Lever Replacement Costs:
New York City Case Study

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Findings

- Ineligible costs: Not all costs are eligible for HAVA funds. City taxpayers will pay all ineligible costs starting in year 1.
- HAVA funds depletion: City taxpayers will pay all annual costs starting approximately year 4.
- Unavailable information: Our cost estimates are low because they are based only on public documents, and not all information is available to the public (see Sec. 1.b).
- Mayor Bloomberg's estimate of costs above HAVA funds shows how low our estimates are: "Sensing that [HAVA funds for replacement of levers] may be insufficient, the Mayor's Office of Management and Budget (OMB) has budgeted an additional $50 million in City tax-levy funds for the purchase of new voting machines. … The City's Capital Budget also includes an additional sum of $47.2 million for other purposes, including the outfitting of office and warehouse space."[1]

NYC's HAVA Funds vs. Costs

Year 1, equipment and software license	Low	High
HAVA funds for equipment to replace levers Title I, §102 (Sec. 10.a.)	$21,230,319	$21,230,319
Year 1 costs for equipment & software license (Sec. 9.a)	$21,877,963	$27,800,370
Year 1 deficit for equipment & software license	**($647,644)**	**($6,570,051)**
Years 1-5, 'other' costs		
HAVA funds for 'other' (includes training, storage, voter registration database, tech support, software licenses, ballot printing, audits) Title I, §101 and Title II, §251 (Sec. 10.a)	$44,188,427	$44,188,427
Year 1 (Sec. 9.a)	$5,078,161	$16,138,136
Years 2-5, each year (Sec. 9.c)	$5,286,361	$16,250,576
Years 1-5, total for the five years	$26,223,605	$81,140,440
Year 6 and after		
HAVA funds remaining for 'other'	$17,964,822	**($36,952,013)**
Year 6 and every year after that (same as years 2-5 plus maintenance)	$5,963,369	$16,887,744

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[1] Hearing on the Fiscal 2010 Executive Budget for the Board of Elections. The Council of the City of New York Finance Division. 5/18/09. Page 3. www.wheresthepaper.org/ExecutiveBudget2010_NYCBOE_May18_09.pdf

[5/6/09] Please contact the authors with feedback or additional information that could make this document more comprehensive. Email to ellen@votersunite.org. Significant updates will be assigned a new major version number, and details will be recorded on this page. Minor additions or corrections will be assigned a new minor version number and will be noted in footnotes

[5/29/09] Cover page was updated to more accurately represent the HAVA funds available and costs of lever replacement.

[7/20/09] Cover page was updated for clarity.

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Lever-Replacement Costs:
New York City Case Study

1. Executive Summary

The costs of replacing lever voting machines with electronic machines will be enormous. The immediate costs – hardware, software, licenses – will rapidly deplete the City's HAVA funds.

The associated costs, which continue from year to year – training, printing paper ballots, pre-election testing, auditing elections, storage, inventory management, new personnel, and new procedures – have not yet been fully identified. Many, perhaps most, of them are not eligible for HAVA funds.

Even excepting the unknown costs, it is clear that the cost of lever replacement will be a heavy burden borne by City taxpayers, not only in the first year, but also in each subsequent year.

1.a Findings.
New York City is currently using a voting system that includes:

- ES&S AutoMark ballot marking devices in poll sites for people with disabilities.
- Lever voting machines in poll sites for other voters.
- Sequoia central count optical scanners for absentee ballots.

Current New York State law requires the replacement of lever voting machines.

New York City is planning to switch to a system of voter-marked paper ballots and precinct-based optical scanners, and is considering the purchase of DS200 scanners from Election Systems & Software (ES&S) to replace the lever machines.

| | --------------------Estimates-------------------- | | |
Findings	Low	Median	High
New York City's HAVA funds remaining.	$65,418,746	$65,418,746	$65,418,746
First year costs of lever replacement – *excluding many significant costs for which we do not have figures.*	$26,956,124	$35,447,315	$43,938,506
Annual, continuing costs after the first year – *excluding many significant costs for which we do not have figures.*	$5,286,361	$10,768,468	$16,250,576
Annual maintenance after the warranty expires.	$677,008	$713,308	$749,608

- Not all costs are eligible for HAVA funds. City taxpayers would pay for all ineligible costs starting from the first year.

- Assuming median costs, and excluding costs for which we do not have figures, *by the fourth year,* HAVA funds would be depleted and City taxpayers would bear all costs.

1.b Limitations.

Many significant costs associated with replacing lever machines are as yet unknown to the public, including:

> Voter education
> Storage for new electronic equipment and accessories between elections
> Electricity for charging batteries before each election
> Securing ballots on election day
> Storage for ballots after elections
> Inventory control and tracking for equipment and accessories
> Replacement of consumable accessories
> Security for equipment while out of the warehouse for election use
> Compensation for additional staff and consultants
> Manually counting 3% of ballots cast in special elections

Replacement may also include increased costs for:

> Poll worker training, and training facilities
> Transporting equipment to training facilities
> Transporting equipment for election use

For some costs, only a range can be estimated until decisions are made in the future or information is received, for example:

> The number of ballots to be printed for general, primary, and special elections.
> The number of annual licenses needed for ES&S election management software.
> The type of privacy booths to be purchased.

Other costs are unpredictable or dependent on unpredictable events, such as the number of special elections that will be held and the number of voters who will vote in them.

1.c Methodology.

No governmental agency or official has published a comprehensive study of the cost of replacing lever machines, nor the cost of using the optical scanner system in future years.

This document has been prepared in order to:

- Inform officials and the public about the financial impact to New York City of replacing lever machines with DS200 scanners.

- Highlight expenses that are unknown to the public at present.

The authors attempted to obtain accurate information from official documents and New York City officials. For example, the ES&S prices we quoted are based on "ES&S Response to New York State Office of General Services Pricing Forms." All documents we used to prepare this report are listed in Appendix A, "Reference Documents."

We tried to cover all areas that may involve cost to the public now and in the future. We are grateful to the Board of Elections in the City of New York for posting detailed information on their website, and by so doing, encouraging people to inform themselves. Without that data, especially RFI responses submitted to them by vendors, this document would have been impossible for private citizens to prepare. However, this document is still not comprehensive due to the many types information we were unable to obtain, listed in Section 1.b.

2. Hardware Purchases

To replace its lever machines with the new DS200 systems, the City would need to purchase scanners, accessories, voting booths, and a computer system on which the Board of Elections would run its central election management software. Most of these costs would be covered by HAVA funds, but after the first year, continuing costs of replacing consumable accessories would likely be borne by the City.

Summary of Initial Equipment Costs to New York City

| | Range for 2,227 scanners and 19,829 booths | |
	Low	High
DS200 Scanners	$17,245,888	$17,245,888
Privacy booths	$490,768	$6,246,135
First year accessories	$2,118,001	$2,118,001
BOE computers and peripherals *	$365,650	$365,650
Total	**$20,242,363**	**$25,997,730**

* Assumes the costs are comparable to Sequoia's costs for comparable components.

2.a DS200 Scanners.

New York City must purchase approximately 2,227 scanners.[2] Calculation details are shown in Appendix F and summarized here:

- 1,794 scanners for poll site use (one for each 4000 active registered voters per poll site[3])
- 358 scanners to provide 20% additional units for spares
- 75 scanners to provide machines for training

Using the ES&S price quote of $7,744[4] per DS200 scanner, the cost for 2,227 scanners will be $17,245,888. The following table shows the number of scanners needed per county, as well as units needed for spares and training.

	# of Scanners	Cost per Scanner	Total Cost
Bronx	277	$7,744	$2,145,088
Kings	527	$7,744	$4,081,088
New York	451	$7,744	$3,492,544
Queens	424	$7,744	$3,283,456
Richmond	115	$7,744	$890,560
Spare units	358	$7,744	$2,772,352
Training units	75	$7,744	$580,800
NYC Total	**2,227**		**$17,245,888**

As required by law[5], the purchase price will include the DS200 and five years of hardware and software maintenance.

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[2] Appendix F shows how the number of scanners per county was calculated. Quantities for spares and training are based on the AutoMark purchases. "Plan B BMD Implementation 2008 Cost Analysis Results V-1.0."

[3] Specified by New York State Regulation 6210.19.

[4] ES&S prices quoted in this document are from "ES&S Response to New York State Office of General Services Pricing Forms," listed in Appendix A, "Reference Documents."

[5] "State of New York 2008 Election Law," Section 7-204, page 235. [Note: this paragraph was corrected in Version1.1.]

2.b Privacy booths.

Section 6210.19 of New York State regulations[6] specifies the minimum number of privacy booths required per poll site for a presidential or gubernatorial election. It is based on the number of active registered voters at each site:

Poll sites with 6000 or fewer voters: one booth per 250 voters
Poll sites with more than 6000 voters: one booth per 350 voters.

The number of privacy booths required is 16,524, plus 20% more for spares.[7]

Bronx	2,546
Kings	4,956
New York	3,963
Queens	4,031
Richmond	1,028
Subtotal	16,524
+ 20% spares	3,305
Total	**19,829**

The cost of one non-accessible voting booth from ES&S ranges from $24.75 to $315.00, and the following table shows a sampling of them. The total cost of these booths ranges from $490,767.75 to $6,246,135.00.

Voting Booth in ES&S Price List	Cost Each	Cost for 19,829
Cardboard Kora-Booth with no Light	$24.75	$490,767.75
Tote-A-Vote Portable Voting Booth	$92.35	$1,831,208.15
Pollstar Voting Booth with Lamp	$138.60	$2,748,299.40
Pollstar Standard Voting Booth without Lamp	$145.00	$2,875,205.00
Model VI Voting Booth without Lamp	$220.50	$4,372,294.50
Pollmaster I Voting Booth with Light & Shelf	$250.00	$4,957,250.00
Model VI Voting Booth with Lamp	$257.25	$5,101,010.25
Model VII Gemini Dual Voting Booth with Lamp	$278.25	$5,517,419.25
1 stall voting booth	$315.00	$6,246,135.00

2.c ES&S consumable accessories for the first year.

The ES&S price list for New York suggests that the city may also need the following consumable accessories for each scanner.

It is unknown whether any of these accessories will be included in the price of the scanners. If they are not included, the table shows the cost for the first year with estimated quantities based on the best information available.

Accessory	Cost Each	#	--Per Scanner-- Cost	#	---For 2,227 Scanners---- Cost
UPS[8]	$215.00	1	$215.00	2,227	$478,805.00
Cancellation Stamp	$15.65	1	$15.65	2,227	$34,852.55

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[6] "6210 Regulations," page 45.

[7] Appendix F shows how the number of booths per county was calculated.

[8] Uninterruptible power supply.

Accessories needed for Scanners		--Per Scanner--		---For 2,227 Scanners----	
Accessory	Cost Each	#	Cost	#	Cost
Mother Board Battery	$4.95	1	$4.95	2,227	$11,023.65
Key	$7.98	3	$23.94	6,681	$53,314.38
Lithium ion battery	$98.95	2	$197.90	4,454	$440,723.30
Thermal Paper Roll	$1.95	3	$5.85	6,681	$13,027.95
8-gigabyte Jump Drive	$214.50	2	$429.00	4,454	$955,383.00
Accessories for Scanners			**$892.29**		**$1,987,129.83**

Secrecy Sleeves needed[9]	Cost Each	---Per Booth---		----For 19,829 Booths----	
"T" Secrecy Sleeve	$3.30	2	$6.60	39,658	$130,871.40

Citywide Total for Consumable Accessories	
Accessories for Scanners	$1,987,129.83
Secrecy Sleeves	$130,871.40
Total Accessories needed	**$2,118,001.23**

2.d Dedicated Election Management Computers and Peripherals.

The ES&S price list indicates that servers, server backups, printers, cables, and laptop computers are needed for the central office. ES&S does not indicate the price per component, nor how many of each component the city would need.

Since ES&S would sell the items to the city at "Cost + 20%", the city may do well to purchase the items elsewhere *if ES&S agrees to provide the same service regardless of whether the items are purchased from them or other vendors.*

The cost of each item and the needed quantity of each item remain unknown. However, assuming the items needed and the prices are comparable to Sequoia's election management system, we can provide an approximation of the cost.

For approximation: the cost of Sequoia's "EMS Datacenter Standard." Sequoia includes election management computers and peripherals in its price list. Sequoia says that the "EMS Datacenter Standard" is suitable for more than 100 Election Districts. This suggests that New York City would need to purchase components comparable to the EMS Datacenter Standard for each of the five counties.[10]

The following table shows the cost for one Sequoia EMS Datacenter Standard for all five New York City counties.

Sequoia EMS Datacenter Standard Components	Cost Each	#	Cost All
EMS Application Server Hardware	$5,800	5	$29,000
EMS Database Server Hardware	$5,800	5	$29,000
EMS Network Attached Storage Server Hardware	$5,800	5	$29,000
Cisco Catalyst Gigabit Switch Hardware (48 ports)	$6,500	4	$26,000
Cisco Catalyst Gigabit Switch Hardware (24 ports) *	$3,250	1	$3,250
APC UPS Backup Devices (2 per EMS Datacenter)	$975	10	$9,750

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[9] Assumes two secrecy sleeves per privacy booth: one for the voter going into the booth, one for the voter taking the ballot to the scanner. See Section 2.b for calculations estimating the number of booths needed.

[10] This list of components is consistent with the "Network Topology" defined for small to medium jurisdictions in Sequoia's response to New York City's request for information, page 45.

Sequoia EMS Datacenter Standard Components	Cost Each	#	Cost All
Datacenter 25U Rack Hardware	$1,560	5	$7,800
Network and power cables	$650	5	$3,250
HP Laser Printer	$650	5	$3,250
Windows Server 2003 R2 Standard	$1,950	5	$9,750
Windows Server 2003 R2 Enterprise	$5,200	10	$52,000
SQL Server 2005 Enterprise	$32,500	4	$130,000
SQL Server 2005 Enterprise *	$15,600	1	$15,600
EMS EED Workstation Hardware with 20" LCD Screen	$1,500	5	$7,500
Windows XP Professional SP2	$300	5	$1,500
EMS RTR Workstation Hardware with 20" LCD Screen	$1,500	5	$7,500
Windows XP Professional SP2	$300	5	$1,500
Total for five EMS Datacenters Standard			**$365,650**

* Prices for these two components would be lower for Richmond County because it is a smaller jurisdiction, with fewer than 500 Election Districts.

3. Software Licenses

The Unity Election Management System (EMS) is required to program the scanners for election-specific ballots, upload results from the scanners via memory cards, tally results, "adjudicate" ballot images,[11] and print reports. This software would run on the BOE servers (see 2.d above).

ES&S does not sell Unity EMS software; rather ES&S licenses it for an annual fee. This annual cost would continue for as long as New York City used the EMS. (The annual license fee for Unity is in addition to the annual license fee for the AutoMark IMS, which serves a similar purpose for programming ballots for the AutoMark ballot marking devices. Firmware license fees for the scanners are included in the cost of the scanners and are not ongoing.)

3.a First year software license fee.
The ES&S price list for New York State[12] determines the license fee according to:

1. the number of licensed users,
2. whether the users are individual named users or concurrent users.
3. the number of active registered voters

ES&S recommends installing the Unity EMS on computer systems at six locations in New York City: the central administrative Board of Elections and at each of the five county Boards of Elections.[13] Since the number of active registered voters in each county is greater than 100,000, the cost range of the Unity EMS license fee would be as follows:

Type of Unity license	Cost for one license	Cost for 6 licenses
5 individual/named users	$272,600	$1,635,600
10 concurrent users	$286,520	$1,719,120
20 concurrent users	$300,440	$1,802,640

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[11] Adjudication is the process of duplicating a ballot image electronically so that it will be accurately counted by the software, without altering the original image of the ballot. For example, if stray marks on a ballot are likely to cause the ballot to be counted incorrectly, the stray marks can be removed.

[12] See Appendix B for a sampling of software license fees charged by ES&S in other states.

[13] "5.0 Requirements & Requirements Response from ES&S." Page 33.

3.b Future software license fee increases.
In other jurisdictions ES&S software license fees have increased from one year to the next. For example, in Charlotte County, Florida, the fee increased 5% from 2008 to 2009.[14] Therefore, although the ES&S price list for New York State gives the current license fee schedule for the state, it is unclear what the fee will be in future years.

