

# **AN INVESTIGATION OF UNITED STATES VOTING METHODS: A MULTIDISCIPLINARY PERSPECTIVE AND LOCAL IMPLICATIONS FOR THE RICHMOND METROPOLITAN AREA**

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## **ABSTRACT**

While voting fraud has been a prevalent issue since the issuance of paper ballots in the 19<sup>th</sup> century, the debate wages on as to whether elections will ever be entirely secure. The Help America Vote Act of 2002 helped localities throughout the United States replace outdated voting technologies with computerized and often paper-less ballots. The City of Richmond, Virginia and surrounding localities have seen a fairly smooth transition to the newer technologies, though area Registrars are divided on the merits of the WINvote Direct Recording Electronic (DRE) machines and the paper-based AutoMARK machines.

## **INTRODUCTION**

This research, funded by the Center for Civic Engagement at the University of Richmond, investigates what some would call the most widely available and important form of civic engagement for citizens of the United States. The right to vote is fundamental to our democracy and provides a solid foundation for our local, state, and national governments only to the extent that citizens believe that elections are conducted in a fair, honest and secure fashion. Backed with a historical analysis of U.S. voting procedures and technologies, we identify what we believe to be, the best solution to current technological shortcomings that have been known to disenfranchise and reduce confidence in a significant portion of the voting population. This paper illuminates the important issues that lead to or detract from voter confidence in elections. Through face to face interviews with election officials of the City of Richmond, Virginia and the surrounding counties, the current status of the methods used in those localities is determined, then compared and contrasted to each other and with the best practice.

## **HISTORY OF VOTING IN THE UNITED STATES**

### ***Contentious Issues Leading to 2000***

The Supreme Court stated, “The concept of political equality from the Declaration of Independence to Lincoln’s Gettysburg Address, to the 15<sup>th</sup>, 17<sup>th</sup>, and 19<sup>th</sup> Amendments can mean only one thing – one person, one vote.” Although the United States was founded on equal opportunity for all citizens, voting disenfranchisement and discrimination have been prevalent in the United States for much of the country’s

existence. From the country's founding until the mid-nineteenth century, restrictions on voting and registration allowed only for white males over the age of twenty-one to have voting rights (Saltman, 2006, pg.65). The right to vote is a central characteristic of possessing full citizenship, but for many years, women's and minorities' votes were suppressed as they were viewed as subordinates or in some cases, less than people. Voting rights have made great progress through three major amendments instituted in United States history in order to ensure people's right to vote is consistent across all races, ages, and genders.

One of the major amendments ratified in 1870 after the American Civil War was the Fifteenth Amendment which granted suffrage to all eligible male voters regardless of their race (Saltman, 2006, pg. 77). Even with this Amendment in place, racial discrimination would continue to occur at the polls through harassment, intimidation, and sometimes even murder of minorities and their supporters (Saltman, 2006, pg. 77). Around this time, the U.S. Supreme Court ruled that the Fifteenth Amendment did not require African Americans be given the right to vote without qualification. Therefore, as long as a poll tax or literacy test was administered without racial bias, it was in effect, constitutional. It was a common trend among Southern lawmakers to require everyone to take a literacy test or pay a poll tax; however this greatly disenfranchised African-American voters (Saltman, 2006, pg. 77). Poll taxes and literacy tests were often biased and capable minorities were commonly turned away from polling stations. In an attempt to end racial discrimination, Congress adopted the Enforcement Act of 1870, which classified any action, prevention, or attempt to inhibit a person from voting or registering to vote to be a federal crime. The Act established the Department of Justice as a Cabinet-level department and was made responsible to uphold voting rights; yet minority voters were still oppressed (Goldman, 2001, pg. 17). An effect of the Civil Rights Movement was the Voting Rights Act, where in 1965 the use of tests or devices as methods of voter suppression was subsequently ended (Saltman, 2006, pg 137). The Voting Rights Act and Civil Rights Movement fought pervasive segregation and the inferior treatment of minorities in every aspect of life.

Prior to the ratification of the Nineteenth Amendment in 1920, women's suffrage had only been granted in Utah, Wyoming, and Colorado. Women's voting rights had a huge impact on the electorate by almost doubling it in size and started a movement for women to gain more equality socially, politically, and professionally. Many believed that women's presence would have a positive effect at the polls and decrease the occurrences of violence and rowdiness (Saltman, 2006, pg. 130).

The latest major development in the voting rights movement resulted from the Vietnam War in which men under the age of twenty-one had been drafted to fight. In 1971, the Twenty-sixth Amendment lowered the voting age from twenty-one to eighteen in order to provide the youth of America a voting voice in choosing officials that could send them to war (Saltman, 2006, pg. 140).

### *Examples of election fraud from a historical perspective*

Despite the purity of the democratic process, where everyone has a voice in the governing of a nation, history has seen elections won and lost through unethical and illegal means. Election fraud, through various schemes and tactics, greatly influenced American politics, most notably in the 19<sup>th</sup> century. While widespread fraud in a Presidential election would be difficult to achieve and to detect, most published accounts of fraudulent elections occurred at the local or city level.

In the early 19<sup>th</sup> century when elections were administered through non-standardized paper ballots, those looking to alter the outcomes of elections were met with little resistance. The use of "floaters" and "repeaters" was quite common. A floater was someone who was willing to vote for a particular ticket in exchange for a monetary award. Similarly, a repeater did much of the same and tended to vote often, including in other precincts (Saltman, 2006, pg. 72). During this time, organized political rings had

considerable say in how people cast their ballots. The most famous political ring of this era, the Tweed Ring of New York City, was instrumental in shaping the outcome of elections. In the 1868 national election, the Tweed Ring organized gangs of repeaters to register and then cast ballots. Each recruited member was given a piece of paper with information including a name and address to be used for registration and voting. Once a repeater cast the initial ballot, he returned to the headquarters location and was given another phony name and address. This practice was being carried out throughout Election Day (Davenport, 1894, pp. 168-174).

The New York City Board of Aldermen's later submitted a report in 1878 to examine the involvement of the Tweed Ring during the same 1868 election. It was estimated that 8% of all votes cast were voted in excess of the population and that 50,000 votes had been cast illegally (Saltman, 2006, pg. 75). Tammany Hall, a large political machine responsible for controlling New York City politics for nearly 200 years, would withhold final ballot figures until it was known how many votes would be needed to surpass any out-of city total. That type of large-scale manipulation was common during the era, especially under the guidance of strong political groups with financial motivations. The success of such political machines was due in large part to the lack of regulation in the polling process. Voter eligibility was difficult to determine due to the lack of voter registration laws across most states. It is also to be noted that election officials were generally partisan, rather than taking a more neutral stance (Argersinger, 1986, p. 672). These flaws within the system made the concept of rigging or even stealing an election that much more plausible.

While not everyone participated in a large political machine, similar to Tammany Hall, it was not uncommon for voters to be bribed in the late 19<sup>th</sup> century. In New Jersey in 1883, a state legislative committee found "a large proportion of... the voting population depended upon Election Day as a regular source of income" (McCormick, 1953, pp. 159-162). Also in New Jersey, the 1889 election was reported by the *State Gazette*, to be an election involving large scale bribery. "Ward workers were given stacks of money at the same time that they picked up stacks of ballots to be distributed among constituents." It was estimated that 50,000 votes involved bribery among the 270,000 votes cast for governor (Saltman, 2006, pg. 91).

In South Carolina, also in the late 19<sup>th</sup> century, there was a formal investigation of the permission of "tissue ballots" by election officials. Essentially, tissue ballots were thin copies of an original completed ballot that were attached prior to submitting the ballot. This method, while clever and illegal, received the cooperation of election officials. Their cooperation was measured by the deliberate shaking of the ballot boxes at the close of the election, where at that point all of the loosely attached thin copies would separate from the original ballot (Goldman, 2001, pg. 68). Another technique used to defraud elections was the technique known as chain voting. Under chain voting, a lead voter would enter the polling station with a ballot indicated with the "assigned" votes, per instructions. The voter would exit the station with the unmarked ballot in hand and pass it off to the next voter, who would then follow the given voting instructions. The first voter would lose the opportunity to vote; however this scheme could be run continuously as long as there were voters willing to participate in the operation (Saltman, 2006, pg. 103). This method of defrauding elections would later be prevented by including sequenced numbers on the blank ballots.

While some fraudulent actions are more overt than others, such as the tissue ballot and the recruitment of felons to vote, the use of intimidation constitutes a tacit form of fraud. In the 1888 national election it was known that large companies in the Mid-West and in New York intimidated their employees to vote a certain way, while some firms even threatened their workers with unemployment (Josephson, 1938, p. 428). There were also reported instances of intimidation at the 1926 Republican primary in Chicago, known to be one the most corrupt elections in history. Violence, kidnapping, repeater, and ballot stuffing were also reported (Harris, 1929, pp. 362-377, 1934, pp. 340-369).

Also during the Prohibition era, it was not uncommon for people to be paid to impersonate dead or moved persons during an election. Such was the case in an election in Louisville, Kentucky in 1925, which was subsequently set aside by the Kentucky Court of Appeals. In Cleveland, it was found in 1928 that votes were deliberately cast in the names of dead or out-of-town voters to sway election results (Harris 1934).

### ***History of Voting Technology: Early Methods to Present Trends***

As noted by Saltman and expounded upon by Roth, the study of human usability of voting equipment has not been well considered by social scientists of recent history. Roth explains that “the human use of voting equipment and voters’ perceptions of the voting experience have largely been overlooked” (Roth, 1998, p. 29). This has been a motivation for this study as we examine the disenfranchisement of particular groups with respect to voting methods.

The history of voting technology in the United States spans a period that involves the most rudimentary methods of recording and tallying votes as well as the most sophisticated; with thousands of lines of computer code to perform the same function, albeit in a more anonymous and theoretically secure manner. The methods employed by election officials to record and tally votes have adapted as technological ingenuity and democratic idealism have allowed.

