Comments on the NYC EVS Voting Machine Report

In February, 2005, the NYC Electronic Voting Systems Department released a preliminary draft report entitled "New Voting Machines — Report on Costs". The report is a cost comparison analysis of different types of voting systems. The introductory remarks acknowledge that the report has, "… *limited value as a reliable projection of actual costs* …"; "… *limited value for projecting actual costs* …"; and "… *only minimal data gathering and elementary analysis* …".

Despite these caveats about the usefulness of the report as an actual cost estimate, many state and local election officials and legislators have been quoting from the report as if it were a definitive study. This is unfortunate, as the EVS report is seriously flawed, relying on unsupported assumptions that exaggerate the costs of precinct based optical scan systems and underestimate the cost of full face ballot touchscreen/pushbutton electronic voting machines (DREs).

To be fair, the report does note that EVS had not yet received data from jurisdictions using polling site scanners. By calling states with many years of experience with optical scanners, more substantive information about optical scanning of paper ballots was acquired by New Yorkers for Verified Voting. These states, from different areas of the country, were able to provide realistic costs of acquisition and operation. While we do not maintain that their experience is identical to the needs of New York City, the real world experience cited by actual users of precinct based scanners diverges significantly from many of the assumptions made in the EVS report.

Questionable Assumptions

Significantly, the report notes that it is impossible to determine realistic costs without knowing the quantity of scanners needed. Unfortunately, the report makes some unsupportable assumptions both for the paper ballot and poll site optical scanner option as well as for DREs.

Number of Scanners per Polling site

The report states that New York will need, "… *about one scanner for every two election districts*". This claim is not supported by practices in other states using optical scanners, where one scanner *per polling place* is the norm. In fairness, the authors state "*Clearly this is an area that needs further analysis and data from jurisdictions already using pollsite scanners.*" But they then proceed to estimate the cost of purchasing scanners using this flawed assumption. We note two reasons that the report draws this erroneous conclusion:

Ballot Storage Capacity

New York City uses a nominal 600 voters per election district. Most precinct based scanners have a storage capacity of 3,000 or more ballots. Strictly in terms of ballot storage capacity then, a single scanner can handle 4 or 5 election districts. So the claim that a single scanner can only service 2 districts cannot be based on ballot storage capacity.

Average Time Needed for Voters to Scan Ballots

The authors say, "… *one scanner should accommodate 1,800 voters in a 900 minute day*". This assumes, with no data to support the notion, 30 seconds per voter. But this is an extraordinarily long time, and not borne out in actual practice. States using scanners report that the time it takes a scanner to scan a ballot is "A few seconds" [1], "Instantaneous"[2], "Insignificant"[3]. The fact is a precinct based scanner intakes and reads a ballot in under 2 seconds. The report's assumption of 30 seconds per voter and the subsequent conclusion that a scanner can service only 2 election districts has no basis in fact. It is merely a conjecture, and a flawed one at that.

[1] Alabama, District of Columbia, Florida
[2] Minnesota
[3] Oklahoma

Replacement Ratio of Lever Machines to Full Face Electronic Machines

The report states "*…a full-face electronic display machine can replace our lever machines at a two-for-three ratio. This means that where practical at a given pollsite, every three lever machines would be replaced with only two new machines*". This is a highly dubious claim. In the first place, the authors ignore the fact that current New York State legislation requires that any DRE have a voter verified paper ballot (VVPB). Such devices require additional time for voters to read the VVPB[4], check it against the choices displayed on the screen ballot for accuracy, and then cast their vote. This is clearly going to require more time than voting on a lever machine. Even assuming the time it takes to cast votes on a lever machine and a DRE is identical[5], voter ballot verification is an additional step that must take additional time.

The authors actually acknowledge this fact, although they then proceed to ignore it in the cost estimate. The report states "*Not taking into account the voter-verifiable paper printout, we believe that with a full-face machine with a printed ballot face, the time for a voter to vote may be a little longer during the initial years of implementation.*.".

We question why, after acknowledging that the VVPB verification step will take additional time, and the time to vote on a DRE will be longer than on a lever machine, the authors then draw the conclusion that lever machines can be replaced by DREs at a 2 for 3 ratio.

Since the authors say "*In the determination of realistic costs, the quantity of machines must be known. And in the determination of realistic quantity, voting time must be factored into the analysis.*", it is hard to understand why they choose to ignore their own statements that voting on DREs with VVPB will take additional time, then conclude that fewer DREs are needed than lever machines.

Printed Ballot Costs

The report says "*We've received price estimates for ballots ranging from $.25 to $1.00 per ballot.*" But NYVV found prices for ballots printed to scanner manufacturer's specifications ranging from 10¢ to 30¢ in our survey of other states.

