Election Commissioners' Association
of the State of New York

A Review of Voting Machine Systems for the Replacement of the AVM in New York State

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Report Objective

The following DRE and optical scan voting system evaluation is intended to give a general knowledge of the systems as a replacement to the AVM lever machine. It is not the objective of this report to provide direction in the purchase of any single system or specific vendors. All information has been obtained from informational surveys, published reports and discussions with vendors. The purpose of this review is to give boards of elections a summary appraisal for which they may use as a foundation to narrow their selection of a voting system appropriate to their county and voters.

Contents

Full-face Machine-Printed ballot face

Full-face Machine-Electronically displayed ballot face

Full face DRE's two types: (1) Full-face Machine with Printed Ballot Face (2) Full-face Machine with an Electronically Displayed Ballot Face.

(1) Full-face Machine with a printed Ballot Face

Some DRE's stand on legs with wheels and weigh a few hundred pounds while others sit on a tabletop and weigh less. The voter approaches the machine at relative eye-level. Some type of panel or curtain provides privacy. To vote, the voter depresses a spot on the face of the ballot next to the candidate selected, and a light appears indicating the vote. Over-voting is prevented, and contests that were missed are indicated to the voter with a light so that, if so desired, the voter can go back and vote for that contest. A paper printout of the voter's choices is displayed behind a window so that the voter can verify his or her choices before casting the ballot.

Ballot information for a given election is entered into each machine via a portable memory device like a cartridge, card or disk. The election's results are carried from the machine at the close of Election Day via the same type of portable memory device. The results are accumulated in the machine vendor's proprietary computer system, from which in turn they are moved to the Board's election computer system.

With this DRE an additional cost for ballot printing may range from $50 to $100 per DRE.

The ballot on the face of the machine is an actual *printed* ballot on paper. Like our lever machines, a ballot is mounted on each machine. Each machine can be used for only one ballot. That ballot must contain all of the information needed for the election district on its one surface.

(2) Full-face Machine with an Electronically Displayed Ballot Face

Like the full-face machine above, this type of machine also stands on legs with wheels and weighs a few hundred pounds. The voter approaches the machine at relative eye-level. Some type of panel or curtain provides privacy.

The machine is prepared and election results are retrieved as described above – a portable memory device is used.

In this case, however, there is no printed-paper ballot on the face of the machine. Instead, the ballot is *electronically displayed* on the face. To vote, the voter touches a spot on the face of the ballot next to the candidate selected, and the voted candidate box is highlighted. Over-voting is prevented, and contests that were missed are highlighted for the voter so that, if so desired, the voter can go back and vote for that contest. A paper printout of the voter's choices is displayed behind a window so that the voter can verify his or her choices before casting the ballot.

Since the ballot is electronically displayed, ballot information can be changed as needed. This means that the ballots of many election districts can be displayed on the same machine. It also means that each political party's primary election ballot can be displayed separately, or ballots in different languages can be displayed separately.

With a full-face machine with an electronically displayed ballot, however, more flexibility is possible. With an electronically displayed ballot, the ballots for all of the EDs in a poll site can be available on every machine in the site. This means that the logistics of the poll site can change. A snake line like those common in banks can be used, so that each voter can use the first-available machine. A delay at one machine will not cause a line to develop for a specific election district – the next voter will simply move to the next machine. A one-for-one replacement ratio may not be necessary. Perhaps a full-face electronic display machine can replace our lever machines at a two-for-three ratio. Where practical at a given poll site every three lever machines would be replaced with only two new machines.

Currently on the market, there are three full-face machines with a printed ballot face ranging in price from approximately $6,000 to $8,000. There are two full-face machines with an electronically displayed ballot face ranging in price from approximately $7,500 to $8,500. The chart below provides an estimated cost of theses items.

Spare Machines

When calculating the number of machines required for your county, please remember that you may want to consider having extra or spare machines available for break downs or emergencies.

