, such as CA and OH, have banned the widespread use of Direct Record Electronic voting machines (including the same machines used in Travis County) because they can be undetectably manipulated, but are allowing their continued use by disabled voters. However, these unsecurable machines are still secretly casting and counting the votes and are putting these votes at a much greater risk of not being counted as the voter intended.*

III. STUDY GROUP MEMBERS SUPPORTING THIS REPORT

1. VoteRescue

ESG Representatives (Rotating): Karen Renick, Vickie Karp, Abbe Waldman-DeLozier and Jenny Clark

Background on VoteRescue

Since 2003, a small group of dedicated election integrity experts living in Austin has been providing elected officials at both the county and state level with an ever growing stack of reputable institutional and governmental studies, books, videos and articles that all clearly explain the serious operational flaws and security vulnerabilities found in the various electronic voting systems used in Travis County and throughout Texas.

In early 2005, VoteRescue was formerly founded as a non-partisan citizen-based organization to assist in educating the public about the serious problems with electronic voting and to form partnerships with other groups also concerned with the increasing lack of response from elected officials.

In August 2007, a state-wide coalition, *Texans for REAL Elections*, was started by VoteRescue. Partners now include Independent Texans, Texans for Accountable Government (TAG), Texas Motorcycle Rights Association (TMRA2), Instruments for Peace, Code Pink Austin, TruthSeekers Austin

and Project for the New American Citizen. Although they have not been officially inducted into *Texans for REAL Elections*, we hope in the near future to be able to also list as our partners the groups supporting this report.

In addition to sitting down with numerous government officials, to educate them on the serious security flaws inherent in all types of electronic voting systems, VoteRescue members have also presented testimony in opposition to the electronic voting systems in public hearings called by the Secretary of State of Texas and the State Legislature over the past seven years. In the last two sessions of the Texas State Legislature, VoteRescue helped author a bill, introduced by Rep. Lon Burnham and Rep. Donna Howard, respectively, which called for the repeal of Title 8 (Voting Systems) of the Texas Election Code and for the enhancement of the security protocols for hand counting paper ballots which are already permitted under the Election Code. During the Interim Session of the Legislature in 2008, VoteRescue was asked by the Chair of the House Elections Committee, Rep. Leo Berman, to bring in national experts to testify about the serious security concerns of electronic voting, which we did.

In 2009, VoteRescue organized, trained and supervised the hand-counted paper ballot Delegate Elections to the Continental Congress 2009 at eighty-four Election Day Voting Centers across the country. Absentee ballots from nearly every state were also hand-counted by teams of VoteRescue volunteers here in Austin at the Lyons Gardens Senior Community Center in conjunction with the Gray Panthers. Other local groups and political parties at the state level have also requested and received our help to run their elections with hand-counted paper ballots.

Over the years, we have found that every time ordinary citizens participate in one of our events that demonstrates the secure, open system of hand-counted paper ballots, they feel empowered and understand, often for the very first time, what taking elections into their own hands truly means for their future and their children's future.

2. **Gray Panthers of Austin**
ESG Representative: Clint Smith, Gray Panthers National, *Board Member*
(See Appendix A for "Gray Panthers Raise Questions about Implications of 1965 Voting Rights Act on Future Electoral Changes in Travis County, TX".)
3. **Travis County Green Party**
ESG Representative: Bill Stout, Green Party of Texas, *Legislative Liaison*
4. **League of United Latin American Citizens (LULAC), District 12**
ESG Representative: Fidel Acevedo, LULAC District XII, *Representative*

IV. BACKGROUND ON ELECTION PROBLEMS IN TRAVIS COUNTY

A Significant Difference of Perspectives

There is a striking difference of perspectives among the primary stakeholders involved in the debate about the problems with our elections in Travis County and it is important to understand these differences.

Over the past several decades, our County Clerk, Dana DeBeauvoir, has built a distinguished career here in Texas and earned a national reputation by wholeheartedly embracing the electronic voting revolution that overtook the country after the passage of the Help America Vote Act of 2002. She certainly is to be commended for the magnitude of time and energy she has devoted to her long-held position. Her top-notch staff who run the County Elections Division are also to be highly commended for their tireless efforts over the years to create and maintain a first class election office. Their procedures are impeccable. It's the voting system they use to conduct our elections that is the problem.

It is quite clear when one reads any recent treatise written by Ms. DeBeauvoir that she remains resolutely convinced, as many of her peers do, that the future of elections in Travis County and elsewhere *will* involve the use of some newer incarnation of electronic voting that will still, at the very least, count all our votes – *in secret*.

So, while the concerns of the County Clerk and her election staff remain entirely focused on maximizing the potential of electronic voting, without question, more and more voters now want to step back away from the trees to fully view the forest and ask, "Why are we, and why have we been, using a voting system that provides us with no way of knowing for certain that our votes are counted correctly?"