Even before votes were cast by paper ballot, eligible voters in the United States were required to publicly declare their chosen candidates. Under this method, referred to as *viva voce*, voters would precede to an established voting location, usually a church, home, store, or pub and be prompted to verify their legal status, i.e. residence and financial state, in front of the election board and others present. *Viva voce* in itself is a fairly pure form of the democratic process. It permitted all those eligible to vote, an opportunity to select candidates with little chance of misinterpreting the voter’s intent, as there were typically several witnesses present. After indicating their choices, the votes were recorded by the election officials. (Saltman, 2006, p. 43). It also would not be uncommon for candidates to be present at polling places, where they could then thank voters for casting their ballots. The simplicity of this method allows for high voter verifiability as well as high voter assurance; however this method greatly lacks anonymity. This “open-air” method of voting permits opportunities for coercion and intimidation among potential voters. The 12<sup>th</sup> Amendment, ratified in 1804, required ballot use for Presidential elections. It was not until the enactment of the Federal Election Law of 1871 did Congress formally mandate voting technologies, thereby requiring the use of paper ballots in all elections, Federal and State. At that time Kentucky and Oregon were the only two remaining states who continued to use *viva voce* as a viable method of election procedure (Saltman, 2006, pg. 82).

Prior to the Federal Election Law, many states began to move away from the *viva voce* method and opted for secret, paper ballots. During this time the ballots were rather simple; most often they were scraps of paper marked only with a voter’s written choice. The voter would then submit his hand-written ballot to the election officials, where it could be recorded and retained in the event of a recount. This method allows for anonymity of the voting population and is auditable. While this was seen as an improved form of voting technology, there remained possibilities for fraud and coercion. Cases involving ballot stuffing and the use of tissue ballots were widely known.

The paper ballot did not see its next phase in development until the introduction of the Australian ballot in the late 19<sup>th</sup> century. The Australian ballot was the first known standardized ballot provided to voters that featured candidates and their party affiliations directly on the ballot (Saltman, 2006, pg. 96). First used in the Australian state of Victoria in 1856, its use spread to the state of South Australia later that year. The development of the Australian ballot came at a good time as there were several contentious issues

surrounding the non-standardized paper ballots. First, the paper ballots provided to the voter at the polling stations were typically given by two main parties. Therefore, it was clear to other voters who one would be voting for, based upon the distinctive partisan ballots. It was also difficult for voters to deviate from straight ticket voting. In some states the Australian ballot featured, along with all represented parties and their respective candidates, party symbols to help denote a candidate's particular affiliation. Given this, the Australian ballot was preferable over other forms of the paper ballot because it was deemed more accessible to the illiterate.

In Virginia the first Australian ballot law was passed in 1894 and provided for an "office group" notation on the ballots, rather than assortment by party. The law did not provide for straight ticket voting or blank spaces for write-in candidates. The state constitution provided that all elections would be conducted by ballot, each provided by the Commonwealth and without any signifying marks or symbols to denote party affiliations. Therefore under this law, only a candidate's name and the office he was seeking could be displayed (Ludington, 1911, pgs.190-191). This differs from the regular concept of an Australian ballot, which would feature symbols that could aid the illiterate in identifying political affiliations.

In order to correctly mark a ballot in the early 20<sup>th</sup> century, voters in Virginia were required to strike a line through the names of the candidates he did *not* wish to vote for and keep all candidates he did wish to vote for unchanged. The law stipulated specifically that the lines must cover at least three-fourths of the names indicated or else the mark would not be considered valid. In order to write in a candidate, a voter could erase the name of a candidate and fill in the desired name as there was not a space allocated for write-ins on the early ballots (Ludington, 1911, pgs. 190-191). The secret ballots used in the early 20<sup>th</sup> century are referred to by Kornbluh as "defacto literacy tests," where blacks, immigrants, and the poor contributed to record low participation rates (Kornbluh, 2000, pg 126).

The demonstration of the Myers machine, the first voting machine to be used in the United States, occurred in Rochester, New York in November of 1889 (Ludington, 1911, p. 51). The "Myers Automatic-ballot cabinet" as it was called, was first implemented in Lockport, New York in 1890 and then in about a dozen small villages around Lockport in 1893 (Saltman, 2006, pg. 112). The early machine was described as being a large cabinet featuring six party columns and thirty-five "knobs" per column. The early reactions of voters and election officials were that they were quite pleased with the new technology. Between 1900 and 1910, several cities began to implement voting machines for election purposes, including Buffalo, Indianapolis, and Hartford. Illinois and Michigan also permitted their use in elections; however Detroit and Chicago did not utilize them in their elections until later in the 20<sup>th</sup> century (Saltman, 2006, pg. 118). It was with the advent of the voting machine that the democratic process began its gradual move away from paper-based elections. The recording of votes occurs within the machines and the final tallies are read from the counters, also within the machines. While this reduced the need for manually tabulating final election results, this method requires a great deal of trust in the system, as noted by Zukerman. He writes that "presumably the voting machine does require an act of faith on the part of the voter in a mechanical contrivance whose workings he cannot see" (Zukerman, 1925, pg. 63). It is striking to note that the issues of voter assurance and transparency were as relevant in 1925 as they are now with electronic voting machines.

As the beginning of the computer age was getting underway in the latter half of the 20<sup>th</sup> century, voting technology began to move back towards paper ballots with the use of pre-scored punch cards (PPCs). Saltman notes that after 1964, PPCs began to replace much of the lever machines previously used, however some municipalities including New York City, continued their use into the 2004 election (Saltman, 2006, pg. 157). PPCs are designed to be read by computers, making the counting of ballots more efficient and accurate. Under PPC voting, a voter would be instructed to select candidates by completely punching through the appropriate boxes with a stylus or another similar device. This type of voting, most famously known as the Votomatic system, grew in its national use, accounting for 40 percent

of all votes in 1988 (Saltman, 1988, pg. 49). A significant difference between PPC voting and voting by lever machines is that a voter's intent can be recorded, a highly debated issue during the 2000 Presidential Election.

Also during this period defined by increasing computerization, marksense ballots were more frequently used. Marksense ballots are similar to PPC voting in that both types of ballots are read and counted by computer. The main difference between the two however is the way in which a voter will indicate a choice on the ballot. As mentioned before, a choice is indicated on a PPC ballot by removing the pre-scored chad with a stylus. A choice on a marksense ballot is indicated by connecting an arrow near the candidate's name or the filling in of the respective circle or square with a pencil, much like a standardized test, such as the SAT. The ballot is then read by an optical scanner where the votes are later tallied. Saltman notes an advantage of the marksense ballot over the PPC ballot in that the marksense ballot is not limited by size constraints, such is the case with standard punch cards. Another advantage of the marksense system, sold mainly as precinct-count systems, is that it can be programmed to return the ballot to the voter if an overvote has been cast (Saltman, 2006, pg. 164). It is also to be noted that in the 2000 election, more voters used a marksense system than a PPC based system (Brace, 2004, attach. 6).

The next development in voting technology was the implementation of Direct Recording Electronic (DRE) machines. Following the 2000 Presidential race that was determined by the interpretation of voters' intent on Florida's PPC ballots, Congress passed the Help America Vote Act (HAVA) in 2002 and with that came the ushering in of electronic voting machines. The DREs were seen as the best solution to preventing another election debacle that occurred in 2000 by helping to eliminate voter error during the voting process. The touch screen based systems require voters to select from a list of candidates until voting is complete. In particular, the Diebold Accuvote system requires the use of digital smart-cards that are to be inserted into the machine by each voter before voting can commence. The smart-cards act as proof that the voter is eligible to vote and contains basic information such as political party and the voter's voting language (Electronic Frontier Foundation, 2004). After completing the voting process, the voter will return the smart-card to the election official where it will be reset to ensure that a voter may not cast additional ballots. At the close of the polls, election officials will use another smart-card, known as the *administrator card*, which will extract all internally stored votes from the DREs and collect them for tabulation and transmission through physical or electronic means to a remote computer.

## **EVENTS: 2000 AND FORWARD**

### ***Florida and the 2000 Presidential Election***

In many ways the 2000 Presidential election changed the course of how elections are conducted and how democracy may be ensured for the future. The election debacle in Florida has served as an impetus for new legislative measures that have dispersed billions of dollars to states (most specifically HAVA of 2002) to alleviate concerns of unreliable voting methods. This period has also been marked by technological innovation, where DREs have altered the landscape of elections. While both the legislative and technological innovations have been lauded as giant steps forward to ensure reliable election results, both have come under tremendous scrutiny from politicians, advocacy groups, and computer scientists for being either misdirected or incomplete.

The Supreme Court of Florida spoke of the 2000 election in *Gore vs. Harris*, that "this Presidential election has demonstrated the vulnerability of what we believe to be a bedrock principle of democracy: that every vote counts" (Supreme Court of Florida, No. SC00-243). The fallout of the events in Florida in 2000 has left many to believe that the system in place prior to the election was doomed to fail; it just

happened to occur during one of the most highly contested Presidential elections in history. Florida's election procedures were in the national spotlight for weeks following the election, showing all of the weaknesses that a PPC-based election possesses. The Votomatic punchcard ballots, like those used in Florida, tend to produce more unrecorded votes than other voting methods (Alvarez, Sinclair, Wilson, 2003; Ansolabehere, Stewart, 2005; Knack, Kroph, 2003a). It was known to election officials that a punch card ballot disfavored a certain portion of the electorate and that a significant amount of voter error was a natural element of the system. Still, no overhauls were made for fear of great costs to the local political groups (Saltman, 2006, pg. 36).

Florida, as well as many other states, used varied forms of voting methods during the 2000 election, including PPCs, marksense, and DREs. Among the three, PPCs were used by more than 60% of the electorate; thus their principal significance in the election process. Issues surrounding the PPC ballots during the election included misvotes, overvotes, and undervotes on the "butterfly" designed ballot. The spacing of the candidates' names as well as the size of the font of the butterfly ballots confused voters as for whom they voted. It was a common mistake among voters who were looking to select the Democratic candidate located beneath the Republican candidate to have mistakenly selected the Reform party candidate of Pat Buchanan (Saltman, 2006, pg 16).

The issue of undervotes and overvotes also proved to be significant in the final tally of votes. Undervotes occur when the voter, either purposefully or accidentally, fails to select the appropriate amount of candidates. For example, an undervote would occur if the voter selected two candidates from a list of five, while being instructed to choose three. This decision is solely the voter's and is legal, however the counting of the votes can be complicated; such was the case in 2000. An overvote occurs when a voter chooses more candidates than allowed. For example, if a voter was instructed to choose two candidates for a town councilman post and consequently selected three candidates, the ballot would become void under the computer- read PPC ballot system.

