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MEMORANDUM

October 1, 2019

TO: City Manager Eileen Donoghue

FROM: Christine O'Connor, Rachel Brown, and Adam LaGrassa

SUBJECT: Motion Response to 9/24/19 by C. Nuon: Req. City Council Specify The Vote Counting Method To Be Used With The At-Large Ranked Choice Option.

The Consent Decree entered in the matter of Huot et al. v. City of Lowell et al. states that if Ranked Choice Voting, a.k.a. Proportional Representation, is selected, then the procedures for implementing the Proportional Representation System, and for determining the winning candidates under such system, shall be "substantially similar" to those currently in place in the City of Cambridge, Massachusetts for the election of the Cambridge City Council and in the City of Minneapolis, including for elections including the Parks and Recreation Board.

In this memorandum, we explain the governing principles of Ranked Choice Voting in a multi-seat election, and the different tabulation procedures that may be used. While the Consent Decree requires that Lowell follow the governing principles of Ranked Choice Voting, it does not specify a specific counting method. The Cambridge and Minneapolis systems in fact use slightly different counting methods, as discussed below.

Governing Principles

The governing principles of Ranked Choice Voting in a multi-seat election are these:

1. Voters rank candidates in order of preference.
2. Number 1 choices are counted first.
3. A threshold number votes is determined for a candidate to be elected. For *n* seats, The threshold is the number at which, for *n* seats, if *n* candidates have received that number, it would be mathematically impossible for *another* candidate *also* to receive that number. Mathematically, it is:

(# voters / (# seats +1) +1[1].

For City Council in Lowell, it is 10% of the vote plus one vote. For example, if 25,000 valid ballots are cast for City Council, the threshold will be 2,501 (25,000 divided by 10, plus 1).

4. Votes for lower ranked preferences are transferred in a series of according to two procedures, with the first procedure always taking priority over the second, until a full council is elected:

    a. Surplus: When a candidate reaches the threshold number of votes, they are deemed elected and their surplus votes (the number above the threshold) are transferred to their voters' next highest preference (this eliminates votes being "wasted" on a candidate who has more than enough to win);

    b. Elimination: The candidate(s) with the lowest number of votes is eliminated, and votes are transferred to their voters' next highest choices (this also eliminates "wasted" votes for a candidate who cannot win).

Tabulation Methods

- The Consent Decree requires the RCV system to be substantially similar to that used in Cambridge and in Minneapolis, which means that the above principles would govern.

- All of 1, 2, 3, and 4(b) are almost the same in Cambridge and Minneapolis.

- Cambridge and Minneapolis *differ* in their method of tabulating 4(a), i.e., *how* surplus votes are transferred to voters' next highest choices.

- In Cambridge: When a candidate exceeds the threshold in the first round of voting (step 2 above), every *nth* ballot is selected from *all* of the elected candidate's surplus ballots, and those ballots are transferred to the next highest choice listed. n = (candidates' total ballots/surplus). So, if Candidate A has 2000 total ballots, 500 of which are surplus because the threshold was 1500, then $n = 4$, and for every fourth ballot the voter's next preference is transferred (the "nth Ballot Method").

- In Minneapolis: When a candidate exceeds the threshold in the first round of voting, the second choices from *all* of the elected candidate's surplus ballots are tabulated, then those second choices are transferred to different candidates according to the percentage, or fraction, of their selection on the ballots (the "Fractional Method"). An example is provided below.

- The Consent Decree does not specify whether the Fractional Method or the nth Ballot Method must be used—either would be "substantially similar" to the procedure used in Cambridge *and* to that used in Minneapolis.

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[1] It is "+1" when the division results in a whole number. When the division results in a fraction, the fraction is rounded up to the next integer, or next whole number.

Recommendation and Example

The Fractional Method is now considered the gold standard in tabulation because it more equitably and precisely achieves the intent of transferring a candidate's surplus votes according to the preference of all that candidate's voters. It is therefore recommended that, if Lowell ultimately adopts Ranked Choice Voting, it use the Fractional Method. Computer software, including open source, is available to perform this calculation reliably and quickly. However, because either tabulation method listed above is consistent with the Consent Decree, the choice of tabulation method would remain within the jurisdiction of the City Council.

EXAMPLE OF FRACTIONAL METHOD:

- Assume candidate A is elected in the first round, based on first choice votes

- Total ballots selecting candidate A as No. 1: **2000**

- Threshold of votes Candidate A needs: **1500**

- Candidate A's surplus votes: **500**

- Of the **2000** people who ranked A No. 1, **800** (40%) ranked Candidate B No. 2, **1100** (55%) ranked Candidate C No. 2, and **100** (5%) ranked Candidate D No. 2.

- Therefore, **200** is added to B's vote total (40% of 500); **275** is added to C's vote total (55% of 500); and **25** is added to D's vote total (5% of 500)

Please let us know if you have additional questions.