



# New Yorkers for Verified Voting

## The Gift That Will Keep On Costing: Operating Expenses and New York's New Voting Machines<sup>1</sup>

New Yorkers for Verified Voting  
Revised January, 2008

As new voting equipment has been implemented across the country, local governments have repeatedly failed to realize in advance major operating costs with which they will be burdened. John Gideon epitomizes the experience counties have had with operating costs through the title of his article reporting on the experience of Salt Lake County: "New Voting Machines: The Gift That Keeps on Costing."<sup>2</sup> Although HAVA "gives" the machines, he quotes the mayor of Salt Lake County as saying technical support and storage cost the county "millions and millions" of dollars.

In New York, counties have been encouraged by vendors to look only at the costs for hardware acquisition, a cost to which HAVA funds can apply. For direct recording electronic voting machines (DREs), large on-going costs that the counties will have to pay have been unmentioned or considered incalculable until contracts are determined by the state procurement process. Nevertheless, reports from across the country, as well as posted bids, caution New York to pay attention to the probability of high on-going costs for DRE software and maintenance contracts, technical support, as well as for essential peripheral equipment.

During the first years of seeking to sell their machines in New York, vendors repeatedly argued against the alternative to DREs, the paper ballot scanner system, by quoting very high costs for its major operating expense: paper ballots. They also emphasized as a negative factor the need to buy both scanners and ballot markers.

Now, however, New Yorkers for Verified Voting has demonstrated that paper ballot costs can be quite reasonable.<sup>3</sup> It also has presented strong evidence that DREs would need to be purchased in cost-prohibitive numbers in order to prevent long waiting lines.<sup>4</sup> These studies agree with the evidence from across the country that the paper ballot scanner system (PBOS) will be much more economical than the DREs, both in acquisition and in operating costs.

<sup>1</sup> New machines continue to target the New York market; however, the present analysis is based primarily on information available about machines that applied for authorization in 2006.

<sup>2</sup> John Gideon, "New Voting Machines: The Gift That Keeps On Costing," [http://votetrustusa.org/index.php?option=com\\_content&task=view&id=2108&Itemid=113](http://votetrustusa.org/index.php?option=com_content&task=view&id=2108&Itemid=113). See also a report from Luzerne County in PA, "E-voting machines will cost \$250,000 in maintenance," [http://www.citizensvoice.com/site/news.cfm?newsid=17421646&BRD=2259&PAG=461&dept\\_id+455154&rfti=6](http://www.citizensvoice.com/site/news.cfm?newsid=17421646&BRD=2259&PAG=461&dept_id+455154&rfti=6). And see "Election success cost an extra \$17 per voter," John Mazzolini, Cleveland Plain Dealer, November 09, 2006, <http://www.cleveland.com/news/plaindealer/index.ssf?base/cuyahoga/1163064993195850.xml&coll+2>. More recently see NJ: Bergen County - Bergen cranks up AC for e-voting machines <http://www.northjersey.com/page.php?qstr=eXJpcnk3ZjczN2Y3dnFIZUVFeXkzJmZnYmVsN2Y3dnFIZUVFeXk3MTYyNTQwJnlvaXJ5N2Y3MTdmN3ZxZWVFRXl5Mg==> and CO: Mesa County - "Elections panel wants \$682,000 for 2008 budget," [http://www.gjsentinel.com/hp/content/news/stories/2007/07/03/7\\_3\\_1b\\_Elections\\_request.html](http://www.gjsentinel.com/hp/content/news/stories/2007/07/03/7_3_1b_Elections_request.html).

<sup>3</sup> Marge Acosta, "Facts About Ballot Printing Costs," July 18, 2007, [www.nyvv.org/newdoc/ballotcost/FactsAboutBallotCosts.pdf](http://www.nyvv.org/newdoc/ballotcost/FactsAboutBallotCosts.pdf).

<sup>4</sup> William A. Edelstein, "New Voting Systems for New York—Long Lines and High Cost" <http://www.nyvv.org/voterlines.shtml>; also "Comments on AIR Voting System User Rate Assessment," <http://www.nyvv.org/newdoc/VotingMachineNumbersForNYS.pdf> and "New York State Board of Elections Proposal for Number of Voters per Machine Guarantees Long Lines and Voter Disenfranchisement," March 26, 2007, <http://www.nyvv.org/doc/Resp070326.pdf>.