Despite the ordered manual recount in Miami-Dade, Palm Beach, Broward, and Volusia Counties, Bush retained the lead and won the election. However, the results may have been different had Vice-President Gore ordered a manual recount of all votes in Florida. According to a study conducted by the Consortium Group, Gore's margin of victory would have been approximately 171 votes (Keating, 2002, pg. 8). The legal actions surrounding the ballot issues, from the Florida Courts to the U.S. Supreme Court, produced what would be the beginning of sweeping changes to how elections would operate. The Florida Supreme Court issued this as part of its statement during the review process: "in these election contests based upon allegations that functioning punchcard voting machines have failed to record legal votes, the demonstrated margins of error may be so great to suggest that it is necessary to reevaluate utilization of the mechanisms employed as a viable system" (Supreme Court of Florida, No. SC00-243). This early call for reform would gain steam in the months following the election and would result in the passing of HAVA in October of 2002.

### ***Reform Attempts***

In response to the Presidential Election of 2000, legislative acts were passed to avoid future election problems by developing voting technology and registration. The Help America Vote Act (HAVA) was a major act passed in October of 2002 which sanctioned federal funding to upgrade voting equipment across the country (Saltman, 2006 pg. 3). The program reserved \$650 million dollars to advance voting technology with computerized devices, train poll workers, improve accessibility, update voter databases, and perform election research and studies (Katel, 2006). The Act's main goals were to create uniform and nondiscriminatory elections. The Act formed the Election Assistance Commission (EAC), founded in 2004, to implement the voting upgrade process by collecting election information, reviewing voting procedures, and distributing funding (Hite, 2007).

HAVA's financial services promote computerized voting stations like the DRE touch screen devices and the update of databases. The quick shift from punch card and lever voting stations to DRE or optical scanners has created much resistance, due to issues concerning transparency, reliability, and security issues. Opposition to the DRE machines has arisen mostly due to the lack of paper records used to confirm voting records as well as the open possibility to corrupt multiple voting machines, which would certainly influence the aggregate results of an election (Rubin, 2006, pgs. 21, 37, 189). Advocates of electronic voting machines have argued that electronic voting is more reliable than punch-card machines, easier to use, and reject reports of vulnerability to software manipulation as extremely rare hypothetical scenarios (Katel, 2006; Rubin, 2006).

In addition to HAVA, Congressman Rush Holt (NJ-12) has introduced the Voter Integrity Bill in the spring of 2007, an act that calls for voter-verifiable paper ballots, security chains with documentation to prohibit vendor fraud, and random audits by hand counting a number of voting precincts in each Congressional District. Furthermore, Representative Holt calls for the inspection of voting system software which would allow for more transparent election processes. Representative Holt has stepped forward to meet the concerns of voters who have become skeptical of the widely used DREs and with this bill, would put pressure on the manufacturers of voting machines to equip machines with paper printout functions.

Other issues concerning HAVA have come from the updating of voter databases and the enacted new voter identification laws. HAVA has allowed first time voters to register to vote by mail while first time voters who did not register by mail will need to show photo identification in order to cast their ballot. In response to terrorism and immigration issues, many states have been creating more stringent photo identification laws, such as Arizona which requires all voters to show definitive proof of U.S. citizenship for registration. Since 2000, twenty-two states have raised their standards for identification, even though HAVA has not imposed any mandate regarding the issue. In 2005, The Carter-Baker commission called for tougher voting identification cards to prevent multiple voting and other forms of voter fraud.

The Democratic Party and the American Civil Liberties Union (ACLU) have been in opposition to stricter ID cards because the fees to acquire the cards parallel the poll taxes Southern states used to inhibit blacks from voting prior to the Voting Rights Act of the 1965. Those in opposition to the ID cards claim that the fees disenfranchise the poor and minority group voters, and also do not toughen requirements for absentee voters. The lack of proper identification among minorities and the elderly could affect the polls and would marginalize these groups by muting their right to vote. The Real ID Act of 2005 calls for proof of citizenship through passports or birth certificates by 2008, and would further disenfranchise the poor, minorities, and the elderly (Katel, 2006).

Part of HAVA calls for the disbursement of funds to states to update voting machines and to educate voters of their use. It was at this time that the touchscreen DREs began to be implemented throughout the country as states were looking to replace the PPC based systems that had failed miserably in Florida. States were beginning the process of upgrading to touchscreen DREs in the summer of 2003 that is, until the release of the industry shaking Johns Hopkins-Rice Report, spearheaded by computer scientist Dr. Aviell Rubin of Johns Hopkins. The study led by Rubin uncovered that the source code behind Diebold's Accuvote voting machine, made available on the internet, possessed critical design flaws that could leave the machine vulnerable to fraud. The immediate impact of the study left many states uncertain and skeptical of the reliability and security of the voting machines. Other issues surrounding this new technology included the lack of voter verifiability. Dr. David Dill of Stanford identifies it as the concern that without a paper record there is no way for a voter to verify that the vote has been recorded accurately. Even if a confirmation screen tells the voter that the vote has been recorded, it does not mean that the vote



has been stored or recorded correctly (Rubin, 2006, pg. 21). These concerns are cause for a reduction in voter confidence.

Rubin describes two scenarios of how an election could be vulnerable to malicious activities, via the DRE machines. The first is retail fraud. Retail fraud is the result of someone wanting to manipulate an election by tampering with each individual machine. The second example is wholesale fraud, which is the ability to corrupt many machines in multiple locations from a single action (Rubin, 2006, pg. 37). While the occurrence of retail fraud in an election is more detectable, the impact of a wholesale fraud attempt would be devastating and would be difficult to trace. Dr. Rubin as well as others in the information security field, believes it is possible for a manufacturer of an electronic voting machine to imbed malicious software that would go undetected even by trained professionals. However, manufacturers of the machines as well as politicians tend to believe that such a scenario is impossible (Rubin, 2006, pg. 39).

At the Center for Information Technology Policy at Princeton, a group of computer scientists took a closer look at the Diebold AccuVote-TS Voting machine to examine its hardware and software for design and security flaws. Among their principal findings, they found that it is possible that malicious software running on the machines could easily and unnoticeably modify all records, audit logs, and counters on the voting machine (Feldman, Halderman, Felten, 2006). The group also found that it is feasible for anyone who would have physical access to the machines to install malicious software in under a minute (Feldman, Halderman, Felten, 2006). Their third finding is that it is possible for software viruses to spread from machine to machine during normal election activity as well as the pre- and post-election activities. Their finding was conclusive as they were able to design a vote-stealing virus that spread easily to different machines through the transfer of memory cards. Their final and most fundamental finding is that the problems uncovered by their previous discoveries could be eliminated by improving both the hardware and software of the Diebold machines (Feldman, Halderman, Felten, 2006). The study is the first to publicly field test the DRE machine and its hardware. Despite critical responses from Diebold, the Princeton group maintains their claims that the systems widely used in U.S. elections are insecure and susceptible to fraud.

In order to combat certain types of fraud, officials are calling for parallel testing to try and identify any rigged machines. Under parallel testing, election officials would randomly select DREs from a randomly selected precinct and test them under normal conditions. On the day of election, testers would come into the selected voting location and remove several random machines where they could later cast votes on them at what is called a *phantom precinct*. At the end of the day the testers would compare the electronic results with the actual amount of votes cast on the machines. If the totals do not match, the testers could reasonably assume that the machines had been manipulated. The aim of parallel testing is to fool any malicious software that was designed to perform under normal testing conditions but would begin to manipulate results during an election (Rubin, 2006, pg. 180). While parallel testing might seem as a positive step forward to supervise the administration of this new technology, some feel that it is inadequate. In essence, testers will only examine a fraction of one percent of all voting machines in a state. This would permit a type of attack that cheats only a small percentage of the time or on a small number of DREs (Rubin, 2006, pg 180). Another limitation of parallel testing is that it would be unable to detect a “knock” attack. A knock attack is a malicious activity that is caused by some action by the voter, for example, touching the bottom right hand corner of the screen four times in a row.

### ***Integrity Still in Question***

There have been several well documented accounts of the new voting machines failing to meet the needs of the electorate. During the 2004 election, major problems with e-voting machines occurred in both Columbus and Youngstown, Ohio, and Jacksonville, N.C. In Columbus, errors with the voting systems

gave President Bush 3,893 extra votes when Franklin County, a suburb of Columbus, recorded almost three thousand votes in excess of total voters. The election's results would not be affected by the erroneous votes as President Bush won by more than 136,000 votes in Ohio, but the findings demonstrate significant flaws in the e-voting systems that could potentially change a close election. The Youngstown case, as reported by an investigation by the *Washington Post*, involved an undetermined transfer of votes for Senator Kerry to President Bush. This unexplained transfer of votes involved 25 voting machines (House Judiciary Committee, 2005, pg. 52).

In the other instance, citizens of Jacksonville, North Carolina voting for commissioner of agriculture lost more than 4,500 votes due to officials believing the e-voting computers stored close to 10,000 votes when in reality the storage unit could only handle 3,005. Officials were misinformed when there was confusion on the model of machines used in the county. Sadly, the computers had no ability to retrieve the 4,530 lost votes that were discarded in Carteret County, NC.

Entering the 2004 Presidential election, the state of Ohio was largely known as a “battleground state” where a significant amount of campaigning was to take place by both President George W. Bush and Senator John Kerry. The election results from Ohio have been widely disputed, due to irregularities in exit poll figures as well as final tallies. The winning margin for Bush in Ohio was substantial, however many are suspect of the methods by which the election was managed.

Secretary of State J. Kenneth Blackwell, charged with overseeing the election in Ohio, came under fire for various accusations of impropriety. To begin with, Mr. Blackwell, while serving as Secretary of State in Ohio, also served as co-chair of President Bush's reelection committee. This relationship was not very different from Florida Secretary of State Katherine Harris' questionable ties in 2000. In the weeks and days preceding the election, Secretary Blackwell modified long-standing election procedures, such as changing the type of acceptable paper for provisional ballots and restricting the use of provisional ballots themselves. The House Judiciary Committee, led by House Representative John Conyers (D-MI.) issued a report on the events of the Ohio election. It notes that in mid-September of 2004, Secretary Blackwell directed that all provisional ballots were to be cast in the actual precincts of the voters or else they would be discarded. His rationale was that allowing voters to cast provisional ballots from outside of their precincts would be “a recipe for Election Day Chaos.” This directive however, led to thousands of validly registered voters to have their ballots thrown out. Ohio Governor Bob Taft believed that decision could have affected over 100,000 voters (House Judiciary Committee, 2005, pg 31). Also, Mr. Blackwell prevented the issuance of provisional ballots for all of those who requested absentee ballots, even if they failed to receive them prior to the official deadline or if they did not receive them at all (Ibid, pg 47). It was not until a lawsuit filed by a college student who did not receive her absentee ballot and was later denied a provisional ballot, did Secretary Blackwell's directive become overturned. This court decision did not occur until late on Election Day and many were not given the opportunity to vote.

