

Appendix I

FairVote Position on Voting Equipment, Election Integrity & Auditability

Any voting technology used for government elections in the U.S. should be secure, accurate, reliable and auditable. To ensure confidence in elections and to provide a paper record, voting machines should use a voter-verified paper ballot that is the basis for recounts and auditing the election. Direct recording equipment (DRE's) should be replaced with paper-based voting methods such as Optical Scan and AutoMark-type technology that utilizes a genuine paper ballot. The ideal method, to maximize security and integrity, is to have a redundant record of every vote. This means a system that has both a computerized record, or "ballot image" of each vote, as well as a paper ballot record of each individual vote (rather than merely running totals). This allows the comparison of the two records as an additional layer of security.

Optical scan machines are examples of acceptable technology. Paper ballot machines with a computerized interface may be acceptable if they generate paper ballots as the official ballots of record and print ballots that are easily readable and test well for usability.

These should be coupled with a manual audit and other protocols such as proper pre- and post-election testing, ballot accounting and secure chain of custody. All government elections should be subject to random, manual, statistical audits able to confirm election outcomes with a high level of confidence. Because Internet voting cannot achieve the standards above, it should not be used for government elections in the U.S. We recognize the right of private associations to run their election on-line if their members are willing to accept the inherent risk that comes with online voting.

Advanced voting methods, such as those using ranked-choice ballots, pose no more risk of fraud than more commonly used voting methods and do not depend on the use of electronic voting. FairVote urges jurisdictions, whether adopting advanced voting methods or not, to also institute the above recommended procedures and voter-verifiable and auditable voting technologies. We urge jurisdictions to set a new and higher standard of transparency by following the precedent of cities such as Burlington, VT and San Francisco, CA, in running ranked-ballot elections, and implement "open source ballots" by also posting the computerized record of every ballot on the Internet.

Longer term, FairVote believes that voting equipment and election administration in the United States requires a national elections commission to create minimum national election standards, and explore purchase of "public interest voting equipment" whereby the software and voting equipment is open source and publicly owned.

INSTANT RUNOFF VOTING PROCEDURES

TOWN OF CARY

OCTOBER 9, 2007 ELECTION

- There are 36 precincts in the Town of Cary
- The majority of the precincts will have more than one ballot style depending on the Board of Education District, outside municipal jurisdiction, etc. The following are ballots for the Town of Cary:
 1. Town of Cary/County Bond
 2. Town of Cary/Board of Education/County Bond
 3. Board of Education/County Bond
 4. County Bond
 5. One precinct will also have a City of Raleigh ballot
- As the sealed voted ballot boxes are returned to the Board of Elections office, Cary precincts will be set aside and the voted precincts returned to the Conference Room. The lock on the conference room will be changed prior to Election Day. Security guards are posted outside the conference room.
- As the sealed provisional ballot bags are returned to the Board of Elections office, Cary precincts will immediately be brought to G-8 of the Board of Elections to begin the audit of the number of provisional ballots per precinct. This will give us an approximate number of provisional ballots cast in the Town of Cary election – but not an exact number of what the Board will approve to be counted.
- Notice will be given that the Board will meet for the sample audit after which time, the Board will discuss the count of the IRV.
- When the Board meets on Thursday, October 11th to conduct the sample audit, a review of the unofficial results and the number of provisional ballots cast will be a good indicator if any candidate in any particular race received majority vote or if the IRV will take effect.
- Once the Board determines that no candidate in a particular race would reach majority, the Board will divide into teams for the 2nd and 3rd choice vote counts.
- The Board will divide into 3 separate teams – one Board Member and two officials to tally the votes.
- All counting will be done in the secure Wake County Office Building Conference Room. Projectors will be set up for all observers to be able to see the ballots being sorted and hand counted. *

*In accordance with NCGS 163-165.1(e), “Any person who has access to an official voted ballot or record and knowingly discloses in violation of this section how an individual has voted that ballot is guilty of a Class 1 Misdemeanor.”