Other states have experienced exorbitant operating costs with DREs, in a number of cases causing jurisdictions to consider changing to the PBOS system even when HAVA funds for machine acquisition already have been spent.<sup>5</sup> Governor Robert L. Ehrlich of Maryland wrote to their state Board of Elections on Feb 15, 2006 that the state had experienced a 1000% increase in the estimated budget for annual maintenance costs with their DRE system.<sup>6</sup> Among the many reports that DREs far exceeded predicted operating costs is this from one election commissioner:<sup>7</sup>

*From \$295- encoders, which program the machines, to \$307-cartridges, which print a paper trail, the new electronic voting machines have extra costs involved—costs the county has to pay. “Nobody had told us about all the expenses... We’ve got to buy the necessary equipment” ...and “We need to train poll workers.”<sup>8</sup>*

## MAJOR COSTS USUALLY NOT PREDICTED

### A. SOFTWARE:<sup>9</sup>

A major cost often missing from estimates is for software purchase and maintenance.<sup>10</sup> This includes costs for Election Management Systems that enable centralized functions, e.g., ballot programming. It also includes charges for pollsite software contracts. Software contracts can affect both acquisition and operating costs for both the paper ballot scanner system and for DREs. That effect, however, will be larger on direct recording electronic voting machines, both because of the way vendors levy charges and because more machines are required when DREs are used.

Two additional factors support our claim that software for the paper ballot scanner system will be less expensive than for DREs: (1) some scanners include software costs in the basic acquisition price, making additional charges for software and maintenance only after five years.<sup>11</sup> (2) The most popular ballot marker includes the software cost in the acquisition price.<sup>12</sup>

Though different vendors calculate software charges for DREs in different ways, it is likely that counties will find the amounts comparably unaffordable. Simplest to calculate is LibertyVote’s pattern of charging 12% of the acquisition cost annually for software and maintenance of its

---

<sup>5</sup> “Miami Dade County Officials Recommend Scrapping DRE Systems for Optical Scanners,” <http://www.nyv.org/reports/MiamiDadeDumpsDREs.pdf> .

<sup>6</sup> A recent “Cost Analysis of Maryland’s Electronic Voting System” (December 2007) is at <http://www.saveourvotes.org/legislation/packet/08-costs-mdvotingsystem.pdf>

<sup>7</sup> See cost comparisons linked from the home page at <http://www.votersunite.org>: Rosemarie Myerson has published studies of counties in Florida and Joyce McCloy of counties in North Carolina. Also see <http://www.verifiedvotingfoundation.org/downloads/New%20vvpbcosts.pdf> . .

<sup>8</sup> “County election costs to get higher,” by Katie Stallcup, The Natchez Democrat, May 13, 2007.

<sup>9</sup> Software estimates have been based on explanations by vendors at demonstrations (e.g., on May 1, 2007, at the BOE Conference in East Syracuse). They also have been extrapolated from the detailed bids from vendors that are on the website for the New York City Board of Elections at <http://www.vote.nyc.ny.us/rfi.html>. In the case of LibertyVote/Nedap, they are based on materials published by the vendor, since it has no bid on this site.

<sup>10</sup> See, e.g., “Cost Comparison of Optical Scanning and Digital Recording Electronic Devices,” Office of the Onondaga County Comptroller & Onondaga County Division of Management and Budget, April 19, 2007.

<sup>11</sup> In its bid to New York City Diebold says that the software is included in the acquisition cost of the AccuVote-OS and that there is an "AccuVote-OS Voting system Annual Warranty (effective post-year 5)" of \$168.00 per machine." See <http://www.vote.nyc.ny.us/rfi.html> NYC BOE Voting system - Cost Response, Diebold Election System, Inc., Bill of Materials - Optical Scan, page 1; & Lever Replacement Solution: Optical Scan Pollsite System, page 10.

<sup>12</sup> No separate software charge is listed for the AutoMARK in the NYC bids by vendors that use it for PBOS accessibility. In a bid to Suffolk County, Diebold says the AutoMARK Information Management System Software is included in the unit price.

DRE. The acquisition cost would include not only the machine itself (\$8250), but also such peripherals as the printer (\$900), ballot bag (\$34.95), and central programming unit (\$1500); if the cost per DRE fitted with a printer is about \$9500, the annual charge would be more than \$1100 per machine.