Even worse, the price per ballot used in the cost estimate section for optical scanners is 75¢ per ballot! Thus the report erroneously concludes that the annual ballot printing cost for New York City would be $3,375,000 [6]. But a better assumption, based on actual printing costs in other states, is that New York, with it's 11 million voters and a competitive bidding process, could purchase ballots for no more than 25¢ per ballot. At this perfectly reasonable price, New York City's annual ballot printing costs would be approximately $1,125,000. *This more realistic annual ballot printing cost is $2,250,000 less than the estimate used in the EVS report.* Indeed, adjusting this figure alone reduces the total annual per election cost stated in the report by nearly 50%! [7]

Consumables

The EVS report mentions several consumable items in relation to poll site scanned paper ballots: Tables, chairs, privacy screens, pens, and cans of compressed air. None of the other states NYVV contacted mentioned using compressed air in either preparation or during operation. There were few reports of problems using specified paper quality and no operational reports of paper dust problems. In fact, compressed air can force paper dust into the mechanism of this type of scanner aggravating rather than mitigating any threat to the operation. Suitable tables and chairs were generally available at other states' polling sites and simple cardboard "display" screens were used at many sites, at very slight cost (~2$).

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[4] Indeed the models of full face VVPB DREs demonstrated in NY have an extremely small, hard to read ballot that will be difficult to read, and consequently take additional time, for many voters.

[5] A dubious claim. Many voters, particularly older voters, will find a touchscreen DRE unfamiliar and difficult to use.

[6] 4,500,000 estimated ballots x 75¢.

[7] The total annual cost quoted for optical scan systems in the report is $4,810,650.

Handling of Paper Ballots

Much has been said in this report and elsewhere about handling paper ballots and the optical scanning equipment. Most users we have spoken with report no difficulty for their poll workers in handling and setting up the equipment, with minimal training. They order the printed ballots bundled in various weights, but report no weight or lifting problems for their workers. And indeed, New York polling sites have some experience with handling paper ballots, as affidavit and absentee ballots must be dealt with. So handling paper ballots is not a completely new task, although the scale is different.

Lifetime of System, Mean Time Between Failure

The question of warranty period, expected life of the hardware, or mean time between failure data is missing from the report. The long term cost for each of the systems in question should be part of this report if a reasonably accurate cost assessment is desired. We note that one of the states we surveyed still has all but one of the 3,000 polling site optical scanners they purchased in 1990 in service. That's 14 years, and the scanners are still going strong.

The report is also incorrect when it states "*Scanners may also be subject to more frequent repairs because of the sensitive optical technology and moving parts.*" Reports from states using precinct based optical scan indicate extremely low rates of repair.[8] This statement about the sensitivity of scanners in the EVS report simply is not supported by facts.

Trucking Costs for Scanners

The report suggests that the cost for trucking the optical scanners will be higher than for the current lever machines, although no supporting evidence is given for this assumption. Once again, responses from several states with long years of experience are to the contrary. They have found the optical scanners to be very rugged in handling by non-professional movers. The size and weight of the scanners is, of course, considerably less than a lever machine or a full face DRE and are consequently far easier to move.

No experienced election official we have spoken with indicated the need for additional personnel with optical scanners.

Pollsite Procedures

In cases where there has been a transition from lever or punch card in recent years, there were no accounts of difficulty or intransigence among existing elections personnel. It is puzzling why the EVS report says, "*Voting on paper ballots might call for the most extensive changes*", when we encountered no such reports.

They seem to buying into the dubious concept that "if it looks like a lever machine, it will be as easy to use as a lever machine". In the first place, there is only one DRE being promoted in New York that actually has a ballot face with a layout substantially similar to a lever machine.[9] Other types of DREs being demonstrated in New York do not look at all like lever machines. Since the authors cannot yet know which machine will eventually be purchased in New York, it is odd that they conclude it will be similar to our existing machines.

Even more important, any similarity in visual appearance of the ballot face to a lever machine *is the only similarity*. Because touchscreen and pushbutton DREs are computers and not mechanical devices, initialization, testing, machine failure, canvassing and close down procedures will all be radically different from current practices, regardless of whether the DRE ballot face looks like a lever machine.

This is like saying that a carriage pulled by a horse has four wheels, and a car has four wheels, so driving both types of vehicles is basically the same.

We find it distressing that the authors seem to pay much attention to physical appearances, and completely ignore that under the hood, there is nothing about DREs even remotely similar to a lever machine.

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[8] Alabama, District of Columbia, Iowa, Minnesota, and Oklahoma report less than one failure per 3000 optical scanners.
[9] The Sequoia AVC Advantage