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COUNTING THE VOTES:

State and Local Governments Act to Ban DRE Voting Systems as Insecure and Unreliable

When Congress enacted the Help America Vote Act of 2002 (HAVA), in the wake of the hanging chad chaos of the 2000 Presidential election, Congress appropriated some \$4 billion dollars to fund replacement by state and local governments of existing voting systems.¹ With federal taxpayer dollars, many state and local governments purchased touchscreen and other direct recording electronic (DRE) voting machines, mostly from one of the big three vendors: Election Systems & Software (ES&S), Sequoia Voting Systems and Diebold (now Premier Election Solutions).² Now, just a few years later, state and local governments are realizing that DREs are insecure and unreliable for voting and replacing them at their own expense.

Respected national authorities have recognized that DREs are insecure and unreliable. *See, e.g.*, reports by the non-partisan Government Accountability Office (GAO), the bi-partisan Carter-Baker Commission, the National Academy of Science's Committee on a Framework for Understanding Electronic Voting, co-chaired by former Governors Richard Celeste and Dick Thornburgh, the National Institute for Standards and Technology (NIST), the Brennan Center for Justice, and the nation's leading computer security experts who, funded by the National Science Foundation, formed ACCURATE.³ Increasingly, the insecurity and unreliability of DREs has been separately and independently confirmed by state authorities, including those in California, Ohio, Colorado, Pennsylvania, Florida, New Mexico, New Jersey, Virginia, Iowa and Maryland.

In 2006, New Mexico replaced touchscreen voting machines with paper ballot voting after suffering touchscreen voting machine troubles in the 2004 election that could have altered the presidential election in that state. Eighteen thousand undervotes in the 2006 congressional election in Sarasota, Florida led Florida to enact a law that provides for the replacement of touchscreen voting machines before the presidential election in November 2008. In 2007, the Secretaries of State of California, Colorado and Pennsylvania, of which two are Democrats and one is a Republican, have decertified touchscreen voting machines as unreliable and insecure. Also in 2007, the Ohio Secretary of State issued a must-read expert risk assessment of DREs that she is relying upon to usher out DREs from the Buckeye State by the November 2008 presidential election. Virginia and Iowa now forbid the purchase of touchscreen voting machines, with the intention of phasing them out, while Maryland has acted to eliminate touchscreens entirely during the next presidential election cycle, if not before, and has budgeted \$6.8 million in 2008 to this end. The Secretary of State (R) and Attorney General (D) are pushing paper ballots in Kentucky. In addition, some counties are moving ahead of their states to replace DREs with paper ballot voting. With more states now acting to eliminate DREs from their elections, the mainstream media is finally focusing attention to the problems with touchscreens.⁴

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Set forth below is a brief review of the growing trend by state governments away from the use of DRE voting systems.

1. California

On August 3, 2007, the Democratic Secretary of State of California, Debra Bowen, decertified touchscreen voting machines by Diebold, Sequoia and Hart InterCivic after “expert reviewers reported that each of the voting systems studied was “inadequate to ensure accuracy and integrity of the election results and contains serious design flaws that have led directly to specific vulnerabilities, which attackers could exploit to affect election outcomes.”⁵ California consequently bars touchscreen voting systems in its elections with limited exceptions: each polling place may have one touchscreen voting machine on Election Day for accessible balloting to voters with disabilities, and California counties may be able use such machines for early voting. Counties using this technology under such conditions must conduct a 100% manual recount of the paper records produced by the machines.