Additionally, you may want to consider more machines in a polling site to allow a person or persons with disabilities for voting in a timely manner. This may be most appropriate in areas that have facilities for the disabled.

Full-face Machine with a printed Ballot Face (Audio Only)

	Cost	Number of DRE's	Total Cost
Low Estimate	6000		
High Estimate	8000		
Paper Ballot	50		
Paper Ballot	100		

Full-face Machine with an Electronically Displayed Ballot Face (Audio Only)

	Cost	Number of DRE's	Total Cost
Low Estimate	7500		
High Estimate	8500		

DRE Requirements

DRE Specifications

Regardless on how well the DRE is designed and which Federal Requirement it meets all of the DRE's will have to have some modifications to meet the needs of counties throughout New York State. Cost of the modifications, will depend of the type of modifications and how many counties require the same modifications**.** The size of some DRE's may need to be considered if polling sites use elevators. A cost associated with this item cannot be determined at this time.

Storage

Each voting machine facility throughout the State of New York will operate differently. But they all will have to store the DRE's, Election Day supplies, records, parts and space for technical staff.

The space required for each DRE in the stored position will vary depending on the size of the DRE. Some facilities will require space in front and back of each DRE, allowing the technician to service them in their storage locations, (i.e. perform quarterly testing, election set-up, re-canvass and repairs). Other facilities will roll the DRE's out into a common area to service them.

Counties who choose to service the DRE's in their storage location, will have to then determine how many and how the DRE's will be grouped. The City of New York determines that a layout of blocks of 14 DRE's with one row of 7 DRE's backs facing one row of 7 DRE's backs; with a 3-foot aisle between the rows and a 5-foot aisle between the blocks may be most efficient.

Counties who choose to store the DRE's grouped together and service them in a common area will have to determine how many DRE's will be in each group and determine how many groups there will be.

Considerations when selecting the method of storing the DRE's will depend on how the counties voting machine facility will operate. Whichever method is selected, the space required will be a cost to the county. The average DRE in a closed position is 6.6 square feet and when opened averages 20.15 square feet.

Environmental Conditions

In addition to the specifications to be provided by the machine vendor, there are environmental requirements to accommodate year-round maintenance activities that are required by New York State regulations. These maintenance activities require that staff perform several tasks (interacting with the DRE's) throughout the year. The maintenance

facilities must have an adequate HAVC system to maintain a temperature similar to an office. The facilities must also be exposed to limited dust conditions.

Power Requirements

Improved electrical systems will be needed to accommodate the power requirements of the machine itself, and to maintain the charge of the batteries. Batteries will need to be charged every one to two months, according to the manufacturer's specifications. The machines will be powered-on at least every three months so that State required quarterly testing can be performed.

Security System

A security system should be considered in the voting machine facility. Each county will have to access their individual requirements.

Additional space will be needed for the following items:

Spare Parts:

It is hard to determine what spare parts will be needed, and how many, but this will require space. It is a realistic estimate that approximately 1 square foot of space will be required per DRE for spare parts.

Work Areas:

Each technician will need an approximately 250 square feet work area. They may require at least 2 tables (24 square feet), 3 storage cabinets (24 square feet), 3 skids (36 square feet) and balance (166 square foot) of space to work on DRE's.

Records:

All records associated with the DRE's may have to be retained for 5 years. This includes, but not limited to, "Voter Verifiable Paper Record", the zero proof printouts, results printout, quarterly test records and all maintenance records. It is fair estimate that at least 1.5 square foot of space will be required per DRE.

Supplies:

Each DRE in your county will need Election Day supplies and supplies during the year the rest of the year. It is a fair estimate that at least ½ square foot of storage space will be required per DRE.

Some DRE's will need desks or tables for the desktop model to be placed on for voting. These tables will mostly need to be a certain height and width to comply with ADA

requirements. Storage space will be needed to accommodate if your voting system requires desk or tables.