The House Judiciary Committee also found that there were large groups of disenfranchised voters, most notably in historically minority and Democratic precincts. This disenfranchisement was due in part by the misallocation of voting machines among precincts. The report cites a *New York Times* investigation that found that officials had relocated voting machines assigned to the city of Columbus to the surrounding suburbs (House Judiciary Committee, 2005, pg 25). This translated to more voting machines per voter among the Bush-supported suburban precincts. This decision helped to influence long waiting lines, such as four to five hour waits in precincts 35B and C in Columbus and a seven hour wait in a precinct with one voting machine per thousand voters. It was told that the adjacent precinct had one machine for every 184 voters (House Judiciary Committee, 2005, pg 26). On that Election Day, many voting machines were held back for unknown purposes. For example, the estimated need for Franklin County was 5,000 voting machines, however was given just 2,866. This number was further reduced as the Franklin County Board

of Elections revealed that 81 voting machines were never put to use and that another 77 malfunctioned on Election Day (House Judiciary Committee, 2005, pg 25).

Adding more suspicion to the election supervised by Secretary Blackwell, there were numerous accounts of electronic votes switching from Senator Kerry to President Bush in Mahoning County. In historically Republican Warren County, election officials locked down their administration building during the counting of votes and refused entry to the media to observe the tallying. When that decision was questioned, officials responded that they were reacting to a terrorist threat, a “10” on a 1-10 scale, while operating with information given by the FBI. When asked about the incident, the FBI stated that they had no information about a terror threat in Warren County (House Judiciary Committee, 2005, pg 49). This type of “behind closed doors” behavior characterized the proceedings in Ohio, as many of the questions surrounding the official results and other contentious issues were not resolved in the months following the election.

### *Disenfranchisement*

Voting disenfranchisement is the suppression or threat to an individual’s voting rights. In the past, disenfranchisement was more apparent with legal restrictions during the Jim Crow Era of the Southern United States, but today voter suppression is more subtle (Friedman, 2005). Today, disenfranchisement tends to increase with population density, high black populations, Democratic loyalty, and as the margin of support between the two main candidates for a nationwide office is narrow. Friedman offers two forms of disenfranchisement; partisan disenfranchisement, consisting of strategies one party uses to depress the turnout of another party’s voters, and structural disenfranchisement, which entails laws and regulations that depress the voter of low status groups. An example of Party disenfranchisement would be the Republican opposition to same day voter registration, as Democrats are more likely to lose if there is low voter turnout at the polls. Structural disenfranchisement is apparent in the registration process of voting (Friedman, 2005). In most cases a form of photo identification or proof of residency is required to register to vote. This requirement disenfranchises the poor who need to pay at a minimum \$40.00 in Virginia for a driver’s license or \$82-\$97 dollars for a passport (U.S. Department of State). A recent study in 2005 at the University of Wisconsin found that 45 percent of African-American men and 51 percent of black women in Wisconsin had valid driver’s licenses. Similarly, only 54 percent of Hispanic men and 41 percent of the women had licenses. The Wisconsin study demonstrates the disadvantage that minorities have in presenting identification when only about half of the population has driver’s licenses, the most common form of identification. The registrars’ offices also allow for utility bills as proof of residency, which may accommodate some of the poor population to acquire identification but still can disenfranchise those who are part of large public housing or are living illegally with a family member in an apartment. Potential voters could be hesitant to acquire utility bills because attempting to prove their residency could jeopardize their housing situations (Friedman, 2005).

Disenfranchisement can also be perceived in the makeup of precincts. Minority voters tend to be less educated and less wealthy than white voters. (Buchler, Jarvis, McNulty, 2004, pg 518) Wealthier precincts which are predominantly white have the necessary resources and funding to acquire the most advanced technological voting equipment, while poorer precincts must prioritize their budget which forces them to focus programs like education instead of voting equipment upgrades. Poorer counties tend to have older, less accurate voting machines.

Prior to the 2000 election Rep. Roybal-Allard (D-CA) requested a national report investigating the connection of race and income to the number of undercounted and uncounted votes in the 2000 election. The study found that voters in low income districts with a high minority population were significantly more likely to cast residual votes than voters in affluent counties with a low minority population. More advanced technology significantly reduced uncounted votes in low income counties with high minority

populations. In any given election, minority voters are casting residual votes at a much higher rate than white voters, mostly due to the fact that their districts have inferior voting technology that allows their votes to be discarded. One way to improve discarded voting is by using DRE or lever machines which cut the gap in voting errors by a factor of ten (Tomz and Van Houweling, 2003).

## **EXTENDING THE RIGHT TO VOTE**

### ***Immigration and Voting***

The Immigration Reform Bill considered in Congress in 2007, if passed, would have criminalized illegal immigrants to the point of detention or deportation. Politicians are treading lightly around the issue for fear of losing valuable votes among minority populations, most specifically Latino and Asian votes. While this issue is continuing to play out in 2007, the results of the legislation should have measurable impacts on the minority electorate.

The immigrant population's involvement in the electoral process is a key contemporary voting issue. It is pertinent in Virginia as 269,121 immigrants entered the commonwealth between 1990 and 2000. There are currently 337,512 non-citizens living in Virginia, compared to the national total of over 18 million (GCIR, 2001). While only naturalized immigrants are granted permission to vote, some localities nationwide grant suffrage to immigrants, both documented and undocumented, for local elections. In Takoma Park, Maryland-a suburb of Washington D.C., non-citizens may vote in local elections. Also, non-citizens in Chicago may vote in school board elections. In 2004, there was a strong effort among immigrant voting advocates in New York City to grant suffrage to approximately 1 million immigrants, of which 35% are of voting age (Zimmer, 2006). This effort was rekindled in early 2007, though Mayor Michael Bloomberg remains firm in his stance to deny suffrage to non-citizens. Immigrants were permitted to vote in national elections until 1926 when the xenophobic conditions of post-World War I United States were enough cause for Congress to prohibit non-naturalized immigrants to vote. Those opposed to allowing non-naturalized immigrants the opportunity to vote believe that such a move would "cheapen" the significance of citizenship. Mayor Bloomberg holds that the only path towards immigrant voting is through the naturalization process (Zimmer, 2006).

Currently, foreign-born voters account for approximately 5 % of the electorate while non-naturalized immigrants would add significantly to that percentage. The strong argument for immigrant suffrage is that they work and pay taxes yet have no say in the government. In New York, immigrants alone pay \$18.2 billion in state income taxes (Zimmer, 2006). Others argue that the laws currently in place to prohibit non-naturalized immigrants to vote muffle the voice of the nation. According to the Urban Institute's Immigration Studies Program, nearly 62% of all Latinos living in the U.S. could not vote in 2000 due to age or citizenship requirements. Also, 59% of Asians were not permitted to vote in the same election. These figures compare to 35% of blacks and 25% of whites who were disenfranchised for similar reasons (Tactaquin, 2004). It is difficult to ignore the large disparity between the two sets of numbers.

A *Washington Times* article from 2004 acknowledges that it is possible for illegal immigrants to vote in elections, however it is expected that only a small number of them do so. First time voters in Virginia are required to show photo ID however any subsequent time at the polls does not require ID. Also, social security numbers are required at the polls, but the cards themselves are not required. Therefore, illegal immigrants who have obtained driver's licenses (and have registered to vote through the Department of

Motor Vehicles) could feasibly vote in an election. Also, election boards at the polling places have no way of determining citizenship (Bellantoni, 2004).

In Richmond, there is a growing Latino community that has the potential to shape local politics; however they have yet to fully mobilize, according to Ms. Tanya Gonzalez, Director of the Hispanic Liaison Office in South Richmond. Currently the Latino population in Richmond has not reached the point where ballots would be available in Spanish. Ms. Gonzalez believes that the Latino aliens in Richmond would vote if given the chance and that those seeking citizenship cite the opportunity to vote as one of the main benefits of becoming naturalized.

### ***Felons***

The justice systems of many states across the country deny or limit the access to vote on the basis of criminal convictions. In particular, Southern states with the smallest voter turnout rates among African American males have permanent disenfranchisement laws revoking the rights of felons from voting for life (Weaver, 1996). In fact, the states with the highest African American populations often have the harshest laws. More than 25 percent of the black male population has prohibited voting rights in Alabama, Mississippi, Virginia, and Florida. In some states, criminals with probationary sentences may lose the right to vote for life. These voting restrictions have disenfranchised 3.9 million people or 2% of the population. Most of the restricted felons are not currently incarcerated (Green, et al. 2004).

Advocates of criminal restrictions argue that felons lost their rights and privileges as citizens when they committed crimes. Some individuals believe that when the felons broke the law they violated their social contracts and should have their civil liberties revoked. Supporters believe that to further punish the criminals and deter from future crime, felons' voting rights should be restricted (Dhami, 2005). The disenfranchisement of felons' voting rights promotes civil responsibility and respect for the law. The major debate over felon disenfranchisement creates tension between disciplinary actions and civil liberties (Uggen, 2006). According to a 2002 study by Uggen, there is little public support for the disenfranchisement of voting rights for all people convicted of felonies. Most of the public perceives the restrictions as severe punishments in a democratic society with universal suffrage. In addition, most Americans believe that the right to vote should be revoked during incarceration but should be reinstated following the completion of the sentence. States such as Florida and Virginia, allow ex-felons to apply for voting right restoration. Applicants are required to have no more than \$1000 in delinquent fines. Opposition to the restriction of voting rights link the requirement to pay fines to poll taxes used in the Jim Crow Era which discouraged minorities from voting. In 2005 Congressman John Conyers (D-MI.) introduced the Civic Participation and Rehabilitation Act, which asserts that citizens of the United States should not be denied the right to vote because of a criminal conviction, unless the citizen is serving a sentence or is imprisoned. Strong opposition to the Act came from fellow legislators who did not want to appear soft on crime, and hence, the legislation never passed.

Please see Appendix C for more information on the felon rehabilitation effort in Richmond.