SORTING PROCEDURES FOR EACH CONTEST INDIVIDUALLY

Team 1

Box of Sealed Voted Ballots

Team Members

- 1 Board Member
- 2 Officials

Task

- Sort
- Tally

Team 2

Box of Sealed Voted Ballots

Team Members

- 1 Board Member
- 2 Officials

Task

- Sort
- Tally

Team 3

Box of Sealed Voted Ballots

Team Members

- 1 Board Member
- 2 Officials

Task

- Sort
- Tally

Step-by-Step Procedures

At any time a Board Member cannot determine the voter's intent on a particular ballot, the entire Board will meet to review the ballot and vote to determine the voter's intent, if at all possible.

STEP 1 - Sort

1. Board member will unseal box of ballots, identifying the precinct number and the ballot styles contained in the ballot box.
2. Sort ballots.
 - If more than one ballot style in a precinct, the non-Cary ballots will be placed in a separate stack (Stack #3).
 - First sort will be 2 stacks – 3 stacks if non-Cary ballots in the precinct
 - As a result of the Election Night Returns (to include Absentee by Mail, One-Stop Absentee Early Voting, Provisional, and Transfer Site), the candidates for each contest that received the most votes will be identified. Each candidate will be referred to in this document as “Candidate A” and “Candidate B”.
3. A Board Member reviews each ballot. The Member will state whether there is a vote in Column 1 for Candidate A or Candidate B. Ballots will be placed in one of 3 stacks. (Stack #1, Stack #2, or Stack #3)
 - STACK #1 - If the ballot does contain a vote for Candidate A or Candidate B in Column 1, the ballot is placed in Stack #1. (This ballot will not be tallied)
 - STACK #2 - If the ballot does not contain a vote in Column 1 for Candidate A or Candidate B, the ballot is placed in Stack #2.
 - STACK #3 - If the ballot is a non-Cary ballot, the Board Member will state non-Cary ballot and place the ballot in stack #3. (This ballot will not be tallied)

