Implementing Proportional Representation in Cincinnati

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A. Findings

1. **Bottom-line**: It is feasible to implement proportional representation (PR) in Cincinnati immediately. Options include using hand counts, precinct-based optical scanning equipment, centralized optical scanners and off-the-shelf office scanners.

2. **Full discussion of options**: There is a range of options for implementing PR in Cincinnati, from a hand count to a fully automated, system using updated software for existing voting equipment.

3. **Tested means to implement PR:** PR was implemented in Cincinnati early in the 20th century and so can certainly be implemented as easily or more easily now. There are far fewer voters in Cincinnati city elections than in the past, with 61,500 cast in the 2007 election, down from well over 100,000 in the 1950s.Cambridge (MA) adopted the Cincinnati PR method in the 1940s and still uses it today. Cambridge automated the vote tally method using Diebold (now Premier) optical scan voting machines in 1996, and still uses that method today. Several other cities have implemented or are in the process of implementing similar ranked choice voting methods, including San Francisco, Pierce County (WA), Minneapolis (MN) and Cary (NC).

4. **Potential role of other vendors**: Representatives of Hart InterCivic have stated that their systems can handle ranked ballots with an upgrade of software. Some vendors for private elections and many overseas companies and election officials have significant experience administering ranked ballot elections.

5. **Voter education**: Voters have easily adapted ranked choice voting even with very low cost, limited voter education programs. San Francisco spent around $2 per registered voter, but exit polls showed that most of the voter awareness of PR resulted from a small portion of the voter education spending. Burlington's quantitatively more successful voter education program cost between $0.25 and $0.50 per registered voter, which is consistent with the cost estimate for voter education provided by the Vermont Secretary of State for prospective statewide ranked choice voting elections.

B. Introduction

This report describes six methods for implementing the ranked choice voting method of proportional representation (PR) for municipal elections in Cincinnati. It details lessons learned from the implementation of ranked choice voting systems in Cambridge (MA), San Francisco (CA) and Burlington (VT) and offers guidance on ballot design, voter education and poll worker training.

Voter education: The goal of voter education is to instruct voters how to rank candidates in PR contests. This can be inexpensively achieved through good ballot design, posters and flyers in polling places and a mailing to voters. Election judges need to be trained to respond to the common questions (can I rank the same candidate more than once, does ranking a second choice hurt my first choice, etc.). Voters historically have adapted well to this change, although good publicity of the change before the election and good graphics in polling places are important.

Cost: We have not yet extensively analyzed costs, but we plan to estimate the costs of the methods after reviewing information from Ohio state government on any certification requirements for commercial off-the-shelf hardware or software used for tallying votes (Federal guidelines exempt such products from any testing or certification), from Cambridge (MA) on manual procedure costs, and from Hart InterCivic on software upgrade costs. The lowest cost approach may be the use of commercial, off-the-shelf scanners and form reading software, although a traditional hand-count would come with very low costs as well.

Access for people with disabilities: Since Ohio now requires voting machines to use a paper record that is to be used for recounts, these paper records can also be used to record voter rankings, even without any upgrade of voting machine software. The E-Slate DRE is no exception.

Constitutional and statutory Issues: There are no state or federal obstacles to Cincinnati's adoption and implementation of PR. The federal Help America Vote Act (HAVA) does not apply to municipal elections. The voting Rights Act does apply, but PR, rather than facing any difficulties, is in fact, the quintessential remedy to minority voting power diminution. In addition, Ohio has a rich legacy of municipal PR elections and an unambiguous Ohio Supreme Court record affirming the right of municipalities under Article XVIII of the Ohio Constitution to supercede state election statutes when designing their municipal election systems.

Summary of methods
PR Method 1: Traditional hand count
PR Method 2: Modified hand-count with optical scan counting of first choices
PR Method 3: "One-touch" hand count with data entry
PR Method 4: Use commercial, off-the-shelf office scanners and form reading software
PR Method 5: Hire an election administration firm that conducts ranked-voting elections
PR Method 6: Use upgraded software in existing voting machines

C. Methods of implementing PR in Cincinnati

PR Method 1: traditional PR hand count

This method is the one used in Cincinnati from 1925 - 1955. Ballots should probably be uniquely for city council, rather than combined onto the machine-read e-scan ballots, although this is not essential. If the Ohio requirement for DRE machines to satisfy disability independent access to voting applies to hand-count elections as well, this is not an obstacle, in that the E-Slate DRE machines are already required to generate a paper ballot (used for recounts), and these machines can be set up to record each ranking as if it were a separate race, without any upgrade to the current software. apply if the city used a manual count ballot. Note that this state ban appears to only apply to the County Board of Elections and not to municipalities within the county if they administer their own elections. Also, note that the ban only applies to doing unofficial results, and there is no such ban on official tallies.