### ***Absentee Voting***

In an effort to increase voter turnout, states passed laws allowing for citizens of the United States the ability to receive absentee ballots before an election and cast their votes without having to be present at the polling stations on Election Day. Voters are to apply prior to the election to receive their ballots and then submit the completed forms by the required date determined by each state. Absentee ballot voters need to be cautious when voting to complete all requirements in order to have their votes certified and

counted. Almost all states offer an early voting option with absentee ballots and most have a “no fault” policy that allows voters to cast their ballots by absentee regardless of reason (Moore, 2003).

The United States established absentee voting during the American Civil War in order to guarantee voting rights to soldiers (Steinbicker, 1938). It was not until 1896 (almost thirty two years later) when the first law allowing absentee ballots for civilians in the state of Vermont was adopted (Feigert, 1973). Many states did not institute laws enabling the use of absentee ballots until World War I to permit electoral action by armed forces and government employees (Steinbecker, 1938). Kornbluh asserts that the states introduction of absentee ballots attributed to higher voting rates among the better educated and higher income voters (Kornbluh, 2000, pg 126).

Following World War I many laws were passed to grant citizens the right to absentee voting in order to account for citizens’ absence due to professional duties, disabilities, or illness (Feigert, 1973). Laws differ among states, as each state’s Secretary of State or Director of Elections independently controls their own system for absentee ballots, including requirements of verifying legal ballots in order to maintain fair elections. In the past, absentee ballots were problematic due to laws specifying the cause of absence, laws regarding the geographical acceptance of votes, and the lack of government reporting (Oliver, 1996). Some states require voters to be within the U.S. territories in order to cast their ballot. Today, the Uniformed and Overseas Citizens Absentee Voting Act of 1986, guarantees nearly all U.S. citizens temporarily residing abroad the right to register and vote (Moore, 2003).

Other evolutions in absentee voting rights have come from the innovation of new technologies and the demand for commercial travel. Many states have permitted the use of absentee ballots by professionals in order to give the right to vote to those engaged in business that are unable to be at their local precinct on election day. The laws mostly affect business people overseas or those in the train or airplane industries. Due to the number of astronauts living in Houston, state officials passed a law in 1997 giving astronauts the right to vote by absentee ballot in case they were in outer space. As a service to these citizens who have trouble getting out to the polls, absentee ballots are also offered to the sick, students living in different countries or states at college, and the handicapped to cast their ballots before Election Day.

Historically, absentee ballots have comprised a significant portion of vote totals. For example in the 1970 Presidential election, absentee voters from California provided Richard Nixon with 147,717 votes to only 94,990 votes for Kennedy, resulting in a Nixon overall margin of 35,623 votes. The national election’s outcome was not decided by this contest, but Nixon did carry California’s 32 electoral votes (Feigert, 1973). Recently in the Presidential election of 2000, it was discovered that absentee votes swayed the election in Florida when the *New York Times* reported (after the election had been certified) that over 680 ballots that were mailed were in violation of Florida law, but were still certified and counted (Imai, 2004).

It has been shown that Republicans hold a distinct advantage when it comes to absentee ballots, in that their vote counts are enhanced, leading them to victory or narrowing the vote margin when the Democrats win (Feigert, 1973). During the 2000 election, Republican lawyers identified the pro-Bush counties that would be crucial to win Florida and argued to officials to accept armed forces votes regardless of written law (Imai, 2004). In heavily Democratic counties, Republican lawyers argued to officials to uphold the law and not allow late absentee ballots to be accepted. Lawyers managed to overturn ballots that had been late, ineligible, or missing postmarks in most counties (Imai, 2004).

## **BEST PRACTICES**

Presently the United States voting process has many issues concerning the reliability and security of elections and equipment. New methods need to be established in order to create a more reliable and

secure voting system that can benefit all voters. The ideal voting machine would be a direct-recording electronic computer instituted nationally that could assure accuracy, security, anonymity, and an auditable paper trail.

Electronic touch screens are ideal because they are quick and easy to use and prevent over-voting and notify voters of any under voting. The machines can be configured to suit any election without difficulty and allow the ballots to be in a variety of languages (Dill, 2003). The electronic touch screens also benefit the visually disabled, as the font sizes may be enlarged and screen contrasts adjusted to better aid those in need of voting assistance. As another option, DREs may be enabled with an audio component to further aid the disabled. To securely and accurately account for all of the votes, electronic touch screen devices would have paper printouts so that voters could verify their selections. Immediately after verification, voters' ballots would be officially counted using an optical scanner, and all paper printouts would be collected as a secondary form in case of a recount. This aspect of voter verifiability would ensure voters that the votes indicated on the DRE touch screens will indeed translate into accurate and transparent results. This ideal voting method involving a "ballot-marking machine" can be attributed to Dr. Avi Rubin of Johns Hopkins. This type of machine would alleviate many of the problems of transparency, accessibility, and verifiability of current voting methods.

Security and reliability can also be enhanced through the separation of manufacturing duties. Different independent companies should be committed to produce the e-voting machines and manufacture optical scanners. The division of production responsibilities among different companies would prevent companies from engaging in fraud or tampering with machines.

Also, in order to prevent such conflicts of interest that have complicated the last two Presidential elections, we prescribe that voting officials be prohibited from serving on political committees that may otherwise interfere or call to question the integrity of their position as elected or appointed voting officials. Should an official be so involved, he or she must release him or herself from the position to protect the integrity of the election process.

## **MOVING FORWARD**

Research continued through a series of interviews with local Richmond, Virginia area election officials, in order to ascertain election procedures, methodologies, and future plans, mostly concerning the upcoming 2008 presidential election. The differences in voting practices within and between local jurisdictions were analyzed with special attention to the effects of socioeconomic factors that can be associated with these differences. The six areas of focus are Henrico County, Hanover County, Goochland County, the city of Richmond, Powhatan County, and Chesterfield County. A contact list of the election officials of the respective counties has been assembled to initiate the interview process [Appendix A]. A group of questions focusing on security, ballot design, and election processes was created to guide the interviews and to help identify relevant differences between the counties' election procedures [Appendix B].

## **INTERVIEW RESULTS**

### *Henrico County*

#### **Background**

Henrico County, a locality with over 284,000 residents, represents suburban Richmond to the north, west, and southeast of the city (2000 Census). The General Registrar of Henrico County, Mr. Mark Coakley,

has served in this position since 2004. Prior to arriving in Virginia, Mr. Coakley served as the director of elections in Asheville, North Carolina from 1999-2004. He currently operates with a staff of nine individuals including the Deputy Registrar, Jacqueline H. Timmons. The Registrar reports to the Electoral Board, comprised of two members of the current Governor's political party and one member of the opposing party.

### **Voting Technology**

The county is divided into 91 voting precincts and is served by Advanced Voting Solutions (AVS) WINvote DRE machines. The machines were selected by the county first through an exploratory committee, where it was decided among the General Registrar and other committee members that the WINvote machines would best suit the County's needs. The suggestion was then taken to the three-member Election Board where it was approved and subsequently taken to the County Supervisors for final approval and procurement. Soon after the purchase of 800 DRE machines in 2005, the county took part in a voter education program, providing demonstrations at different locations, including fairs, festivals, libraries, supermarkets, and Rotary Club meetings. Since the introduction of the machines, Henrico County holds public demonstrations only at the General Registrar's office as well as at polling places on Election Day.

### **Ballot Design**

Mr. Coakley is currently responsible for ballot design in Henrico County. While other localities might contract the ballot design service out to a software vendor, Henrico County performs this service in-house with software acquired from AVS. After designing the ballot, it is submitted to the State Election Board for approval. After the approval of ballots, the ballots are then programmed onto SMART cards, where they may then be transmitted onto the voting machines on Election Day. During an election, the Registrar's office may be responsible for the design of up to 11 or 12 different ballots, depending on the precinct and its related political races.

### **Security**

The WINvote machines are stored in locked cages in an offsite, unmarked warehouse, which is locked and secured with video surveillance. When preparing for the election, the machines are transported from the storage location by voting machine technicians to the various precincts. The machines are delivered on the Thursday, Friday, or Monday prior to the Tuesday election depending on the precinct location. On arrival, the machines will have been sealed and secured with numbered locks. Prior to the election, each machine will have had a Logic and Accuracy Test performed on it to ensure that the machine is functioning properly and will record votes accurately. Before the opening of the polls on Election Day, each machine will have run another test to certify that no prior votes have been cast. Throughout Election Day, each precinct is responsible for monitoring the machines to prevent tampering.

### **Polling Places**

In the 91 precincts of Henrico County, each polling place is typically staffed with 7 to 13 poll workers, depending on the size of the precinct. Each poll worker receives between 2-3 hours of training by the county two weeks prior to an election. The number of voting machines present at each polling place will also tend to vary with precinct size. The county has approximately one machine for every 150 voters; therefore the number of machines will be different for each precinct and will vary depending on expected voter turnout.

### **Other Points**



Presently, General Registrar Mark Coakley believes Henrico County has sufficient resources to administer fair elections. In Fiscal year 2007, the Electoral Board has been allocated \$1,351,297 in 2007, an increase of 16.2% from 2006. (Henrico County, 2006).

Asked if he could change anything in the election process, Mr. Coakley said that he would like to see a move to Early Voting, thus giving voters more than just one day to cast their ballots.

Mr. Coakley foresees that the Presidential Election in 2008 could be frustrating for General Registrars across the state. A Virginia law that goes into effect July 1, 2007, further prohibits the purchasing of new DRE equipment that is not equipped with a voter-verifiable paper ballot. Any existing DRE equipment may be used until they become worn out. This puts registrars and localities into an interesting position as the Commonwealth is advocating the use of equipment that is not yet invented.

### *Goochland County*

#### **Background**

Goochland County, located between Charlottesville and Richmond, is a predominately rural locality with a 2006 Census estimated population of 20,085 (Census). The General Registrar serving Goochland County is Frances Ragland. Ms. Ragland has served in that capacity since 1992. Her staff consists of 1 part-time assistant. The county has approximately 14,000 registered voters who cast ballots in nine precincts. The Registrar's office is overseen by the three-member Electoral Board of Goochland County.

#### **Voting Technology**

Voters in Goochland County cast ballots on the Advanced Voting Solutions (AVS) WINvote DRE machines. The Electoral Board recommended the purchase of forty WINvote machines which was then approved by the County's supervisors. Prior to the DREs, Goochland employed lever machines to cast ballots. The County received the machines prior to the 2004 General Election and received training by the voting machine vendors. Ms. Ragland credits AVS for the smooth transition between voting methods. In order to educate voters on the use of the machines, the Registrar traveled to different civic groups and churches throughout the County and held demonstrations of the WINvote machines. There is also a demonstration machine located in the Registrar's office for voter education. The demographics of the County were measured when selecting the voting equipment as the older population of Goochland County was considered.