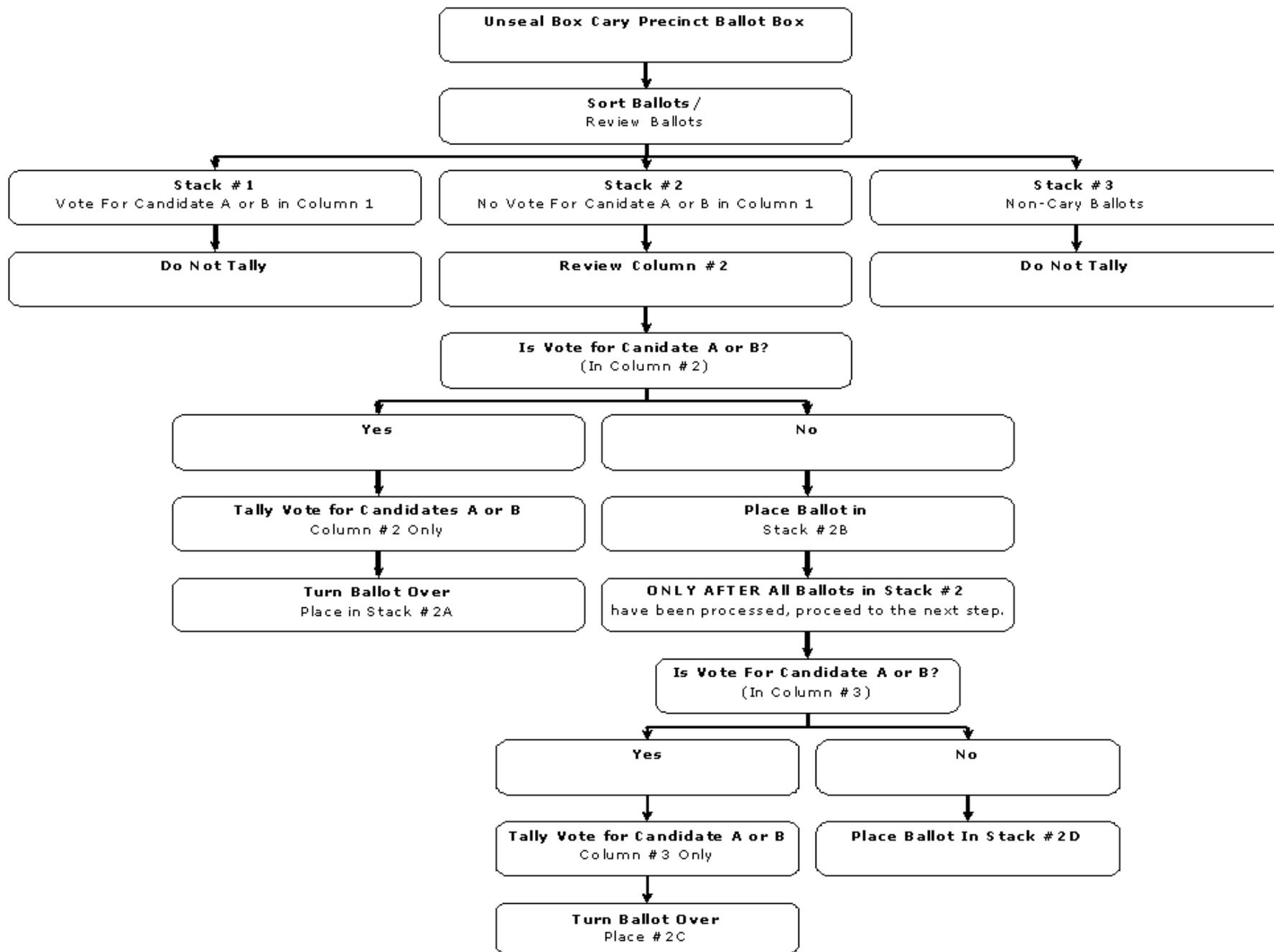
STEP 2 - Column 2 Tally

Once all ballots for one precinct have been sorted, the hand count of Column 2 will begin. (Stack #2)

4. The Board Member will ONLY review Column 2 on each ballot and state if there is a vote for Candidate A or Candidate B. If so, the vote will be tallied. After the ballot is tallied, the ballot will be turned over to signify that the ballot has now been tallied and be placed in Stack #2A.
 - While the Board Member begins to review Column 2, a separate “official” will verify that the ballots sorted into Stack #1 and Stack #3 was properly conducted.
 - Any ballots not properly sorted are brought to the attention of the Board Member and the sort team for placement into the correct stack.
5. If there is no vote in Column 2 for Candidate A or Candidate B, the ballot will be placed in Stack #2B for Column 3 ballots.

STEP 3 - Column 3 Tally

6. After all ballots have been tallied for Column 2, the Board Member will review Column 3 in Stack #2B. The Member will state if there is a vote for Candidate A or Candidate B. If so, the vote will be tallied. The ballot will be turned over and placed in Stack #2C to signify that the ballot has now been tallied.
7. If there is no vote in Column 3 for Candidate A or Candidate B, the ballot will be placed in Stack #2D for ballots with no Candidate A or B choices.
8. Once all votes have been tallied for Candidate A or Candidate B, the hand count totals will be added to the Official Results for that Contest.
9. All ballots from the counted precinct will be returned to the original ballot box and sealed until the next contest needs to be counted, if any.
10. Precinct ballot from the counted precincts will be placed in a separate location to indicate the precinct ballots have been counted.



1.1 A bill for an act

1.2 relating to elections; establishing procedures for home rule charter jurisdictions
1.3 that adopt ranked-choice voting; amending Minnesota Statutes 2006, sections
1.4 205.13, subdivision 2; 206.83; proposing coding for new law in Minnesota
1.5 Statutes, chapter 206; proposing coding for new law as Minnesota Statutes,
1.6 chapter 204E.