In her upcoming article, "Doing Things Differently This Time Around – *Perspective from an Elections Administrator*", Ms. DeBeauvoir presents a refreshingly candid overview of the frustrations experienced by the various players on the election stage during these past "rocky years". These players include election administrators such as herself, the voting machine vendors, the computer security academicians and experts, and the vast array of government agencies. The only player, ironically, who didn't receive the same degree of attention as the others in her article was the most important of all – the voter.

We applaud her frankness in an attempt to "get it right" on a second time around, but wish to point out that practically every item on her lists about the new "roles" every player "must" take on and the questions about "Where to start?" would become moot if she, too, could stand back from the forest with us, the voters, and look back at it with a fresh perspective. For that matter, all of our elected officials should do the very same thing for a change – for the right change.

Perhaps even more relevant questions are: How do We, the People, get our public servants to see the concerns of the people – the voters – from the *voters'* perspective instead of their own? And, Why are our election officials *allowing* private corporations who have private financial interests to provide the programming, software, equipment and assistance to *any* aspect of our elections when there is an alternative that is totally in the voters' best interest.

V. MISSION STATEMENT OF 2009 ELECTION STUDY GROUP

The Mission Statement of the 2009 Election Study Group was presented to the Travis County Commissioners Court by the County Clerk in her document entitled "*Outline of Study Group Mission, Background Issues, and Process*". (The original document was revised after comments were submitted to the County Clerk from VoteRescue.) The revised version reads as follows:

1. Ensure that Travis County voters have an accurate, fair, secure, transparent to the public, and accessible voting system.
2. Determine a minimum and maximum time range as to when replacement of the current voting system is necessary. When the voting system was purchased in 2003, it was assumed that the life of this type of technology was at least ten years.
3. Evaluate concerns regarding the existing electronic voting system and any other type of system that may be under consideration. These concerns include, but are not limited to, security; ease of use for voters; intent of voter issues; accessibility; accuracy of count; transparency to the public, and efficient use of taxpayer money to purchase, operate, and maintain a system.
4. Make recommendations to Commissioners Court regarding options for upgrading or replacing the current election system.

The following section is also pulled from the County Clerk's revised outline and is helpful for a better understanding of the intended scope of the study group's mission:

A Careful Review of the Different Voting Systems will be Required:

A major responsibility of this Study Group will be to develop a working knowledge of the different voting systems that have been certified at the state and federal level. This includes systems that have met full ADA compliance. With this background, the committee can develop a list of the pros and cons of each system and determine where additional research is needed. **A risk analysis of key negative aspects of each system will be required** [our emphasis]. The main categories of systems that will be reviewed are hand-counted paper ballots, optical scan systems (with and without precinct ballot counters), and electronic voting (with and without a voter-verified paper trail). We will also want to review new technologies in development for the future.

VI. OBSERVATIONS OF THE STUDY FORMAT AND GROUP PROCESS

As group participants, we believe it is fair to include our observations of the actual study group format and process because the outcome of any endeavor relies heavily on the establishment of these parameters from the outset. Since most persons reading this report and the report by the County Clerk were not present during any of the sessions, we would like to offer the following observations. Persons interested in viewing the recordings of the sessions, may go to the Travis County Elections Division webpage http://www.co.travis.tx.us/county_clerk/election/study_group_2009/default.asp.

Study Group Size and Group Dynamics

Originally, the number of proposed participants discussed by the County Clerk (and the number of those involved in the previous Election Study Group in 1999) was around 20 to 25 total. Although a tad on the high end for getting into full participation by all group members in a “round table” setting, it would have sufficed for the intended purpose of the 2009 Election Study Group.

The County Clerk decided that the total number of study group participants would be increased to forty-five, nearly twice the number originally proposed.

In our opinion, this one decision had a significant negative impact on the format and process of the group, as well as on the interactions among the members. It was no longer a group setting where members could sit around a common table facing their colleagues for easier and more interactive conversations, but rather it was forced to become a classroom setting with rows of tables all facing in one direction. From the beginning, we were all were back in school with the teacher in the front, raising our hand for permission to speak. Depending on where one sat in the room during a particular meeting (there were no seat assignments), one would only see the back of the heads of the people in front (if they weren’t on the front row) and were unaware of all those sitting behind. It is true that polite conversations with one’s flanking neighbors could occur before and after the meeting, but getting to know the entire group was near to impossible because of the large numbers and the seating arrangement.

Therefore, there was no opportunity for real, honest group-level conversations between the members. Typically, if there wasn’t a presentation, the discussion or Q & A session was always moderated by the person “in charge” at the front acting as the broker or director between group members. More often than not, this individual was the County Clerk or the Elections Division Manager. Therefore, getting to know the wisdom and knowledge that each participant brought to the study group was impossible due to the large size of the group. Most likely there were many who did not share their thoughts with the group because of its size and so when the more vocal participants (such as VoteRescue) chimed in often during the “allowed” discussion times, those persons came across to some (we’re certain) as being too assertive for the more regimented classroom-type decorum.