In decertifying the DREs, the California Secretary of State relied upon the extensive reports of experts who intensively tested the security and reliability of DREs in the preceding months. The experts, selected and supervised by principal investigators from the computer science faculties of the University of California at Berkeley and Davis, demonstrated, among many DRE failings, that

Sequoia AVC Edge DREs⁶

- “[A]llow the insertion of a Trojan program via a malicious USB removable storage media device that could modify ballot definitions and results.” at 4.
- Are “designed to conduct Logic and Accuracy testing in a mode distinct from Election Day mode, which enable malicious firmware . . . to avoid operating in an incorrect manner while in testing mode.” at 3.
- Contain “a shell-like scripting language in the firmware . . . that could be coerced into performing malicious actions, in apparent violation of 2002 Voting System Standards [and that] includes, among others, a command to set the protective counter of the machine . . . ; a command that can be used to overwrite . . . the system firmware or audit trail; and a command to reboot the machine at will.” at 3-4.
- Permit “corrupted or malicious data injected into removable media . . . with potentially serious consequences including alteration of recorded votes, adding false results, and, under some conditions, causing damage to the election management system when the corrupted or malicious data is loaded for vote counting.” at 2.
- Could be made to “shift[s] votes from one candidate to another and [the shift] was not detectable on the voter verifiable paper audit trail (VVPAT).” at 4.

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Accu-Vote TSx DREs⁷

- Source code software “contains vulnerabilities that could allow an attacker to install malicious software on voting machines and on the election management system, which could cause votes to be recorded incorrectly or to be miscounted,” and “is susceptible to computer viruses that propagate from voting machine to voting machine and even voting machine to the election management system, which could allow an attacker with access to only one voting unit or memory card to spread malicious code, between elections, to many, if not all, of a county’s voting units.” at 2.
- The server software permitted a person who lacked access to the source code to corrupt the election management system database, “which could result in manipulated voter totals or the inability to read election results, rendering an election impossible to complete electronically,” and to gain “root access” that “allowed manipulation of every setting on the networking devices and on the election management system server.” at 2-3.
- Without accessing the source code, investigators (1) “were able to violate the physical security of every aspect of the TSx direct recording electronic voting machine under polling place conditions using tools found in a typical office,” (2) “identified attacks on the TSx direct recording electronic voting machines that could allow a voter to delete all electronic records of ballots cast up to the time of the attack, including backup records,” and (3) identified attacks on the voter verified paper audit trail that “when combined with an electronic attack that destroyed ballots, [] could serve to effectively nullify most – if not all – of the votes cast on a particular TSx unit.” at 3.
- “[A]ttacks could be carried out in a manner that is not subject to detection by audit, including review of software logs.” at 3.

Hart InterCivic e-Slate DREs⁸

- Are vulnerable to the “use of a laptop computer to tamper with a Mobile Ballot Box memory device used to record votes cast . . . that . . . could alter vote totals in a manner not detected by technological safeguards. at 3.
- Contain “network interfaces that are not secure against direct attack” and that “can be used in a fashion for which they are not intended.” at 2.
- Allow their election software to be run on “a standard Windows desktop environment, a possible vector for unauthorized access to the voting system’s databases.” at 2.
- Use (1) “a single countywide symmetric key . . . that could allow a person to forge ballot information and election results in multiple polling locations” and (2) unchecked inputs that could enable “an attacker to use voting system components to reprogram voting system units throughout the county with malicious code that would affect a subsequent election.” at 2.

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2. Ohio

On December 14, 2007, after conducting an entirely separate and independent risk assessment of electronic voting systems, which found in DREs “critical security failures,” the Democratic Ohio Secretary of State, Jennifer Brunner, recommended elimination from the state of touchscreen voting systems.⁹ By directive dated January 2, 2008, Secretary Brunner ordered counties to make available paper ballots to any voter requesting to vote by paper.¹⁰

Since the introduction of touchscreens in Ohio, the Secretary found that “public confidence in the new machines and trust in Ohio’s elections system have suffered.” The Evaluation & Validation of Election-Related Equipment, Standards & Testing (“EVEREST”) risk analysis report makes plain how frail DREs are and how easy they are to hack, including ways that are consistent with the “vote switching” of which voters have complained in the 2004 and 2006 federal elections in Ohio. “To put it in every-day terms, the tools needed to compromise an accurate vote count [on these touchscreen machines] could be as simple as tampering with the paper audit trail connector or using a magnet and a personal digital assistant or phone [such as a Palm Pilot or Treo],” Secretary Brunner said.¹¹ These easily compromised touchscreen machines used in Ohio are used in other states throughout the country and “[w]hen asked whether her report is an indictment on how the nation votes, Brunner said, ‘I suppose it would be.’”¹²