Staging Area:

A staging area is a holding area next to the loading docks, where each truckload of DRE's are loaded or unloaded. This space is required; no matter if the shipping is done by outside vendor or in house staff. The required space for staging will depend on the DRE size (when closed) and the average number of DRE's per truckload. It is a fair estimate, that at least 1/10 of the square footage (of the DRE closed) will be required per DRE.

Staff:

With the arrival of the DRE's, the voting machine facility supervisor, technician and clerks (if need) will require desk space. Each position will require varying amounts of space. It is a fair estimated average, that at least 40 square feet will be required per person.

Portable Memory Devices (Storage Cabinets)

If your county is going to secure the portable memory devices in cabinets, then 12 square feet per cabinet is required. It is a fair estimate that each cabinet be able to store 300 to 750 portable memory devices.

Item	Approximately Square footage per DRE	Quantity (DRE or Staff)	Total Square Footage
Spare Parts	1		
Work areas	250		
Supplies	.50		
Records	1.5		
Staging Area	.10		
Staff	40		
Cabinets	12		
		Total	

External Storage Container (if required)

All counties throughout the State of New York need voter registration lists, emergency/affidavit ballots and other Election Day supplies to arrive at the poll sites. If counties deliver theses items inside the machine, then the DRE's storage space must be evaluated. If during the evaluation, it is determined that external storage container maybe needed, theses storage containers may also have to be stored in the voting machine facility. The space requirement cannot be determined at this time.

Quarterly Testing

Current State of New York Election Law (Subtitle V – Part 6209.13 Annual Test of Voting Equipment) requires that each DRE be tested annually with a minimum of 800 test votes. A minimum of 100 test votes must be cast on each DRE per quarter.

To accomplish this task, each DRE must be set-up with a ballot configuration and either simulated votes and/or manually votes cast. Depending on the number of DRE's, and only having approximately 60 workdays within the quarter, will determine staff requirements.

Maintenance

When maintaining the DRE's throughout the year, repairs and adjustments will be required. According to current State of New York Election Law (Subtitle V – Part 6209.9 Contracts (2) Service provision (ii)), the vendor must, without additional cost, provide a five-year guarantee of parts and service. During this time frame there will be repairs not caused by normal wear and tear that will be required. This cost cannot be determined at this time.

During the five year analysis of the different repairs, the expected life of parts and common damages will provide counties with data to determine their estimated yearly maintenance cost.

Additional equipment may be required for repairing and adjusting the DRE's. At the present time, this equipment cannot be identified.

This time frame is an ideal opportunity for counties to implement a technical training program resulting in the counties becoming non vendor dependent.

Preparing the Machines for Election Day

In New York State, the window of time for preparing the DRE's for an election is small. So when selecting and then modifying a DRE, the method of preparing and ease of changing ballots must be taken into consideration. Preparing a DRE for an election may include (but is not limited) to the following task:

- Testing of DRE's that it is functioning correctly including
  - Software
  - Hardware
  - External Devices
- Confirming that the ballot for that ED is correct (paper or electronic display)
- Test Vote (simulated and manual)
- Load supplies (if required)
- Prepare Delivery and Retrieval Receipts (one per poll site)
- Place Shipping Label on DRE

- Seal DRE
- Place shipping cover on DRE (or place in a cart system)

Shipping

Cost

The cost may vary within New York State. Each county needs to obtain pricing and contracts from various moving companies for transporting voting machines and supplies. Some counties may desire to have their own "in house" transportation system in place rather than going to an outside vendor.

Operations

All counties throughout the State of New York will be required to deploy the DRE's to their appropriate poll sites. This deployment must be completed with accuracy and efficiency due to the time constraints. This will include (but is not limited to) generation of delivery and retrieval receipts, verifying that the correct DRE arrived at the correct poll site.