Additionally, though the names of all study group members were distributed prior to or during the first meeting, e-mail addresses or phone numbers of members were never distributed to the group; in fact, communication between group members outside of the study group setting was discouraged and even thought to be in violation of “open meeting” laws by a city official in the study group. Though we and a few other members were able to distribute additional handouts to the group, we all had to obtain prior permission to do so. In all these different ways, fairly tight control was maintained over extracurricular discussion and dialogue among the group members during the course of the study.

Elections 101, not a Think Tank

As was stated by the County Clerk in her outline for the study group, a “working knowledge” of the different potential voting systems would first need to be developed before more substantive discussions could occur. The goal of dispensing the “nuts and bolts” information about elections was definitely accomplished over the course of the eight sessions which gave the overall experience of the study group a feel more like that of a college lecture course (in fact, one of the initial sessions was titled “Elections101”) than an in-depth discussion group about stakeholders’ concerns, the pros and cons of the potential options and the risk analyses of each. More meaningful, roll-up-your-sleeve-and-let’s-get-serious-type conversations never happened.

VII. ALTERNATE FINDINGS

- a. The major failure of the study group agenda was its notable lack of a comprehensive presentation on the true security problems inherent with electronic voting systems of all types. Instead, these security concerns were dismissed as something that Travis County voters did not need to be concerned with. The message given by the County Clerk was that these types of security issues only happen rarely, in other settings and on other, less secure election equipment than that currently being used here. This was a very misleading view that became group-think early on in the study group.
- b. Glaringly missing were any mention by the Clerk or her staff of the numerous academic and governmental studies about electronic voting that have been published over the years which provide irrefutable evidence of the very security problems that caused VoteRescue to appeal to the County Commissioners for relief in the first place. Posting these studies to the county website does not constitute bringing this information to the attention of the group during live sessions, which should have led to at least one or even several study group discussion sessions on the security topic; this would have likely caused the security issue to hold a much higher priority position and be addressed in more comprehensive detail in the group’s final recommendations.

- c. Because the County failed to do so in any meaningful way during the first five study group sessions, VoteRescue felt it necessary to present at least some of the “hard evidence” on security issues during the first half of its September 23rd presentation on hand-counted paper ballot elections;
- d. Other than a brief discussion of the Voterescue presentation during the next session, the evidence presented was never mentioned, explained, discussed, or debated by the County; instead it was simply dismissed out of hand by the Elections Division staff with no mention or explanation offered, for example, of the Dan Wallach interview (Associate Professor of Computer Science from Rice University and nationally-recognized computer security expert) in which he clearly explains why each of the three types of testing done by the Travis County Election staff cannot protect against undetectable vote total manipulation. This evidence alone should be enough to discontinue the use of Hart eSlate machines here in Travis County. Nor was there any reaction or discussion about the ease with which optical scanners could be hacked, as demonstrated in the video clips we showed the study group on September 23rd from the 2007 Emmy-award nominated film, “Hacking Democracy”.
- e. The study group members did not have the opportunity they needed to fully grasp the serious situation that exists with Travis County elections: instead of demanding more answers to the irrefutable evidence against the machines presented by VoteRescue, the majority of group members still managed to deem our elections “safe” as if none of that information had ever been brought up. Clearly, this was a case where the messenger was perceived as an outside threat and therefore, both the messenger and the message were dismissed, hence, illustrating the vital importance of the group members hearing this same information directly from the perceived “teacher”, the County Clerk. This did not happen.

VIII. ALTERNATE RECOMMENDATIONS

The twelve recommendations of the 2009 Election Study Group, as last drafted by the Travis County Clerk and issued to the group members for comments in December 2009, are included below in *italics*. Immediately following each one is the corresponding ALTERNATE Recommendation.

No. 1

The 2009 Election Study Group recommends a move as soon as possible away from an all-electronic voting system because of these systems’ potential vulnerability to computer attacks and the public’s concern that these attacks might be possible.

ALTERNATE Recommendation No. 1

We agree that such a move must be made, but instead recommend that the move be made immediately, as opposed to “as soon as possible”. In numerous reputable studies, all-electronic voting systems, also known as a Direct Recording Electronic (DRE) voting systems, have been proven to be vulnerable to undetectable fraudulent manipulation both in advance of and during elections, as opposed to having “potential” vulnerability. (California Secretary of State Debra Bowen’s July 2007 “Top To Bottom Review”, Ohio Secretary of State Jennifer Brunner’s December 2007 “Project Everest” study, Princeton viral hacks by Professor Ed Felton, etc.) More importantly, these voting systems count votes secretly inside the computer, i.e., out of the public’s view. Counting votes in secret is in direct violation of the Texas State Constitution, Article VI, Section 4, which demands that the purity of the ballot box is preserved in all elections. How can the purity - the untainted accuracy of the votes - be preserved if the counting is done in secret?

No. 2

The 2009 Election Study Group finds that no voting system is 100% tamper proof, but recommends Travis County move to a system that has the advantages offered by combining both a paper ballot and an electronic count and also meets the other requirements this Group finds fundamental.