4. Training for Election Workers, Voting Machine Technicians, and Voters

Poll worker training classes for the DS200 would be longer than comparable classes for the lever machines, and would likely require higher pay for trainees. New training facilities may be needed, and scanners would need to be transported to and from the facilities during the training season.

ES&S support would be needed to train:

- Trainers for the poll workers
- Board of Election personnel to use the Unity election management software
- Voting machine technicians to maintain and repair the equipment.

Voters would need to be educated on how to use the new system.

4.a Poll worker training for the first year.
A typical New York City election requires 30,000 to 36,000 poll workers.[15]

In its Request for Information ("RFI"), the Board of Elections in the City of New York suggests that the Board plans to have ES&S conduct DS200 training for 40,000 poll workers for the Primary and General elections in the first year.[16] Poll worker training is not included in the price of the hardware or software and will be an ongoing cost.

ES&S costs for poll worker training. ES&S limits the class size to 20 participants and holds each class for one-half day. ES&S charges $1,800 per training day.

Thus, the cost for ES&S to train 40 poll workers, by conducting two classes on one day for 20 poll workers each, would be $1,800. At this rate, for each 1,000 poll workers, ES&S training requires 25 training days at a cost of $45,000. These estimates assume that all classes are full and no vacancies occur that would result in fewer than 20 poll workers being trained per half-day class.

Poll Workers to Train	Training Days Required	ES&S Cost
5,000	125	$225,000
10,000	250	$450,000
15,000	375	$675,000
20,000	500	$900,000
25,000	625	$1,125,000
30,000	750	$1,350,000
35,000	875	$1,575,000
40,000	1000	$1,800,000

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[14] Emails from Blanche House, the Charlotte County Assistant Supervisor of Elections, state that ES&S charged a license fee of $13,891.50 for 2008 and increased the fee by 5% to $14,586.08 for 2009.

[15] "New York City Board of Elections Request For Information III." App B

[16] "5.0 Requirements & Requirements Response from ES&S."

Two factors would reduce the costs of poll worker training. First, the city might conduct its own poll worker training, thus reducing the cost of training the poll workers on the new equipment. Second, New York City now conducts poll worker training on the lever machines. The cost of this training is unknown, but if this training is no longer needed the savings would somewhat offset the cost of training on the new equipment.

4.b ES&S "train the trainer" courses.
If the city conducts its own poll worker training, trainers would have to be prepared. ES&S offers a 3-day course to become a certified poll worker trainer. The course consists of a 2-day "train the trainer" class, one half-day AutoMark operation class, and one half-day DS200 operation class.

For each 20 trainers, the course recommended by ES&S will require 3 days of ES&S time at a cost of $1,800 per day, for a total of $5,400.

Trainers to Prepare	Days Required	ES&S Cost
20	3	$5,400
40	6	$10,800
60	9	$16,200

4.c Poll worker pay for training days.
Poll workers must be trained on the DS200 as well as the AutoMark ballot marking device. ES&S recommends one half-day of training for each type of equipment – more than twice as long as the current 3-hour training session.[17] Anticipating extended training time, the Board of Elections has requested that poll worker pay for training be increased from $25 to $100.[18]

The following table shows the cost of current poll worker pay for training, and the *increase* in cost if pay is raised to $50, $75, or $100 per poll worker.

	Current Pay	Increased Cost if Pay is Raised to......		
Poll Workers	$25	$50	$75	$100
5,000	$125,000	$125,000	$250,000	$375,000
10,000	$250,000	$250,000	$500,000	$750,000
15,000	$375,000	$375,000	$750,000	$1,125,000
20,000	$500,000	$500,000	$1,000,000	$1,500,000
25,000	$625,000	$625,000	$1,250,000	$1,875,000
30,000	$750,000	$750,000	$1,500,000	$2,250,000
35,000	$875,000	$875,000	$1,750,000	$2,625,000
40,000	$1,000,000	$1,000,000	$2,000,000	$3,000,000

4.d Additional poll worker training facilities.
Currently, the city has 61 facilities used for training 30,000 to 35,000 poll workers over a period of six weeks, with a class size of 62, which increases as the election approaches.[19] It is likely that additional facilities would be needed.

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[17] "New York City Board of Elections Request For Information III." App B

[18] "Testimony of Marcus Cederqvist before the New York City Council." March 12, 2009. Page 5.

[19] "New York City Board of Elections Request For Information III." App B

A full day of training would be required to train poll workers on both the DS200 and the AutoMark. The current facilities would not be sufficient for providing one full day of training for 40,000 poll workers, with class sizes limited to 20, unless:

- All 61 facilities are available 5 days per week during the 6-week training season, and
- At least some of the facilities are available 6 days per week, and
- At least 61 trainers are available during the entire training season, and
- Each class is full so that more classes aren't needed as the election approaches.

4.e Transporting equipment to training facilities.
ES&S estimates a need for two or three DS200 scanners at each poll worker training session. However, if the city buys only 75 scanners for training, each training site could have only one.

The increase in the cost of transporting voting equipment to training facilities cannot be estimated, because the following are unknown:

- How many training sessions will be held concurrently.
- How many different facilities will be used.
- How much it would cost to transport the scanners to each facility.
- How much it currently costs to provide lever machines at the training facilities.

4.f Training for the BOE staff and Voting Machine Technicians
ES&S charges $1,800 per day for training election management system users, technical staff, other BOE staff, and voting machine technicians.

Initial training classes would teach BOE personnel and voting machine technicians to perform preventative maintenance. Class size is limited to 20 students. Other information about the training classes is unknown. In its response to the NYC Request for Information, ES&S said it would conduct training classes,[20] but it did not provide information about the number of days per class, so the cost of training is unknown.

Future training to allow the City to become vendor independent would require technicians to attend and pass a technician certification program. Hardware training classes are limited to 20 participants. Software training classes are limited to 10 participants. ES&S says that "Typically it takes 2-3 weeks to become fully certified on the hardware and 6-8 weeks to become certified on the software."[21]

If no more than 20 certified hardware technicians and no more than 10 software technicians would be needed, classes would cost from $72,000 to $99,000.

Certification Program	Min Days	Max Days	Cost per Day	Low Cost	High Cost
20 Hardware Technicians	10	15	$1,800	$18,000	$27,000
10 Software Technicians	30	40	$1,800	$54,000	$72,000
Both Programs				**$72,000**	**$99,000**

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[20] "5.0 Requirements & Requirements Response from ES&S." Page 47

[21] "5.0 Requirements & Requirements Response from ES&S." Page 89

4.g. Voter education.

New York City has a $6.5 million contract with Burson-Marsteller to provide voter outreach and education.[22] The amount spent on AutoMark education and the amount remaining for DS200 education are unknown.

5. Per Election Costs

It is unlikely that HAVA funds can be used for the costs of holding elections. Per election costs using scanners would be somewhat offset by not using levers, but such savings would fall far short of compensating for both new and higher costs, which include:

- Ballot layout and programming
- Printing paper ballots
- Pre-election testing
- Mandatory 3% manual audit
- Transporting and securing equipment and ballots
- Replacing consumed accessories

5.a Ballot layout.

Ballot layout means setting up the ballots for printing. Contest names, candidate names, party names, other text, and graphic elements are entered and positioned as they will appear on the printed ballot. Ballot layout for the DS200 may have to be done separately from ballot layout for the AutoMark ballot marking device and separately from ballot layout for New York City's Sequoia central scanners.

It is expected that the Board will do its own ballot layout. This may require additional staff time and/or consultants before each election.

However, if ES&S ballot layout services are needed, the prices are based on the number of ballot faces (also called ballot styles) *per language*. English and Spanish are billed as one language, and each additional language is extra. In addition to English and Spanish, some New York City ballots contain Chinese, some contain Korean, and some contain both.

According to the Board of Elections,[23] a typical New York City general election involves 934 different ballot faces. We estimated approximately 280 extra language fees for Chinese and 61 for Korean.[24] The following table shows the cost for ES&S to do ballot layout for 934 ballot faces with extra fees for these languages. Note that the ballot layout cost is less when ES&S also does the ballot programming (see Section 5.b.)

Language	Ballot Faces / Lang. Fees	w/ Ballot Programming Cost Each	Cost Total	Ballot Layout Only Cost Each	Cost Total
English, Spanish	934	$25	$23,350	$45	$42,030
Chinese	280	$50	$14,000	$90	$25,200
Korean	61	$50	$3,050	$90	$5490
Approximate ES&S Layout Cost / Election			**$40,400**		**$72,720**

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[22] "New York elections board selects Burson for voter education campaign." PRWeek. July 29, 2008. by Frank Washkuch. http://www.prweekus.com/New-York-elections-board-selects-Burson-for-voter-education-campaign/article/113011/ Archived at: http://www.votersunite.org/article.asp?id=8383

[23] Details for a typical NYC election are from "New York City Board of Elections Request For Information III." App B

[24] Appendix E shows how we estimated the extra language fees.

Currently, the city lays out the ballot strips for the front of the lever machines. If these strips were no longer needed, the savings would somewhat offset the cost of ballot layout for the scanners.

5.b Ballot programming.

Ballot programming means creating the election-specific ballot definition files that determine which marks on a ballot are credited to which candidates in the electronic vote database. Different software programs are used for programming ballots for the DS200, the AutoMark ballot marking device, and New York City's Sequoia central scanners, so ballot programming will have to be done separately for each of the three types of machines.

It is expected that the city will do its own ballot programming. This is likely to require additional staff time and/or consultants before each election.

However, if ES&S ballot programming services are needed, the prices are calculated per election district, per ballot face, per contest, and per candidate. New York City has 6,111 election districts.[25] According to the Board of Elections, in a typical New York City general election,[26] there may be as many as 934 different ballot faces, 2,000 contests, and 17,000 candidates. The following table shows the cost for ES&S to do the ballot programming for these numbers.

Item in ES&S Price List	Quantity	Cost Each	Cost Total
Base charge for DS200			$437.50
Base charge for Unity setup			$437.50
Election district	6,111	$6.00	$36,666.00
Ballot face	934	$13.00	$12,142.00
Contest	2,000	$15.00	$30,000.00
Candidate	17,000	$6.00	$102,000.00
ES&S Ballot Programming Costs / Election			**$181,683.00**

Currently the city performs the mechanical programming for the lever machines. If this mechanical programming were no longer needed, the saving would somewhat offset the cost of software ballot programming for the scanners.

5.c Printing paper ballots.

ES&S has quoted a base charge not to exceed $1.00 per ballot for printing ballots through an ES&S partner printer. Additional services including stub and/or numbering, folding, scoring, packaging, color, other designs, and shipping would cost as much as $0.16 more per ballot. Additional but unspecified costs would apply to special requests such as watermarking or unique packaging requirements.

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[25] "New York City Board of Elections Request For Information III." App B

[26] Details for a typical NYC election are from "New York City Board of Elections Request For Information III." App B

Costs for general election and citywide primary election. Given voters' unfamiliarity with using paper ballots, voters may spoil some ballots. New York law allows each voter to receive a maximum of three ballots—one blank ballot upon signing in, and up to two blank replacement ballots for spoiled ballots.[27] For a general election it may be necessary to print more ballots than active registered voters, as many as 110% or higher. Fewer ballots are likely to be needed for citywide primary elections.

The following table shows the printing costs for different per-ballot prices and for different percentages of active registered voters for which ballots are printed. As of April 1, 2009, New York City had 4,219,471 active registered voters.[28]

% of Voters	# of Ballots	-----------------------ES&S Price per Ballot-----------------------			
		$0.75	$0.90	$1.00	$1.16
50%	2,109,736	$1,371,328	$1,687,789	$1,898,762	$2,236,320
70%	2,953,630	$2,004,249	$2,447,293	$2,742,656	$3,215,237
90%	3,797,524	$2,637,169	$3,206,798	$3,586,550	$4,194,154
110%	4,641,419	$3,270,091	$3,966,304	$4,430,445	$5,173,072
130%	5,485,313	$3,903,011	$4,725,808	$5,274,339	$6,151,990
150%	6,329,207	$4,535,932	$5,485,313	$6,118,233	$7,130,907

New York City provides emergency ballots to each Election District for use by voters in case of lever machine malfunction. These ballots cost $0.47 to $0.50 each.[29] If the lever machines were replaced with DS200 scanners, these emergency ballots would no longer be needed. Assuming that 300 emergency ballots are prepared for each of 6,111 Election Districts in a general election, eliminating the need for these ballots would save $916,650. This would partially offset the cost of printing DS200 ballots. Assuming only 100 emergency ballots are printed for each Election District in a primary election, the savings would be $305,550.

Costs for special elections. In New York City, 25 special elections were held (or planned) in the years 2001 through 2009, for an average of two or three per year.

The following tables show the cost of printing ballots for each of three types of special election. Appendix C shows the calculations for the average number of voters for each type of district.

State Senate District (with 160,000 active registered voters)

% of Voters	# of Ballots	----------Ballot Costs for Each ES&S Ballot Price----------			
		$0.75	$0.90	$1.00	$1.16
10%	16,000	$12,000	$14,400	$16,000	$18,560
20%	32,000	$24,000	$28,800	$32,000	$37,120
30%	48,000	$36,000	$43,200	$48,000	$55,680

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[27] "State of New York 2008 Election Law." Section 8-312.1, page 261

[28] "NYS Voter Enrollment by County, Party Affiliation and Status."

[29] Emergency ballot prices received from the Board of Elections in the City of New York by telephone, April 21, 2009.

City Council District (with 81,000 active registered voters)

% of Voters	# of Ballots	----------Ballot Costs for Each ES&S Ballot Price----------			
		$0.75	$0.90	$1.00	$1.16
10%	8,100	$6,075	$7,290	$8,100	$9,396
20%	16,200	$12,150	$14,580	$16,200	$18,792
30%	24,300	$18,225	$21,870	$24,300	$28,188

Assembly District (with 65,000 active registered voters)

% of Voters	# of Ballots	----------Ballot Costs for Each ES&S Ballot Price----------			
		$0.75	$0.90	$1.00	$1.16
10%	6,500	$4,875	$5,850	$6,500	$7,540
20%	13,000	$9,750	$11,700	$13,000	$15,080
30%	19,500	$14,625	$17,550	$19,500	$22,620

The cost for printing ballots for special elections, as shown above, would be somewhat offset by the savings of not printing emergency ballots for each Election District.

Assuming three special elections per year, the following table estimates the range in annual cost for printing special election ballots.

Special Election Type	Low	High
State Senate District	$12,000	$55,680
City Council District	$6,075	$28,188
Assembly District	$4,875	$22,620
Total for Three Elections	**$22,950**	**$106,488**

5.d Pre-election testing.

Section 6210.8 of New York State Regulations[30] requires a "pre-qualification test" to be conducted on each voting system prior to its use in an election. For each ballot face, a set of ballots, called a "test deck" is marked with a predetermined set of votes. The test deck is fed into each scanner, and the scanner's results are compared to the expected results to ensure that the scanner counts all voting positions correctly. Any discrepancies require the error or errors to be corrected and the scanner to be retested.

Guidelines for creating a test deck of ballots,[31] prepared by a certified software quality engineer, describe how to create the minimum number of ballots that provide thorough testing for an optical scanner. The number of ballots in the test deck varies according to the number of contests and number of candidates on the ballot. For example, the sample ballot described in the guidelines has 12 contests and 40 candidates; testing requires 155 ballots.

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[30] "6210 Regulations," page 17

[31] "Guidelines for Creating a Deck of Test Ballots." By John Washburn
http://www.washburnresearch.org/archive/TestingGuidelines/GuidelinesForCreatingTestBallots.pdf

A typical New York City general election involves 934 different ballot faces, and some elections involve as many as 6,111 faces.[32] The following table shows the cost of printing blank ballots at a cost of $1.00 per ballot for the test decks needed for both numbers of faces (assuming all ballots had the same number of contests and candidates). A special election has only one ballot face and few candidates, so few test ballots would be needed.

# of Ballots in Test Deck	Cost for 934 ballot faces	Cost for 6,111 ballot faces
50	$46,700	$305,550
100	$93,400	$611,100
150	$140,100	$916,650
200	$186,800	$1,222,200

See section 6.e for more information about the testing process and time required for testing the machines.

5.e Mandatory 3% manual audit.