1.7 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

1.8 Section 1. **[204E.01] APPLICABILITY.**

1.9 (a) This chapter applies to all elections conducted using ranked-choice voting. All
1.10 other provisions of Minnesota Statutes also apply, to the extent they are not inconsistent
1.11 with this chapter.

1.12 (b) Except as otherwise provided, a jurisdiction that chooses to adopt ranked-choice
1.13 voting pursuant to section 204E.03 must conduct the elections according to the method
1.14 and procedures established by this chapter.

1.15 Sec. 2. **[204E.02] DEFINITIONS.**

1.16 Subdivision 1. **Scope.** The definitions in this section apply to this chapter.

1.17 Subd. 2. **Batch elimination.** "Batch elimination" means a simultaneous defeat of
1.18 multiple continuing candidates that have no mathematical chance of being elected.

1.19 Subd. 3. **Continuing candidate.** "Continuing candidate" means a candidate who
1.20 has been neither elected nor defeated.

1.21 Subd. 4. **Defective ballot.** "Defective ballot" means a ballot in which a first ranking
1.22 is not indicated or if more than one candidate is given a first ranking.

1.23 Subd. 5. **Duplicate ranking.** "Duplicate ranking" occurs when a voter ranks the
1.24 same candidate at multiple rankings.

2.1 Subd. 6. **Exhausted ballot.** "Exhausted ballot" means a ballot that cannot be
2.2 transferred to a lower ranked candidate because the next ranking is blank or there is more
2.3 than one candidate given the next ranking.

2.4 Subd. 7. **Highest continuing ranking.** "Highest continuing ranking" means the
2.5 ranking on a voter's ballot with the lowest numerical value for a continuing candidate.

2.6 Subd. 8. **Overvote.** An "overvote" occurs when a voter ranks more than one
2.7 candidate at the same ranking.

2.8 Subd. 9. **Ranked-choice voting.** "Ranked-choice voting" means an election method
2.9 in which voters rank candidates for an office in order of their preference and the ballots are
2.10 counted in rounds that, in the case of a single-seat election, simulate a series of runoffs
2.11 until one candidate meets the threshold, or until two candidates remain and the candidate
2.12 with the greatest number of votes is declared elected. In the case of multiple-seat elections,
2.13 the series of runoffs are simulated until all seats to be elected have been filled.

2.14 Subd. 10. **Ranked-choice voting tabulation center.** "Ranked-choice voting
2.15 tabulation center" means the place selected for the automatic or manual processing and
2.16 tabulation of ballots.

2.17 Subd. 11. **Ranking.** "Ranking" means the number assigned by a voter to a candidate
2.18 to express the voter's preference for that candidate. Ranking number one is the highest
2.19 ranking. A ranking of lower numerical value indicates a greater preference for a candidate
2.20 than a ranking of higher numerical value.

2.21 Subd. 12. **Round.** "Round" means an instance of the sequence of voting tabulation
2.22 steps established in sections 204E.06 and 204E.07.

2.23 Subd. 13. **Skipped ranking.** "Skipped ranking" occurs when a voter leaves a
2.24 ranking blank and ranks a candidate at a subsequent ranking.

2.25 Subd. 14. **Surplus.** "Surplus" means the total number of votes cast for an elected
2.26 candidate in excess of the threshold.

2.27 Subd. 15. **Surplus fraction of a vote.** "Surplus fraction of a vote" means the surplus
2.28 divided by the total votes cast for the elected candidate, calculated to four decimal places.
2.29 Surplus fraction of a vote = (Surplus)/(Total votes cast for elected candidate).

2.30 Subd. 16. **Threshold.** "Threshold" means the number of votes sufficient for a
2.31 candidate to be elected. In any given election, the threshold equals the total votes counted
2.32 in the first round after removing defective ballots, divided by the sum of one plus the
2.33 number of offices to be filled and adding one to the quotient, disregarding any fractions.
2.34 Threshold = (Total votes cast)/(Seats to be elected + 1) + 1.

2.35 Subd. 17. **Transferable vote.** "Transferable vote" means a vote or a fraction of a
2.36 vote for a candidate who has been either elected or defeated.