ALTERNATE Recommendation No. 2

We agree there is no perfect voting system, but recommend Travis County move to a hand-counted paper ballot voting system because it is the only voting system that can provide a continuous, publicly observable chain of custody of the votes and hence maintains the “purity of the ballot box”. An “electronic count” uses ballot-scanning electronic machines that use computer software proven (in the same reputable studies) to be just as vulnerable to undetectable manipulation as the DRE voting systems and secretly counts the votes, as well, therefore violating the rights of Texans as guaranteed by the State Constitution.

No. 3

The 2009 Election Study Group concludes that a move to a new system at this time would be premature because the market does not currently offer a voting system that meets the standards this Group has deemed essential and because election equipment vendors are now entering a stage where they are actively developing and/or preparing to release new generations of voting systems.

ALTERNATE Recommendation No. 3

We conclude that a hand-counted paper ballot voting system, which can be implemented immediately, would entirely eliminate the (mistaken) need to wait for election equipment vendors to develop the new generation of voting system. The tried and true voting system of hand-counted paper ballots meets all the standards deemed

essential to us including supporting the local economy of Travis County by spending the tax dollars to hire citizens to publicly count votes instead of using the people's money to pay the vendors the high dollar amounts for their machines to count our votes in secret.

No. 4

The 2009 Election Study Group commends and supports the County Clerk's current emphasis on security. While the Group has concerns about all-electronic voting in general, the extensive information and demonstrations provided by the County Clerk show that the Travis County Clerk's Office provides safeguards beyond those provided by law and incorporates numerous practices that minimize risk. The Group believes the manner in which Travis County has implemented electronic voting makes it as or more secure than most other systems currently in use, even those that incorporate a paper ballot.

ALTERNATE Recommendation No. 4

As mentioned in the "Alternate Findings" section, we support the extensive discoveries of computer security expert and Rice University professor, Dan Wallach – one of a handful of persons worldwide who has been permitted to examine the Hart Intercivic eSlate voting system used in Travis County. Professor Wallach has stated on numerous occasions, including a taped interview presented to the study group by VoteRescue, that the three types of security testing done by the staff of the Travis County Election Division on the Hart eSlate machines would *not* be able to detect malicious tampering done at any time to the software. Hence, the County's continued insistence that their security measures are sufficient to protect the integrity of Travis County's votes is illogical and must be called into serious question. Professor Wallach is in a unique and knowledgeable position of expertise on this subject and his researched conclusions about the Hart machines, and all other current versions of electronic voting systems, should be highly prioritized by the County Clerk and the County Commissioners.

No. 5

The 2009 Election Study Group recommends that until a change in voting systems can occur, that the County Clerk continue her focus on and search for even higher standards of security, stronger methods for mitigating risk, and better detection practices. The Study Group recommends that the Clerk continue to use the expertise of computer security experts to assist in identifying, analyzing, mitigating, and detecting these risks. The Group also recommends the Court continue to work with the Clerk to keep the current system maintained and operating at top performance until a new system can be implemented.

ALTERNATE Recommendation No. 5

To state as a recommendation that the Clerk should continue to use the expertise of computer security experts, while she is totally ignoring the work, evidence and conclusions of Rice University Professor Dan Wallach on the Clerk's ineffective

security measures using the Hart eSlates, proves that this recommendation is all words and no substance. Nor are any of the other scholarly reports by computer experts who condemn electronic voting - cited elsewhere in this document - being considered by the Clerk, nor their authors being requested for further advice or consult.

We recommend that the County immediately change its focus from propping up a seriously vulnerable, irreparably insecure all-electronic voting system and immediately put its resources and efforts into a hand-counted paper ballot voting system that safeguards the rights of all Texans, rather than violates them as all secret vote-counting systems do. The constant search for higher standards of security, stronger methods for mitigating risk and better fraud detection practices should be re-directed at the newly implemented hand-counted paper ballot system because elections are (rightly) about DIStrust and people will always try to steal votes one way or another. Eliminating all types of electronic vote counting immediately will have the positive effect of removing the voting method that allows for “wholesale” election fraud to occur – for example, programming for vote total manipulation can undetectably change election results with one keystroke on a computer, or the introduction of a virus into one machine that spreads to other machines, or vote total manipulation through the switching out of a single memory card which is the same as an electronic “ballot box”. To achieve the same level of election fraud with hand-counted paper ballots would be extremely difficult, if not impossible.

No. 6

The 2009 Election Study Group encourages the political parties, candidate and issue representatives, and interested members of the public to continue to participate in and observe the process of voting to help ensure the process is fair and secure.

ALTERNATE Recommendation No. 6

We contend that the County should first ensure that the voting process is fair and secure by changing to the voting system of hand-counted paper ballots because it is a fully observable system. Both types of electronically-based counting systems, the DREs currently in use and the paper ballot scanner proposed option, make it impossible for anyone to truly participate in and observe a fair and secure voting process. Group B also contends that more members of the public will want to participate in the process and also be willing to hand-count ballots on Election Day when they know the process is fully observable. A widespread public education effort will be needed to remind/educate the citizens that their involvement is critical to maintaining our freedoms and the viability of our constitutional republic.