Section 9-211 of state law requires 3% of machines to be randomly selected after each election, and the votes cast on those machines to be hand counted.[33]

Average cost of counting a vote-for-one contest on large numbers of ballots. The cost of hand counting varies significantly, so we have calculated an average cost per vote based on the **approximate** costs obtained from six sources. The table that follows shows the source, approximate number of ballots counted, number of vote-for-one races counted, and cost per vote.

Source	Ballots	Contests	Cost per Vote
WA 2004 gubernatorial recount[34]	2,466,454	1	$0.37
MN 2008 general election audit[35]	100,000	5	$0.09
CT 2008 general election audit[36]	116,469	5	$0.11
CT 2007 general election audit[37]	105,580	3	$0.10
AZ 2006 RTA initiative recount[38]	120,821	2	$0.05
NH averages from many manual counts[39]			$0.07
Average			**$0.13**

General and Citywide Primary Elections. In the table below, we have simplified the determination of how many ballots would have to be hand counted by using 3% of the number of ballots cast.

New York City had 4,219,471 active registered voters as of April 2009. Using that number, the following table shows five different turnout percentages, the number of ballots to hand count for each turnout (calculated by taking 3% of turnout), and the cost of hand-counting at $0.13 per vote-for-one contest for five different numbers of contests per ballot.

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[32] Details for a typical NYC election are from "New York City Board of Elections Request For Information III." App B

[33] "State of New York 2008 Election Law." Page 306

[34] http://www.votersunite.org/info/2004GovManualRecount.pdf

[35] Citizens for Election Integrity MN report at http://www.ceimn.org/files/ceimn.report.5.26.pdf.

[36] http://www.ctvoterscount.org/CTVCdata/09/04/CostStatsNov08.pdf [correction 5/6/09; from 3 at 19¢ each to 5 at 11¢ each]

[37] http://www.ctvoterscount.org/CTVCdata/09/04/CostStatsNov08.pdf

[38] Attorney General's press conference at http://blip.tv/file/2022123. Time: 8:20 for ballots counted; 13:30 for total cost.

[39] Information received by the authors in an email from Thomas Manning, Assistant Secretary of State, New Hampshire.

Turnout	30%	40%	50%	60%	80%
3% Ballots to Hand Count	37,975	50,634	63,292	75,950	101,267
1 Contest	$4,937	$6,582	$8,228	$9,874	$13,165
5 Contests	$24,684	$32,912	$41,140	$49,368	$65,824
10 Contests	$49,368	$65,824	$82,280	$98,736	$131,647
15 Contests	$74,052	$98,736	$123,420	$148,103	$197,471
20 Contests	$98,736	$131,647	$164,559	$197,471	$263,295

Special Elections. In New York City, 25 special elections were held (or planned) in the years 2001 through 2009, for an average of two or three per year.

For special elections in State Senate, City Council, and Assembly districts, for five different turnout percentages, the following table estimates the number of ballots to be hand counted. Appendix C shows the calculations to determine the average number of active registered voters per district.

District Type	# Voters	----------------------Turnout----------------------				
		5%	**10%**	**15%**	**20%**	**25%**
		Ballots to Hand Count (# Voters x Turnout x 3%)				
State Senate	160,000	240	480	720	960	1,200
City Council	81,000	122	243	365	486	608
Assembly	65,000	98	195	293	390	488

Cost of counting a vote-for-one contest on small numbers of ballots. In a hand count of small numbers of ballots, the cost of administrative management to oversee procedures would be spread over a much smaller number of ballots, and it is likely that the cost per ballot would be higher than $0.13. Due to lack of information about management costs, we have not estimated the cost of counting the small number of ballots required to be hand counted after special elections for State Senate, City Council, or Assembly.

5.f   Transporting and securing equipment and ballots.
The costs of transporting and securing the DS200, accessories, and ballots before and after an election are unknown. These costs include:

- **Equipment transportation.** A DS200 scanner and its ballot box are not as heavy as a lever machine, and the city would be transporting approximately one-fourth as many scanners as lever machines. However, transporting fragile electronic equipment requires additional care, so it is unclear whether the transportation costs will increase or decrease.

  Most accessories are likely to be transported in the ballot box of the DS200. This may include marking pens, privacy sleeves, uninterruptible power supply, and the second lithium battery. The ballots needed for the election districts to be served by each scanner may also be transported in the ballot box.

- **Equipment security.** It is necessary to provide security for DS200 scanners, ballots, accessories, and jump drives while they are in transit and at the poll sites.

  Jump drives hold the ballot programming. They must be programmed and inserted into their ports in each DS200 scanner for transportation with the scanner. The door over these ports in each scanner must be secured with tamper evident seals. It is unknown whether the seals will have individual numbers that must be logged upon installation.

5.g Replacing consumed accessories.
For most consumables the lifespan and cost of replacement in future years is unknown. It will depend on:

> The longevity of the 2,227 uninterruptible power supplies.
> The longevity of the 2,227 mother board batteries.
> The quantity of the 6,681 DS200 keys lost or not returned to the BOE.
> The longevity of the 4,454 lithium ion batteries.
> The life of a jump drive, and whether they must be saved for up to 22 months.
> The quantity of privacy sleeves that are taken by voters or otherwise lost or damaged.

A fresh roll of thermal paper must be used in each DS200 for each election,[40] and an extra should be on hand for general elections in case the paper roll needs to be replaced due to high voter turnout.[41] The cost of a paper roll is $1.95. The following table shows the estimated annual cost of paper rolls for elections.

Election Type	DS200s	Paper Rolls	Cost Each	Cost Total
General (2 rolls per scanner)	1,794	3,588	$1.95	$6,996.60
Citywide Primary	1,794	1,794	$1.95	$3,498.30
State Senate Special [42]	67	67	$1.95	$130.65
City Council Special	38	38	$1.95	$74.10
Assembly Special	30	30	$1.95	$58.50
Total				**$10,758.15**

6. Storage, tracking, maintenance, disposal

The cost of storage, inventory control and tracking, maintaining and replacing DS200 equipment, and disposing of lever machines is unknown. It is unlikely that HAVA funds will cover these costs, which include:

- Storage for the DS200 between elections.
- Recharging batteries before elections.
- Storing ballots after elections.
- Tracking and replacing equipment and accessories.
- Quarterly testing of the DS200 scanners.
- Disposal and recycling of scanner-related consumables and ballots, a continuing cost
- Storage of lever machines until disposed of.
- Disposal of lever machines, a one-time cost.

6.a Storage for the DS200 between elections.
Storage facilities for the DS200 scanners must be environmentally controlled and physically secure, and must provide electricity for recharging the 4,454 batteries before each election (2,227 scanners with two batteries each).

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[40] "5.0 Requirements & Requirements Response from ES&S." Page 74.

[41] "5.0 Requirements & Requirements Response from ES&S." Page 59.

[42] The number of DS200 scanners for each special election assumes one scanner per poll site and is based on the average number of poll sites in each type of district in Bronx and New York Counties. Appendix D shows how those averages were calculated.

6.b Recharging batteries before elections.

Batteries for each of the 2,227 DS200 scanners should be charged no more than 4 weeks prior to an election. Charging time can take up to 8 hours to ensure a fully charged battery.[43] It is unknown how much electricity and how much staff time will be required.

6.c Storing ballots after elections.

Federal law requires that ballots voted in a federal general election be securely stored for 22 months. Section 3-222 of state election law requires that all ballots, voted and unvoted, be stored.[44] Such storage requires storage boxes or other appropriate containers, storage facilities, and personnel to manage and secure the facilities.

The following calculations show the minimum size of a secured area required to store boxes of ballots, assuming a 17-inch ballot and depending on the percentage of active registered voters for which ballots were printed.

Number of ballots in box	1000
Height of box (inches)	9
Length of box (inches)	18
Width of box (inches)	9
Citywide active registered voters	4,219,471

Ballots printed (% active reg. voters)	40%	60%	80%	100%
Number of ballots to store	1,687,788	2,531,683	3,375,577	4,219,471
Number of boxes	1,688	2,532	3,376	4,220
Area needed to store boxes of ballots:				
Height, in feet, for ten 9" boxes	7.5	7.5	7.5	7.5
Length, in feet, for ten 18" boxes	15	15	15	15
Width, in feet, for number of 9" boxes	13	20	26	33
[Number of 9" boxes in the width]	[17]	[26]	[34]	[43]

Thus, for example, for a general election in which ballots are printed for 100% of active registered voters, 4,220 boxes of ballots would need to be stored. If these boxes were stored 10 high and 10 deep, the number of boxes wide would be 42.2, which has been rounded up to 43 boxes wide. The volume in feet of the storage space needed would be 7.5 feet high, 15 feet deep, and 33 feet wide.

6.d Tracking and replacing equipment and accessories.

Procedures for tracking the DS200 scanners and accessories must be developed. Personnel must be allocated to:

- Track the location and maintenance status of each DS200;
- Test, schedule maintenance for, and supervise repairs to and replacements for DS200s;
- Track the location and status of accessories;
- Order, receive, store, install, and track replacements for consumables.

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[43] "5.0 Requirements & Requirements Response from ES&S." Page 48.

[44] State of New York 2008 Election Law." Page 46

6.e. Quarterly testing of the DS200 scanners.

New York State Regulation 6210.2 requires quarterly testing of each piece of equipment[45] according to prescribed procedures. The quarterly testing procedures for ballot marking devices[46] is currently available in draft form. Since these procedures are similar for the Sequoia ImageCast BMD and the AutoMark BMD, it is likely that similar procedures will be used for testing the DS200 scanners each quarter.

Quarterly maintenance is a ten-step process. Pre-election testing, which can replace the quarterly maintenance for the quarter in which it occurs, includes these same steps, along with a test of the tabulation accuracy on all the test decks. For each unit, the process includes:

- Verifying serial numbers, security seals, and inventory of accessories; and inspecting the unit for damage.

- Verifying the functionality. In pre-election testing, this step includes scanning the test deck and verifying results. *The county election commissioners themselves must perform this step for all units.* Quarterly testing instructions from the State Board of Elections say:

  "If security seals must be removed during this step, the bipartisan team must reseal the BMD and record the security seal information on the Interim Quarterly Maintenance Log once all maintenance is completed."

- Preparing the unit for re-storage or transport to the poll sites.

- Updating the maintenance log with all test information and new security seal numbers, and notifying the State Board of the test results.

The following table shows the total time required for a bipartisan pair of staff and/or technician to test 2,227 units, at several different lengths of time per unit. This time would be in addition to the time required to test the AutoMark ballot marking devices New York City purchased.

	-------Time per Unit per Technician------		
Quarterly Testing Required	**20 minutes**	**30 minutes**	**40 minutes**
Time for 2,227 DS200 scanners	742 hours	1,114 hours	1,484

Using these estimates, at 8 hours per day, forty technicians (20 pairs of 2 technicians) would require one to two weeks of dedicated time to complete this process each quarter.

6.f Disposal and recycling.

If the city replaces lever machines with DS200 scanners, the following costs must be considered:

- Storing lever machines for an appropriate length of time before disposal.
- Disposing of, selling, or recycling lever machines.
- Disposing of toxic lithium ion batteries when they are no longer rechargeable.
- Disposing of toxic UPS batteries when they are no longer rechargeable.

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[45] "6210 Regulations." page 4.

[46] "Lot 2 BMD Interim Quarterly Maintenance Procedure." Version 7.4. New York State Board of Elections. February 25, 2009.
  http://www.votersunite.org/info/Lot2BMDInterimQuarterlyMaintenanceProcedurev7.4.pdf

- Recycling ballots when storage periods expire.

7. Vendor On-site Support

In addition to the training discussed in Section 4, ES&S recommends that it provide the following first year support services to the City:[47]

- Project management.
- Acceptance testing support.
- Voting machine facility assessment.
- Pre-election equipment setup.
- Election management system acceptance testing support.
- Election management system pre-election support.
- Election day support for voting machine technicians, poll workers, and a call center.

ES&S charges $1,800 per day for each onsite support person. It is unknown how many person-days this support would involve.

8. Additional Staff and Consultants

Additional staff and/or consultants may be needed for these tasks and possibly others:

- Quarterly testing of the DS200 scanners (see section 6.e)
- Charging batteries before each election (see section 6.b)
- Pre-election testing of the DS200 scanners (see section 5.d)
- Training poll workers (see sections 4.a and 4.b)
- Educating voters (see section 4.g)
- Purchasing and tracking ballots (see sections 5.c and 6.d)
- Ballot layout and/or ballot programming (see section 5.a and 5.b)
- Transporting and securing ballots, scanners, and accessories (see section 5.f)
- Tracking/repairing scanners (see section 6.d)
- Tracking/purchasing consumable accessories (see section 6.d)

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[47] "5.0 Requirements & Requirements Response from ES&S." Page 94

9. Summary of Costs

9.a First year costs we were able to estimate.

The range of first year lever replacement costs we estimated in previous sections is shown below. Both the "Low" and "High" are lower than the full costs New York City will face because they do not include costs for which our information was limited (see Section 1.b).

Costs that can be Estimated		First Year Estimated Cost Range	
		Low	High
Initial equipment costs		$20,242,363	$25,997,730
Software license fees		$1,635,600	$1,802,640
Total Hardware and Software		**$21,877,963**	**$27,800,370**
Poll worker training by ES&S[48]		$1,350,000	$1,575,000
Increase in poll worker training pay		$0.00	$2,625,000
ES&S "train the trainers" classes[49]		$5,400	$16,200
Technician certification classes[50]		$72,000	$99,000
General Election:	Ballot printing[51]	$3,270,091	$7,130,907
	Test decks[52]	$46,700	$1,222,200
	3% manual audit[53]	$65,824	$98,736
	<Emergency ballots[54]>	-$916,650	-$916,650
Citywide Primary Election:	Ballot printing[55]	$1,371,328	$3,215,237
	Test decks[56]	$46,700	$1,222,200
	3% manual audit[57]	$49,368	$49,368
	<Emergency ballots>[58]	-$305,550	-$305,550
Three Special Elections:	Ballot printing[59]	$22,950	$106,488
Total 'Other' Costs		**$5,078,161**	**$16,138,136**
Total Hardware, Software, and 'Other'		**$26,956,124**	**$43,938,506**

9.b First year costs for which our information is too limited to estimate.

We expect the first year costs to be larger than summarized in the section above. This is because the shortfall does not include the additional costs we have been unable to estimate.

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[48] Assumes the city uses ES&S training in the first year, training for 30,000 to 35,000 poll workers.

[49] Assumes ES&S training for 20 to 60 trainers.

[50] Assumes only 20 certified hardware technicians and 10 certified software technicians would be needed.

[51] General election, low is for printing ballots for 110% of voters at $0.75 per ballot; high is for 150% at $1.16 per ballot.

[52] Low is for decks of 50 ballots for 934 ballot faces; high is for decks of 200 ballots for 6,111 ballot faces, both at $1 per ballot.

[53] Assumes a turnout of 40% to 60% for the general election, with 10 vote-for-one contests on the ballot.

[54] Assumes savings from not needing 300 emergency ballots printed for each of 6,111 election districts.

[55] Citywide primary, low is for printing ballots for 50% of voters at $0.75 per ballot; high is for 70% at $1.16 per ballot. The offset for not printing emergency ballots varies too much to estimate for primary elections.

[56] Low is for decks of 50 ballots for 934 ballot faces; high is for decks of 200 ballots for 6,111 ballot faces, both at $1 per ballot.

[57] Assumes a turnout of 30% for the primary election, with 10 vote-for-one contests on the ballot.

[58] Assumes savings from not needing 100 emergency ballots printed for each of 6,111 election districts.

[59] Special elections for one State Senate seat, one City Council seat, and one Assembly seat., low is for printing ballots for 10% of voters at $0.75 per ballot; high is for 30% at $1.16 per ballot. The cost of printing a test deck is negligible; the cost of conducting an audit on so few ballots is unknown; and the number of emergency ballots is unknown; so those costs aren't included.

Unestimated costs, first year:

Voter education	?.??
Storage for new electronic equipment and accessories between elections	?.??
Electricity for charging batteries before each election	?.??
Securing ballots on election day	?.??
Storage for ballots after elections	?.??
Inventory control and tracking for equipment and accessories	?.??
Replacement of consumable accessories	?.??
Security for equipment while out of the warehouse for election use	?.??
Compensation for additional staff and consultants	?.??
Manually counting 3% of ballots cast in special elections	?.??