3.1 Subd. 18. **Undervote.** An "undervote" occurs when a voter does not rank any
3.2 candidates for an office.

3.3 Sec. 3. **[204E.03] IMPLEMENTATION OF RANKED-CHOICE VOTING.**

3.4 (a) A home rule charter city or county that adopts the use of ranked-choice voting
3.5 in local elections must adopt a charter amendment no later than 30 days before the first
3.6 day for filing affidavits of candidacy for the office for which ranked-choice voting is to be
3.7 used as the method of election.

3.8 (b) The use of ranked-choice voting may be eliminated through repeal of the charter
3.9 amendment no later than 30 days before the first day for filing affidavits of candidacy for
3.10 offices for which ranked-choice voting is used as the method of election.

3.11 (c) The chief election official in the jurisdiction must notify the secretary of state
3.12 and, if applicable, the county auditor within 30 days following adoption or repeal of
3.13 the charter amendment.

3.14 Sec. 4. **[204E.04] BALLOTS.**

3.15 Subdivision 1. **Ballot format.** (a) A ballot must allow a voter to rank at least
3.16 three candidates for each office in order of preference and must also allow the voter to
3.17 add write-in candidates.

3.18 (b) A jurisdiction may use ballots compatible with alphanumeric character
3.19 recognition voting equipment.

3.20 Subd. 2. **Mixed-election method ballots.** If elections are held in which
3.21 ranked-choice voting is used in addition to other methods of voting, the ranked-choice
3.22 voting and non-ranked-choice voting elections must be on the same ballot card if possible,
3.23 with ranked-choice voting and non-ranked-choice voting portions clearly separated on the
3.24 ballot card. A separate ballot card may be used if necessary. A jurisdiction may deviate
3.25 from the standard ballot order of offices to allow separation of ranked-choice voting
3.26 and non-ranked-choice voting elections.

3.27 Subd. 3. **Ballot instructions.** (a) In an election held using optical-scan voting
3.28 technology, the ballot must include instructions to voters appearing substantially as
3.29 follows:

3.30 "INSTRUCTIONS: Mark your first choice in the first column by completely filling
3.31 in the oval next to your choice, as shown in the picture. To indicate a second choice, select
3.32 a different candidate in the second column. To indicate a third choice, select a different
3.33 candidate in the third column.

3.34 1. Rank candidates in order of your preference.

4.1 2. You may rank as few candidates as you wish or as many as is allowed.

4.2 3. Do not skip rankings.

4.3 4. Do not give the same ranking to more than one candidate.

4.4 5. Do not rank the same candidate more than once."

4.5 (b) In an election held using alphanumeric character recognition technology,
4.6 the ballot must contain the instructions as provided in paragraph (a), provided that the
4.7 instructions may be modified where necessary to reflect the appearance and layout of
4.8 the ballot.

4.9 **Sec. 5. [204E.05] RANKED-CHOICE VOTING TABULATION CENTER.**

4.10 The chief election official in the jurisdiction shall designate one location to serve as
4.11 the ranked-choice voting tabulation center. The center must be accessible to the public for
4.12 the purpose of observing the vote tabulation. Tabulation of votes must be conducted as
4.13 described in sections 204E.06 and 204E.07.

4.14 **Sec. 6. [204E.06] TABULATION OF VOTES; SINGLE-SEAT ELECTIONS.**

4.15 Subdivision 1. **Applicability.** This section applies to a ranked-choice voting election
4.16 in which one seat in office is to be filled from a single set of candidates on the ballot. The
4.17 method of tabulating ranked-choice votes for single-seat elections as described in this
4.18 section must be known as the "single-seat single transferable vote" method of tabulation.

4.19 Subd. 2. **Precinct tabulation.** When the hours for voting have ended and all voting
4.20 has concluded, the election judges in each precinct shall record and publicly declare the
4.21 number of votes at each ranking on the ballot. The election judges must then securely
4.22 transfer all electronic voting data, if applicable, from the precinct to the ranked-choice
4.23 voting tabulation center designated pursuant to section 204E.05.