Demonstrations

With the introduction of new technology, demonstrations to the public will play a key roll in a smooth and successful transition. With demonstrations comes the question of how to bring the new technology to the communities. Each county throughout the state will have to determine the most feasible method of accomplishing this task. No matter what method their will be a cost. One cost may be the purchase of a special vehicle for transporting voting equipment.

Election Day Operations

During the day

With the introduction of new technology, the method and approaches of resolving Election Day machine related problems will have to be evaluated. If it is determined that modifications are required, there may be a direct or indirect cost.

Election Night Tallies

The method of collecting individual district tallies will have to be evaluated and modified. The cost associated with this procedure can not be determined at this time.

Recanvassing

Procedures with regard to recanvassing of elections will most likely change with a new voting system. This may include recanvassing of the verified paper ballots. This will be subject to the provisions set forth by the New York State Legislature.

Public Relations

Public out reach is *essential to insure a smooth transition to a new voting system.* This particular item has several costs to be considered, such as development and implementation of a public relations strategy. Each county will develop and implement a plan to meet their individual needs. At this particular time no dollar value can be associated with this task.

Training

No matter which DRE is selected, training will be a major task. Counties throughout the state will have a certain number DRE's that will solely be used as training. These DRE's will allow the polls to open and close repeatedly, without having to be reset. Note, these DRE's ***will not*** be used to conduct elections.

The creation of videos and manuals for inspector training will be needed for implementing a new voting system.

Office Staff

Office staff will need training on the new system. This will include clerical staff and technical staff. Training will have to be conducted on ballot preparation, writing to a cartridge and retrieving election night tally information. This will require development and implementation. At the present time no dollar value can be associated with this task.

Voting Machine Facility Staff

A new voting system will require new training for all voting machine facility staff. Different staff members will require different technical training.

With the DRE's technician training a five year implementation plan of different skill levels will allow the counties to become non-vendor dependent.

If your county implements supplemental systems, in addition, to a vendor system, training will be required on all systems.

All the different types of training will have a direct and indirect cost.

Inspectors

All inspectors will be required to attend and pass new hands on training program associated with the DRE. This will require development and implementation. At the present time no dollar value can be associated with this task.

Software

Licenses for the use of the voting system will be part of the procurement and will have a cost associated. Prices for these systems vary from vendor to vendor. The price or scope of this effort is not known at this time, but the cost will be incurred at the earliest stages of the procurement.

Supplemental applications may have to be developed and or modified to accommodate new technology. At this time, an estimated cost can not be determined. This may include but may not be limited to the following: Interfacing election night returns, audio preparation, such as having tapes made-real voice- or synthesized for the audio portion of the voting machine.

Procedures

All Election Day procedures will be affected. It will effect staff and personnel. A cost direct or indirect cannot be determined at this time.

Poll site Configuration

It is our opinion that the polling site set-up will primarily remain the same.

Poll site Experiences

The experiences in the polling site for both the voters and the poll workers should be straightforward. However, the boards of elections will need adequate time and the necessary resources to make a new voting system successful in New York State.

The following chart will assist counties in estimating costs.

DRE COST

Full-face Machine with a printed Ballot Face

	Cost	Number of DRE's	Total Cost
Low Estimate	6000		
High Estimate	8000		
Paper Ballot-Low	50		
Paper Ballot-High	100		

Full-face Machine with an Electronically Displayed Ballot Face

	Cost	Number of DRE's	Total Cost
Low Estimate	7500	10000	
High Estimate	8500	10000	

Storage

DRE's

Item	Approximate Square footage per DRE	Quantity (DRE or Staff)	Total Square Footage
Closed	6.6		
Open	20.15		

Additional Items

Item	Approximate Square footage per DRE	Quantity (DRE or Staff)	Total Square Footage
Spare Parts	1		
Work areas	250		
Supplies	.50		
Records	1.5		
Staging Area	.10		
Staff	40		
Cabinets	12		
		Total	