Unestimated costs, first year, may also include:

Additional poll worker training facilities	?.??
Additional costs for escalating manual audit of ballots if discrepancies are found	?.??
Additional cost of transporting equipment to training facilities	?.??
Additional costs of transporting equipment on election day	?.??

Savings from not using lever machines. Replacing lever machines would result in savings from costs not expended on lever machine usage. Such savings would somewhat offset the costs of using a paper ballot and optical scanner system, but are likely to be insignificant compared to the estimated and unestimated costs of the new system. Annual savings include:

Citywide primary election emergency ballots	-?.??
Three special elections emergency ballots	-?.??
Ballot layout for lever machine strips for general, primary, and 3 special elections	-?.??
Setting up lever machines for general, primary, and 3 special elections	-?.??
Lever machine maintenance and repair	-?.??

9.c Recurring annual costs

Recurring annual costs for which ranges can be reasonably estimated include:

		Estimated Ongoing Cost Range	
Costs that can be Estimated		Low	High
Software license fees		$1,635,600	$1,802,640
Increase in poll worker training pay		$0.00	$2,625,000
General Election:	Ballot printing[60]	$3,270,091	$7,130,907
	Test decks[61]	$46,700	$1,222,200
	3% manual audit[62]	$65,824	$98,736
	<Emergency ballots[63]>	-$916,650	-$916,650

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[60] General election, low is for printing ballots for 110% of voters at $0.75 per ballot; high is for 150% at $1.16 per ballot.

[61] Low is for decks of 50 ballots for 934 ballot faces; high is for decks of 200 ballots for 6,111 ballot faces, both at $1 per ballot.

[62] Assumes a turnout of 40% to 60% for the general election, with 10 vote-for-one contests on the ballot.

[63] Assumes savings from not needing 300 emergency ballots printed for each of 6,111 election districts.

| | Estimated Ongoing Cost Range | |
Costs that can be Estimated	Low	High
Citywide Primary Election: Ballot printing[64]	$1,371,328	$3,215,237
Test decks[65]	$46,700	$1,222,200
3% manual audit[66]	$49,368	$49,368
<Emergency ballots>[67]	-$305,550	-$305,550
Three Special Elections: Ballot printing[68]	$22,950	$106,488
Total recurring annual cost	**$5,286,361**	**$16,250,576**

Unknown recurring annual costs include:

Software license fee increase	?.??
Voter education	?.??
Storage for DS200 and accessories between elections	?.??
Electricity for charging batteries before each election	?.??
Securing ballots on election day	?.??
Storing ballots after elections	?.??
Tracking, repairing, and replacing DS200 scanners	?.??
Replacing consumable accessories	?.??
Securing equipment on election day	?.??
Increased compensation for voting machine technicians (years 1-5)	?.??
Compensation for additional staff and consultants	?.??
Manually counting 3% of ballots cast in special elections	?.??

Possible additional unknown annual costs:

Additional poll worker training facilities	?.??
Additional costs for escalating manual audit of ballots if discrepancies are found	?.??
Additional cost of transporting equipment to training facilities	?.??
Additional costs of transporting equipment on election day	?.??

Savings from not using lever machines. Replacing lever machines would result in savings from costs not expended on lever machine usage. Such savings would somewhat offset the costs of using a paper ballot and optical scanner system, but are likely to be insignificant compared to the estimated and unestimated costs of the new system. Annual savings include:

Citywide primary election emergency ballots	-?.??
Three special elections emergency ballots	-?.??
Ballot layout for lever machine strips for general, primary, and 3 special elections	-?.??
Setting up lever machines for general, primary, and 3 special elections	-?.??
Lever machine maintenance and repair	-?.??

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[64] Citywide primary, low is for printing ballots for 50% of voters at $0.75 per ballot; high is for 70% at $1.16 per ballot. The offset for not printing emergency ballots varies too much to estimate for primary elections.

[65] Low is for decks of 50 ballots for 934 ballot faces; high is for decks of 200 ballots for 6,111 ballot faces, both at $1 per ballot.

[66] Assumes a turnout of 30% for the primary election, with 10 vote-for-one contests on the ballot.

[67] Assumes savings from not needing 100 emergency ballots printed for each of 6,111 election districts.

[68] Special elections for one State Senate seat, one City Council seat, and one Assembly seat., low is for printing ballots for 10% of voters at $0.75 per ballot; high is for 30% at $1.16 per ballot. The cost of printing a test deck is negligible; the cost of conducting an audit on so few ballots is unknown; and the number of emergency ballots is unknown; so those costs aren't included.

9.d Maintenance and support contracts after expiration of the 5-year warranty.

After the 5-year warranty expires on the scanners, additional voting machine technicians may be needed. Such technicians may require increased compensation due to their computer expertise, compared to current technicians who work with the mechanical lever machines.

Alternatively the city may sign a maintenance and support contract with ES&S. The following table shows the **currently quoted** costs of three maintenance and support contracts ES&S offers for 2,227 DS200 units:[69]

	Per Unit	Total Cost
1 Year Hardware Preventative Maintenance and Support:	$213	$474,351
1 Year Firmware Maintenance and Support:	$91	$202,657
Total Cost for 1 Year under One-year Contract		**$677,008**
Cost per Year		**$677,008**
3 Year Hardware Preventative Maintenance and Support:	$672	$1,496,544
3 Year Firmware Maintenance and Support:	$288	$641,376
Total Cost for 3 Years under Three-year Contract		**$2,137,920**
Cost per Year		**$712,640**
5 Year Hardware Preventative Maintenance and Support:	$1,178	$2,623,406
5 Year Firmware Maintenance and Support:	$505	$1,124,635
Total Cost for 5 Years under Five-year Contract		**$3,748,041**
Cost per Year		**$749,608**

*   ES&S includes the following caveat with these price quotes:
"The pricing of these programs will be ES&S' then-current fees at the time a program is put in place."

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[69] Costs were quoted in ES&S' response to New York City's RFI. "5.0 Requirements & Requirements Response from ES&S." Page 107.

10. The Use of HAVA Funds

10.a New York State and New York City, as of 2007.

As of December 2007, New York State had $230,513,327 in funds that were appropriated under three sections of HAVA. New York City's share of the State's HAVA money is 36.9088%.[70] The City's share shown in the chart below is likely too high, because State expenditures may reduce the funds available to apportion to the counties.

Source of Funds	New York State[71]	City of New York
2007 Title I, Section 101	$2,657,504	$980,853
2007 Title I, Section 102	$57,521,022	$21,230,319
2007 Title II, Section 251	$170,334,801	$62,868,531
Total Funds as of December 2007	**$230,513,327**	**$85,079,703**

As a condition for receiving Section 251 funds, HAVA requires each state to appropriate funds equal to 5% of the total amount of its Section 251 program. As of June 23, 2006, the City's portion was $2,766,476. We did not include these funds in the chart because, although they are intended for Section 251 expenditures, they appear to be a City expense rather than a HAVA grant.

Title I, Section 101 City has $980,853	Intended for: 1. Improving the administration of elections for Federal office. 2. Educating voters about voting procedures, voting rights, and voting technology. 3. Training election officials, poll workers and election volunteers. 4. Developing a plan for managing Section 251 funds. 5. Improving, acquiring, leasing, modifying, or replacing voting systems. 6. Improving the accessibility and quantity of polling places. 7. Providing assistance to voters with limited English proficiency. 8. Establishing toll-free telephone hotlines for voters.
Title I Section 102 City has $21,230,319	Intended for: - Replacing punch cards or lever machines.
Title II, Section 251 City has $43,207,574	Intended for: 1. Procuring voting systems that comply with the requirements of Title III, Section 301, such as accessibility. 2. Implementing provisional voting. 3. Providing required information to voters in the polling place. 4. Developing and implementing a statewide voter registration list. 5. Implementing ID requirements for first-time voters who register to vote by mail. 6. Improving the administration of elections for federal office.

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[70] Memo from State Board of Elections to County Boards of Elections. June 23, 2006.

[71] "State Governments' Use of Help America Vote Act Funds." Pages 14, 20, 23, and 28.

10.b New York City, as of 2009.

In 2008 New York City purchased accessible Ballot Marking Devices (BMDs) with money received under HAVA Title II, Section 251.

2007 Title II, Section 251	$62,868,531
<2008 NYC costs for AutoMark BMDs>[72]	-$19,660,957
2009 remaining Section 251 Funds	**$43,207,574**

As of 2009, the City's remaining HAVA funds are approximately:

Source of Funds	City of New York
2007 Title I, Section 101	$980,853
2007 Title I, Section 102	$21,230,319
2009 Title II, Section 251	$43,207,574
Total Funds as of 2009	**$65,418,746**

New York City's Section 102 funds – $21,230,319 – might not cover the first-year cost of replacing the lever machines by purchasing scanners, privacy booths, accessories and software licenses, for which our estimate ranges from $21,877,963 to $27,800,370. However, it appears that Section 101 and Section 251 funds may be able to be used to cover the shortfall.

It also appears the Section 101 and Section 251 funds could be used to pay for many of the first year's unestimated costs, such as voter education, poll worker training, and developing procedures to track and control the inventory of scanners and accessories.

It is less clear whether HAVA funds could be used to pay for continuing annual costs of lever replacement, such as the annual software license fees, replacement accessories, and post-warranty maintenance fees.

Costs directly associated with conducting elections are not covered by HAVA funding. Each year, New York City's election costs would increase for:

- Printing ballots and test decks
- Manually counting ballots from 3% or more of the scanners.
- Storing, securing, and transporting the equipment and post-election ballots.
- Additional staff and/or consultants to perform the tasks listed in Section 8.

Many of these costs cannot be estimated because information is limited. Costs that can be estimated vary from **$5,286,361 to $16,250,576 per year.**

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[72] Estimate provided by ES&S in the "Plan B BMD Implementation 2008 Cost Analysis Results V-1.0." Actual cost is unknown.

Appendix A. Reference Documents

1. "5.0 Requirements & Requirements Response from ES&S." The Board of Elections in the City of New York. December 17, 2008, http://www.vote.nyc.ny.us/pdf/documents/boe/rfi/2009/50_ESSresponse/ES&S%20Requirements%20 Response_01.09.09_FINAL%20for%20Web.pdf

2. "6210 Regulations." Officially entitled "Subtitle V of Title 9 of the Official Compilation of Codes, Rules and Regulations. Part 6210. Routine Maintenance and Testing of Voting Systems, Operational Procedures, and Standards for Determining Valid Votes." http://www.elections.state.ny.us/NYSBOE/law/6210Regulations09052008.pdf

3. "ES&S Response to New York State Office of General Services Pricing Forms." IFB #21231. Centralized Contracts for the Acquisition of Voting Systems and Ballot Marking Devices. http://www.ogs.state.ny.us/purchase/spg/pdfdocs/2230021231PL_ES&S.pdf

4. Memo from State Board of Elections to County Boards of Elections. June 23, 2006. Stanley Zalen and Peter Kosinski, Co-Executive Directors. Subject: Use of Funds Provided by Counties as Matching Funds Equal to 5% of the Total Available Requirements Payment. http://www.wheresthepaper.org/HAVA_AllocationToCountyBOEs.pdf

5. "New York City Board of Elections Request For Information III." App B Prices, Costs, Volumes & Subs v-5. Fall 2009. http://www.vote.nyc.ny.us/pdf/documents/boe/rfi/2009/20_AppendixB/App%20B%20NYC%20BOE%20RFI%20III%20Fall%202009%20App%20B%20Prices,%20Costs,%20Volumes%20&%20Subs%20v-5%20Final.pdf

6. "NYS Voter Enrollment by County, Party Affiliation and Status." New York State Board of Elections. April 1, 2009 http://www.elections.state.ny.us/NYSBOE/enrollment/county/county_apr09.pdf

7. "Plan B BMD Implementation 2008 Cost Analysis Results V-1.0." February 6, 2008. http://vote.nyc.ny.us/pdf/documents/boe/rfi/2008implementation/PlanBBMDImplementation2008CostAnalysisResultsv10Draft.pdf

8. "State Governments' Use of Help America Vote Act Funds." 2007. U.S. Election Assistance Commission. http://www.eac.gov/election/HAVA%20Funds/docs/2007-report-on-hava-spending-by-states/attachment_download/file

9. "State of New York 2008 Election Law." Amended Through October 31, 2007. http://www.elections.state.ny.us/NYSBOE/download/law/2008NYElectionLaw.pdf

10. "Testimony of Marcus Cederqvist, Executive Director, New York City Board of Elections, before the New York City Council Committee on Governmental Operations." March 12, 2009. http://www.wheresthepaper.org/NYC_BOE_BudgetTestimonyMarch12_09.pdf

Appendix B. Software License Fees in a Sampling of Other Jurisdictions

The Unity license fee varies widely among ES&S customers. This table shows a sampling of fees and indicates the jurisdiction, the year to which the fee applies, the number of registered voters in the jurisdiction when the contract was signed, and the software to which the license applies.

Jurisdiction	Year	Voters	Software Licensed	Cost
Pinellas County, FL DS200 scanner and AutoMark	2008	643,423[73]	Unity (all modules) and AutoMark Information Mgmt Software One license	$110,500[74]
Charlotte County, FL DS200 scanner and AutoMark	2008 2009	118,837[75]	Unity (all modules) and AutoMark Information Mgmt Software One license	$13,892[76] $14,586
Wyoming M100 scanner and AutoMark	2006	263,083[77]	Unity (all modules) and AutoMark Information Mgmt Software 12 licenses for most modules	$790,500[78]
North Dakota M100 scanner and iVotronic DRE	2005	316,049[79]	Unity Election Data Manager and Election Reporting Manager 54 licenses	$221,805[80]
Jefferson County, WA	2005	21,165[81]	Unity (all modules) One license	$38,500[82]
Bexar County, TX	2002 -2006	883,172[83]	Unity (all modules) One license for five years, includes warranty	$258,000[84]

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[73] http://www.voterfocus.com/hosting/pinellas/ew_pages/files/Miscellaneous%20Statistics/regstat.pdf

[74] http://www.votersunite.org/info/PinellasE&SSContract.pdf

[75] http://www.charlottevotes.com/index.php?id=64&spanish=N

[76] http://www.votersunite.org/info/CharlotteCountyLicenseFees.pdf

[77] http://soswy.state.wy.us/Elections/docs/VR-Stats_by_Party.pdf

[78] ES&S contract with Wyoming. Page 38 http://accurate-voting.org/contracts/WY/WY_ess_2005.pdf

[79] See: http://www.nd.gov/sos/electvote/voting/elec-stats.html for the ballots cast in the 2004 general election. North Dakota does not require voters to register.

