2009 Professional Practices Program

WHY THE WAIT?
Using a Quantitative Formula To
Allocate Voting Machines And
Reduce Election Day Waiting Times

FRANKLIN COUNTY, OHIO

Submitted by:

Michael Stinziano, Director
Matthew DamSchroder, Deputy Director
Karen Cotton, Director of Operations

280 E. Broad St. Rm 100
Columbus, OH 43315
(614) 462-5303
mpstinzi@vote.franklincountyohio.gov
www.vote.franklincountyohio.gov
Leading up to the November 2008 election, the over 800,000 registered Franklin County, Ohio, voters remained apprehensive of the possibility of waiting in long lines to vote as a result of a predicted record turnout and a very long ballot. The origin of such concern was due to many voters’ November 2004 experience in Franklin County when voters did experience very long lines, a very long ballot and too few voting machines.

Ultimately, such anxiety was found to be unwarranted as the board, based on the experience of 2004, implemented an alternative allocation method relying on a utilization formula that moved beyond the past way of distributing machines to polling locations and properly accounted for “controls” that result in the formation of lines. Reliance on the formula and consideration of service time provided a quantitative and standardization that ultimately provided integrity and fairness to the voting process, as well as a lack of Election Day lines. Such a process and considerations are easily adaptable for implementation by other jurisdictions as it results in a reasonable and logical way to distribute voting machines based on a transparent, simulation-theory motivated process.

Historically, distribution of voting machines among precincts boiled down to the “gut instinct” of the board members. As is the case with many election officials, allocation of voting machines were baselined on an examination of the number of registered voters and the number of voters who had turned out at a precinct on previous Election Days. From that starting point, allocation then occurred based on guess work and piecemeal with consideration to polling locations known to have had previous issues. This method however failed to consider many other extenuating components that cause lines on Election Day, primarily turnout and ballot length, leaving the voting process open for criticism that preference and bias resulted in certain locations receiving more resources than others.

Rather than fall into such a trap again and in recognition that such a baseline failed to properly account for all the components that played a role for creating the real problem of long lines, the Franklin County Board of Elections choose to change its approach with the goal of improving voter satisfaction and Election Day lines. While not able to predict the unpredictable of where problems would arise on Election Day, the objective was to predict in advance where the highest chance for line formation may occur and arrange, prior to Election Day, to avoid such an occurrence and provide equal access through minimal line waiting and enhanced voting machine allocation.

The first step in this transformational course of action was the hiring by the Franklin County Board of Elections of Lextant, a Columbus company that studies consumers’ behavior to make products and services more user-friendly, and Sagata, which designs computer systems based on statistical models. The consultants studied records from the 2006 election and 2008 primary to determine the service time it took to process a voter and how long it took voters to complete a ballot. They also staged a mock election which included 60 people of different ages, genders, ethnicities, and voting experience. The result of this study was a “wait line study” report and public hearing regarding why lines form on Election Day.
In addition, we now had detailed investigations regarding the “arrival rates” and “service rates” of voters.

![Queue Process Diagram]

Arrival rates are viewed as the number of voters per hours. Service rate can be summarized as how much time voting requires based on ballot length and the nature of the voting equipment.

Based on this information, the consultants devised a mathematical utilization formula for initial allocation of all of Franklin County’s 4,639 DRE iVotronic voting machines to the County’s 454 voting locations.

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\text{Number of Machines} = \text{roundup} \left( \frac{\text{avg. voting time mins.})(\#registered)(turnout)}{(0.85)(13 hr)(60 mins./ hr.)} \right)
\]

The controls for the formula included:
1) The number of registered voters in Franklin County as of the close of registration;
2) Ballot length in each jurisdiction; and
3) Absentee ballot requests received.

When extracting from the initial sample, we learned a number of functional components we could use to predict Election Day activity and where we could face major lines. For example, jurisdiction wide the average voter would expect to wait 11 minutes. Most would wait 0 minutes and 18 polling locations would have average waits over 1 hour. Knowing these components, our board then created a spreadsheet to generate feasible allocations throughout our entire jurisdiction that we could adopt allocation changes in order to minimize all jurisdictions that had wait lines deemed unacceptable. We accomplished this task by increasing both poll worker staff and increasing the allotment of machines. Fortunately, all this effort resulted in minimal lines and no criticism that preference and bias resulted in certain locations receiving more resources then others.

Ultimately, we found the consideration of wait lines to be a fantastic tool when addressing machine allocation as we were able to optimize what had previously been considerably impossible, consideration of service time and ballot length in grouping to election day resources. This was accomplished though a transparent and defensible allocation with easy spreadsheet implementations that were able to generate a defensible motivated voting machine allocation.

The application of this exercise for other counties is that based on our experience, the reliance of a quantitative allocation might help other political systems and election administrators think about the waiting time implications of their allocations or initiatives. The consideration and implementation of a utilization formula provides, when the expectation of significantly high turnout exists, for a simple and quantitatively efficient way to apportion machines that accounts for variable ballot length across numerous precincts.
Formula helps divvy up voting machines

Barbara Carmen

THE COLUMBUS DISPATCH

October 25, 2008

Douglas J. Preisse, chairman of the Franklin County Board of Elections, flipped through a thick plan to distribute voting machines and asked, "It's a bit science and a bit art, right?"

Not this year, he was told.

"I think the good news for this election is that it's more science than art," Deputy Director Matthew Damschroder said.