Item	Cost Annually	Quantity	Total
Staffing			
Maintenance			
Shipping			
DRE			
Operation			
Demonstration			
Election Day Operations			
During Day			
Election Night Tallies			
Public Relations			
Training			
Office Staff			
Voting Machine Facility Staff			
Inspector			
Software			
		Total	

End of DRE Report

Poll Site Optical Scanner

Purchase Cost - Replacement Cost – *"Initial purchase"*

Currently there is no approved election district in New York State that Optical Scan systems are permitted for use. Therefore, the information on cost has been arrived at by survey and vendor estimates of the possible purchase price in the New York State market.

Scanner consolidation. Poll site scanners are used in a number of states and in these states multiple precinct/election districts are considered normal. For use in this review the following methodology will be used. Election day is 15 hours long that equates into 900 available minutes for voting. Taking an average of 30 seconds per ballot to have the scanner read and record each ballot that leaves a maximum number of votes at 1800[1] per machine. Under current New York State Election Law 4-100 and 7-203 it would limit both mechanically and legally no more than two election districts to one poll site scanner.

Scanner Cost. In the survey the range of cost was between $5000 and $6000. Realistically responses from vendors and the survey place a projected machine at approximately $5500. In addition to the machine a ballot container will be required with the ability to secure ballots during the voting day and then transport back to the board of election. This ballot box would also be used to create a scanner freestanding station and transport ballots to the poll site from the central distribution point.

Voter Assistance Device. HAVA requires that voters with disabilities have the opportunity to vote in a private manner. In order for a paper based system to be compliant with HAVA each poll site will require an additional voter assistance device[2] to aid the voter with disabilities to mark the ballot without assistance from election workers. Several municipalities have purchased the leading device at $5400[3] to $5500[4] per unit.

Privacy Booths. With the transfer to scanner it will be required to provide private booths to mark ballots. Seeing the wide range of poll site situations it is recommended for boards of election to provide free standing voting booths. This purchase will initially be just the first year[5]. Several vendors carry this item and volume purchases lower prices. The price average[6] for numbers of 1 to 250 units are $235 per unit including shipping. A recommended number per election district is three booths.

[1] Based on consistently using a machine with no delay. Delays such as rejected ballots will cause additional time. Additional consolidations could be made if ED's are smaller than NYSEL required size.
[2] As of June 1, 2005 one has not been certified for use by the federal government.
[3] Wharton County TX.
[4] Bowie County TX
[5] This item would have to be replaced over time but no recommendation of life expectancy could be determined.
[6] Intab, inc. was used in this example.

Cost of Scanner system to replace AVM

1:1	1:2	Ratio of Scanners to Election Districts
$5500	$5500	Scanner cost[7]
$5500	$5500	Voter Assistance Device
$705	$1410.00	Free standing voting booths
$11,705.00[8]	**$12,410.00**	**Total equipment cost**

Comparison of replacement costs of equipment in various illustrations

Election Districts	Percent Consolidation	Cost
100	0	1,170,500.00
100	10	1,053,450.00
100	20	936,400.00
100	30	819,350.00
100	40	702,300.00
100	50	585,250.00

Software Cost

Software. In order to test, set-up and print canvass reports there will be a vendor supplied software package that will be necessary to run the optical scan system. Depending on the state negotiations and the vendors the typical price for a standard system is in the range of $25,000-$65,000[9]. There will be a continuing maintenance/upgrade fee that is standard in the industry. As of yet that cannot be established prior to a final system specification made by the legislature and the New York State Board of Elections.

Operational /Continuing Cost

Ballots. As the optical scan system is paper based it will be necessary to print ballots for each election cycle. This will be an ongoing cost and will raise in relation to the number of active registered voters.[10] Because of New York State's full-face requirement the ballot has more columns, which adds to ballot cost.