No. 7

The 2009 Election Study Group recommends the Clerk continue carefully monitoring potential new federal and state legislation that could impose new regulations for voting systems and may provide full or partial funding for new system purchases.

ALTERNATE Recommendation No. 7

We agree that the County Clerk, with the support of the Commissioners Court, must continue to proactively monitor all federal and state legislation, not only for the funding possibilities, but to be certain that it will never harm or interfere with the current laws regarding hand-counted paper ballot voting systems and the Texas Constitutional right of Texans to a “ballot box”, i.e., a voting process, that is pure and open for all to see and understand.

No. 8

The 2009 Election Study Group recommends that the Travis County Commissioners Court study whether or not any state or federal legislative changes are necessary in order to implement the voting system the Study Group supports and that Commissioners Court take action to pursue those changes.

ALTERNATE Recommendation No. 8

We recommend that the County Clerk and the Commissioners Court make every effort to enhance the security protocols of the hand-counted paper ballot voting system by encouraging and supporting legislation at both the federal and state levels. We present as an example of security-enhancement legislation the two bills introduced by State Representatives Lon Burnam and Donna Howard in the 2007 and 2009 Texas State Legislative Sessions respectively. Among the several revisions to the Texas Election Code called for in both Burnam’s HB 9834 and Howard’s HB 4653 were increased public observation protocols during the hand counting of the paper ballots, posting the final precinct results at the polling place before the moving of any ballots and repealing the use of all electronic, hence secret, vote-counting systems in Texas.

In addition, we recommend that the County Clerk and the Commissioners Court immediately seek legislative remedy for the current law prohibiting video cameras at the polling place, so that cameras can be used to add security to the hand-counted paper ballot election process. In this manner it can be validated that the ballot box does not leave the table or the room all day and that all votes are publicly counted and the count recorded on videotape.

We also recommend that the current laws requiring Early Voting be revised to either:

- (1) eliminate this highly insecure phase of the voting process statewide (because the publicly observable chain of custody - possible only with a hand-counted paper ballot voting system - is violated *daily* over the course of two weeks prior to Election Day) and return to Election Day and Absentee voting only, or
- (2) allow voting jurisdictions at any level (county, city, school district, MUD, etc.) to opt out from Early Voting and return to Election Day and Absentee voting only.

It appears that the Travis County Clerk is also thinking along similar lines, albeit from an economical standpoint which we also support. On June 4, 2010, the editorial board of the Austin American Statesman published a piece entitled, “Democracy in action or

democracy inaction?" (<http://www.statesman.com/opinion/democracy-in-action-or-democracy-inaction-727927.html>) and included the following statement,

"In discussing ways that cash-strapped school districts and city governments can save money on elections — municipal elections are also low turnout affairs — DeBeauvoir [the Travis County Clerk] mentioned a couple of ideas worth exploring. One would be to shorten the early voting period, and the other is for school boards and municipalities to consider scrapping runoffs... While we are not yet prepared to embrace either shortening the early voting period or scrapping runoffs, there is certainly no harm in exploring the possibilities. It is disheartening to even mention the notion of restricting access to voting, but it's even more disheartening to witness the electorate ignoring elections."

In our opinion, the paper's editorial board, as well as most public officials, refuse to acknowledge that the public's low participation in elections may very well be due to the voters' inherent lack of confidence in the results because they perceive that the system is, or can be easily, "rigged". And, whereas, many in public office prefer to portray Early Voting as increasing access to voting, in reality it is simply putting more importance on convenience than protecting our basic right to vote and to know - by publicly observing - that our votes are counted as cast. (Please also read our comments about Early Voting under "Cost Comparisons", p. 20.)

No. 9

The 2009 Election Study Group recommends that the County Clerk provide vendors, legislators, and the appropriate government agencies the basic list of requirements that Travis County wants including in soon-to-be-introduced voting systems. This list of requirements includes providing a voting system that has:

- a. a paper record that is verified by the voter and can be used to independently, transparently, and efficiently reconcile an electronic tally in an audit or recount;*
- b. an electronic tallying system that offers an accurate count of voters' choices;*
- c. hardware, firmware, and software that has been evaluated by independent computer security and engineering experts who can substantiate that the system is well designed and meets high security standards. The experts must confirm that proper measures were taken to minimize the risk of tampering. They must also ensure that efficient and reliable methods exist to test or audit the system before, during, and after an election to confirm that the counts are accurate and that the system has not been altered;*
- d. demonstrated methods for securing the paper element of the system and detecting security attacks;*
- e. an efficient means of managing intent-of-the-voter issues;*
- f. vendor-independent programming;*

- g. the same voting method other voters use for the disabled community and those who do not have English as their first language;*
- h. a secure, easy-to manage, cost-efficient, and environmentally friendly means of handing ballot distribution during early voting and in the possible future use of vote centers;*
- i. ease and convenience for the voter;*
- j. reliable and durable equipment;*
- k. methods for setting up, operating, and taking down the system in the field that are easily managed by election workers;*
- l. received certification using the new federal Election Assistance Commission standards and certification by the State of Texas;*
- m. a reasonable cost to purchase, operate, and maintain;*
- n. been designed and manufactured in an environmentally responsible manner. For example, we encourage the selection of a system that is built using recycled materials, operates using minimal amounts of paper and electricity, and can be recycled or disposed of in an environmentally friendly manner at the end of its life;*
- o. the ability to manage the different types of elections and high number of ballot formats that are required in Travis County; and*
- p. funding and a detailed plan for providing public education on the aspects and use of the new system.*

ALTERNATE Recommendations 9a. through 9p.