4.24 Subd. 3. **Ranked-choice voting tabulation center.** (a) Tabulation of votes at the
4.25 ranked-choice voting tabulation center must proceed in rounds. First the threshold must
4.26 be calculated and publicly declared. After calculation of the threshold, each round must
4.27 proceed sequentially as follows:

4.28 (1) The number of votes cast for each candidate, as indicated by the highest
4.29 continuing ranking on each ballot, must be counted. If a candidate's vote total is equal to or
4.30 greater than the threshold, the tabulation is complete. If no candidate's vote total is equal
4.31 to or greater than the threshold, the tabulation must continue as described in clause (2).

4.32 (2) Candidates appearing on the ballot who do not receive any votes are defeated
4.33 immediately, before any transfers.

5.1 (3) All candidates are defeated whose vote total, plus all potentially transferable
5.2 votes from candidates with fewer votes, is less than the vote total of the candidate with the
5.3 next higher number of votes, such that it is mathematically impossible for that candidate
5.4 to be elected. All candidates for whom it is mathematically impossible to be elected
5.5 must be considered defeated simultaneously.

5.6 (4) The candidate with the fewest votes is defeated. Votes for the defeated candidate
5.7 must be transferred to each ballot's next-ranked continuing candidate. Ties between
5.8 candidates with the fewest votes must immediately and publicly be decided by lot by the
5.9 chief election administrator at the tabulation center. The candidate chosen by lot must
5.10 be defeated. The result of the tie resolution must be recorded and reused in the event of
5.11 a recount.

5.12 (5) The procedures in clauses (1) to (4) must be repeated until one candidate reaches
5.13 the threshold, or until only two continuing candidates remain. If only two candidates
5.14 remain, the candidate with the most votes must be elected. In the case of a tie between two
5.15 continuing candidates, the tie must be decided by lot as provided in section 204C.34. The
5.16 result of the tie resolution must be recorded and reused in the event of a recount.

5.17 (b) If any ballot cannot be advanced because no further continuing candidates
5.18 are ranked on that ballot, or because a voter has skipped a ranking or ranked the same
5.19 candidate in two or more rankings, that ballot must immediately be declared "exhausted."
5.20 Any ballot that has been declared an undervote, overvote, or exhausted must not count
5.21 towards any candidate in that round or in subsequent rounds.

5.22 **Sec. 7. [204E.07] TABULATION OF VOTES; MULTIPLE-SEAT ELECTIONS.**

5.23 Subdivision 1. **Applicability.** This section applies to a ranked-choice voting election
5.24 in which more than one seat in office is to be filled from a single set of candidates on
5.25 the ballot. The method of tabulating ranked-choice votes for multiple-seat elections as
5.26 described in this section must be known as the "multiple-seat single transferable vote"
5.27 method of tabulation.

5.28 Subd. 2. **Precinct tabulation.** When the hours for voting have ended and all voting
5.29 has concluded, the election judges in each precinct must record and publicly declare the
5.30 number of votes at each ranking on the ballot. The election judges must then securely
5.31 transfer all electronic voting data, if applicable, from the precinct to the ranked-choice
5.32 voting tabulation center designated pursuant to section 204E.05.

5.33 Subd. 3. **Ranked-choice voting tabulation center.** (a) Tabulation of votes at the
5.34 ranked-choice voting tabulation center must proceed in rounds. First the threshold must

S.F. No. 3247, as introduced - 2007-2008th Legislative Session (2007-2008)

6.1 be calculated and publicly declared. After calculation of the threshold, each round must
6.2 proceed sequentially as follows:

6.3 (1) The number of votes cast for each candidate, as indicated by the highest ranked
6.4 continuing candidate on each ballot, must be counted. If the number of candidates whose
6.5 vote totals equal or exceed the threshold is equal to the number of seats to be filled, the
6.6 tabulation is complete.

6.7 (2) Surplus votes for any candidates whose vote total is equal to or greater than
6.8 the threshold must be calculated.