Ballot cost will vary with ballot style[11], volume and if it is a primary or general election. It is important to note that it is clear that these costs will have to be budgeted annually. As you can not predict if there will or will not be a primary or any other set of possible ballot situations you will have to budget for worst case scenario to insure the electoral process is not impaired.

[7] It is recommended that for every 100 machines 5 be purchased as spares that can be used in case of malfunction on Election Day.
[8] This cost number will be used for Scanner consolidation numbers.
[9] State of Michigan contract 071B4200234.
[10] Most states have an average of 3 columns as compared to 8 for NYS.
[11] New York's major elections occur only twice a year therefore several different offices must be combined on one ballot. This causes multiple ballot styles in each municipality increasing difficulty of the printing of the ballot.

In conjunction with the New York City Board of Elections a number of surveys were sent to other states. The result was a range of ballot costs. This report will take an actual "*real word*" range to assist in a cost comparison. Costs in the survey ranged from .25 to .75 per ballot. In two cases when printers were contacted by phone, the ballot explained the costs went to an average for a general election of approximately .50 per ballot. Costs for lower number of ballots may if other states are used as a comparison increase to .85 cents[12] for small quantities.

The continuing ballot cost is an expense[13] that New York State's boards of election have not had previously. This should be view as an additional yearly expense when making a comparison of systems. In the calculations primaries and general elections are used, as these costs must be budgeted annually to accommodate the likelihood of these elections. It should be noted that New York State's printing market is considerably different than other states. A true cost comparison should be weighted heavily on the market conditions in New York. New York State's election printing market, as it is driven by the official political calendar and current NYSEL, is both involved and time sensitive.

Ballot to Voter cost will be based on 110 percent of active registered voters in the county as most likely will be suggested by the NYSBOE.

Ballots Cost Comparisons

Ballot Number	Cost per ballot	Total for Election
100,000 = 110,000 x 2	**.40**	**$88,000.00**
50,000 = 55,00 x 2	**.40**	**$ 44,000.00**
100,000 = 110,000 x 2	**.50**	**$110,000.00**
50,000 = 55,000 x 2	**.50**	**$55,000.00**
100,000 = 110,000 x 2	**.60**	**$132,000.00**
50,000 = 55,000 x 2	**.60**	**$66,000.00**
100,000 = 110,000 x 2	**.75**[14]	**$165,000.00**
50,000 = 55,000 x 2	**.75**	**$82,500.00**

Privacy Sleeves

With the use of paper ballots there is a need to protect the voter's privacy prior to inserting the ballot into scanner. These devices additionally provide voting instructions to assist the voter in casting their vote at the scanner station. The use of these items will have a limited life expectancy so replacements and spares should be calculated. The range of cost was found from $2.50 to $3.50[15] per unit. A sufficient number would be required at each poll site, which would include the high volume periods. It would be logical to have between 10-15 percent of the registered voters in a district available. This range would cost a county an average of $37,500.00 for 100,000 voters.

[12] State of Michigan contract 071B4200234.
[13] Ballot costs are not covered under HAVA and will be a total local expense.
[14] Present cost of a full-face absentee ballot for Orange County, NY.
[15] Intab, inc. and the State of Michigan contract 071B4200234.

Storage of Scanners

As every county will approach the storage of the optical scanners slightly differently, there are still basic requirements. As there will be a requirement to test the scanner on a periodic basis[16] it would be preferable to store the ballot box with the scanner as to provide a ready platform for testing and maintenance. The storage of the machine will require a minimum of 6.6 square feet per scanner with attached ballot box. Taking into account access will be needed for testing and battery charging a minimum working area of three feet between machines should to planned for.

The storage facility must also accommodate environmental conditions and precautions one would take with computer equipment sensitive to heat and cold. During testing, maintenance and set-up conditions should be able to come to the level of a normal working area for board staff.

Included in the storage facility should be a workbench area of at least 8' x 8 ' to allow for the repair and benching of machines for an on going maintenance cycle.