Ohio’s voting system integrity assessment cost approximately \$2 million and involved evaluation by experts from academia and business, participation and reaction by the voting system manufacturers, and advice and review by a bipartisan team of 12 election board directors and deputy directors. Some of the “disturbing” EVEREST findings are that¹³

ES&S iVotronic DREs

- “Poll workers or voters can re-calibrate the screen of an iVotronic to prevent voting for certain candidates or to cause voter input for one candidate to be recorded for another. The procedure for re-calibrating required about one minute and is ‘largely indistinguishable from normal voter behavior.’” at 39.
- “Access to certain PEBs [personal electronic ballots] could allow unauthorized individuals to alter poll-closing functions, such as the precinct’s reported vote tallies, and inject malicious code that could be transferred from memory cards to other DREs and memory cards to the board of elections’ central system or server.” at 39.
- With a PEB or memory card, an unauthorized individual can “effectively take control over the [Unity tallying] system,” including “chang[ing] the votes of both inattentive and attentive voters monitoring the VVPAT [voter verified paper audit trails].” at 39.

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- “The iVotronic’s security mechanisms – such as passwords and firmware update functions – are ‘ineffective.’ This is extremely serious, as the firmware controls every aspect of the ballot presented to the voters, the recorded votes, and the tally system. . . For example, a firewall alteration was experimentally proved to fake a voter into believing that his or her vote was cast, although it was not.” at 39.
- “The interaction of the DRE units with their memory cards proved to be ‘extremely vulnerable,’” and susceptible to the introduction and transfer of illicit code to the server. at 28.
- “A mechanism exists in the Unity software for a user to arbitrarily edit vote totals.” at 28
- “The software or firmware of almost every major component can be altered or replaced by input from the other components with which its communicates.” at 40.
- To verify whether an ES&S iVotronic is using certified software and firmware “requires disassembly of the unit, physical extraction of the non-volatile memory device and use of special equipment to read the binary data for comparison,” and “can only be performed by qualified personnel.” This “presents severe risks to election integrity, as the firmware in the iVotronic voting machine could be ‘compromised and modified without detection,’ conceivably occurring ‘before, during or after an election.’” at 51.

Diebold Accu-Vote TSx

- Attackers can cause the TSx “to boot into administrative mode, in which an unauthorized individual could gain access to reconfigure the DRE device, change election settings, and delete electronic ballot results previously cast on the voting machines under the individual’s control.” at 21.
- Unauthorized access to a memory card may modify elections results. “The researchers experimentally proved that, because the memory cards for the DRE machines are encrypted using the same data key, a single compromised voting machine renders vulnerable the results on all other memory cards in the county.” at 41.
- “[T]he TSX DRE erases vote data on the memory card during the voting process when memory capacity is exceeded on the memory card.” at 57.
- Unauthorized individuals can “cause the server tabulating votes to report precincts having been counted but the votes from the precinct were not actually added to the tally of the results.” at 22.
- The server and election media processor lack anti-virus software or up-to-date anti-virus software and otherwise “allow unauthorized individuals to deploy malware or other malicious code if given access to the system, even for a short period of time.” at 21.

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- The security tool purporting to overcome already known weaknesses publicly identified in other tests “is not configured to enforce many of the rules for which it is programmed” and is otherwise “easily circumvented.” at 21.

Hart InterCivic e-Slate DREs

Unauthorized individuals can:

- “...vote multiple times using the DRE device.” at 31.
- “...easily tamper with the data” on memory cards used to transport election data from the precincts to the board of elections.” at 32.
- Edit election results without a trace. at 32.
- “...forg[e] or otherwise manipul[at]e . . . with even brief access to the voting systems”, “virtually every ballot, vote, election result and audit log.” at 43.