[80] ES&S contract with North Dakota, page 13. http://accurate-voting.org/contracts/ND/ND_ess_2004.pdf

[81] http://test.co.jefferson.wa.us/weblinkext/PDF/fkua3555lc2jmguljmjpheyj/6/November%202%2c%202004%20 General%20Election.pdf

[82] ES&S contract with Jefferson County, page 11 http://accurate-voting.org/contracts/WA/Jefferson/WA_jefferson_2005.pdf

[83] http://www.bexar.org/ISDMS/EL/PE/G/Media%2020021105%20Joint.txt

[84] ES&S contract with Bexar County, pages 24 and 27. http://accurate-voting.org/contracts/TX/Bexar/TX_bexar_2002.pdf

Appendix C. Average Number of Voters in Special Election Districts

State Senate Districts[85]

District	Active Registered Voters	Counties (NYC voters in parenthesis)
10	164,500	Queens
11	161,520	Queens
12	139,951	Queens
13	109,677	Queens
14	166,798	Queens
15	141,172	Queens
16	151,914	Queens
17	168,586	Kings
18	195,474	Kings
19	165,714	Kings
20	169,843	Kings
21	145,671	Kings
22	142,456	Kings
23	140,978	Kings, Richmond
24	188,083	Richmond
25	200,263	Kings, New York
26	216,370	New York
27	145,757	Kings
28	160,660	Bronx, New York
29	225,847	New York
30	200,784	New York
31	181,928	Bronx, New York
32	164,499	Bronx
33	131,036	Bronx
34	151,238	Bronx (95,220) Westchester
36	166,354	Bronx (144,770) Westchester
159,150		**Average Number of Voters Per District**

City Council Districts[86]

District	Active Registered Voters	Counties
1	91,129	New York
2	102,775	New York
3	113,758	New York
4	120,182	New York
5	99,889	New York
6	112,302	New York
7	93,773	New York
8	99,566	New York and Bronx
9	100,281	New York
10	72,419	New York

[85] Source: http://www.elections.state.ny.us/NYSBOE/enrollment/senate/senate_apr09.pdf

[86] Source: http://www.vote.nyc.ny.us/pdf/documents/boe/EnrollmentTotals/2008/CouncilDistrictSummary.pdf

City Council Districts[86]

District	Active Registered Voters	Counties
11	79,596	Bronx
12	85,329	Bronx
13	77,642	Bronx
14	62,253	Bronx
15	66,986	Bronx
16	76,500	Bronx
17	85,706	Bronx
18	86,070	Bronx
19	81,667	Queens
20	61,998	Queens
21	49,428	Queens
22	67,342	Queens
23	81,591	Queens
24	77,601	Queens
25	63,259	Queens
26	68,200	Queens
27	88,368	Queens
28	69,977	Queens
29	72,837	Queens
30	68,294	Queens
31	79,773	Queens
32	74,881	Queens
33	96,246	Kings
34	84,088	Queens and Kings
35	91,329	Kings
36	86,255	Kings
37	69,401	Kings
38	58,230	Kings
39	82,139	Kings
40	72,922	Kings
41	82,120	Kings
42	87,225	Kings
43	76,407	Kings
44	62,667	Kings
45	75,346	Kings
46	84,091	Kings
47	71,876	Kings
48	70,149	Kings
49	84,123	Richmond
50	82,380	Kings and Richmond
51	90,271	Richmond
81,149		**Average Number of Voters Per District**

Assembly Districts[87]

District	Active Registered Voters	Counties
22	46,381	Queens
23	62,917	Queens
24	68,980	Queens
25	54,307	Queens
26	69,551	Queens
27	59,608	Queens
28	66,984	Queens
29	65,782	Queens
30	55,433	Queens
31	60,713	Queens
32	64,566	Queens
33	69,629	Queens
34	45,408	Queens
35	47,800	Queens
36	56,550	Queens
37	52,863	Queens
38	51,718	Queens
39	36,342	Queens
40	69,456	Kings
41	63,979	Kings
42	56,739	Kings
43	63,015	Kings
44	62,273	Kings
45	52,432	Kings
46	60,888	Kings
47	60,888	Kings
48	47,885	Kings
49	46,339	Kings
50	66,160	Kings
51	49,174	Kings
52	89,006	Kings
53	69,282	Kings
54	62,256	Kings
55	67,295	Kings
56	71,707	Kings
57	77,324	Kings
58	60,039	Kings
59	63,282	Kings
60	68,990	Kings, Richmond
61	67,917	Richmond
62	75,866	Richmond
63	68,460	Richmond
64	76,559	New York
65	85,996	New York

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[87] Source: http://www.elections.state.ny.us/NYSBOE/enrollment/assembly/assembly_apr09.pdf

Assembly Districts[87]

District	Active Registered Voters	Counties
66	91,497	New York
67	92,596	New York
68	80,022	New York
69	86,849	New York
70	80,017	New York
71	76,247	New York
72	63,410	New York
73	89,828	New York
74	88,689	New York
75	96,794	New York
76	64,312	Bronx
77	54,564	Bronx
78	47,090	Bronx
79	67,638	Bronx
80	54,910	Bronx
81	62,060	Bronx
82	69,384	Bronx
83	59,084	Bronx
84	62,622	Bronx
85	56,765	Bronx
86	47,469	Bronx
	64,099	**Average Number of Voters Per District**

Appendix D. Poll sites per State Senate, City Council and Assembly District

This appendix shows how we determined the average number of poll sites in the State Senate, City Council, and Assembly Districts in Bronx and New York Counties. These averages were used in Section 5.g to determine the number of paper rolls needed per special election.

The data for this appendix was copied from paper books of poll sites per district obtained from the New York State Elections Board.

State Senate Districts in Bronx and New York Counties

District Number	Number of Poll Sites	Boroughs
25	57	New York
26	59	New York
28	66	Bronx and New York
29	95	New York
30	91	New York
31	70	Bronx and New York
32	71	Bronx
33	43	Bronx
34	51	Bronx
36	64	Bronx
	67	**Average Number of Poll Sites per District**

City Council Districts in Bronx and New York Counties

District Number	Number of Poll Sites	Boroughs
1	49	New York
2	43	New York
3	43	New York
4	46	New York
5	27	New York
6	43	New York
7	40	New York
8	49	Bronx and New York
9	56	New York
10	28	New York
11	35	Bronx
12	36	Bronx
13	40	Bronx
14	21	Bronx
15	24	Bronx
16	36	Bronx
17	37	Bronx
18	32	Bronx
	38	**Average Number of Poll Sites per District**

Assembly Districts in Bronx and New York Counties

District Number	Number of Poll Sites	Boroughs
64	36	New York
65	19	New York
66	38	New York
67	37	New York
68	44	New York
69	37	New York
70	35	New York
71	33	New York
72	26	New York
73	32	New York
74	39	New York
75	36	New York
76	27	Bronx
77	21	Bronx
78	16	Bronx
79	35	Bronx
80	32	Bronx
81	23	Bronx
82	32	Bronx
83	25	Bronx
84	30	Bronx
85	20	Bronx
86	15	Bronx
	30	**Average Number of Poll Sites per District**

Appendix E. ES&S Additional Language Fees Charged for Typical Election

When ES&S does the ballot layout, it charges a fee per language per ballot face. In Section 5.a, "Ballot Layout," we estimated the number of additional language fees charged in an election with 934 ballot faces. To calculate that estimate, we did the following.

1. We contacted the Board of Elections in the City of New York and learned, for each county, the number of Election Districts that print Chinese on the ballot and the number that print Korean. The following table shows the number of Election Districts in which Chinese and Korean appear on the ballot.

County	EDs that offer Chinese	EDs that offer Korean
Bronx	0	0
Kings	717	0
New York	275	1
Queens	847	395
Richmond	0	0
Total EDs per Language	**1,839**	**396**

New York City has 6,111 election districts. In a typical general election there may be as many as 934 different ballot faces.[88]

2. We assumed that the ratio of EDs to ballot faces would remain consistent citywide. Given the number of EDs with Chinese printed on the ballot, we used the ratio to estimate how many ballot faces would be printed with Chinese.

$$\frac{934 \text{ ballot faces}}{6{,}111 \text{ EDs}} = \frac{280 \text{ ballot faces with Chinese}}{1{,}839 \text{ EDs with ballot faces with Chinese}}$$

3. We assumed that the ratio of EDs to ballot faces would remain consistent citywide. Given the number of EDs with Korean printed on the ballot, we used the ratio to estimate how many ballot faces would be printed with Korean.

$$\frac{934 \text{ ballot faces}}{6{,}111 \text{ EDs}} = \frac{61 \text{ ballot faces with Korean}}{396 \text{ EDs with ballot faces with Korean}}$$

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[88] "New York City Board of Elections Request For Information III." App B

Appendix F. Per County – Quantities of Scanners and Privacy Booths

This appendix describes how we calculated the number of scanners and privacy booths needed for poll site use in each county in New York City. Appendix G describes how we determined the citywide quantities. The Excel file used for the calculations is printed in full in Appendix H.

Results per County: Site IDs is the count of **2006 Poll Site IDs** listed in the detail portion of the same column.

Details per County: 2006 Poll Site IDs. We used the list of poll sites per county as of November, 2006. This data was obtained from the Board of Elections in the City of New York[89].

Results per County:				
Kings:				
Site IDs	392			
2006 Voters	1,140,731			
2009 Voters		1,271,398		
DS200s			527	
Booths				4,956

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
00038	3001	3345	1	14
00039	6147	6851	2	20
00041	1354	1509	1	7
00042	3859	4301	2	18
00043	2457	2738	1	11

Results per County: 2006 Voters is the sum of the numbers of **2006 Voters per Poll Site** listed in the detail portion of the same column.

Details per County: 2006 Voters per Poll Site. We used the number of active registered voters per poll site as of November, 2006. This data was obtained from the Board of Elections in the City of New York.

Results per County:				
Kings:				
Site IDs	392			
2006 Voters	1,140,731			
2009 Voters		1,271,398		
DS200s			527	
Booths				4,956

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
00038	3001	3345	1	14
00039	6147	6851	2	20
00041	1354	1509	1	7
00042	3859	4301	2	18
00043	2457	2738	1	11

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[89] Poll site and voter data was used in reports at:
  Bronx: http://www.wheresthepaper.org/BronxCost_061106.pdf
  Kings: http://www.wheresthepaper.org/BrooklynCost_061106.pdf
  New York: http://www.wheresthepaper.org/ManhattanCost_061106.pdf
  Queens: http://www.wheresthepaper.org/QueensCost_061106.pdf
  Richmond: http://www.wheresthepaper.org/SICost_061106.pdf

Results per County: 2009 Voters is the number of active registered voters per county as of April, 2009, obtained from the New York State Board of Elections.[90]

This number is the same as the sum of the numbers of **2009 Voters per Poll Site** listed in the detail portion of the same column.

Details per County: 2009 Voters per Poll Site. The number of active registered voters per poll site was estimated by calculation.

For simplicity, we assumed that the *percentage increase* in the number of active registered voters *per poll site* from 2006 to 2009 was the same as the *percentage increase per county*.

$$\frac{\text{2009 voters per county}}{\text{2006 voters per county}} = \frac{\text{2009 voters per poll site}}{\text{2006 voters per poll site}}$$

To obtain the number of 2009 voters in each poll site, we used the ratio of 2009 voters per county to 2006 voters per county. We multiplied that ratio by the number of 2006 voters in that poll site.

For each county, we used this method:

1. First, we calculated the *percentage increase* in active registered voters by dividing the number of 2009 voters per county by the number of 2006 voters per county.

    For example, the *percentage increase* in Kings County was calculated by dividing 1,271,398 by 1,140,731. This yielded a ratio of 1.1145, which is a *percentage increase* of 111.45%.

    $$\frac{1,271,398}{1,140,731} = 1.1145 = 111.45\%$$

2. Then, for each poll site in the county, we multiplied the number of 2006 voters per poll site by the county's *percentage increase*.

    For example, in 2006 Kings County poll site 00038 had 3,001 active registered voters. We multiplied 3,001 by King County's *percentage increase* to estimate the number of 2009 voters.

    3,001 x 1.1145 = 3,345

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[90] "NYSVoter Enrollment by County, Party Affiliation and Status." Voters Registered as of April 1, 2009.
http://www.elections.state.ny.us/NYSBOE/enrollment/county/county_apr09.pdf

Results per County: DS200s is the sum of the numbers of **DS200s Needed per Poll Site** listed in the detail portion of the same column.

Details per County: DS200s Needed per Poll Site. New York State Regulations Section 6210.19 requires one scanner per 4000 active registered voters per poll site. In other words, each poll site needs one scanner for poll sites with up to 4000 voters, two scanners for poll sites with 4001 up to 8000 voters, and so on.

The number of scanners needed per poll site was calculated by dividing the number of 2009 voters by 4000 and rounding up to the nearest whole number.

Results per County:

Kings:

Site IDs	392			
2006 Voters	1,140,731			
2009 Voters		1,271,398		
DS200s			527	
Booths				4,956

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
00038	3001	3345	1	14
00039	6147	6851	2	20
00041	1354	1509	1	7
00042	3859	4301	2	18
00043	2457	2738	1	11

Results per County: Booths is the sum of the numbers of **Booths Needed per Poll Site** listed in the detail portion of the same column.

Details per County: Booths Needed per Poll Site. New York State Regulations Section 6210.19 requires, for a presidential or gubernatorial election, one booth per 250 voters in poll sites with fewer than 6000 voters, or one booth per 350 voters in poll sites with 6000 voters or more.

The number of privacy booths needed per poll site was calculated by:

- Allowing one booth for each 250 voters with poll sites having fewer than 6000 2009 voters.

- Allowing one booth for each 350 voters with poll sites having 6000 or more 2009 voters.

Results per County:

Kings:

Site IDs	392			
2006 Voters	1,140,731			
2009 Voters		1,271,398		
DS200s			527	
Booths				4,956

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
00038	3001	3345	1	14
00039	6147	6851	2	20
00041	1354	1509	1	7
00042	3859	4301	2	18
00043	2457	2738	1	11

Appendix G. Citywide – Quantities of Scanners and Privacy Booths

This appendix describes how we calculated the number of scanners and privacy booths needed for poll site use citywide in New York City. Appendix F describes how we determined the per county quantities. The Excel file used for the calculations is printed in full in Appendix H.

Columns:

Total 2006 Poll Sites.
This column lists the total number of 2006 poll sites in each of the counties.

Total 2006 Act Reg. Voters.
This column lists the total number of 2006 active registered voters in each county.

Total 2009 Act Reg. Voters.
This column lists the total number of 2009 active registered voters in each county.

Total DS200s Needed.
This column lists the total number of scanners needed for each county.

Total Privacy Booths Needed.
This column lists the total number of scanners needed for each county.

Citywide Results:	Total 2006 Poll Sites	Total 2006 Act. Reg. Voters	Total 2009 Act. Reg. Voters	Total DS200s Needed	Total Privacy Booths Needed
Kings	392	1,140,731	1271398	527	4,956
New York	359	896,586	1008504	451	3,963
Queens	311	926,037	1035532	424	4,031
Bronx	218	578,490	645898	277	2,546
Richmond	87	234,155	258139	115	1,028
Spares				358	3,305
Training				75	
Citywide				2,227	19,829

Rows:

[County Name]
For each of the five counties, these rows contain the "Results" values described in Section 1 of this appendix.

Spares.
In addition to the number of AutoMark ballot marking devices needed for each poll site, the city purchased an additional 20% of the devices for spares.[91] We estimated 20% of the total scanners needed to be 358 and added that to the number required to be purchased. We also added 20% to the number of booths needed for poll site use to determine the total number needed.

Training.
The city purchased an additional 75 AutoMark devices for training.[92] To determine the total number of scanners needed, we added 75 to the total number required for poll site use and for spares.

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[91] "Plan B BMD Implementation 2008 Cost Analysis Results V-1.0."

[92] "Plan B BMD Implementation 2008 Cost Analysis Results V-1.0."