#### **Ballot Design**

In Goochland County, ballot design is a responsibility of AVS. The county has contracted the service out to the voting machine vendor instead of producing the digital layout of the ballot in-house. This was an economic decision for the County as it weighed the costs of purchasing the necessary software and using the vendor's ballot design service.

#### **Security**

The County's forty WINvote machines are stored in locked, metal cages at an undisclosed location, where the Office of the Registrar has access. Prior to Election Day, the voting machines are given to the Chief of Elections of the various polling places until the Monday before elections. The night before Election Day, the machines remain in the possession of the Chiefs of Elections, who are then responsible for transporting the machines to the precincts the following morning. This is a practice encouraged by the General Registrar. Following the close of the polls, the results are telephoned to the Registrar's office.

While there is statement of the DRE results available to be printed, there is no voter-verifiable paper record produced.

### **Polling Places**

In order to maintain a balance of political party representation at the polling places, Goochland County will often ask poll workers to represent either party during Election Day. It can be difficult to staff a totally bi-partisan panel of poll workers in each of the precincts in the strongly Republican Goochland County. However it is made sure that the Chief of Elections and Assistant Chief of Elections at each precinct are of different parties. The amount of poll workers per site will depend on the size of the precinct. The largest precinct, Manakin, will be staffed by about ten poll workers, whereas some of the smaller precincts will be staffed by three workers.

### **Other Points**

The Registrar of Goochland County is currently pleased with the amount of funding that is used towards election administration. In 2007, the office of the General Registrar has been allocated \$104,998 (Goochland County, 2006).

Ms. Ragland shares in the uncertainty of other area registrars over the new legislation going into effect in July, 2007. Any new election equipment that would be used in the 2008 election has yet to be invented, according to the Registrar.

### *Hanover County*

#### **Background**

Hanover County, located Northeast of Richmond, is another mostly rural locality with an estimated population of 98,983 (Census). The General Registrar of Hanover County is Robert M. Ostergren and he is assisted by the Deputy Registrar, Shirley M. Morris. Mr. Ostergren has held the post of General Registrar since 1987. He reports directly to the Electoral Board of Hanover County and the State Board of Elections on aspects such as ballot design approval. The Registrar of Hanover County administers elections for 64,000 registered voters.

#### **Voting Technology**

In Hanover County, elections are conducted through the use of optical scan technology, where votes are read and tallied by counting machines manufactured by Election Systems and Software (ES&S). For disabled voters or for those with special needs, Hanover County employs the AutoMARK machines also manufactured by ES&S, which will magnify the paper ballots and will mark the ballots as indicated by voters. The AutoMARK machines also include an audio component to further aid voters who might need further assistance.

Each precinct is provided with one counting machine and at least one AutoMARK machine. The counting machines are able to automatically detect undervotes and overvotes, and as long as the voter does not leave the polling place before the ballot is counted, the voter will have a chance to correct his or her ballot, should they so choose.

#### **Ballot Design**

In Hanover County, the responsibility of ballot design falls on the General Registrar. Mr. Ostergren designs the layout of the ballots by using a software package before submitting it to the Electoral Board of Hanover County and the State Board of Elections for approval. He cites the appropriate amount of oversight of the process as a reason why there is little issue with ballot design in the locality.

## **Security**

The use of optical scan technology in Hanover County was implemented over the DRE machines because of concerns regarding the lack of a paper trail with the DREs. Even if it means more work for the Registrar's office, Hanover County is committed to provide enough transparency and verifiability of election results, Mr. Ostergren said. The testing and programming of the ballots takes place well in advance of the election and includes the participation of different individuals to ensure oversight of the process.

Counting machines are received at the polling sites on the Thursday or Friday prior to Election Day. They are transported from a secured storage location by a law enforcement officer and Mr. Ostergren's twin brother, who has been appointed by the Electoral Board, to carry out the task. The machines are secured through a series of locks and the Chief of Elections is responsible for unlocking the machines on Election Day. The counting machines contain a log of all recorded operations that occur throughout Election Day and can be recalled on a memory card or through a physical paper printout. The AutoMARK voting machines arrive with the counting machines and require a password to turn on.

## **Polling Places**

In Hanover County there are 300-400 voting stations that are distributed among the 33 voting precincts. Each precinct will receive an ES&S M-100 Counting Machine and at least one AutoMARK machine. As with other counties, the amount of poll workers per precinct will vary on the election and size of the precinct. Typically the range of poll workers will be from a minimum of three to approximately ten. Again, the Commonwealth of Virginia asks that each polling place have equal representation of parties by poll workers, and is often met in Hanover County by asking poll workers to represent either party on Election Day. As with some of the other counties surveyed, Hanover County is predominately Republican.

## **Other Points**

At this time Mr. Ostergren believes that his office is sufficiently funded to administer fair elections in Hanover County. In 2007, the office of the General Registrar has been budgeted \$321,829, representing an 8% increase from the \$298,118 allocated in 2006 (Hanover County, 2006). While well funded, Mr. Ostergren notes that he tries to remain fiscally responsible. However, Mr. Ostergren believes that his office is understaffed. He would like to see 1-2 staff members added to the Registrar's office.

When asked if there is an area locality which implements elections well, Mr. Ostergren identified Chesterfield County. He credits the leadership in Chesterfield as well as the financial support from its government for its honorable reputation.

When asked if he could change any election process, Mr. Ostergren would like to see a "No Fault Absentee Ballot," where voters would not have to state a reason as to why they are voting by absentee ballot. He also believes that the Commonwealth should be more involved in the oversight of technology issues and voting. He notes that there are too few people who are trained in technology who could be of assistance in administering elections and that technology issues require close attention; especially when the integrity of elections could be called to question.

## *Chesterfield County*

### **Background**

Chesterfield County, located Southwest of Richmond, is home to an estimated population of 296,718 (Census). Lawrence C. Haake, III was named the General Registrar of Chesterfield County after serving as a lieutenant in the Richmond police force for sixteen years, a year on the Chesterfield Electoral Board, and five years working for a software publishing company. He reports directly to the Electoral Board of Chesterfield County and the State Board of Elections on aspects such as ballot design approval. The Registrar of Chesterfield County administers elections for 183,000 registered voters.

### **Voting Technology**

In Chesterfield County, elections are conducted through the use of optical scan technology, where votes are read and tallied by counting machines manufactured by ES&S. For disabled voters or for those with special needs, Chesterfield County employs the AutoMARK machines also manufactured by ES&S, which will magnify the paper ballots and will mark the ballots as indicated by voters. The AutoMARK machines also include an audio component to further aid voters who might need further assistance.

Each precinct is provided with one counting machine and at least one AutoMARK machine. The counting machines are able to automatically detect undervotes and overvotes. The shift from punch card voting to optical scanners occurred after the enactment of the Help America Vote Act when Chesterfield County, like many other localities across the country, needed to make a decision to replace their voting technologies. General Registrar Lawrence Haake met with the Electoral Board, County Administrator, and Board of Supervisors to evaluate optical scanners and computerized DRE machines as possible options. In an effort to maintain transparency, confidence, and familiarity, the committee decided that optical scanners would be an easy transition for voters and provide for a secure election. The committee came to their final decision to use optical scanners because of their many concerns with DRE machines, such as the lack of a voter verifiable paper trail and security issues surrounding the systems that have wi-fi capability. Today, Chesterfield County has established a cutting edge and reliable infrastructure with a strong checks and balances system for maintaining the integrity of elections.

One significant factor that establishes Chesterfield County as a technologically progressive locality is the Election Reporting and Voter Verification (ERVV) software developed by Mr. Haake. ERVV is unique to Chesterfield County and provides poll workers with voter name verification, social security number verification, precinct maps, tallies, and reporting abilities. Chesterfield uses the technology to verify voter's precincts and direct voters to the correct polling places. The program provides quick and efficient transmission of results for two thirds of the county's precincts.

### **Ballot Design**

In Chesterfield County, the responsibility of ballot design falls on the General Registrar. Mr. Haake designs more than twenty layouts of the ballots before submitting one of the designs to the Electoral Board of Chesterfield County and the State Board of Elections for approval.

### **Security**

The use of optical scan technology in Chesterfield County is designed to provide enough transparency and verifiability of election results. To ensure secure elections, Chesterfield County has a system of

checks and balances to prohibit tampering with voting machines. Testing and programming of the ballots takes place well in advance of the election and includes the participation of different individuals to administer the process. The County tests the machines again on Election Day to analyze the machines for possible technical problems. Machines are locked in transportable cages with multiple locks for counting machines and storage areas. The Friday or Monday prior to the election, government employees deliver the machines and ballots to the polling stations. The night before the election, the Chief of Elections is responsible for unlocking the cages and setting up voting booths if they choose to, but the optical scanner and ballots are not opened until the morning of the election. The counting machines contain a log of all recorded operations that occur throughout Election Day and can be recalled on a memory card or through a physical paper-printout.

### **Polling Places**

In Chesterfield there are approximately 450 voting stations that are distributed among the 33 voting precincts. Each precinct will be provided with an ES&S M-100 Counting Machine and at least one AutoMARK machine. As with other counties, the amount of poll workers per precinct will vary on the election and size of the precinct and the projected turnout for the election. Typically the range of poll workers is from seven to sixteen workers. Again, the Commonwealth of Virginia asks that each polling place have equal representation of parties by poll workers, and is often met in Chesterfield County by asking poll workers to represent either party on Election Day.

### **Other Points**

Mr. Haake expressed how fortunate he felt to be in a county like Chesterfield that provides him with more than adequate funding, but if he had the power to change election processes he would close schools for the day to ensure the safety of voters and provide adequate parking. Mr. Haake also stated that it would be beneficial to create more communication with Department of Motor Vehicles so that provisional ballots could be verified with more efficiency and speed. In the next year, Mr. Haake will update ERVV by providing an option for provisional ballot entry so that the process of verification could begin faster. He is also creating a second deputy registrar position to focus solely on the election process. Mr. Haake would also like to explore the possibility for transportation to the polls if possible and feels it would enhance the election by providing for more voters to reach the polling station. In 2007, the budget for the General Registrar's office in Chesterfield is \$709,600, which is an 8.3% increase from the previous year (Chesterfield County, 2006).