In recommending the elimination of DREs in Ohio, Secretary Brunner found it “discouraging that public funds have been spent not just in Ohio, but also nationally, for computer-based voting software that is antiquated, underdeveloped from a security standpoint, and in many cases, unstable.” at 74. She seeks to complete the dispatch of DREs from Ohio before the November 2008 Presidential election.

3. Colorado

On December 17, 2007, the Republican Secretary of State in Colorado decertified ES&S and Sequoia DRE voting machines citing security and accuracy problems. By letter of that date, the Secretary wrote ES&S that its “DRE, iVotronic ADA 2w/3-button (9.1.6.2) and iVotronic non-ADA (9.1.6.2)” are “[d]ecertified” because, among other things, they are “vulnerable to security attack” and “fail[] to provide auditable data to detect security violations. This decision is effective immediately.”¹⁴ Also by letter dated December 17, 2007, the Secretary wrote Sequoia that its “Edge II (including VeriVote; Edge Audio Union; and Card Activator), Version Number 5.0.31/4.3/50 Rev. C and Edge II Plus (including HAAT Model 50, Version Number 1.233” are decertified effective immediately. Among other failures of these Sequoia DRE voting machines, the Secretary found “1. Failure of device to operate in a secured state requiring passwords. 2. Failure to provide auditable data to detect security violations. 3. Failure to ensure all electronic records have corresponding V-VPAT records.”¹⁵ Additional grounds for decertification are provided by accompanying reports on these voting systems. The Secretary based these decertifications on tests of the DREs by experts that he commissioned in the wake of litigation in Colorado challenging the security and reliability of DRE voting machines available for use in elections there.¹⁶ In September 2006, the Denver District Court had ruled in favor of a challenge brought by Colorado voters to the Secretary of State’s certification of DRE voting systems in the state. The court had ordered then-Secretary Ginette Dennis to enact meaningful security standards for electronic voting machines and to retest the systems under those standards before authorizing their use in any future elections.¹⁷ On January 23, 2008, Governor Bill Ritter

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and Colorado lawmakers announced a deal to return the state to paper ballots for the 2008 general election.¹⁸

4. Pennsylvania

In December 2007, the Pennsylvania Department of State decertified the AVS WinVote DRE voting system, which was used in elections in Lackawanna, Wayne and Northampton counties.¹⁹ The state suspended certification of this voting system in August 2007 when it became known that AVS was using different motherboards on its machines from the ones submitted for federal testing.²⁰ This action occurred in the midst of pending litigation brought by a group of Pennsylvania voters challenging the certification of DRE voting systems in the state. In April 2007, the Commonwealth Court of Pennsylvania ruled in that case that voters have a right under the Pennsylvania constitution to reliable and secure voting systems and may challenge the use of electronic voting machines “that provide no way for Electors to know whether their votes will be recognized” through voter verification or independent audit.²¹ The Pennsylvania Secretary of State has filed a petition before the Pennsylvania Supreme Court seeking to appeal this ruling. That petition remains pending before the Pennsylvania Supreme Court.

On January 25, 2008, the voter-plaintiffs in that case filed a motion for a preliminary injunction before the Commonwealth Court of Pennsylvania seeking to block any new purchases of DRE voting systems in the state, in the wake of the Secretary’s decision to decertify the AVS WinVote DRE system present in three of Pennsylvania’s counties.²² A court hearing is scheduled on that motion for February 7, 8 and 25, 2008.

5. Florida

Led by Republican Governor Charlie Crist, Florida has rejected the touchscreen voting machines that it purchased with federal dollars to replace punch card voting machines that were the focal point of the disputed 2000 presidential election. In February 2007, The New York Times heralded Florida’s decision to bar touchscreen voting as “the nation’s biggest repudiation yet of touch-screen voting.”²³ Pursuant to state law, after July 1, 2008, Florida counties will provide for voting on paper ballots that will be scanned optically for tabulation. Fifteen Florida counties, which have over half of the state’s residents, and which turned to DRE voting after the 2000 election, may continue to use one DRE in each polling place for use by voters with disabilities, although they may choose other options to accommodate those voters.²⁴

The decision by Florida to jettison touchscreen voting machines came on the heels of the disputed 2006 Florida Congressional District 13 election between Vern Buchanan and Christine Jennings, in which Buchanan claimed a 369 vote victory and in which more than 18,000 voters who used touchscreen machines in Sarasota County did not have their votes recorded in that race.²⁵ This election travesty was preceded by concern about the insecurity and unreliability of touchscreens in the 2004 presidential election.