We believe that Travis County does *not* need to wait for a yet-to-be-introduced voting system because there is one already available and currently in use in Texas that “ensures that Travis County voters have an accurate, fair, secure, transparent to the public, and accessible voting system” as described in the 2009 Election Study Group’s Mission Statement. This voting system is commonly referred to as Hand-Counted Paper Ballots and has the following basic list of requirements that mirror closely those of the computerized voting system recommended by the Election Study Group:

- a. a paper ballot (not a paper record - see note below) that all voters can privately and independently mark and readily review before casting into a secure, publicly-observable ballot box and that can be used to independently, transparently and correctly reconcile a disputed election result for a recount or handle a randomly selected audit;*
(Note: a paper record - also called a paper trail - is typically produced by a printing device that has been attached to a Direct Recording Election (DRE) voting system. Studies have shown that 10 to 20 percent of paper records are typically unusable for audits or recounts due to paper jams, failures in printing, and mistakes in recording accuracy. In addition to the high percentage of paper records being unusable in audits and recounts, studies have also shown that a large percentage - nearly 33% - of voters do not even look to verify a paper record printout, so discrepancies between the way they voted and the paper record could be missed. A third and very serious problem exists with a paper record: computer programmers have confirmed

that a paper *record* could be printed to match a voter's choices while inside the machine, the software can easily be pre-programmed to record the vote a different way, which could ONLY be discovered if a 100% recount of the paper *records* was possible to perform. But, with paper *records*, 100% of them are never produced successfully, therefore they are useless.)

- b. hand counting the paper ballots in full public view at all times, rather than secret, unobservable counting by people in back-rooms or by DREs and ballot scanners that have also been proven to be vulnerable to undetectable fraudulent manipulation such as malicious programming, spreading of viruses, switching out of memory cards or remote hacking;
- c. a voting process with an unbroken, publicly observable chain of custody start to finish on Election day that allows any citizen the ability to know for certain that the ballot they cast is still in a ballot box that has remained in its same position all day with citizen observers present, that it is one of the total number of ballots removed for counting at the polling place and that the final results for each precinct are posted at each polling place immediately after the counting and before the ballots are moved away from that location and a voting process that does not require expert knowledge for the voter to understand or confirm the method of counting and the results;
- d. demonstrated methods for securing the paper element and detecting security attacks
- e. a means for handling intent-of-the-voter issues;
- f. more of the county's money spent on elections is kept in the community because the printing contracts can go to locally-owned printers and county citizens are being paid to execute the election as opposed to paying the voting machine corporations
- g. the use of one ballot-marking device (that marks the same paper ballot used by every voter) in each precinct to fulfill the HAVA requirement for the disabled and those who do not have English as their first language and that still allows those paper ballots to be hand-counted along with all the other voters' ballots;
- h. a secure, easy-to manage, cost-efficient, and environmentally friendly means of handing ballot distribution on Election Day to all the precinct polling places;
- i. ease and convenience for voters – no long waits at voter's neighborhood polling place on Election Day due to ability to accommodate more voters voting at same time;
- j. vastly fewer numbers of machines to purchase, maintain and store
- k. methods for setting up, using and taking down the components of the voting system in the field that are easily managed by election workers;
- l. legally allowed for use in the State of Texas;
- m. a reasonable cost to (a) purchase, maintain and store election supplies and ballot-marking equipment, (b) prepare the ballots and (3) to recruit, train and pay election workers;
- n. an environmentally responsible voting system because it uses a renewable and recyclable material for the ballots: paper. After the legally-prescribed

- length of time that all ballots must be kept after an election, the paper can be properly and securely shredded and recycled;
- o. the ability to manage different types of elections and high number of ballot formats;
- p. funding of a detailed plan for providing public education on the importance of the public's literal "hands-on" involvement in their election process from start to finish. (See ALTERNATE Recommendation No. 6 above.)

No. 10

The 2009 Election Study Group recommends that requirements for any new system must address the weaknesses that computer scientists have found exist in some or all of the voting systems that have an electronic component. These conditions must be met for any type of voting system that is considered whether it is all-electronic or has a paper ballot component with electronic tallying (for example: a precinct ballot counter with an optical or digital reader).

ALTERNATE Recommendation No. 10

We contend that when electronic voting systems are no longer used for either vote casting or vote counting (however, their use for ballot marking for the disabled is important to maintain), all the complex and difficult issues of software and machine compromises effectively disappear off the table and are no longer relevant problems. With the exit of secret vote-counting by the voting machines, new challenges do emerge with hand-counted paper ballots, primarily in regards to the recruitment of large numbers of poll workers needed to count the ballots on Election Day and the acceptability of election results being reported later than the 10 o'clock news. We recommend that the County Clerk immediately convene a summit of community-based organization leaders for the purpose of figuring out the best approaches for solving these two challenges.