### *Powhatan County*

### **Background**

Powhatan County, located west of Richmond, is home to an estimated population of 22,273 (Census). Inez L. Poe is the General Registrar of Powhatan County and is supported by the Assistant Registrar Jamie Swemba. She reports directly to the Electoral Board of Powhatan County and the State Board of Elections on aspects such as ballot design approval. The Registrar of Powhatan County administers elections for 16,000 registered voters.

### **Voting Technology**

In Powhatan County, elections are conducted through the use of electronic touch screen technology, where votes are processed by the WINvote DRE machines manufactured by Advanced Voting Solutions. The machines provide for easy transportation, quick programming, and the ability to adapt the ballot for foreign speakers and the disabled. Ms. Swemba explained to us that the technology has the ability to

reproduce every vote with a paper trail, which may be printed from a master voting machine or each individual machine at each precinct.

Powhatan County followed similar procedures as other local counties to choose new technology to meet HAVA's standards by reaching a collaborative decision from the Electoral Board and Registrar's office. The committee decided to switch from lever machines to DRE machines produced by Advanced Voting Solutions. The company provides the county with WINvote machines as well as creates state certified ballot designs, which takes a great deal of pressure off the Registrar's office to create and adapt ballots for state approval every year. When making the decision to switch voting methods, the county desired the latest, most advanced technologies that would benefit the county the most. During the switch, area voters responded very positively and praised the technology as quick and easy to use. Assistant Registrar Swemba also applauded the DRE machine on its ability to efficiently collect votes, easy transportability, and claims that the technology decreases the chance for human error in counting.

### **Ballot Design**

In Powhatan County the ballot is designed by Advanced Voting Solutions. The design is presented to the Electoral Board of Powhatan County and the State Board of Elections for approval.

### **Security**

To make certain the machines are safe before an election, Powhatan County keeps the WINvote DRE machines locked in a warehouse. The machines are secured in cages. The day before the election Mrs. Swemba delivers the voting machines to the Chiefs of the Precincts. Mrs. Swemba explained that the machines are in the Chiefs of Precincts possession for the night and usually the machines are brought home with the Chiefs. Prior to the election, all members working in the precinct need to verify that the machines have blank voting counts. Also prior to the election, the workers need to deactivate the wireless interface on the computers to shield them from internet hacking. The machine's wireless function is turned on for three minutes prior to the election and three minutes after the election to collect all of the data.

### **Polling Places**

In Powhatan there are 45 voting machines that are distributed among the 10 voting precincts. Each precinct has one to three machines and a backup machine in case of any problems that might occur. The number of poll workers per precinct varies with the type of election and size of the precinct. Powhatan has an average of eight poll workers per precinct. The Commonwealth of Virginia asks that each polling place have equal representation of parties by poll workers, Powhatan County has trouble finding Democratic representatives in the mostly Republican county, but poll workers are willing to sit in as Democratic poll workers for the day.

### **Other Points**

Some areas that Assistant Registrar Swemba would like to change would be to allow the wireless connection on voting machines to remain on for longer periods in order to have a master computer that would collect all of the voting machines tallies automatically. Assistant Registrar Swemba expressed the importance of the wireless connection to aid the poll workers especially at the end of the day. Ms. Swemba feels the process of manually counting each machine in the precinct leaves open the ability of human error and if the wireless component was permissible by the State, the main computer could calculate the votes without error. In addition, Mrs. Swemba feels the county has an adequate number of voting machines but would still like to see more purchased. In FY 2007, Powhatan County has

appropriated \$119,529 for the Registrar's office, which is an 18.5% increase from 2006 (Powhatan County, 2006).

### *Richmond City*

#### **Background**

Richmond, the capital of the Commonwealth of Virginia is located in central Virginia and has a population of 192,913 (Census). Ms. J. Kirk Showalter serves as the General Registrar of Richmond City. She previously worked in the Governor's budget office and was appointed General Registrar in 1995. Ms. Showalter reports directly to the Electoral Board of Richmond City and the State Board of Elections. The Registrar of Richmond oversees elections for 74,784 registered voters. For 2007, the office of the General Registrar of Richmond has been apportioned \$811,012, down from \$827,953 in 2006 (City of Richmond, 2005).

#### **Voting Technology**

The City of Richmond formed a committee to select new technologies after the 2000 election. Each committee member was instructed to rate the various systems using a grading scale. The top two scorers were tested and the committee found WINvote to be the more reliable of the two. Members of the committee took into regard the high elderly population of Richmond City when grading the machines. The city mainly chose the DRE machine because of its easy adaptability and General Registrar felt that paper ballots created more security issues than DRE machines. Ms. Showalter, commended the technology for being able to be programmed in any language, provide easy readability, is a light machine and can easily provide for curbside voting. The machines have zoom capability as well as an audio component for the elderly or sight impaired. Ms. Showalter realizes the capability of computer tampering through "hacking" but she feels that the potential of tampering to occur would be highly unlikely.

#### **Ballot Design**

In Richmond City, General Registrar Showalter designs the ballot design using Advanced Voting Solutions software and submits it to the Electoral Board of Richmond City and the State Board of Elections for approval.

#### **Security**

Pre-election, Ms. Showalter holds a mock election with county employees to check for tampering of election equipment. Prior to the election, the machines are locked in steel cages and stored in an unmarked warehouse. The week before the election, county employees deliver the machines to the precincts and machines are secured at the polling places in locked closets until Election Day. All voting tallies are transmitted by telephone to the Registrar's office and then the official canvass is taken the next day for final confirmation.

#### **Polling Places**

In Richmond sixty-five voting precincts are accessible for voters to cast their ballots. Each precinct has on average, 2,500 people and is equipped with eight voting machines on average, but larger precincts can have up to fifteen machines. The number of poll workers per precinct varies because of the expected turnout for the election and the number of workers available. Normally a polling station has two workers per check-in table, two workers for every three machines, and a chief of the precinct. Richmond tries to

uphold the equal representation of parties at election polls but the city has few volunteers and often is fortunate to get enough people to work regardless of party affiliation.

### **Other Points**

If Ms. Showalter could change the elections in Richmond City she would like to keep DRE machines and open the wireless option. She also would like central voting stations in four areas of the city and allow for voters to vote over a two week period to increase turnout. In reference to poll workers, Ms. Showalter believes that election officials should have some formal training and would like a system of public service to be instituted much like jury duty to increase the number of poll workers.

## **CONCLUSION**

In this study, we illuminated the history of voting in the United States through its methods, technologies, and procedures. We found that the current system of elections is far from perfect, where everyone who is eligible to cast a ballot, would have their vote counted. It took a disastrous national election for lawmakers to begin to maintain any serious oversight on the type or quality of voting equipment. The resulting legislation, the Help America Vote Act, initiated the massive procurement of voting technologies that should theoretically prevent another large-scale election fiasco made famous by Florida in 2000.

While the advancement from punch card-based elections to DRE or optical scan technology is an improvement, each technology has its shortcomings. As it currently stands, a vast majority of DRE machines used by localities produce no paper record. While the DREs have been touted as a highly accessible and convenient means by which to cast ballots, the lack of an auditable paper trail is troubling. The DRE machines currently in use in the Richmond metropolitan area have been widely accepted by Registrars and voters alike. However, the technology was at one time, vulnerable enough to cause concern. Prior to the passage of State Legislation, the wi-fi or wireless component of certain DRE machines was an encouraged and widely accepted practice among users of the WINvote DREs. The wireless technology would enable election administrators to quickly initiate and close the polls through machine to machine communication. Yet this feature of the WINvote machines leaves elections highly vulnerable to attack, according to one Registrar familiar with the technology.

Optical Scan technology, used in two of the six metropolitan jurisdictions, is perhaps the most secure and transparent form of election technology currently used. The paper ballots serve as the official record of a voter and can be used in an audit or recount, whereas the DREs do not have a physical paper record of each vote. While one area Registrar cites that the use of paper in an election increases security issues by “one-hundred fold” over DRE machines, we have not found evidence to support it. Despite its transparency and voter verifiability, optical scan technology by itself, is not as accessible to the vision-impaired or voters who would require a ballot in another language. The use of the AutoMARK system in conjunction with the optical scanning devices allows the vision-impaired to mark their ballots on a magnified screen. We believe that the AutoMARK system is the closest technology currently implemented in the Richmond Metropolitan area that satisfies our terms for best practice. The AutoMARK system is, in essence, a ballot marking device that produces a paper record that is voter verifiable. However, according to the General Registrar of Chesterfield County, Mr. Lawrence Haake, the main obstacle for widespread implementation of the technology is the cost and transportability of the device. Mr. Haake stated that the AutoMARK devices currently implemented by Chesterfield were paid for by the County and not with federal assistance from HAVA.



The prospect for election fraud in the six localities examined in this study is relatively low. However, we did find a trend among the more rural counties that appeared disconcerting on the surface. Two counties, both using the WINvote DRE machines, would place the voting machines in the possession of election chiefs the day before elections. While other localities implementing the same technologies will have the machines delivered and secured in the voting precincts in the days prior to an election, the reliance on election chiefs to store and transport the voting machines unilaterally is cause for some concern. However, in the defense of the localities, the dependence on election chiefs to transport the machines to remote and occasionally insecure precincts may be their best logistical solution. Yet the potential to tamper with the voting machines remains. While there are levels of security to detect any physical tampering with the machines, someone with enough external motivation could possibly find ways to defraud the equipment. Though it is unclear if other rural localities across the nation employ a similar practice, it would not seem uncommon if it were the case.

A solution to this issue would include finding a polling place within the precinct that could be secured to the point where election chiefs would not be required to keep the voting machines in their homes the night before an election. If that is not possible, the machines could be transported to the various precincts in the early morning hours of Election Day. While this might be difficult to implement in a logistical sense, it does not call to question the integrity of the election as much as the current practices might.

We see in the budgetary figures for the various Registrars' offices that the amount of funds divided among registered voters differs considerably among localities (Table A). Among the two localities that employ optical scan technology, Hanover and Chesterfield Counties, we see the lowest budgeted dollars per registered voter among the set of six localities which can be attributed to the lack for software and vendor contracts that localities using DRE machines would be required to pay as part of the regular upkeep of the voting machines. Common among all localities in their budgetary figures are salaries and benefits, funds to staff election officials, office equipment, postage to mail voter ID cards, rent, either for the voting machine storage or for the registrars' offices, and the printing of absentee ballots.