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At the start of early voting in Palm Beach, Florida, in the 2004 presidential election, at least five Sequoia AVC Edge touch-screen voting machines at one precinct failed to boot-up and had to be replaced, causing many voters to wait hours to vote only to have to return the next day to vote at which time the machines froze on them.²⁶ The Republican Party of Florida felt compelled during that election cycle to distribute fliers telling voters to forgo voting at their usual polling place on a DRE and instead vote absentee on paper ballots.²⁷ The DREs used in Florida in the 2002 elections also had serious problems.²⁸ DRE failures occurred in the January 29, 2008 Florida Primary, their last Federal election in the Sunshine State.²⁹

6. New Mexico

On March 2, 2006, Governor Bill Richardson of New Mexico signed into law legislation requiring paper ballots to replace touchscreen voting machines in that state.³⁰ The day before that, Governor Richardson wrote to the governors of all 50 states imploring them to do the same. He wrote “[s]ome believe that computer touch screen machines are the future of electoral systems, but the technology simply fails to pass the test of reliability. As anyone who uses one can attest, computers break down, get viruses, lose information, and corrupt data. We know this to be the case, and so we back-up our files to ensure nothing important is lost. Paper ballots serve as the ultimate back-up for our elections, providing secure and permanent verification of the will of the people.”³¹ The New Mexico DRE ban followed litigation arising out of DRE problems in the 2004 presidential election. Testifying experts found that the DRE voting machine totals in New Mexico in the 2004 presidential election were “inaccurate or otherwise unreliable,” and that “[t]he experience with using the [Sequoia AVC] Edges in New Mexico, as in other states, reveals serious flaws that jeopardize the accuracy and integrity of election results.”³² Further evidence showed these DREs to switch votes from the voter’s candidate of choice to another candidate.³³ The evidence also showed “a serious problem with undervotes” in precincts using DREs such that this problem alone could have changed the outcome of the presidential election in 2004 in New Mexico where the margin of victory was less than 10,000 and the number of undervotes exceeded 20,000.³⁴ Hispanic and Native American minority precincts using DREs in 2004 suffered disproportionately from “undervotes,” which disparity disappeared after New Mexico switched entirely to paper ballots.³⁵

7. New Jersey

In ongoing litigation in New Jersey, a county judge declared DREs are vulnerable to tampering.³⁶ This ruling, in September 2007, followed the decision by Attorney General Anne Milgram not to certify machines used in all but one of the state’s counties.³⁷ Attorney General Milgram declined to certify the DREs because testing performed on the machines by computer scientists from the New Jersey Institute of Technology concluded that the DRE printers are faulty.³⁸ New Jersey currently is out of compliance with its own law requiring DREs to have voter verifiable paper trails by January 1, 2008.

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The DREs at issue are the Sequoia AVC Advantage, Sequoia AVC Edge and the Avante Vote-Trakker. Moreover, Andrew Appel, an expert for the plaintiffs in the litigation, has declared that “[i]t’s very easy to replace the software inside a computerized machine so it tells the voter it is voting for one candidate but really puts the vote in the wrong column. . . . You can even program it to do that on Election Day.” A trial is up-coming in the case to resolve whether the DREs violate the state constitution because voters using them cannot verify their votes and because the machines do not count votes as cast.³⁹