6.9 (3) Candidates appearing on the ballot who do not receive any votes are defeated
6.10 immediately, before any transfers.

6.11 (4) After any surplus votes are calculated but not yet transferred, a candidate is
6.12 defeated whose vote total, plus all potentially transferable votes from elected candidates
6.13 and candidates with fewer votes, is less than the vote total of the candidate with the next
6.14 higher number of votes, such that it is mathematically impossible for that candidate to be
6.15 elected. All candidates for whom it is mathematically impossible to be elected must be
6.16 defeated simultaneously.

6.17 (5) The surplus fraction of each vote cast for an elected candidate must be transferred
6.18 to the next continuing candidate on that ballot. If two or more candidates have vote totals
6.19 that equal or exceed the threshold, the surplus fraction of the votes cast for the elected
6.20 candidate with the most votes must be transferred to the next continuing candidate on
6.21 each ballot. The surplus fraction of votes cast for other elected candidates, in order of
6.22 vote totals, must then be transferred to the next continuing candidate on each ballot. A
6.23 tie between two or more candidates must immediately and publicly be resolved by lot by
6.24 the chief election administrator at the tabulation center. The candidate chosen by lot
6.25 must be defeated. The result of the tie resolution must be recorded and reused in the
6.26 event of a recount.

6.27 (6) If there are no transferable surplus votes, the candidate with the fewest votes
6.28 is defeated. Votes for the defeated candidate are transferred to each ballot's next-ranked
6.29 continuing candidate. Ties between candidates with the fewest votes must be decided by
6.30 lot, and the candidate chosen by lot must be defeated. The result of the tie resolution must
6.31 be recorded and reused in the event of a recount.

6.32 (7) The procedures in clauses (1) to (6) must be repeated until the number of
6.33 candidates whose vote totals equal or exceed the threshold is equal to the number of seats
6.34 to be filled, or until the number of continuing candidates is equal to the number of offices
6.35 yet to be elected. If the number of continuing candidates is equal to the number of offices
6.36 yet to be elected, the remaining continuing candidate must be declared elected. In the case

7.1 of a tie between two continuing candidates, the tie must be decided by lot as provided in
7.2 section 204C.34, and the candidate chosen by lot must be defeated. The result of the tie
7.3 resolution must be recorded and repeated in the event of a recount.

7.4 (b) If any ballot cannot be advanced because no further candidates are ranked on that
7.5 ballot, that ballot must immediately be declared "exhausted." Any ballot that has been
7.6 declared an undervote, overvote, or exhausted must remain so and shall not count towards
7.7 any candidate in that round or in subsequent rounds.

7.8 Subd. 4. **Alternate counting methods.** Notwithstanding subdivision 1, a
7.9 jurisdiction may use a different ranked-choice counting method for multiple-winner
7.10 elections upon application to and approval of the secretary of state. The secretary of state
7.11 must adopt rules governing the approval of alternate counting method applications.

7.12 **Sec. 8. [204E.08] WRITE-IN PROCEDURES.**

7.13 In the event that votes cast for the write-in category are not eliminated as provided in
7.14 section 204E.06, subdivision 2, or 204E.07, subdivision 3, each ballot must be examined
7.15 by the elections administrator and the results must be entered into the ranked-choice
7.16 voting tabulation software.

7.17 **Sec. 9. [204E.09] REPORTING RESULTS.**

7.18 (a) Each precinct must print a precinct summary statement, which must include the
7.19 number of votes in each ranking for each candidate.

7.20 (b) The ranked-choice voting tabulation center must print a summary statement,
7.21 which must include the following information: total votes cast; number of undervotes;
7.22 number of defective and spoiled ballots; threshold calculation; total first choice rankings
7.23 for all candidates; round-by-round tabulation results, including simultaneous batch
7.24 eliminations, surplus transfers, and defeated candidate transfers; and exhausted ballots
7.25 at each round.