Appendix H. Spreadsheet: Per Poll Site – Quantities of Scanners and Privacy Booths

Results per County:

	Kings:					New York				
Site IDs	392					359				
2006 Voters	1,140,731					896,586				
2009 Voters		1,271,398					1,008,504			
DS200s			527					451		
Booths				4,956					3,963	

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
00038	3001	3345	1	14	00001	256	288	1	2
00039	6147	6851	2	20	00004	203	228	1	1
00041	1354	1509	1	7	00006	2491	2802	1	12
00042	3859	4301	2	18	00007	1669	1877	1	8
00043	2457	2738	1	11	00008	999	1124	1	5
00045	1188	1324	1	6	00009	3326	3741	1	15
00046	2912	3246	1	13	00013	4227	4755	2	20
00047	802	894	1	4	00016	3411	3837	1	16
00048	4632	5163	2	21	00017	1743	1961	1	8
00049	692	771	1	4	00018	355	399	1	2
00050	3613	4027	2	17	00019	1261	1418	1	6
10009	1802	2008	1	9	00020	2539	2856	1	12
10040	6345	7072	2	21	00021	4606	5181	2	21
10043	693	772	1	4	00023	4358	4902	2	20
10047	1999	2228	1	9	00025	1982	2229	1	9
10048	1885	2101	1	9	00028	5224	5876	2	24
10052	2898	3230	1	13	10007	1361	1531	1	7
10053	3238	3609	1	15	10098	614	691	1	3
10054	1969	2195	1	9	10099	5278	5937	2	24
10058	1990	2218	1	9	10100	3557	4001	2	17
10060	2322	2588	1	11	10115	1716	1930	1	8
10062	2760	3076	1	13	10119	6438	7242	2	21
10068	1852	2064	1	9	10121	2081	2341	1	10
10102	1360	1516	1	7	10131	1403	1578	1	7
10111	6491	7235	2	21	10139	3549	3992	1	16
10114	4250	4737	2	19	10141	3184	3581	1	15
10122	2107	2348	1	10	10142	2878	3237	1	13
10127	3346	3729	1	15	10143	372	418	1	2
10154	3831	4270	2	18	10145	4196	4720	2	19
10160	2532	2822	1	12	10147	2849	3205	1	13
10168	1557	1735	1	7	10148	2128	2394	1	10
10172	1224	1364	1	6	10161	806	907	1	4
10187	1721	1918	1	8	10176	10710	12047	4	35
10216	1486	1656	1	7	10205	1446	1626	1	7
10217	2363	2634	1	11	10222	807	908	1	4
10245	2369	2640	1	11	10226	690	776	1	4
10247	2280	2541	1	11	10227	5748	6466	2	19
10253	3846	4287	2	18	10239	223	251	1	2

Results per County:

	Kings:				New York				
Site IDs	392				359				
2006 Voters	1,140,731				896,586				
2009 Voters		1,271,398				1,008,504			
DS200s			527				451		
Booths				4,956				3,963	

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
10254	3841	4281	2	18	10241	1883	2118	1	9
10256	2102	2343	1	10	10249	2780	3127	1	13
10258	2172	2421	1	10	10250	2078	2337	1	10
10268	837	933	1	4	10251	2118	2382	1	10
10274	1625	1811	1	8	10261	4926	5541	2	23
10282	2667	2972	1	12	10271	4056	4562	2	19
10284	629	701	1	3	10272	825	928	1	4
10286	691	770	1	4	10275	550	619	1	3
10295	4800	5350	2	22	10279	3606	4056	2	17
10305	3952	4405	2	18	10297	519	584	1	3
10319	2832	3156	1	13	10304	886	997	1	4
10324	1244	1386	1	6	10306	555	624	1	3
10325	1714	1910	1	8	10307	606	682	1	3
10326	2037	2270	1	10	10308	490	551	1	3
10327	2508	2795	1	12	10309	895	1007	1	5
10333	4434	4942	2	20	10314	1990	2238	1	9
10361	1612	1797	1	8	10317	154	173	1	1
10366	2919	3253	1	14	10344	1484	1669	1	7
10399	2974	3315	1	14	10350	884	994	1	4
10437	7687	8568	3	25	10358	1413	1589	1	7
10443	1023	1140	1	5	10363	2006	2256	1	10
10447	1696	1890	1	8	10383	2160	2430	1	10
10450	3144	3504	1	15	10384	2743	3085	1	13
10460	2479	2763	1	12	10385	2006	2256	1	10
10470	1436	1600	1	7	10386	660	742	1	3
10504	1581	1762	1	8	10389	1955	2199	1	9
10507	2046	2280	1	10	10392	718	808	1	4
10540	4488	5002	2	21	10393	1961	2206	1	9
10541	1471	1639	1	7	10394	1025	1153	1	5
10551	2459	2741	1	11	10395	1369	1540	1	7
10555	850	947	1	4	10396	1863	2096	1	9
10556	1883	2099	1	9	10397	3378	3800	1	16
10557	2833	3158	1	13	10401	5871	6604	2	19
10580	4848	5403	2	22	10404	862	970	1	4
10597	2537	2828	1	12	10405	1242	1397	1	6
10598	4308	4801	2	20	10407	870	979	1	4
10654	1007	1122	1	5	10408	2597	2921	1	12
10661	1594	1777	1	8	10409	4276	4810	2	20

Appendix H. Spreadsheet: Per Poll Site – Quantities of Scanners and Privacy Booths (cont')

Results per County:

	Kings:				New York			
Site IDs	392				359			
2006 Voters	1,140,731				896,586			
2009 Voters		1,271,398				1,008,504		
DS200s			527				451	
Booths				4,956				3,963

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
10671	33	37	1	1	10410	4041	4545	2	19
10672	30	33	1	1	10423	1054	1186	1	5
10673	33	37	1	1	10425	520	585	1	3
10674	143	159	1	1	10426	641	721	1	3
10675	100	111	1	1	10427	4072	4580	2	19
10676	26	29	1	1	10428	2009	2260	1	10
10677	128	143	1	1	10429	1656	1863	1	8
10678	85	95	1	1	10430	2333	2624	1	11
10680	121	135	1	1	10431	1340	1507	1	7
10681	152	169	1	1	10433	1692	1903	1	8
10682	96	107	1	1	10434	720	810	1	4
10718	3704	4128	2	17	10438	2774	3120	1	13
10784	1387	1546	1	7	10439	6293	7079	2	21
10785	815	908	1	4	10440	2442	2747	1	11
10786	2105	2346	1	10	10441	380	427	1	2
10788	1485	1655	1	7	10445	798	898	1	4
10839	703	784	1	4	10446	574	646	1	3
10842	863	962	1	4	10454	5308	5971	2	24
10857	2789	3108	1	13	10457	436	490	1	2
10868	738	823	1	4	10463	1477	1661	1	7
10931	2184	2434	1	10	10464	1195	1344	1	6
10933	582	649	1	3	10465	1902	2139	1	9
10964	678	756	1	4	10466	2638	2967	1	12
10966	1529	1704	1	7	10468	3707	4170	2	17
10967	1099	1225	1	5	10478	1373	1544	1	7
10984	1505	1677	1	7	10479	1652	1858	1	8
11007	1964	2189	1	9	10502	2696	3033	1	13
11010	354	395	1	2	10515	2261	2543	1	11
11011	2563	2857	1	12	10516	2963	3333	1	14
B0001	3753	4183	2	17	10517	3418	3845	1	16
B0002	809	902	1	4	10518	1274	1433	1	6
B0003	5750	6409	2	19	10520	841	946	1	4
B0004	6536	7285	2	21	10522	631	710	1	3
B0008	2391	2665	1	11	10523	1509	1697	1	7
B0009	2578	2873	1	12	10524	1714	1928	1	8
B0010	462	515	1	3	10526	1790	2013	1	9
B0011	2058	2294	1	10	10527	2367	2662	1	11
B0012	2334	2601	1	11	10531	1820	2047	1	9

Results per County:

	Kings:				New York			
Site IDs	392				359			
2006 Voters	1,140,731				896,586			
2009 Voters		1,271,398				1,008,504		
DS200s			527				451	
Booths				4,956				3,963

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
B0014	4330	4826	2	20	10537	2612	2938	1	12
B0016	2749	3064	1	13	10538	924	1039	1	5
B0017	5224	5822	2	24	10539	1492	1678	1	7
B0018	3344	3727	1	15	10547	1009	1135	1	5
B0019	4445	4954	2	20	10548	1591	1790	1	8
B0020	7072	7882	2	23	10553	4637	5216	2	21
B0022	4440	4949	2	20	10559	1462	1644	1	7
B0023	4034	4496	2	18	10562	1724	1939	1	8
B0024	5379	5995	2	24	10563	2033	2287	1	10
B0026	3306	3685	1	15	10565	2209	2485	1	10
B0027	5597	6238	2	18	10568	1071	1205	1	5
B0029	3024	3370	1	14	10569	6843	7697	2	22
B0030	4425	4932	2	20	10576	2421	2723	1	11
B0032	1886	2102	1	9	10577	1482	1667	1	7
B0033	4861	5418	2	22	10593	687	773	1	4
B0034	4500	5015	2	21	10594	3260	3667	1	15
B0037	2542	2833	1	12	10611	2077	2336	1	10
B0039	4678	5214	2	21	10612	3016	3392	1	14
B0042	3128	3486	1	14	10614	1329	1495	1	6
B0043	3516	3919	1	16	10620	1910	2148	1	9
B0044	4733	5275	2	22	10624	2463	2770	1	12
B0046	2910	3243	1	13	10625	3037	3416	1	14
B0048	1731	1929	1	8	10626	2125	2390	1	10
B0049	2767	3084	1	13	10630	1652	1858	1	8
B0051	1273	1419	1	6	10657	1372	1543	1	7
B0053	5244	5845	2	24	10659	3810	4286	2	18
B0055	2377	2649	1	11	10666	1114	1253	1	6
B0056	726	809	1	4	10710	1269	1427	1	6
B0057	2337	2605	1	11	10716	950	1069	1	5
B0058	1623	1809	1	8	10726	491	552	1	3
B0059	4499	5014	2	21	10727	996	1120	1	5
B0060	2127	2371	1	10	10742	3016	3392	1	14
B0061	961	1071	1	5	10744	616	693	1	3
B0062	968	1079	1	5	10745	2251	2532	1	11
B0064	2194	2445	1	10	10746	1121	1261	1	6
B0067	602	671	1	3	10750	2702	3039	1	13
B0068	1077	1200	1	5	10759	3953	4446	2	18
B0069	1337	1490	1	6	10760	1926	2166	1	9

Results per County:

	Kings:				New York			
Site IDs	392				359			
2006 Voters	1,140,731				896,586			
2009 Voters		1,271,398				1,008,504		
DS200s			527				451	
Booths				4,956				3,963

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
B0071	4287	4778	2	20	10761	512	576	1	3
B0073	3256	3629	1	15	10762	1221	1373	1	6
B0074	3994	4451	2	18	10768	1360	1530	1	7
B0075	1611	1796	1	8	10783	1761	1981	1	8
B0076	6563	7315	2	21	10794	717	807	1	4
B0077	4365	4865	2	20	10799	1483	1668	1	7
B0079	897	1000	1	4	10831	2193	2467	1	10
B0080	3473	3871	1	16	10837	5972	6717	2	20
B0081	4150	4625	2	19	10867	670	754	1	4
B0082	2509	2796	1	12	10892	2208	2484	1	10
B0083	573	639	1	3	10916	2502	2814	1	12
B0085	3577	3987	1	16	10924	1476	1660	1	7
B0086	4304	4797	2	20	10925	2073	2332	1	10
B0087	3018	3364	1	14	10926	672	756	1	4
B0088	1270	1415	1	6	10927	1341	1508	1	7
B0089	10265	11441	3	33	10928	1726	1941	1	8
B0090	5957	6639	2	19	10930	1161	1306	1	6
B0091	5077	5659	2	23	10932	3670	4128	2	17
B0092	2768	3085	1	13	10943	588	661	1	3
B0093	5479	6107	2	18	10944	1220	1372	1	6
B0094	4330	4826	2	20	10958	2373	2669	1	11
B0096	6065	6760	2	20	10980	2012	2263	1	10
B0098	4294	4786	2	20	10981	1509	1697	1	7
B0100	3136	3495	1	14	10982	919	1034	1	5
B0101	2553	2845	1	12	10988	773	869	1	4
B0103	1325	1477	1	6	10990	1014	1141	1	5
B0104	11300	12594	4	36	10993	825	928	1	4
B0106	4149	4624	2	19	11032	2219	2496	1	10
B0107	3449	3844	1	16	11036	3418	3845	1	16
B0108	715	797	1	4	M0002	1282	1442	1	6
B0109	2217	2471	1	10	M0004	8177	9198	3	27
B0110	5111	5696	2	23	M0007	412	463	1	2
B0112	2997	3340	1	14	M0010	716	805	1	4
B0113	6382	7113	2	21	M0011	2006	2256	1	10
B0114	2158	2405	1	10	M0012	2026	2279	1	10
B0116	5849	6519	2	19	M0013	4239	4768	2	20
B0117	3488	3888	1	16	M0014	4846	5451	2	22
B0119	5466	6092	2	18	M0015	1225	1378	1	6

Results per County:

	Kings:				New York				
Site IDs	392				359				
2006 Voters	1,140,731				896,586				
2009 Voters		1,271,398				1,008,504			
DS200s			527				451		
Booths				4,956					3,963

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
B0120	1706	1901	1	8	M0018	7812	8787	3	26
B0121	3369	3755	1	16	M0019	5826	6553	2	19
B0123	4416	4922	2	20	M0021	709	798	1	4
B0125	2014	2245	1	9	M0023	2862	3219	1	13
B0126	2753	3068	1	13	M0024	1706	1919	1	8
B0127	1942	2164	1	9	M0026	1757	1976	1	8
B0131	6891	7680	2	22	M0027	3842	4322	2	18
B0133	4542	5062	2	21	M0028	3144	3536	1	15
B0134	5328	5938	2	24	M0032	4040	4544	2	19
B0135	2869	3198	1	13	M0033	5542	6234	2	18
B0136	2460	2742	1	11	M0034	2121	2386	1	10
B0139	796	887	1	4	M0037	3762	4232	2	17
B0141	2189	2440	1	10	M0038	1930	2171	1	9
B0142	955	1064	1	5	M0039	4755	5349	2	22
B0144	6896	7686	2	22	M0041	642	722	1	3
B0146	2615	2915	1	12	M0043	2995	3369	1	14
B0147	1485	1655	1	7	M0044	5640	6344	2	19
B0149	499	556	1	3	M0045	609	685	1	3
B0152	632	704	1	3	M0046	2387	2685	1	11
B0155	2098	2338	1	10	M0049	4885	5495	2	22
B0157	3058	3408	1	14	M0050	8474	9532	3	28
B0158	585	652	1	3	M0051	1242	1397	1	6
B0159	646	720	1	3	M0052	3980	4477	2	18
B0160	3046	3395	1	14	M0053	1394	1568	1	7
B0161	640	713	1	3	M0056	3744	4211	2	17
B0162	1202	1340	1	6	M0057	513	577	1	3
B0163	1902	2120	1	9	M0063	651	732	1	3
B0165	620	691	1	3	M0064	2250	2531	1	11
B0167	2547	2839	1	12	M0065	3740	4207	2	17
B0168	481	536	1	3	M0066	1271	1430	1	6
B0169	668	745	1	3	M0067	2996	3370	1	14
B0170	755	841	1	4	M0068	1016	1143	1	5
B0171	495	552	1	3	M0069	2028	2281	1	10
B0172	772	860	1	4	M0070	1438	1618	1	7
B0175	4126	4599	2	19	M0071	1522	1712	1	7
B0176	3228	3598	1	15	M0072	9911	11148	3	32
B0177	6502	7247	2	21	M0073	1967	2213	1	9
B0179	840	936	1	4	M0078	2730	3071	1	13

Results per County:

	Kings:				New York			
Site IDs	392				359			
2006 Voters	1,140,731				896,586			
2009 Voters		1,271,398				1,008,504		
DS200s			527				451	
Booths				4,956				3,963

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
B0180	759	846	1	4	M0079	2821	3173	1	13
B0182	700	780	1	4	M0080	2401	2701	1	11
B0183	2123	2366	1	10	M0081	5138	5779	2	24
B0184	895	998	1	4	M0082	5996	6744	2	20
B0185	2992	3335	1	14	M0083	2860	3217	1	13
B0186	3152	3513	1	15	M0084	3919	4408	2	18
B0187	2268	2528	1	11	M0086	2838	3192	1	13
B0188	2832	3156	1	13	M0088	3032	3410	1	14
B0189	1967	2192	1	9	M0089	485	546	1	3
B0190	984	1097	1	5	M0091	2004	2254	1	10
B0191	6462	7202	2	21	M0093	3155	3549	1	15
B0193	3662	4081	2	17	M0094	944	1062	1	5
B0194	6306	7028	2	21	M0095	255	287	1	2
B0195	3559	3967	1	16	M0096	663	746	1	3
B0196	5668	6317	2	19	M0098	2149	2417	1	10
B0198	1796	2002	1	9	M0100	2441	2746	1	11
B0200	3853	4294	2	18	M0103	963	1083	1	5
B0203	1939	2161	1	9	M0104	4084	4594	2	19
B0204	3416	3807	1	16	M0105	1057	1189	1	5
B0205	3736	4164	2	17	M0107	651	732	1	3
B0207	483	538	1	3	M0108	657	739	1	3
B0208	5214	5811	2	24	M0110	2153	2422	1	10
B0211	2358	2628	1	11	M0111	6197	6971	2	20
B0212	4543	5063	2	21	M0112	1828	2056	1	9
B0213	3902	4349	2	18	M0113	583	656	1	3
B0217	4171	4649	2	19	M0114	595	669	1	3
B0218	3356	3740	1	15	M0122	1525	1715	1	7
B0223	2827	3151	1	13	M0123	1693	1904	1	8
B0224	785	875	1	4	M0128	2591	2914	1	12
B0225	3259	3632	1	15	M0129	11330	12744	4	37
B0227	1657	1847	1	8	M0131	2023	2276	1	10
B0228	2045	2279	1	10	M0132	1677	1886	1	8
B0229	3625	4040	2	17	M0134	1315	1479	1	6
B0230	2645	2948	1	12	M0135	8491	9551	3	28
B0231	4754	5299	2	22	M0140	3757	4226	2	17
B0234	2577	2872	1	12	M0142	2746	3089	1	13
B0235	5037	5614	2	23	M0143	1532	1723	1	7
B0236	3375	3762	1	16	M0144	2676	3010	1	13