The detailed step-by-step procedures for conducting a hand count may still exist in the city's archives. If not, the 1993 Cambridge (MA) manual of procedures for conducting a hand count can be used. Cambridge adopted the "Cincinnati" method in 1941. Cambridge still uses PR today, but updated to optical scan voting machines before the 1997 city elections. The Cambridge manual is available at http://www.fairvote.org/media/1993countmanual.pdf

Hand counting PR is a labor-intensive method, but inexpensive. If the 2007 election turnout of 61,500 were repeated with a PR count, we estimate conservatively that costs would be approximately $20,000, and possibly several thousand dollars less. It will likely take more than a day to complete in its entirety. The charter default for handling transfer votes from winning candidates is to use random whole ballot transfer. In summary, all ballots are sorted by first choice. A candidate who reaches the winning threshold, has a random sample of surplus ballots added to the totals of that voter's second choice candidates (unless that candidate has also already reached the winning threshold, or been eliminated, in which case the ballot is counted for the third choice, and so on.) Once all surpluses have been redistributed, if there are still un-filled seats, the candidate with the fewest votes is eliminated and all of the ballots in that candidate's stack are added to the totals of all of those voters' next choice (who is neither already elected nor eliminated). The process continues until all seats are filled. Ballots can be "stacked" for a particular candidate by using boxes, rubber-bands, etc.

The City could train its own election staff and pollworkers to conduct this count, as done in Cambridge, or contract with an outside firm, as done in local school board elections for many years in New York City.

PR Method 2: Hand count after first choices are counted at the polls

In 2007, Wake County (NC) successfully pioneered a variation of a traditional hand-count in a ranked choice voting using, using a method of counting recommended by the Vermont Secretary of State for prospective statewide use. In this tabulation system, voter use current voting ballot papers and current voting equipment at the polls, but would be able to indicate a full range of choices. First choice tallies are counted at the polls and released immediately and ballots are then brought to a central counting station. At this point, they are sorted according to first choices, and then a traditional hand-count begins.

PR Method 3: "One-touch" PR hand count

This method is similar to the off-the-shelf method (option 4 discussed next), except that the voters' rankings on the ballots are manually entered onto a computer at a central location, rather than scanned.

First choices in the PR council race could be counted on Election Day on existing optical scan voting machines using existing firmware, or simply deposited into a ballot box without scanning at the polls. (In that latter case, a separate ballot paper would be used for other races and ballot questions that would be handled as usual.)

It should be possible to record rankings using the existing firmware on the e-slate systems as well, by treating each ranking as a separate race on the screen and using the voter-verifiable paper record. This will need to be confirmed. If this is not possible, the e-slate could not be used for the council election, and an alternative method of allowing disabled voters to vote would need to be provided (such as renting auto-mark machines to mark e-scan ballots or providing human assistance).

Ohio law prohibits conducting an unofficial tally of optical scan ballots at a central location if optical scan machines are the primary means used in the county. However, Ohio Supreme Court rulings have made it abundantly clear that Ohio election laws that might interfere with the secure and efficient conduct of a PR election and tabulation would not stand against a municipal charter. Thus, the law prohibiting unofficial central counts when a county primarily uses optical scan machines would not prevent the city from conducting a central tally, even with optical scan ballots. The charter amendment, under home rule principles repeatedly affirmed by the Ohio Supreme Court, gives Cincinnati the option of doing a central tally. In any event, there is no state law prohibiting the *official* tally from being conducted centrally. So, after provisional ballots are evaluated, an official PR tally could be conducted without any statutory issue.

At the central location, an appropriate number of tables with teams of counters are arranged. The caller looks at a ballot and calls out the name of the candidates in the order the voter has ranked them on the ballot. The recording clerk then keys in the corresponding ranking on the computer using commercial off-the-shelf spread sheet or database software, or a simple open-source DOS program designed specifically for ranked ballot data entry such as Voting Solutions' Elect software. Note that although Elect is trivially simple software, it may or may not be subject to certification requirements. The text output files showing every voter's rankings are then tallied by the same ChoicePlus Pro software as in the off-the-shelf option. This method avoids any need to re-handle any ballots with surplus or eliminated candidates, required under the traditional hand-count method. It also allows for the more precise fractional surplus transfers.

This method requires more training, supervision and monitoring than a hand recount in a plurality contest. It was used in the 1996 Community School Board elections in New York City.

PR Method 4: Commercial, off-the-shelf (COTS) office scanners and form reading software

A novel and possibly the most cost-effective approach for Cincinnati would be to use commercial, off-the-shelf scanners to take digital images of all ballots and then to use form-reading software to read, review and store voting marks.