No. 11

The 2009 Election Study Group understands the requirements at this initial level are broad because new ideas and technologies could supersede any specific requirements that we can imagine at this time. The Group recommends that flexibility and openness be maintained so that a wide variety of solutions can be considered. For example, one specific idea of interest is a system where the voter uses an electronic component to make selections. That unit then produces a machine-marked paper ballot that can be reviewed by the voter before it is placed in a ballot box that automatically tallies the vote. We are assuming this same unit would also provide ease of use by voters with disabilities and those who do not have English as their primary language.

ALTERNATE Recommendation No. 11

We recommend wholeheartedly that "flexibility and openness be maintained so that a wide variety of solutions can be considered" especially in regards to looking at hand-counted paper ballot voting systems in other counties both here in Texas and in other

states, as well as in other countries, to incorporate more stream-lined counting practices and security measures. For example, the Swiss paper ballot voting system uses color-coded ballots to differentiate local from federal races. There is much to be gleaned from others to incorporate here in Travis County so it can maintain its national leadership role in election protocols - now with hand-counted paper ballots and putting people, not corporations, first.

No. 12

The 2009 Election Study Group recommends the Clerk reconvene the Study Group with the purpose of considering and preparing for the purchase of a new voting system when new products meeting this Group's basic requirements become available on the market. Included in this effort will be the creation of a detailed list of specifications this Group wants included in a request for proposal for a new system.

Alternate Recommendation No. 12

We concurrently recommend that the Clerk reconvenes the Study Group, even on an ongoing basis, to not only become familiar with new hand counting protocols (as mentioned in No. 11), but to also take a closer look into what other counties here in Texas have experienced since the passage of the Help America Vote Act of 2002 (HAVA). This one piece of federal legislation, written predominantly by the machine vendors' lobbyists, singlehandedly swept electronic voting into every jurisdiction in this country. Many of the 90+ Texas counties that used hand-counted paper ballots exclusively until 2006 when the HAVA mandates went into effect, have seen their election budgets skyrocket and in turn cause serious county-wide budgetary problems. Those suffering the worst among these former paper ballot counties were the counties that were apparently misled by the machine vendors and were told they had to totally abandon their paper ballots and go with all electronic voting. Voters of all ages in these counties, but especially the older voters, are very displeased and do not wish to have their votes counted secretly inside a machine. Many of these frustrating experiences have been included in a survey conducted by Voterescue volunteers of eighty-four of the election administrators in former hand-counted paper ballot Texas counties.

IX. COST COMPARISONS

During the latter part of the study group sessions, two independently prepared voting system cost comparisons were completed and presented to the study group; one by VoteRescue and the other by the County Clerk and her Elections Division staff.

VoteRescue's cost comparison was presented during their presentation on hand-counted paper ballots on September 23, 2009. Having contracted with the Austin office of the nationwide consulting firm of MGT of America, Inc., VoteRescue used information from a variety of sources, including Travis and Garza Counties, the Texas Secretary of State and the New Hampshire Fair Elections Committee. The three voting systems

compared using voter participation and election cost data related to the November 2006 Mid-Term Election in Travis County included (1) the Hart Intercivic voting system currently used in Travis County, (2) a paper ballot/precinct scanner system and (3) a hand-counted paper ballot system.

During the month *following* the VoteRescue presentation, a second cost comparison was completed, this time by the County Clerk and her Elections Division staff and with the help of 4-5 specifically selected members of the study group. Surprisingly, VoteRescue was *not* selected to participate even though we had just gone through a considerable amount of effort and great personal expense to provide a professional cost comparison to the group that realistically reflected our vision of a fully transparent public election.

After four months of repeated requests to the County Clerk and her elections staff, we were finally granted a follow-up meeting on February 17, 2010 to thoroughly review both our cost comparison and the County Clerk's. We were essentially scolded for not being totally aware of the entire election preparation process and the costs associated with it. We do admit we made several errors and omissions and thank the Clerk's staff for the corrections, but we will not capitulate on two of our positions for which we - and our professional cost consultant, MGT - were publicly admonished in front of the group and in subsequent correspondence. These include:

1. Excluding all costs associated with Early Voting

Early voting fails to meet the world's election gold-standard of providing an uninterrupted, publicly observable chain of custody of the ballots. Period. All the other countries that use the hand-counted paper ballot voting system provide only one vote-in-person opportunity – on Election Day. Therefore, without Early Voting, the high staffing costs to prepare the hundreds of permutations of paper ballots for all the Early Voting locations would be eliminated. We, unfortunately, are not privy to all the specifics of this preparation process in order to correctly calculate these savings, but know it would be significant based on our conversations with the Election Division staff at our meeting to discuss costs in mid-February, 2010. To properly assess these numbers, an impartial outside party should be enlisted.