In Table B we demonstrate that the voting technologies are employed regardless of the sociological characteristics present in each locality. We do not believe that there is any neglect or discrimination of any group occurring in the six localities when it comes to using voting equipment. It can be seen in Table B that similar technologies are used in diverse populations as well as more homogeneous populations and that technologies used in wealthier localities are also used in localities where a greater percentage of the population lives beneath the poverty line. Also, each type of voting equipment selected by each locality and is used throughout; therefore all voters in a particular precinct will use the same voting equipment as the entire locality.

## **Appendix A**

### **Richmond Area Election Officials Contact Information**

#### **Richmond City-**

J. Kirk Showalter, General Registrar  
900 E. Broad Street, Room 105  
Richmond, Virginia 23219  
Telephone: 804-646-5950  
Fax: 804-646-7848  
E-mail: [Kirk.Showalter@Richmondgov.com](mailto:Kirk.Showalter@Richmondgov.com)

#### **Chesterfield County-**

Lawrence C. Haake III, General Registrar  
9848 Lori Road  
Chesterfield, VA 23832  
Telephone: (804) 748-1471  
Fax: (804) 751-0822  
E-mail: [registrar@chesterfield.gov](mailto:registrar@chesterfield.gov)

#### **Powhatan County-**

Inez L. Poe, General Registrar  
Powhatan County Administration Building  
3834 Old Buckingham Road, Suite G  
Post Office Box 58  
Powhatan, Virginia 23139  
Telephone: (804) 598-5604  
Fax: (804) 598-5877  
E-mail: [govote145@state.va.us](mailto:govote145@state.va.us)

#### **Hanover County-**

Robert M. Ostergren, General Registrar  
General Registrar  
P O Box 419  
Hanover, VA 23069-0419  
Telephone: (804) 365-6080  
Fax: (804) 365-6078  
E-mail: [rmostergren@co.hanover.va.us](mailto:rmostergren@co.hanover.va.us)

#### **Goochland County-**

Frances C. Ragland, General Registrar  
P.O Box 1013  
Goochland, VA 23063  
Telephone: 804-556-5803  
Fax: 804-556-6323  
E-mail: [fragland@co.goochland.va.us](mailto:fragland@co.goochland.va.us)

#### **Henrico County-**

Mark J Coakley, General Registrar  
P.O. Box 27032  
Richmond, VA 23273  
Telephone: (804) 501-4347  
Fax: (804) 501-5081  
[registerandvote@co.henrico.va.us](mailto:registerandvote@co.henrico.va.us)

## **Appendix B**

### **Sample Questions for Voting Officials**

#### **Official's Background**

- What path did you take to arrive at your present position?
- Where did you receive your training?
- To whom do you report?
- How many people report to you?
- Is there one person on whom you rely to execute election procedures?

#### **Election Preparation**

- What is the next election on the calendar?
- When did the preparations for that election begin?
- Could you give me the timeline for preparation prior to an election?
- How is the ballot designed?

#### **Decision Maker**

- Who is responsible for ballot design?
- Who makes the decision to determine which type of voting method is used in your county?-If not you, are you permitted to make recommendations?

#### **Voting Machine Security/Procedures**

- Where and how are voting machines stored?
- What voting machines are used in your jurisdiction? Are they the same for every precinct?
- What brand of machine is used?
  - What model?
  - If DRE, is there a paper record?
- Is there a predetermined audit procedure?
- Were demographics a consideration when selecting voting technologies for your county?
- Who is responsible for transporting the machines?
- How are election results transmitted?
- What is the current ratio of voters per machine in your county?
- Are there any laws governing such an issue?
- Who guards the machines?
- What security measures are taken to ensure a reliable election?
- Prior to Election Day, when are the machines received?

#### **Polling Places and Workers**

- How bi-partisan are panels of poll workers? Is there a prescribed formula?
- How many polling places are in your jurisdiction?

How many registered voters are there per polling place?

How vast is the voting register per precinct? Does it cover more than those assigned to the precinct?

How many voting machines are available at each voting place? How is this determined?

Can a voter vote at a polling place other than the one to which s/he was assigned?

What time do the polls open/close?

What happens at closing time? Are voters in line allowed to vote? How is it determined who is in the line at closing time (specific logistics)

Who implements the “end of line” policies?

How many poll workers per place?

What is their training? Is it the same for all workers?

What is the “order of operations” among poll workers from opening the polls to closing?

### **Voter Characteristics**

What kind of education programs are in place for voters to use and accept DREs?

-How has HAVA impacted this?

Does the county/city provide voter transportation to the polls?

What requirements must be met by voters?

Must voters provide ID?

What forms of ID are acceptable?

Are there any materials located at the poll sites to further educate voters to use the equipment?

If I was a voter, what would be the process by which I vote, from arriving at the poll place to leaving?

What would you change if you could?

Do you have sufficient resources to administer fair elections?

Which county, do you consider, is the gold standard for elections among area counties? How much communication takes place between counties?

*What differences if any, will there be in procedures, methods, or technologies will be in place for the 2008 Presidential election?*

## **Appendix C**

## **Boaz and Ruth**

**[www.boazandruth.com](http://www.boazandruth.com)**

Founded by Martha Rollins in 2002, Boaz and Ruth is a faith-based nonprofit organization that serves to reconnect ex-convicts to society by providing life skills training as well as jobs within its six business enterprises. The organization started as one building located in the center of Highland Park, one of Richmond, Virginia's most troubled areas, and grew to become an entire block including the main retail and training facility, a café/catering service, a moving company, ex-offender housing, and a newly renovated firehouse that will eventually be a small retail shopping area (Boaz and Ruth). Upon leaving the penal system, many ex-convicts have trouble mixing back into society and, without the proper programs in place, often find themselves returning to their old communities that have the same influences that initially lead them in to a life of crime (Boaz and Ruth). Boaz and Ruth address issues concerning economic development, prisoner reentry, recidivism, and cultural isolation and through community involvement and service create personal growth (Boaz and Ruth). The organization has a comprehensive approach to the systematic problems that afflict both released prisoners and the communities to which they return. Every week there are planned events, including forums, lectures, and social activities, designed to foster friendships and create a stable foundation for trainees (Boaz and Ruth).

One of the main ways in which Boaz and Ruth helps ex-offenders is through their morning workshops in which trainees learn emotional and relational competency, perform self examinations, and challenge their own beliefs and perceptions in their support group to heal the emotional wounds from prison and life experiences (Shapiro, 2007). Most of the morning sessions are life-labs that are operated by prisoner reentry trainees. Trainees are involved in every stage of the process, from construction to management, to teach personal empowerment, so that ex-convicts will be able to grow into active contributors to society (Shapiro, 2007). The personal growth and empowerment is an important aspect of rehabilitation for people to regain an identity and purpose in society (Boaz and Ruth). After the morning classes, trainees go to work at their day job working in one of the six businesses where they learn vocational skills and get on the job experience.

One of the main issues Boaz and Ruth confront is that the punishment of criminals extends far beyond the walls of prison, as most criminals have restricted rights and face social discrimination on a daily basis. At first, reestablishing a role in society is the most challenging barrier for the ex-offenders because they are constantly being punished for a sentence that has been served. Many of the ex-convicts working for Boaz and Ruth claim that reentering society was difficult because very few employers and landlords would consider their applications. One trainee who served a sentence for over twenty five years obtained his Bachelor's Degree and performs service work with Boaz and Ruth, yet even now is being denied some of his most basic rights, such as the right to vote. In the state of Virginia, felons are permanently disenfranchised and can never vote again unless the government chooses to reinstate their rights. Convicts imprisoned at a young age for a felony charge are punished in the state of Virginia for the rest of their lives. "We live in a society that preaches forgiveness, but forgives so few," one trainee told us when asked about the fairness of the statute. Boaz and Ruth continues to grow in its fifth year of operations and has expanded to provide GED classes, computer training and computer lab for clients and the community, and job placement services for residents to help provide "a way out" of poverty and hopelessness (Boaz and Ruth). The organization has been a vital aspect in the restoration of a troubled community and provides individuals with a second chance (Shapiro, 2007).

**Table A**  
**Locality Comparisons**

	Chesterfield County	Goochland County	Hanover County	Henrico County	Powhatan County	Richmond City
Population*	296,718	20,085	98,983	284,399	27,649	192,913
Registered Voters	186,000	13,838	64,000	176,000	16,000	74,784
2007 Registrar Budget	\$709,600	\$104,998	\$321,829	\$1,351,297	\$119,529	\$811,012
Budgetary Dollars per Voter	\$3.81	\$7.59	\$5.02	\$7.68	\$7.47	\$10.84
Voting Technology (Manufacturer)	Optical Scan (ES&S)	WINvote (AVS)	Optical Scan (ES&S)	WINvote (AVS)	WINvote (AVS)	WINvote (AVS)
Paper Trail	Yes	No	Yes	No	No	No
Voters Per Machine	425#	400	160#	150	355	190
Precincts	64	9	34	91	11	65
Ballot Designed In- House?	Yes	No	Yes	Yes	No	Yes
Previous Technology	Punch Cards	Lever Machines	Lever Machines	Punch Cards	Lever Machines	Lever Machines

**Source: Census 2000**  
**\*2006 Population Estimates**  
**#Voters per Voting Station**

**Table B**  
**Sociological and Economical Data by Locality**

	Chesterfield County	Goochland County	Hanover County	Henrico County	Powhatan County	Richmond City
Population for whom Poverty Status is Determined	255,117	15,546	84,211	258,106	19,932	188,116
Population below Poverty Level	11,586	1,068	3,065	15,917	1,133	40,185
% of pop. below poverty level	7%	6.9%	3.6%	6.2%	5.7%	21.4%
Per Capita Income*	\$25,286	\$29,105	\$25,120	\$26,410	\$24,104	\$20,337
White Population	196,896	11,834	74,723	177,566	17,252	71,482
% White pop. beneath poverty level	3.4%	4.5%	2.7%	3.8%	5.5%	10.8%
Latino or Hispanic Population	6,971	80	934	6,005	136	4,981
% Latino or Hispanic pop. beneath poverty level	9.0%	0%	4.2%	14.33%	0%	30.9%
Black or African- American Population	43,472	3,509	7,504	63,245	2,375	108,206
% Black pop. beneath poverty level	8.0%	14.7%	12.2%	11.5%	7.7%	27.6%

**Source: Census 2000**

**\*In 1999 Dollars**



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