The same point discussed above about the home-rule powers of the charter to supercede state election laws, such as the state law prohibiting unofficial tallies being conducted centrally if optical scan machines are the primary voting method used at the polling places, applies to this option.

Using existing firmware to record first choices would not entail any change in Election Day procedures because the machines would only count first choices at the polling place; the machines would simply ignore 2nd and 3rd and subsequent choices.

In addition to minimizing cost, this approach provides unparalleled transparency, security and accuracy. It also entails no change in equipment, ballot or procedures at polling stations. Modestly priced, commercial office scanners can image 40-60 double-sided ballots per minute. Then commercial form-reading software can be used to process the voting marks on the ballot and review ballots to ensure they are being counted according to how the voter intended. Unclear or questionable ballots can be flagged and reviewed by election officials using the graphic image of the ballot, or even by pulling out the actual paper ballot from the stack.

The federal Election Assistance Commission has promulgated Voluntary Voting System Guidelines, which the Ohio Secretary of State has opted to follow. Ohio and most other states require some sort of certification for special-purpose voting machines used in state elections. It does not appear that this applies to unmodified, commercial off-the-shelf (COTS) hardware and software, such as proposed in this option, as the EAC guidelines Ohio follows expressly exempt COTS hardware and software from any testing or certification requirement.

Whether for an unofficial tally, or an official tally conducted after provisional ballots are dealt with, the procedure is as follows. To conduct the PR tally, all ballots would be transported to a central location and scanned. The tally using the STV algorithm can be conducted using free open-source software such as Choice Plus Pro. However, since this software is special-purpose election software, it may require certification. It is possible to perform the tally using COTS spread sheet software such as Excel, but it is not simple, and a Macro command would need to be written and tested or would need to be repeated by different individuals or double-checked with ChoicePlus Pro to assure accuracy.

Note that election administration companies have used this type of system in private elections for years, and have even been used to audit public elections. Also note that a group composed largely of volunteers recently assembled such a system for ranked choice elections for a non-profit membership organization with 100,000 voters in five cities. Several vendors produce the type of form reading software that is required. A by no means exhaustive list of vendors -- and with no endorsement or recommendation intended -- includes:

- Remark software from Gravic, Inc. (http://www.gravic.com)

- ABBBY (http://www.abbyy.com)

- I.R.I.S. (http://www.irislink.com/c2-373/Form-reading.aspx)

The benefits of this approach are:

- Security: preserving actual paper ballots along with digital images of them makes it easy to detect and correct any fraudulent post-election alterations to the ballots or data;

- Transparency: digital images can be compared to the original paper and any member of the public can review the images to verify official counts;

- Flexibility: The form reading software can read ballots of virtually any format as long as the marks are in a recognizable shape, such as a square or bubble, and the paper fits the scanner hopper. It is possible to have different ballot formats and simply tell the software where to find the voters' marking locations on each format.

• Low cost: Off-the-shelf scanners can process thousands of ballots per hour, so far fewer staff would be required with this approach than with any type of hand count. The computer work necessary to set up such a system is quite simple and straightforward, requiring no special skills or training.

Since this method relies on both commercial off-the-shelf hardware and software it should be exempt from federal testing.

The cost of this option will depend largely on whether existing city-owned scanners are used, or high-speed scanners are purchased or rented for this purpose. So the cost of scanners might range from zero to $20,000 The form reading software should cost less than $5,000. A reasonable estimate for this option is $30,000.

PR Method 5: Hire a voting administration firm to conduct a central tally with optical scan ballots

This method is essentially the same as method 4, except that rather than developing its own capacity, Cincinnati can hire an existing company that already has experience conducting ranked-ballot elections in this manner. The city could issue an RFP to secure bids. As with method 3, questions about state or federal certification and disability independent voting would need to be answered. One experienced contractor has provided an estimate of $70,000 - $100,000 for a PR election tally the size of Cincinnati's, although costs could be less in a competitive bidding environment.

PR Method 6: Acquire upgraded software for existing Hart InterCivic e-scan and e-slate voting machines.

The existing voting machine hardware used by Cincinnati is able to handle ranked ballots, however there are two kinds of upgraded software that would be needed. The first is the firmware running inside the e-scan and e-slate machines, which captures the rankings on each individual ballot. The other software runs the PR algorithm on the previously recorded set of rankings. San Francisco has used this method for their ranked-choice elections. However, San Francisco has used ES&S and Sequoia machines, rather than Hart InterCivic. The second piece of software need not be developed by Hart InterCivic, since free open-source software called Choice Plus Pro already exists. Again, state law may require state and or federal certification of any software upgrades. There is currently a substantial delay from a bottleneck for testing and certification of voting equipment by the federally selected independent testing labs, as well as a considerable cost associated with such testing.