*See Appendix I for indications of the various ways vendors charge for software.*

## **B. TECHNICAL SUPPORT AND OTHER LABOR COSTS:**

Counties have found it very hard to estimate the budget increase that will be necessary in order to pay needed technological experts to set up the new equipment initially, but also to maintain and program it in the future. Many jurisdictions hope to be able to learn to do the work themselves. Nevertheless, most recognize that, particularly with DREs, they will have an on-going need for technically trained experts. A rough sense of the potential expenses to the counties for technical experts can be gained in the bids posted at the New York City website. For example, Avante lists an hourly rate for a Programmer at \$125; Sequoia lists the same hourly rate for Product Specialists who do Pollsite Support.<sup>13</sup> For “Senior” Specialists and Managers, Sequoia lists hourly fees of \$225-\$275. At the same time Sequoia notes that these fees do not include travel and expenses as well as that travel in excess of a four hour round trip will be billed for a minimum of eight hours per day.<sup>14</sup>

By contrast, the technical support needed for scanners will be much more modest. New York State is highly familiar with scanner technology (e.g., the lottery) and should be able to deploy its own experts to guarantee election integrity, as has Oklahoma for almost twenty years. The ballot marking devices may need special training, but will not be so heavily used or deployed in such great numbers.

Even local, non-technological labor costs will be less with PBOS. For example, logic and accuracy tests for DREs require that each vote be entered into each machine the required number of times. By contrast, testing of scanners can be done by inserting the test ballot (with all of the votes) in each scanner. John Washburn, cryptographer and statistician, argues that testing of DREs is twice as expensive as PBOS.<sup>15</sup> In addition, once scanners are in each county, the counting of absentee ballots will require paying for many fewer hours of labor.

## **C. TRANSPORTATION AND STORAGE**

During the same period of time when HAVA has asked for purchase of new voting equipment, New York has instituted centralization of election management. Counties now will have additional costs for storing machines in a central location and transporting them to pollsites.

Estimates that omit costs for transportation and storage of voting equipment erase substantial cost advantages of the paper ballot scanner system (PBOS). The equipment for PBOS is much more manageable by average election workers than DREs.

- Paper ballot scanner equipment also takes much less space in a van or truck as well as in storage. Scanners and ballot markers are small, light,<sup>16</sup> come with hard cases, and can be stored on shelves or wheeled racks.

---

<sup>13</sup> <http://www.vote.nyc.ny.us>. Use the link to RFI Voting Systems, follow cost responses for different vendors.

<sup>14</sup> Sequoia bid to Suffolk County.

<sup>15</sup> See Washburn’s articles linked through “Election Integrity” at <http://www.washburnresearch.org>. Some also are linked from the home page at <http://www.votersunite.org>.

<sup>16</sup> Ballot scanners weigh between 19 and 39 lbs.; the AutoMARK ballot marker weighs 48 lbs. and can be rolled on a wheeled cart and easily lifted onto a table by two poll workers or machine custodians.

- Ballot boxes are on wheels and folding privacy screens and adjustable folding tables are light and compact. This equipment is not fragile and requires no specialized maintenance.

In contrast, it is clear that transportation and storage would be much more expensive for DREs.

*See Appendix II for evidence to support this claim about transportation and storage*

#### **D. PERIPHERAL EQUIPMENT**

Both voting systems authorized under New York law require some peripheral equipment; however that required for the paper ballot scanner is nontechnical: e.g., folding privacy booths/screens, adjustable tables, handcarts, privacy sleeves, and ballot security bags. This equipment requires minimal maintenance and storage, and will not need frequent replacement. Batteries will need to be tested and replaced when necessary.

In contrast, DREs can require encoders, voter access cards, printers, paper rolls for the VVPAT, accessible devices for the disabled, as well as batteries.

*See Appendix III for indications of Peripheral equipment with DREs.*

#### **E. THE NUMBER OF MACHINES INCREASES OPERATING COSTS<sup>17</sup>**

It is important to keep in mind that the more machines New York has to purchase, the more cost there will be for maintaining and operating the machines. As we have said, use of DREs requires more machines than the PBOS system for numerous reasons, including:

- Only one person can vote at a time on a DRE.
- With DREs, persons with special needs also would use the same equipment as others. They sometimes would require 20-40 minutes to set up the equipment and vote.
- By contrast, with PBOS, many voters can mark ballots simultaneously in privacy booths, either by hand or with the ballot marker.
- With PBOS, the scanning of the marked ballots is done in a matter of seconds.
- If each DRE must serve as many as 550 voters, as in one NY state Board of Elections proposed policy, paper (for the Voter Verifiable Paper Audit Trail) may need to be re-filled and/or receptacles may need to be emptied during Election Day, causing machine downtime. The ballot boxes with the scanners may also need to be emptied, depending on the type ordered and the voter turn-out, but some hold as many as 3,000 ballots.
- One advantage of PBOS, of course, is that persons with special needs could take the time they need in the booth with the ballot marker without the pressure of lines of other voters waiting. The NY State Board of Election is mandating that no voter be required to wait in line for more than thirty minutes.