Appendix H. Spreadsheet: Per Poll Site – Quantities of Scanners and Privacy Booths (cont')

Results per County:

	Kings:				New York				
Site IDs	392				359				
2006 Voters	1,140,731				896,586				
2009 Voters	1,271,398				1,008,504				
DS200s			527				451		
Booths				4,956					3,963

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
B0237	2095	2335	1	10	M0145	2885	3245	1	13
B0238	5883	6557	2	19	M0149	2926	3291	1	14
B0240	664	740	1	3	M0152	3594	4043	2	17
B0241	3465	3862	1	16	M0153	1267	1425	1	6
B0242	5976	6661	2	20	M0154	335	377	1	2
B0243	3516	3919	1	16	M0155	5035	5664	2	23
B0244	4028	4489	2	18	M0156	1293	1454	1	6
B0245	730	814	1	4	M0159	2238	2517	1	11
B0246	1787	1992	1	8	M0160	2275	2559	1	11
B0247	3157	3519	1	15	M0164	4003	4503	2	19
B0249	757	844	1	4	M0166	721	811	1	4
B0250	4898	5459	2	22	M0168	2295	2581	1	11
B0252	1005	1120	1	5	M0169	5135	5776	2	24
B0253	4246	4732	2	19	M0170	1797	2021	1	9
B0255	3808	4244	2	17	M0171	13703	15414	4	45
B0256	4105	4575	2	19	M0172	1342	1510	1	7
B0257	3585	3996	1	16	M0173	4058	4565	2	19
B0258	2713	3024	1	13	M0175	1327	1493	1	6
B0259	1666	1857	1	8	M0177	3946	4439	2	18
B0260	4806	5357	2	22	M0178	3031	3409	1	14
B0261	974	1086	1	5	M0179	3158	3552	1	15
B0262	8033	8953	3	26	M0181	3548	3991	1	16
B0263	1046	1166	1	5	M0192	2796	3145	1	13
B0264	3809	4245	2	17	M0195	2046	2301	1	10
B0265	2262	2521	1	11	M0198	1487	1673	1	7
B0266	2546	2838	1	12	M0199	4747	5340	2	22
B0267	3426	3818	1	16	M0201	1644	1849	1	8
B0271	4037	4499	2	18	M0202	1573	1769	1	8
B0272	4102	4572	2	19	M0204	2468	2776	1	12
B0273	1587	1769	1	8	M0205	519	584	1	3
B0274	648	722	1	3	M0211	403	453	1	2
B0275	1330	1482	1	6	M0212	2319	2608	1	11
B0276	832	927	1	4	M0215	718	808	1	4
B0277	3518	3921	1	16	M0216	466	524	1	3
B0278	4110	4581	2	19	M0218	5712	6425	2	19
B0279	5887	6561	2	19	M0219	559	629	1	3
B0281	2382	2655	1	11	M0223	3379	3801	1	16
B0282	2814	3136	1	13	M0224	12099	13609	4	39

Appendix H. Spreadsheet: Per Poll Site – Quantities of Scanners and Privacy Booths (cont')

Results per County:

	Kings:				New York			
Site IDs	392				359			
2006 Voters	1,140,731				896,586			
2009 Voters		1,271,398				1,008,504		
DS200s			527				451	
Booths				4,956				3,963

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
B0283	3589	4000	2	17	M0226	1130	1271	1	6
B0284	2269	2529	1	11	M0227	2086	2346	1	10
B0286	2568	2862	1	12	M0231	2469	2777	1	12
B0287	2033	2266	1	10	M0232	2841	3196	1	13
B0288	8025	8944	3	26	M0233	2628	2956	1	12
B0289	4604	5131	2	21	M0234	7533	8473	3	25
B0291	9724	10838	3	31	M0235	2075	2334	1	10
B0292	2623	2923	1	12	M0236	562	632	1	3
B0293	1905	2123	1	9	M0237	5107	5744	2	23
B0294	4646	5178	2	21	M0239	567	638	1	3
B0295	2208	2461	1	10	M0240	4692	5278	2	22
B0298	5731	6387	2	19	M0244	2012	2263	1	10
B0300	5015	5589	2	23	M0245	7650	8605	3	25
B0301	3676	4097	2	17	M0247	2283	2568	1	11
B0302	484	539	1	3	M0248	4067	4575	2	19
B0303	7277	8111	3	24	M0249	1051	1182	1	5
B0304	2375	2647	1	11	M0252	3044	3424	1	14
B0305	5054	5633	2	23	M0254	3109	3497	1	14
B0306	2088	2327	1	10	M0255	3229	3632	1	15
B0307	5264	5867	2	24	M0256	4413	4964	2	20
B0309	2386	2659	1	11	M0259	1848	2079	1	9
B0310	1915	2134	1	9	M0262	1818	2045	1	9
B0312	1646	1835	1	8	M0265	3306	3719	1	15
B0313	4518	5036	2	21	M0267	1501	1688	1	7
B0314	4538	5058	2	21	M0268	5144	5786	2	24
B0315	1396	1556	1	7	M0271	2070	2328	1	10
B0317	4970	5539	2	23	M0273	2352	2646	1	11
B0319	1162	1295	1	6	M0278	4482	5041	2	21
B0320	3529	3933	1	16	M0279	1890	2126	1	9
B0321	2321	2587	1	11	M0280	965	1085	1	5
B0323	5444	6068	2	18	M0282	2541	2858	1	12
B0324	728	811	1	4	M0284	1333	1499	1	6
B0325	2052	2287	1	10	M0285	1893	2129	1	9
B0326	1768	1971	1	8	M0286	4298	4835	2	20
B0328	5644	6291	2	18	M0287	5113	5751	2	24
B0329	267	298	1	2	M0288	1800	2025	1	9
B0330	481	536	1	3	M0289	5230	5883	2	24
B0331	2866	3194	1	13	M0290	3031	3409	1	14

Appendix H. Spreadsheet: Per Poll Site – Quantities of Scanners and Privacy Booths (cont')

Results per County:

	Kings:				New York				
Site IDs	392				359				
2006 Voters		1,140,731				896,586			
2009 Voters			1,271,398				1,008,504		
DS200s				527					451
Booths					4,956					3,963

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
B0332	4020	4480	2	18	M0292	3157	3551	1	15
B0333	3343	3726	1	15	M0293	1724	1939	1	8
B0335	1758	1959	1	8	M0295	5401	6075	2	18
B0336	768	856	1	4	M0296	1269	1427	1	6
B0337	4145	4620	2	19	M0299	1625	1828	1	8
B0338	2844	3170	1	13	M0300	3338	3755	1	16
B0339	5978	6663	2	20	M0303	6041	6795	2	20
B0340	3892	4338	2	18	M0313	2439	2743	1	11
B0342	3077	3429	1	14	M0316	637	717	1	3
B0343	3877	4321	2	18	M0317	2218	2495	1	10
B0344	1712	1908	1	8	M0319	2672	3006	1	13
B0345	3962	4416	2	18	M0320	2226	2504	1	11
B0346	2141	2386	1	10	M0321	1924	2164	1	9
B0348	2750	3065	1	13	M0324	2774	3120	1	13
B0349	6134	6837	2	20	M0326	5801	6525	2	19
B0351	2067	2304	1	10	M0333	4277	4811	2	20
B0353	1604	1788	1	8	M0334	3570	4016	2	17
B0354	2249	2507	1	11					
B0355	3266	3640	1	15					
B0357	1254	1398	1	6					
B0358	2581	2877	1	12					
B0359	4106	4576	2	19					
B0360	1452	1618	1	7					
B0361	1931	2152	1	9					
B0362	3030	3377	1	14					
B0363	1861	2074	1	9					
B0366	5884	6558	2	19					
B0367	2439	2718	1	11					
B0368	1183	1319	1	6					
B0369	1238	1380	1	6					
B0371	5040	5617	2	23					
B0372	1292	1440	1	6					
B0374	2996	3339	1	14					
B0375	4849	5404	2	22					
B0376	2228	2483	1	10					
B0378	2565	2859	1	12					
B0379	4593	5119	2	21					
B0380	682	760	1	4					

Results per County:

	Kings:				New York				
Site IDs	392				359				
2006 Voters	1,140,731				896,586				
2009 Voters		1,271,398				1,008,504			
DS200s			527				451		
Booths				4,956				3,963	

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
B0382	4897	5458	2	22					
B0383	2949	3287	1	14					
B0384	4635	5166	2	21					
B0386	6725	7495	2	22					
B0387	4739	5282	2	22					
B0388	3713	4138	2	17					
B0390	5330	5941	2	24					
B0391	5792	6455	2	19					
B0394	3994	4451	2	18					
B0396	4139	4613	2	19					
B0397	2291	2553	1	11					
B0406	6323	7047	2	21					

Appendix H. Spreadsheet: Per Poll Site – Quantities of Scanners and Privacy Booths (cont')

Results per County:

	Queens:					Bronx:				
Site IDs	311					218				
2006 Voters		926,037					578,490			
2009 Voters			1,035,532					645,898		
DS200s				424					277	
Booths					4,031					2,546

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
00055	2417	2703	1	11	00030	3145	3511	1	15
00058	1921	2148	1	9	00036	619	691	1	3
00060	5299	5926	2	24	10024	313	349	1	2
00061	2354	2632	1	11	10066	2521	2815	1	12
00062	4108	4594	2	19	10071	1227	1370	1	6
00063	1433	1602	1	7	10072	3347	3737	1	15
10135	2828	3162	1	13	10073	1268	1416	1	6
10162	1845	2063	1	9	10074	2869	3203	1	13
10164	1212	1355	1	6	10075	1977	2207	1	9
10179	1596	1785	1	8	10076	2607	2911	1	12
10180	1813	2027	1	9	10077	2178	2432	1	10
10185	1531	1712	1	7	10078	4004	4471	2	18
10186	1867	2088	1	9	10080	694	775	1	4
10198	1622	1814	1	8	10084	1219	1361	1	6
10200	1404	1570	1	7	10086	1904	2126	1	9
10201	2338	2614	1	11	10087	1272	1420	1	6
10202	2190	2449	1	10	10090	1771	1977	1	8
10203	3066	3429	1	14	10091	923	1031	1	5
10206	5218	5835	2	24	10092	3642	4066	2	17
10208	2491	2786	1	12	10097	903	1008	1	5
10220	1837	2054	1	9	10137	172	192	1	1
10221	5436	6079	2	18	10207	2544	2840	1	12
10225	2638	2950	1	12	10210	3839	4286	2	18
10263	755	844	1	4	10212	2008	2242	1	9
10287	4299	4807	2	20	10230	719	803	1	4
10330	1335	1493	1	6	10302	4543	5072	2	21
10343	1009	1128	1	5	10312	2121	2368	1	10
10382	95	106	1	1	10313	788	880	1	4
10453	4234	4735	2	19	10354	1596	1782	1	8
10455	922	1031	1	5	10359	4818	5379	2	22
10509	1706	1908	1	8	10420	101	113	1	1
10552	2718	3039	1	13	10421	123	137	1	1
10560	2860	3198	1	13	10484	99	111	1	1
10561	1755	1963	1	8	10512	1054	1177	1	5
10566	3024	3382	1	14	10543	882	985	1	4
10585	3698	4135	2	17	10544	4110	4589	2	19
10586	1705	1907	1	8	10546	2382	2660	1	11
10587	277	310	1	2	10588	1371	1531	1	7

Results per County:

	Queens:				Bronx:			
Site IDs	311				218			
2006 Voters	926,037				578,490			
2009 Voters	1,035,532				645,898			
DS200s			424				277	
Booths				4,031				2,546

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
10589	1067	1193	1	5	10591	2863	3197	1	13
10590	758	848	1	4	10601	3627	4050	2	17
10592	2011	2249	1	9	10603	1934	2159	1	9
10608	2987	3340	1	14	10616	1045	1167	1	5
10609	3032	3391	1	14	10628	2068	2309	1	10
10610	1158	1295	1	6	10632	2286	2552	1	11
10627	1123	1256	1	6	10639	1534	1713	1	7
10638	2195	2455	1	10	10652	1902	2124	1	9
10670	143	160	1	1	10686	192	214	1	1
10684	33	37	1	1	10688	172	192	1	1
10691	89	100	1	1	10690	439	490	1	2
10692	74	83	1	1	10712	1541	1721	1	7
10693	60	67	1	1	10713	1840	2054	1	9
10694	63	70	1	1	10715	2619	2924	1	12
10695	74	83	1	1	10817	3208	3582	1	15
10696	46	51	1	1	10856	1386	1548	1	7
10697	113	126	1	1	10859	1048	1170	1	5
10698	208	233	1	1	10949	1536	1715	1	7
10731	3068	3431	1	14	10959	959	1071	1	5
10732	2237	2502	1	11	11004	1491	1665	1	7
10733	2218	2480	1	10	11006	1998	2231	1	9
10734	1273	1424	1	6	11009	1523	1700	1	7
10735	3283	3671	1	15	11015	1516	1693	1	7
10736	973	1088	1	5	11016	5918	6608	2	19
10737	1269	1419	1	6	11021	849	948	1	4
10738	3610	4037	2	17	11022	919	1026	1	5
10739	434	485	1	2	11023	865	966	1	4
10740	1462	1635	1	7	X0002	541	604	1	3
10748	1997	2233	1	9	X0003	3504	3912	1	16
10815	2800	3131	1	13	X0004	1205	1345	1	6
10819	1216	1360	1	6	X0005	3554	3968	1	16
10838	758	848	1	4	X0006	1730	1932	1	8
10843	2708	3028	1	13	X0007	2821	3150	1	13
10844	1551	1734	1	7	X0008	5023	5608	2	23
10860	1530	1711	1	7	X0009	1191	1330	1	6
10861	2209	2470	1	10	X0013	6433	7183	2	21
10862	2508	2805	1	12	X0015	2055	2294	1	10
10864	3824	4276	2	18	X0017	4325	4829	2	20

Results per County:

	Queens:				Bronx:			
Site IDs	311				218			
2006 Voters	926,037				578,490			
2009 Voters	1,035,532				645,898			
DS200s			424				277	
Booths				4,031				2,546

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
10929	2144	2398	1	10	X0018	752	840	1	4
10961	2079	2325	1	10	X0019	4116	4596	2	19
10962	2796	3127	1	13	X0020	4540	5069	2	21
10963	2919	3264	1	14	X0021	1213	1354	1	6
10965	657	735	1	3	X0022	2045	2283	1	10
11014	1838	2055	1	9	X0023	4624	5163	2	21
Q0002	2156	2411	1	10	X0024	6340	7079	2	21
Q0003	3159	3533	1	15	X0025	4215	4706	2	19
Q0004	744	832	1	4	X0026	2155	2406	1	10
Q0005	6250	6989	2	20	X0027	1789	1997	1	8
Q0006	1402	1568	1	7	X0028	4886	5455	2	22
Q0007	2876	3216	1	13	X0032	4125	4606	2	19
Q0009	2059	2302	1	10	X0033	575	642	1	3
Q0011	3509	3924	1	16	X0034	6331	7069	2	21
Q0012	5493	6142	2	18	X0035	8004	8937	3	26
Q0013	4711	5268	2	22	X0037	3093	3453	1	14
Q0014	4131	4619	2	19	X0038	496	554	1	3
Q0015	2894	3236	1	13	X0039	3774	4214	2	17
Q0016	4526	5061	2	21	X0040	2908	3247	1	13
Q0017	4898	5477	2	22	X0041	2659	2969	1	12
Q0022	640	716	1	3	X0042	2351	2625	1	11
Q0023	6743	7540	2	22	X0043	3702	4133	2	17
Q0025	5465	6111	2	18	X0044	1695	1893	1	8
Q0028	2086	2333	1	10	X0051	4172	4658	2	19
Q0029	4291	4798	2	20	X0052	4129	4610	2	19
Q0032	3672	4106	2	17	X0053	4858	5424	2	22
Q0033	1463	1636	1	7	X0055	461	515	1	3
Q0034	4089	4572	2	19	X0057	1423	1589	1	7
Q0035	481	538	1	3	X0059	8472	9459	3	28
Q0036	3550	3970	1	16	X0060	2455	2741	1	11
Q0037	4892	5470	2	22	X0061	3250	3629	1	15
Q0039	1634	1827	1	8	X0062	6110	6822	2	20
Q0040	1450	1621	1	7	X0063	2644	2952	1	12
Q0042	3058	3420	1	14	X0065	3668	4095	2	17
Q0044	1936	2165	1	9	X0066	4171	4657	2	19
Q0045	957	1070	1	5	X0067	2823	3152	1	13
Q0047	2392	2675	1	11	X0068	4020	4488	2	18
Q0048	6309	7055	2	21	X0069	1041	1162	1	5