The elections board yesterday revised its strategy to divvy up 4,639 touch-screen electronic machines in what is expected to be a record 80 percent turnout of voters on Nov. 4.

Franklin County has 846,343 registered voters. So Preisse and his three fellow board members paid close attention to which precincts were losing machines and which were gaining them under a mathematical formula devised by consultants.

For the first time, machines will be issued to precincts based on ballot length and the number of voters who have already cast a ballot in early voting at Veterans Memorial or requested an absentee ballot by mail.

Columbus bond issues make the city's ballot take about three minutes longer to vote than ballots in most suburbs, so city precincts will get more machines to smooth lines. And at some polls, business will be light on Election Day because so many people have voted absentee.

For example, the polling place at All Saints Episcopal Church in New Albany was originally slated to have more than a dozen machines to serve 863 voters. But 288 of the 863 registered voters indicated they are voting absentee. The board now plans to provide four machines to serve -- if every voter shows up -- 575 people during the 13 hours that polls are open.

Preisse noted that on Election Day in 2004, he waited in line for three hours at his Schiller Park precinct. Others waited as long as five hours to vote in some Columbus precincts in that presidential-election year.

http://nl.newsbank.com/nl-search/we/Archives?p_action=print&p_docid=1240D431B8F004... 4/1/2009
Since then, the board has nearly doubled the number of machines it owns, from 2,818 to 4,639. And it has waged a publicity and mail campaign to urge **voting** early by absentee ballot.

The board expects that 225,000 voters -- one-third of the projected turnout -- will vote early.

The board also has changed sign-in rules. Voters now will check in by the first initial of their last name and be directed to vote on any open machine; previously, voters were restricted to **voting** on a specific machine in their precinct.

bcarmen@dispatch.com

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Election 2008

To Avoid Long Lines, Ohio Officials Say Vote By Mail
by Pam Fessler

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All Things Considered, September 9, 2008 - Voters are expected to turn out in droves for this year's election, and that has many people worried about long lines.

In the key battleground state of Ohio in 2004, some voters waited up to 10 hours to cast their ballots. This year, officials are trying to alleviate some of the Election Day load by encouraging some residents to vote early by mail.

Mostly, voting officials want to eliminate the scene that occurred four years ago, when lines of voters snaked out of many polling sites into the pouring rain.

That day, volunteer Sue Willard was in Franklin County, which she complained didn't have enough equipment to handle a record number of people.

"They're having to wait three hours, because we're at a polling place in the inner city of Columbus with three machines for the entire polling place," she said that day. "So it's frustrating."

In other parts of the state, the waits were even longer. No one knows how many voters got discouraged and did not vote at all. The worst problems were in urban areas, which led to accusations that African-American voters suffered the most.

Absentee Ballots As The Answer

This year, election officials say they're trying to avoid a similar disaster.

Last week, mailing machines in Ohio ran almost nonstop — folding hundreds of thousands of absentee ballot request forms and stuffing them into envelopes.

The forms have been sent to every single registered voter in Franklin County, and about 20 other counties. Officials hope voters will take advantage of a new state law that allows anyone to vote early; they no longer need an excuse, such as being out of town on Election Day.

Michael Stinziano is the Democratic director of the Franklin County Board of Elections. He wants about one-third of the county's voters to cast absentee

in a card reading machine to count the
votes on Nov. 2, 2004, in Cleveland.

"It's simple. It's easy," Stinziano said. "You can do it at your own time, at your
own leisure, in the comfort of your own home. Everything is prepaid for. You
just have to request a ballot and then mail it back."

Some Polling Sites Open As Early As Late September

Franklin County will allow early in-person voting at a central site beginning Sept. 30. The site will be open seven
days a week, and the county hopes to have almost twice as many voting machines as it did four years ago.

Even so, the prospect of long lines remains. The county recently hired some waiting-line experts to look at what
gone wrong in 2004 and how to fix it.

"Two of the key issues were the insufficient number of voting machines that we had at the time, and also a very
long ballot," says Matthew Damschroder, who was the county's Republican election director in 2004 and who is
now serving as the deputy.

He says machines used to be allocated according to the number of registered voters in a precinct, but that was a
problem. "Ballot length in the city of Columbus was much larger and much longer than ballot length in the
suburban portions of Franklin County," he says.

Now, Franklin County is taking a novel approach: It is factoring in ballot length in the formula it uses to allocate
machines, because once again, the city of Columbus has a much longer ballot. But there's still bad news.

Debbie Barksdale is with the nonpartisan voter advocacy group the Advancement Project. She notes that under
the new plan, average wait times are still projected to be more than an hour in many precincts — and that's
assuming a relatively modest turnout, which no one really expects.

Barksdale's group is especially worried about first-time voters, who often need more time at the polls.

"Looking back historically," she says, "and looking at the voter registration drives that are going on right now and
where they're concentrating their efforts, I would say that more likely, the increase in the first-time voters
would be in the inner-city and college students."

Her group wants the county to buy more machines.

Michael Slater, who heads Project Vote, a nonpartisan group that's helped to register more than a million new
voters this year, also worries that election officials are not taking into account large get-out-the-vote efforts.

"We need election officials who are thinking through, 'Where could turnout really spike that I'm not planning
for?'" Slater says.

Stinziano says that's what officials are trying to do, but that there's only so much they can predict. And he repeats:
The only guarantee against waiting in line is to vote by mail.