More about the Early Voting Debate:

We have been told repeatedly by the County Clerk and her elections staff that Travis County voters would *never* give up the convenience of Early Voting. We challenge this long-held assumption and surmise that if the voters truly understood how the broken chain of public observation of the ballots *every day* during Early Voting compromised the certainty of the results, they would forgo this hollow "convenience". For those who truly are unable to go to their neighborhood precinct polling place on Election Day, there is still absentee voting which, unfortunately, is fraught with many of the same issues of ballots leaving the public view before being counted. Making Election Day a mid-week work (and school) holiday would also greatly help

voters get to the polls all on one day and vastly increase the pool of people available to work at the polls as judges, workers, ballot counters and watchers.

(Note: In a very limited public survey taken on February 26, 2010 during Early Voting in Austin, VoteRescue volunteers asked voters to mark on a scale numbered left to right how they would compare “accuracy of the vote count” to “the convenience of Early Voting”. Most of the voters who participated strongly favored the “accuracy” end of the scale. We want to thank UT Prof. Marc Musick for his assistance in designing this semantic differential type survey with VoteRescue. As a disclaimer, we are not saying these results prove our point, but show that at least the notion of foregoing Early Voting is something that voters might consider after all. Hopefully, more statistically-valid surveys will be done.)

2. Using the 3 seconds per race multiplier for read & mark counting method.

Until we can observe an actual researcher-directed vote counting time study, we will continue to use our figure of three seconds, as opposed to the six seconds used by the County Clerk. Our method of calculating the number of counters needed on Election Night included a full extra hour for readying the ballots for counting, settling disputes about voter intent, tallying the results, etc. Our multiplier is derived from our hand counting experiences over the years and from our observations of counting teams – albeit from a series of videos - filmed in several New Hampshire townships during the November 2004 elections, as well as a video about hand counting from the Texas Secretary of State.

Given the lack of incentive of the County to even explore the possibility of no Early Voting in the future because it is legally mandated now and therefore make the appropriate adjustments in a cost model for hand-counted paper ballot elections that do *not* include Early Voting, it may never be possible to know the true cost comparison between a totally transparent voting system with hand-counted paper ballots cast only on Election Day and the current system used in Travis County which includes two weeks of Early Voting and the use of the paperless electronic voting systems, the Hart eSlates.

Since any adjustments we attempt to make to our cost comparison will be lacking well-informed assumptions about the Early Voting preparation processes for paper ballots, we will not be submitting a revised VoteRescue cost estimate with this report, but may release one in the future for other purposes.

X. CONCLUSION

Travis County must take the issue of corporate privatization out of our elections by immediately taking steps to convert our current election process to one that is citizen-monitored to the fullest degree. Hand-counted paper ballot elections held only on Election Day (with no Early Voting option) will undoubtedly be difficult to orchestrate and execute in the first few years after changing over from machines. But the will must be found because this is the only election system when executed with the proper security protocols that allows for total transparency of the election process and allows all voters to know with certainty, without having any special technical knowledge, that their votes are being counted as cast.

Having concluded the above, we have little confidence that this type of shift can happen here in Travis County given that the County Clerk and her Election Division staff have deeply entrenched biases *for* electronic voting systems and strong dislikes for handling large quantities of paper, even if counted electronically. This has been made very clear to us in every conversation we have attempted to have with them about hand-counted paper ballot elections. They will continue to construct barriers to our ideas and work hard to convince their fellow public officials, the members of the legislature and the public at large that hand-counted paper ballot elections will never work because the voters don't want them when, in fact, it is they themselves who don't.

Voters are waking up, but it may be too late. Or is it? That's a question we each have to decide for ourselves and for the future of our country. We can only hope that America will ultimately follow the brave example of the Germans and resoundingly reclaim its elections from the corporate vendors and put them back into the hands of its people. And it all can begin right here, in Travis County, Texas. Now.

APPENDIX A

Gray Panthers Raise Questions about Implications of 1965 Voting Rights Act on Future Electoral Changes in Travis County

Gray Panther Views/Comments (prepared by Clint Smith):

- (1) In '06 Congress voted & the President signed a 25-year extension of the Voting Rights Act of 1965, (with its basic enforcement provisions all included);
- (2) The VRA was based on/& extended protections of/in the Fifteenth Amendment to the United States Constitution (i.e., covering eligible U.S. Citizens regardless of race/creed/gender/extenuating etc).
- (3) The original '65 VRA, signed by Pres. LBJ to establish overall fair/equitable electoral SYSTEMS is still very much in force and effect (since 2006, for another 22 years), then,
- (4) Why has this review, analysis & report on electoral system operation & possible changes by the TC Clerk not referenced the 1965 VRA background & regulatory requirements in establishing &/or updating or to otherwise consider IN EVALUATING ANY NECESSARY CHANGES, TO ENSURE INTEGRITY IN OUR ELECTION SYSTEM/CIVIL LIBERTIES PROTECTIONS?-

Question:

Why does the TC Clerk's study & publication of the report not discuss electoral process & program changes and requirements within the context of governing policies/operational context of the VRA?