---

<sup>17</sup> See Marge Acosta, "Survey Data on the Number of Voters per DRE in Other State Jurisdictions," <http://www.nyv.org/newdoc/StateTimingData.pdf>.

- If the number of DREs is underestimated for the initial HAVA-funded purchase, the additional DREs needed to guarantee that no voter needs to wait more than the 30 minute limit will have to be charged to county budgets as operating costs.
- Another cost advantage of PBOS is that increasing the number of privacy enclosures does not increase technical maintenance and software costs.

## **F. PAPER BALLOTS**

As we said above, the major on-going operating cost with the PBOS system is paper ballots. New Yorkers for Verified Voting has gained information from printing and printer companies that makes it clear that the estimates of paper ballot costs that have been offered by the vendors and the county commissioners are unnecessarily high; they sometimes have talked of charges as high as one dollar per ballot.<sup>18</sup> A new study by Marge Acosta of New Yorkers for Verified Voting, “Facts About Costs for Ballot Printing” presents evidence that high prices for ballots will not be necessary even for New York’s complex ballot with its tear-off stub.<sup>19</sup> Estimates from printing companies for 14 or 29 cents per ballot for Suffolk County are attached to the Acosta study. In addition, one company quotes the average cost for other, smaller counties at 32 cents per ballot.

Even more promising is the new alternative being pursued by some counties: in-house printing using county-owned or regionally-shared digital printers. Acosta has demonstrated per ballot costs with this alternative as low as 6 cents. Besides reduced costs, this arrangement allows Boards of Elections more independence from the vendors and printing companies in meeting deadlines and dealing with last minute changes.<sup>20</sup>

*See Appendix IV for additional matters to keep in mind about the cost of paper ballots.*

## **CONCLUSION**

In a time when New York is trying to find every possible way to reduce taxes, it would be negligent for its officials to choose the voting system (DREs) that is known to be much more expensive both in acquisition and in operating costs, especially since the alternative, the paper ballot scanner system, is judged by experts to be more reliable.

---

<sup>18</sup> For example, see “Paper Ballot Costs and Printing,” <http://www.nyvv.org/reports/PaperBallotPrintingCosts.pdf>.

<sup>19</sup> Marge Acosta, “Facts About Ballot Printing Costs,” <http://www.nyvv.org/newdoc/ballotcost/FactsAboutBallotCosts.pdf>

<sup>20</sup> “Summit ponders printing ballots,” Lisa A. Abraham, 1/3/2007 <http://www.wheresthepaper.org/AkronBeaconJournal061210SummitPondersPrintingBallots.htm>

## APPENDIX I:

### EXAMPLES OF DIFFERENT WAYS VENDORS LEVY SOFTWARE AND MAINTENANCE COSTS:

- **Sequoia Voting System** charges \$0.85 per active voter for software purchase/ maintenance, whether for its Advantage Plus DRE or for its scanner.<sup>21</sup> The bid to Suffolk County also indicates a license fee of 15% of the purchase price beginning in the second year.
- **LibertyVote/Nedap** charges 12% of the acquisition costs annually for its DRE. Acquisition costs would include charges for the peripheral equipment noted below.
- **Avante** charges \$600 per machine for pollsite software for its DRE.<sup>22</sup> In addition, central site software is needed for programming each election. New York City apparently purchased central software for Plan B; otherwise the contract for them would be \$30,000. With **Avante**, there is a “per unit”/machine charge (\$90) for annual software maintenance from 2008 onward as well as a per machine pollsite maintenance charge of \$300.<sup>23</sup>
- Implied in the NYC bid for the **ES&S M 100** scanner is a Central Site Software charge of approximately \$65.00 per pollsite (for scanner and AutoMARK together). ES&S lists no annual software maintenance charge for this PBOS equipment until after the initial five years.<sup>24</sup>
- The **Diebold AccuVote-OS** scanner calls for a Central Site Software purchase cost for NYC that would imply about \$180 per scanner.<sup>25</sup> The bid for Suffolk Co. indicates that after 5 yrs the warranty would be \$195 per unit. The GEMS central software would be 18% of initial cost.
- The **Dominion (now Sequoia Insight-Image CAST)** scanner from Canada has an accessible ballot marking device included with the scanner; and the software cost for this is not separate.<sup>26</sup>