8. Maryland

On February 15, 2006, then Republican Governor Robert Ehrlich of Maryland joined Democratic Governor Bill Richardson in expressing his desire to make his state, like New Mexico, an all paper ballot state due the “unreliability and tremendous costs of DRE voting systems.”⁴⁰ In October, Governor Ehrlich ordered paper ballots for polling places out of fear that Diebold DREs would fail in the 2006 mid-term elections.⁴¹ On January 16, 2008, Democratic Governor Martin O’Mally included \$6.8 million in state’s budget to ensure that DREs are replaced by optical scan voting machines by 2010.⁴² In 2007, Maryland outlawed DREs by 2012 in response to studies that showed that the Diebold DREs used in the state pose a serious risk to election integrity.⁴³ As Johns Hopkins University Computer Science Professor Avi Rubin described in congressional testimony in the spring of 2007, “[s]everal studies were performed to assess the security of the Diebold DRE, including mine,⁴⁴ the SAIC report,⁴⁵ and the RABA report.⁴⁶ All of the studies found serious security problems with the Diebold machines. The media covered these studies, and public sentiment began to shift against the use of these machines. Besides the security studies, awareness was raised that these machines cannot perform recounts, they cannot be audited, and they cannot recover from many different kinds of failures.”⁴⁷ A recent poll shows that two-thirds of Maryland voters support the switch from DREs to paper ballot voting.⁴⁸

9. Connecticut

In 2006, Connecticut decided to replace its lever machines with optical scans after determining that its initial decision to purchase DREs was unwise.⁴⁹

10. Virginia

On April 10, 2007, the Governor of Virginia, Tim Kaine, signed legislation passed by the General Assembly to prohibit new purchases of DREs for use in elections in the Commonwealth.⁵⁰ The law provides that “[o]n and after July 1, 2007, no county or city shall acquire any direct recording electronic machine (DRE) for use in elections in the county or city.”⁵¹

11. Iowa

In April 2007, Iowa enacted a law that prohibits the purchase of DREs, providing for the eventual phase-out of DREs as the already purchased ones are retired.⁵²

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12. Kentucky

The Republican Secretary of State of Kentucky, Trey Grayson, is urging counties to buy optical scanners for voting with paper ballots. A press release states that the Secretary's appeal "comes amid growing concerns that hackers could tamper with results by exploiting weaknesses in the current electronic voting system's security."⁵³ Meanwhile, the Democratic Attorney General, Gregory Stumbo, had earlier demanded of vendors Diebold and Hart InterCivic that they immediately correct security flaws identified in the 2007 independent reviews by experts in California with respect to all DRE and other voting systems used in Kentucky.⁵⁴ Attorney General Stumbo then issued an expert report critical of Kentucky's voting system testing and certification procedures.⁵⁵

13. Texas

The Republican Party of Wharton County, Texas, will use voter-marked paper ballots counted by optical scanner in the March 2008 federal primary election after deciding that the ES&S iVotronic is unreliable.⁵⁶

14. Alaska

In September 2007, the Republican Lt. Governor of Alaska, Sean Parnell, asked the University of Alaska to conduct a review and recommend possible changes to the state's electronic voting system in light of the top-to-bottom voting system review conducted in the summer of 2007 in California.⁵⁷

15. Tennessee

In a report dated September 27, 2007 and urging reforms, the Tennessee Advisory Commission on Intergovernmental Relations highlighted the decertifications of DREs and other anti-DRE action in other states, DRE problems experienced in Tennessee in 2006 and 2007, and the revelation that ES&S manufactures DREs in Manila, Philippines, where the quality control rejection rate reportedly is "about 40%."⁵⁸

16. South Carolina

Legislators seek to return South Carolina to paper ballots after 80% of the ES&S iVotronics in Myrtle Beach and surrounding Horry County failed to operate properly in the Republican primary on January 19, 2008.⁵⁹

17. New York

New York continues to use the voting machines it used in the 2000 election as it deliberately develops and administers laws and regulations to protect the right to vote. These laws and regulations make it difficult for state certification of DREs currently on the market.⁶⁰ Indeed, none of the vendors of DREs decertified or tested by California, Ohio or Colorado in 2007 – ES&S, Sequoia, Diebold, Hart Inter-civic - have sought to sell their DREs in New York.⁶¹