In addition there will be further need to house spare parts, additional machines used for training and general supplies.

Storage of Voted Ballots

A normal lot, 1000 ballots weights 15 ½ pounds and take a footprint of 8 ½" x 18". Depending on the size of the county and ballot storage number one would need at least a 10' x 12' room that would be both secure and fire proof. The board would be required to store these ballots on a rotating basis for two years. This area would be enlarged to provide a centralized storage area that would include the other required items boards are required to maintain for two years per NYSEL.

Memory Devices

As the scanners read the results onto a memory device that requires they be maintained in a fireproof storage cabinet on site with the scanners. Cost of a 37"x22"x52" fireproof cabinet is $4,000 - $4,500 each. Two cabinets are needed for every 100 machines.

In addition additional memory devices will be necessary which would average two per each machine. An average cost is $70 to $100.00[17] per unit per machine. To house each memory device a transport container will be needed at the cost of approximately $10 to $12 per unit.

On Going Maintenance and Repair

For the first five years vendors will be required to provide at no cost parts and service[18]. It should be noted that this new technology would require a different skill set than present

[16] NYSEL Subtitle V – Part 6209.13 Annual Test of Voting Equipment.
[17] State of Michigan contract 071B4200234.
[18] NYSEL Subtitle V – Part 6209.9 Contracts.

custodians. Counties could find it more cost effective to invest in training that would allow repair and maintenance to be done in-house as opposed to more costly factory service. Post warranty costs were obtained from the State of Michigan put per unit cost of post warranty at around $133 to $153 per year.

Poll Site Delivery

With the exception of New York City and three other counties in New York State that currently deliver voting machines, the delivery to the poll site will be a new function of the board of elections. As the optical scanners will need to be stored under controlled environments the board will have to create a delivery plan and factor into it a cost. As each county has very different set of cost factors only local research will determine these costs.

A general state cost range from the committee's local survey ranged from $50.00 to $90.00 per machine per election.

If federal funds are available it may be more cost effective for boards to purchase trailers at approximately $7000.00 to $10,000.00 a piece and deliver the machines themselves if other county departments' equipment could be used for drawing them.

Training

Seeing the optical scanner system has not been used as a voting system in New York prior to the 2006 elections it will be of critical importance to devote a substantial amount of effort in training the public and election inspectors in this new system.

A critical factor in rolling out this new voting system will be public demonstrations. To insure a smooth transition it will be necessary to insure a number of scanners are deployed for months prior to the first election to familiarize the public with the new voting process. Additional staff cost including part-time and over-time should be budgeted. It is safe to speculate there will be a quadrupling of present training time and cost including weekend and evening time slots.

Administrative Change Cost

The current AVM operational model will for a large part change. This may require new board policies and administrative procedures. In just the way elections will be handled in respect to an "all paper" election makes it hard to predict with accuracy the cost implications. As reviewed in the preceding sections storage, canvassing, security and delivery and pick-up will change the board's pre and post Election Day operations. Included into this will be a new operations model for poll site operations as required by the handing out of paper ballots and the necessity to control them.

As best can be determined with the short time to implement a totally new voting system it would be estimated, after exhaustive discussions with many election commissioners, in the range of additional hours per week of at least 10[19] hours a week per staff member for a period of six

[19] If no legislative action is taken by the end of June 2005 it may not be operationally impossible to make the transition by the 2006 federal deadline.

months prior to the 2006 primary. This would be, at best, additional staff time to re-write, organize, test, plan, install and train on new software and set up a warehouse.

Price Break Down to Replace one Voting Machine

Scanner/Scanner Ballot Container	$5500
Voter Assistance Device	$5500
Voting Booths	$705
Ballot Cost @ 880[20]	$440
Privacy Sleeves	$240
Total Estimated Cost	**$12,385**

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[20] Based on 800 active voters. Ballots are a cost plus item to present operations.