Results per County:

	Queens:				Bronx:				
Site IDs	311				218				
2006 Voters	926,037				578,490				
2009 Voters		1,035,532				645,898			
DS200s			424				277		
Booths				4,031				2,546	

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
Q0049	3063	3425	1	14	X0070	1473	1645	1	7
Q0050	2960	3310	1	14	X0071	4112	4591	2	19
Q0051	4262	4766	2	20	X0074	1656	1849	1	8
Q0052	6044	6759	2	20	X0075	2530	2825	1	12
Q0053	3061	3423	1	14	X0076	5744	6413	2	19
Q0054	4339	4852	2	20	X0077	3548	3961	1	16
Q0056	4820	5390	2	22	X0078	1897	2118	1	9
Q0057	3728	4169	2	17	X0079	3264	3644	1	15
Q0062	4952	5538	2	23	X0080	2040	2278	1	10
Q0063	1354	1514	1	7	X0081	2934	3276	1	14
Q0064	5675	6346	2	19	X0083	2297	2565	1	11
Q0067	3552	3972	1	16	X0084	2969	3315	1	14
Q0071	3541	3960	1	16	X0085	1403	1566	1	7
Q0072	759	849	1	4	X0086	1423	1589	1	7
Q0074	2496	2791	1	12	X0087	1346	1503	1	7
Q0076	4671	5223	2	21	X0088	496	554	1	3
Q0077	1936	2165	1	9	X0091	5158	5759	2	24
Q0079	2911	3255	1	14	X0092	8587	9588	3	28
Q0082	5863	6556	2	19	X0093	7318	8171	3	24
Q0083	1789	2001	1	9	X0094	2617	2922	1	12
Q0084	5900	6598	2	19	X0095	1807	2018	1	9
Q0085	3513	3928	1	16	X0096	2272	2537	1	11
Q0086	5529	6183	2	18	X0097	1138	1271	1	6
Q0087	2822	3156	1	13	X0098	2156	2407	1	10
Q0088	2330	2606	1	11	X0101	3057	3413	1	14
Q0089	1305	1459	1	6	X0103	2886	3222	1	13
Q0090	6750	7548	2	22	X0104	3548	3961	1	16
Q0092	7108	7948	2	23	X0108	1903	2125	1	9
Q0093	5100	5703	2	23	X0109	1987	2219	1	9
Q0094	3470	3880	1	16	X0110	1763	1968	1	8
Q0096	6599	7379	2	22	X0111	4943	5519	2	23
Q0097	2851	3188	1	13	X0112	1853	2069	1	9
Q0098	3319	3711	1	15	X0113	1307	1459	1	6
Q0099	5330	5960	2	24	X0114	6932	7740	2	23
Q0100	5129	5735	2	23	X0116	1048	1170	1	5
Q0102	3632	4061	2	17	X0117	2254	2517	1	11
Q0105	4507	5040	2	21	X0118	4760	5315	2	22
Q0106	3266	3652	1	15	X0121	3240	3618	1	15

Results per County:

	Queens:				Bronx:			
Site IDs	311				218			
2006 Voters	926,037				578,490			
2009 Voters		1,035,532				645,898		
DS200s			424				277	
Booths				4,031				2,546

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
Q0107	2229	2493	1	10	X0122	2280	2546	1	11
Q0108	7714	8626	3	25	X0126	4370	4879	2	20
Q0109	7437	8316	3	24	X0127	3374	3767	1	16
Q0110	1966	2198	1	9	X0128	1620	1809	1	8
Q0111	1876	2098	1	9	X0129	2781	3105	1	13
Q0112	5265	5888	2	24	X0131	715	798	1	4
Q0113	3976	4446	2	18	X0132	1860	2077	1	9
Q0115	2841	3177	1	13	X0133	4229	4722	2	19
Q0116	3260	3645	1	15	X0134	471	526	1	3
Q0117	3304	3695	1	15	X0137	4468	4989	2	20
Q0118	8279	9258	3	27	X0138	2465	2752	1	12
Q0119	3639	4069	2	17	X0140	1631	1821	1	8
Q0121	5321	5950	2	24	X0141	1953	2181	1	9
Q0123	5752	6432	2	19	X0143	4198	4687	2	19
Q0124	7300	8163	3	24	X0144	1652	1844	1	8
Q0125	2805	3137	1	13	X0147	620	692	1	3
Q0126	1308	1463	1	6	X0149	1544	1724	1	7
Q0127	4437	4962	2	20	X0150	2138	2387	1	10
Q0128	1823	2039	1	9	X0152	3254	3633	1	15
Q0129	3692	4129	2	17	X0153	4305	4807	2	20
Q0130	5694	6367	2	19	X0155	2901	3239	1	13
Q0131	2180	2438	1	10	X0156	3936	4395	2	18
Q0132	2773	3101	1	13	X0157	5951	6644	2	19
Q0133	2004	2241	1	9	X0160	1526	1704	1	7
Q0134	4060	4540	2	19	X0161	3375	3768	1	16
Q0136	1848	2067	1	9	X0163	1506	1681	1	7
Q0137	632	707	1	3	X0165	2120	2367	1	10
Q0138	4996	5587	2	23	X0166	6451	7203	2	21
Q0139	3588	4012	2	17	X0167	5055	5644	2	23
Q0140	4543	5080	2	21	X0168	3333	3721	1	15
Q0141	2414	2699	1	11	X0172	923	1031	1	5
Q0142	3573	3995	1	16	X0174	97	108	1	1
Q0144	2316	2590	1	11	X0176	2624	2930	1	12
Q0145	8067	9021	3	26	X0177	3476	3881	1	16
Q0146	3619	4047	2	17	X0178	4765	5320	2	22
Q0147	4913	5494	2	22	X0179	4988	5569	2	23
Q0148	1872	2093	1	9	X0183	3190	3562	1	15
Q0151	2839	3175	1	13	X0184	2801	3127	1	13

Results per County:

	Queens:				Bronx:				
Site IDs	311				218				
2006 Voters	926,037				578,490				
2009 Voters	1,035,532				645,898				
DS200s	424				277				
Booths	4,031				2,546				

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
Q0152	2208	2469	1	10	X0186	6055	6761	2	20
Q0153	2776	3104	1	13	X0188	2841	3172	1	13
Q0155	2952	3301	1	14	X0189	2750	3070	1	13
Q0158	4772	5336	2	22	X0190	2535	2830	1	12
Q0159	786	879	1	4	X0191	2581	2882	1	12
Q0160	1685	1884	1	8	X0195	1287	1437	1	6
Q0166	5087	5688	2	23	X0197	2041	2279	1	10
Q0168	5537	6192	2	18	X0201	6404	7150	2	21
Q0169	2283	2553	1	11	X0203	3927	4385	2	18
Q0171	1954	2185	1	9	X0204	1095	1223	1	5
Q0174	2638	2950	1	12	X0205	3498	3906	1	16
Q0175	4693	5248	2	21	X0207	2641	2949	1	12
Q0176	1827	2043	1	9	X0209	2039	2277	1	10
Q0177	1263	1412	1	6	X0210	1008	1125	1	5
Q0178	1309	1464	1	6	X0213	2329	2600	1	11
Q0181	3701	4139	2	17	X0214	3269	3650	1	15
Q0182	6563	7339	2	21	X0215	2362	2637	1	11
Q0184	4839	5411	2	22	X0216	1790	1999	1	8
Q0185	812	908	1	4	X0219	6384	7128	2	21
Q0186	2476	2769	1	12	X0221	857	957	1	4
Q0188	4297	4805	2	20	X0224	3999	4465	2	18
Q0190	4779	5344	2	22	X0225	2357	2632	1	11
Q0191	2956	3306	1	14	X0226	1682	1878	1	8
Q0192	1955	2186	1	9	X0229	1580	1764	1	8
Q0193	3632	4061	2	17	X0231	1303	1455	1	6
Q0196	1792	2004	1	9	X0234	5807	6484	2	19
Q0197	3764	4209	2	17	X0235	492	549	1	3
Q0198	4196	4692	2	19	X0237	1547	1727	1	7
Q0199	4920	5502	2	23					
Q0200	2328	2603	1	11					
Q0201	2411	2696	1	11					
Q0202	2376	2657	1	11					
Q0203	1905	2130	1	9					
Q0204	1418	1586	1	7					
Q0205	1791	2003	1	9					
Q0206	433	484	1	2					
Q0209	2625	2935	1	12					
Q0210	4263	4767	2	20					

Results per County:

	Queens:				Bronx:				
Site IDs	311				218				
2006 Voters	926,037				578,490				
2009 Voters	1,035,532				645,898				
DS200s		424				277			
Booths			4,031				2,546		

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
Q0211	5070	5669	2	23					
Q0213	4216	4715	2	19					
Q0214	689	770	1	4					
Q0215	820	917	1	4					
Q0216	3793	4241	2	17					
Q0217	2626	2936	1	12					
Q0219	479	536	1	3					
Q0222	3361	3758	1	16					
Q0223	3833	4286	2	18					
Q0225	4797	5364	2	22					
Q0226	3414	3818	1	16					
Q0227	2938	3285	1	14					
Q0228	3713	4152	2	17					
Q0229	5032	5627	2	23					
Q0231	1230	1375	1	6					
Q0232	5291	5917	2	24					
Q0233	2935	3282	1	14					
Q0234	6382	7137	2	21					
Q0237	2647	2960	1	12					
Q0238	3639	4069	2	17					
Q0239	2967	3318	1	14					
Q0240	3408	3811	1	16					
Q0243	760	850	1	4					
Q0245	1656	1852	1	8					
Q0246	477	533	1	3					
Q0247	1451	1623	1	7					
Q0248	3521	3937	1	16					
Q0249	3583	4007	2	17					
Q0250	3552	3972	1	16					
Q0251	6374	7128	2	21					
Q0252	732	819	1	4					
Q0253	4376	4893	2	20					
Q0254	4039	4517	2	19					
Q0255	481	538	1	3					
Q0256	489	547	1	3					
Q0257	3834	4287	2	18					
Q0258	604	675	1	3					
Q0259	1591	1779	1	8					

Results per County:

	Queens:				Bronx:				
Site IDs	311				218				
2006 Voters	926,037				578,490				
2009 Voters		1,035,532				645,898			
DS200s			424				277		
Booths				4,031					2,546

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
Q0260	1157	1294	1	6					
Q0261	5731	6409	2	19					
Q0262	7701	8612	3	25					
Q0264	1212	1355	1	6					
Q0265	1680	1879	1	8					
Q0266	2255	2522	1	11					
Q0269	1023	1144	1	5					
Q0270	3634	4064	2	17					
Q0271	2361	2640	1	11					
Q0272	5276	5900	2	24					
Q0273	4476	5005	2	21					
Q0274	910	1018	1	5					
Q0275	2843	3179	1	13					
Q0276	1806	2020	1	9					
Q0277	941	1052	1	5					
Q0278	4019	4494	2	18					
Q0279	1469	1643	1	7					
Q0280	3744	4187	2	17					
Q0282	3459	3868	1	16					
Q0284	2839	3175	1	13					
Q0286	5522	6175	2	18					
Q0288	3250	3634	1	15					
Q0291	2422	2708	1	11					
Q0292	527	589	1	3					
Q0293	904	1011	1	5					
Q0294	2674	2990	1	12					
Q0295	6991	7818	2	23					
Q0296	1360	1521	1	7					
Q0298	5012	5605	2	23					
Q0299	6820	7626	2	22					
Q0300	2098	2346	1	10					
Q0301	4875	5451	2	22					
Q0303	5225	5843	2	24					
Q0304	5379	6015	2	18					
Q0307	3795	4244	2	17					
Q0308	6258	6998	2	20					
Q0309	910	1018	1	5					
Q0310	3390	3791	1	16					

Results per County:

	Queens:				Bronx:				
Site IDs	311				218				
2006 Voters		926,037				578,490			
2009 Voters			1,035,532				645,898		
DS200s				424				277	
Booths					4,031					2,546

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site	2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
Q0312	1890	2113	1	9					
Q0313	1270	1420	1	6					
Q0314	3492	3905	1	16					
Q0315	5674	6345	2	19					
Q0318	4900	5479	2	22					
Q0319	1166	1304	1	6					
Q0321	1137	1271	1	6					

Results per County:

	Richmond			
Site IDs	87			
2006 Voters		234,155		
2009 Voters			258,139	
DS200s				115
Booths				1,028

Details per County:

2006 Poll Site IDs	2006 Voters per Poll Site	2009 Voters per Poll Site	DS200s Needed per Poll Site	Booths Needed per Poll Site
00067	3008	3316	1	14
10006	3127	3447	1	14
10008	5332	5878	2	24
10010	5102	5625	2	23
10011	1772	1954	1	8
10012	2965	3269	1	14
10013	4674	5153	2	21
10023	3500	3858	1	16
10027	2043	2252	1	10
10181	5143	5670	2	23
10182	722	796	1	4
10233	516	569	1	3
10234	145	160	1	1
10298	4508	4970	2	20
10299	2379	2623	1	11
10301	2831	3121	1	13
10341	2194	2419	1	10
10398	1264	1393	1	6
10417	3489	3846	1	16
10535	5300	5843	2	24
10574	1389	1531	1	7
10596	7888	8696	3	25
10599	1547	1705	1	7
10633	3540	3903	1	16
10634	3494	3852	1	16
10636	4667	5145	2	21
10637	70	77	1	1
10699	55	61	1	1
10700	85	94	1	1
10701	56	62	1	1
10702	106	117	1	1
10703	41	45	1	1
10704	81	89	1	1
10705	80	88	1	1
10706	71	78	1	1
10707	37	41	1	1
10708	53	58	1	1
10709	2392	2637	1	11

Results per County:

	Richmond			
Site IDs	87			
2006 Voters	234,155			
2009 Voters		258,139		
DS200s			115	
Booths				1,028

Details per County:

10728	1804	1989	1	8
10858	3121	3441	1	14
10994	1310	1444	1	6
11005	3648	4022	2	17
11012	615	678	1	3
S0001	3716	4097	2	17
S0003	2166	2388	1	10
S0004	5158	5686	2	23
S0005	1332	1468	1	6
S0006	3793	4182	2	17
S0009	248	273	1	2
S0011	4206	4637	2	19
S0014	2850	3142	1	13
S0017	3204	3532	1	15
S0020	1111	1225	1	5
S0022	5583	6155	2	18
S0023	4822	5316	2	22
S0024	2198	2423	1	10
S0025	598	659	1	3
S0026	2263	2495	1	10
S0029	4468	4926	2	20
S0030	617	680	1	3
S0032	5914	6520	2	19
S0034	6048	6667	2	20
S0035	4288	4727	2	19
S0040	2367	2609	1	11
S0043	4204	4635	2	19
S0045	3427	3778	1	16
S0046	1301	1434	1	6
S0047	1772	1954	1	8
S0048	6568	7241	2	21
S0050	2309	2546	1	11
S0052	2179	2402	1	10
S0054	220	243	1	1
S0055	2372	2615	1	11
S0056	3502	3861	1	16
S0057	2166	2388	1	10
S0058	1502	1656	1	7
S0059	4458	4915	2	20
S0061	3097	3414	1	14
S0062	4877	5377	2	22
S0071	2666	2939	1	12

Results per County:

	Richmond			
Site IDs	87			
2006 Voters		234,155		
2009 Voters			258,139	
DS200s				115
Booths					1,028

Details per County:

S0072	1499	1653	1	7
S0073	2329	2568	1	11
S0074	5803	6397	2	19
S0075	4843	5339	2	22
S0076	3963	4369	2	18
S0078	5241	5778	2	24
S0082	743	819	1	4