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On January 24, 2008, the New York Board of Elections rejected the use of DREs by voters with disabilities and, accordingly, the state is expected to have all of its voters using paper ballots soon.⁶²

* * *

In the six years since Congress appropriated billions of dollars for the replacement of voting systems around the country, new questions arise as to whether US voting machine companies – which have significantly profited from this appropriation – should now be held accountable for marketing a product that has proven to be insecure and unreliable. Are the companies liable under breach of contract and breach of warranty claims? Did any company knowingly market a defective product and, in doing so, commit commercial fraud? Should state and local governments be able to recover the billions of taxpayer dollars spent on the DRE technology? The debate on these questions is likely to grow as more jurisdictions discontinue the use of DRE machines for the counting and recording of votes.

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¹ The Help America Vote Act of 2002 (“HAVA”), Pub. L. No. 107-252, 116 Stat. 1666.

² This memorandum will refer interchangeably to “touchscreens” and “DREs” because touchscreens is the more common term. The criticisms of DREs extend, however, to those DREs that do not employ touchscreen technology, including the eSlate, which is a push-button DRE sold by Hart InterCivic. This memorandum also will refer to Diebold inasmuch as Diebold owns Premier, is better known than Premier, and only recently labeled its voting systems business Premier after it could not find a buyer for that business. David Bennett, *Diebold to realign Election Systems unit*, Crain’s Cleveland Business, Aug. 16, 2007, available at <http://www.craigslist.com/apps/pbcs.dll/article?AID=/20070816/70816/FREE/70816004/1088GProfile=1088>.

³ Federal Efforts to Improve Security and Reliability of Electronic Voting Systems Are Under Way, but Key Activities Need to Be Completed, Government Accountability Office, Sept. 2005, available at <http://www.gao.gov/new.items/d05956.pdf>; Building Confidence in U.S. Elections, Report of the Commission on Federal Election Reform, Sept. 2005, available at <http://www.american.edu/ia/cfer/report/report.html> (the Carter-Baker Report); Asking the Right Questions About Electronic Voting, the National Academy of Sciences Committee on a Framework for Understanding Electronic Voting, 2005, available at <http://nap.edu/books/0309100240/htm> (Governor’s Report); National Institute of Standards and Technology Staff, Requiring Software Independence in WSG 2007: STS Recommendations for the TGD, Nov. 2006, available at <http://www.vote.nist.gov/DraftWhitePaperOnSlinVWSG2007-20061120.pdf>; Lawrence Norden, *The Machinery of Democracy: Voting System Security, Accessibility, Usability and Cost*, The Brennan Center for Justice, Voting Technology Assessment Project, NYU School of Law, 2006, available at http://www.brennancenter.org/content/section/category/voting_technology; Accurate (A Center for Correct, Usable, Reliable, Auditable, and Transparent Elections), Public Comment on the 2005 Voluntary Voting System Guidelines, submitted to the U.S. Election Assistance Commission, Sept. 30, 2005, available at <http://www.accurate-voting.org/accurate/docs/2005-vvsg-comment.pdf> (the ACCURATE Report).

⁴ See, e.g., Clive Thompson, *Can You Count on Voting Machines?*, N.Y. Times Magazine, Jan. 6, 2008 at 41; News Hour: *California Experiences Problems with Voting Machines*, PBS Television Broadcast, Jan. 16, 2008; Lou Dobbs Tonight, CNN Television Broadcast, Jan. 16 and 23, 2008, available at www.voteraction.org/node/311 and [node/324](http://www.voteraction.org/node/324); Pam Fessler, *Several States Abandon Electronic Voting for Paper*, NPR, Jan. 25, 2008, <http://www.npr.org/templates/story/story.php?storyId=18399431>.

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⁶ Bulleted information is taken from the Withdrawal of Approval/Conditional Reapproval – October 25, 2007 Revision for Sequoia. See footnote 5.

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