## APPENDIX II: TRANSPORTATION AND STORAGE OF DRES

- Full-face touch-screen DREs like those made by Sequoia and Avante, would require specialized equipment for transportation to and from polling places, probably a truck with a hydraulic lift. They also would require specialized labor.
- The Sequoia Advantage Plus weighs approximately 350 lbs; Sequoia says that it has wheels and one person can roll it. Sequoia also says it has handles, but that it would take four or more people to lift it.<sup>27</sup> The Sequoia Advantage is 66.66”x 29.38” x 40.12 (h) in the storage position. The specifications for the Avante Vote-Trakker DRE are comparable to the Sequoia Advantage: approximately 350 pounds. Storage position= 60”x 29.5” x 70.” Casters for rolling and handles for lifting or moving.
- The LibertyVote/Nedap DRE might seem compact by comparison, since in its original form the machine folded into a case. But addition of the voter verifiable paper audit trail has made storage, transportation, and set-up much more complex.<sup>28</sup>

<sup>21</sup> This is from several sources, but see also pages 9 and 14 of Cost Response Sequoia Op Scan.xis at <http://www.vote.nyc.ny.us/rfi.html>.

<sup>22</sup> <http://www.vote.nyc.ny.us/rfi.html>, “Software Expenses Not Included in Other Unit Costs” on table of “One-Time Costs for Avante Full-Face Vote-Trakker,” page 14.

<sup>23</sup> <http://www.vote.nyc.ny.us/rfi.html>, Avante Cost Response, “On-going Commodities Costs (2008 onward),” page 8.

<sup>24</sup> <http://vote.nyc.ny.us/rfi.html>, ES&S NYC BOE Cost Response.xis, page 10.

<sup>25</sup> <http://www.vote.nyc.ny.us/rfi.html>, Cost Response Diebold Op Scan.xis, page 5.

<sup>26</sup> Sequoia and Dominion agents at East Syracuse, May 1, 2007.

<sup>27</sup> <http://www.vote.nyc.ny.us/rfi.html>, Sequoia Voting Systems, “A Report for the Board of Elections in the City of New York (Nov. 2006). Technical Clarification, NYC Advantage Response, page 4.

<sup>28</sup> The printer is a separate unit that must be attached at the polling places. In addition, a blue canvas bag, approximately 2.5 feet x 12 inches serves as a receptacle for the slips of paper from the paper audit trail. Both

### APPENDIX III: PERIPHERAL EQUIPMENT FOR DRES

Often missing from estimates for the cost of DREs are some necessary accessories. For example,

- Added to the \$8,900 basic unit cost for the **Avante** would be an Encoder for the voter access cards (\$600 on NYC bid, \$200 on NYS bid), the Voter Access Cards themselves, and accessible devices for the disabled (\$380), and the battery (\$160).<sup>30</sup>
- A 2005 price list for the **Liberty Vote** system provides a summary indication of some of the costs beyond the machine itself (printer and programming unit add up to \$1400). In addition, the large paper ballot face for each machine has been estimated at a \$50 printing and paper cost for each election.
- The **Sequoia DRE** has less peripheral equipment, but it demands more labor and training from election workers, since, for example, the pollworker must set the machine for each voter to the correct election district as well as for any special accessibility devices.
- **In New York, all DREs are required to provide a voter verifiable paper trail (VVPAT).** In Carson City, Nevada, this has brought added costs for specialized training of workers to change the paper rolls needed for the paper trail. Some VVPATs require a new roll for every 100 – 125 voters. Because the process was deemed too difficult for poll workers, Cheyenne County, Colorado reduced the font size so that poll workers would not have to change the roll. Of course, this was only possible because the number of registered voters per DRE on Election Day was limited to 213.

### APPENDIX IV: ADDITIONAL INFORMATION ABOUT PAPER BALLOT COSTS

- A New York election official has said that HAVA funds could be used to purchase printers that produce ballots that meet state requirements.
- DRE systems are told to have ample paper ballots in each precinct in case there are machine failures. New York’s Draft regulations (see 6210.11 J) call for a “contingency plan” and available emergency ballots.
- Even with DREs, election workers must be paid for hours of labor to prepare paper ballots, since ballots must be prepared for absentee, military, provisional, and emergency use. With the paper ballot scanner system all voters in the same jurisdiction use the same ballot, adding no labor hours for preparation of different types of ballots. There has been legislation proposed in the Congress that requires jurisdictions using DREs to make available a paper ballot to any voter who requests one at the pollsite.
- The many cost comparisons that reported higher operating costs with the use of DREs than with PBOS had already included the cost of paper ballots in these comparisons.

---

privacy curtains and accessibility devices are transported separately from the machines and assembled at the polling place.

<sup>30</sup> <http://www.vote.nyc.ny.us/rfi.html>, Avante Cost Response, “One-Time System Costs Based on 10,000 Full Face Touch Screen DRE with VVPB,” p. 6