7.26 (c) The election abstract must include the information required in the ranked-choice
7.27 voting tabulation center summary statement, with the addition of the number of registered
7.28 voters by precinct, the number of same day voter registrations, and the number of absentee
7.29 voters.

7.30 **Sec. 10. [204E.12] RECOUNTS.**

7.31 (a) A candidate defeated in the final round of tabulation may request a recount
7.32 as provided in section 204C.36.

8.1 (b) A candidate defeated in an earlier round of tabulation may request a recount at
8.2 the candidate's own expense. The candidate is responsible for all expenses associated
8.3 with the recount regardless of the vote difference between the candidates in the round in
8.4 which the requesting candidate was defeated.

8.5 Sec. 11. **[204E.13] RULES.**

8.6 The secretary of state may adopt rules necessary to implement the requirements
8.7 and procedures established by this chapter.

8.8 Sec. 12. Minnesota Statutes 2006, section 205.13, subdivision 2, is amended to read:

8.9 Subd. 2. **Notice of filing dates.** At least two weeks before the first day to file
8.10 affidavits of candidacy, the municipal clerk shall publish a notice stating the first and last
8.11 dates on which affidavits of candidacy may be filed in the clerk's office and the closing
8.12 time for filing on the last day for filing. The clerk shall post a similar notice at least
8.13 ten days before the first day to file affidavits of candidacy. The notice must indicate the
8.14 method of election to be used for the offices on the ballot. If ranked-choice voting is to be
8.15 used for a multiple-winner election and the method of tabulating votes is different from
8.16 that described in section 204E.07, the notice must also indicate the date on which the
8.17 secretary of state approved the alternate tabulation method and a location at which a full
8.18 copy of the tabulation procedures to be used may be inspected.

8.19 Sec. 13. **[206.802] ELECTRONIC VOTING SYSTEMS; PURCHASING.**

8.20 Any new voting equipment purchased for use in Minnesota for the purpose of
8.21 replacing a voting system must have the ability to:

8.22 (1) capture and store ballot data;

8.23 (2) keep data anonymous;

8.24 (3) accept ranked or cumulative voting data under a variety of tabulation rules;

8.25 (4) be programmable to follow all other specifications of the ranked-choice voting
8.26 system as provided in chapter 204E;

8.27 (5) provide a minimum of three rankings for ranked-choice voting elections;

8.28 (6) notify voters of the following errors: overvotes, skipped rankings, and duplicate
8.29 rankings in a ranked-choice voting election; and

8.30 (7) be programmable to print a zero tape indicating all rankings for all candidates in
8.31 a ranked-choice voting election.

9.1 EFFECTIVE DATE. This section is effective upon certification by the secretary
9.2 of state that equipment meeting the standards required by this section is available for
9.3 purchase and implementation.

9.4 Sec. 14. Minnesota Statutes 2006, section 206.83, is amended to read:

9.5 **206.83 TESTING OF VOTING SYSTEMS.**

9.6 (a) Within 14 days before election day, the official in charge of elections shall
9.7 have the voting system tested to ascertain that the system will correctly mark ballots
9.8 using all methods supported by the system, including ranked-choice voting if applicable,
9.9 and through assistive technology, and count the votes cast for all candidates and on all
9.10 questions. Public notice of the time and place of the test must be given at least two days
9.11 in advance by publication once in official newspapers. The test must be observed by at
9.12 least two election judges, who are not of the same major political party, and must be open
9.13 to representatives of the political parties, candidates, the press, and the public. The test
9.14 must be conducted by (1) processing a preaudited group of ballots punched or marked to
9.15 record a predetermined number of valid votes for each candidate and on each question,
9.16 and must include for each office one or more ballot cards which have votes in excess of
9.17 the number allowed by law in order to test the ability of the voting system tabulator and
9.18 electronic ballot marker to reject those votes; and (2) processing an additional test deck
9.19 of ballots marked using the electronic ballot marker for the precinct, including ballots
9.20 marked using the electronic ballot display, audio ballot reader, and any assistive voting
9.21 technology used with the electronic ballot marker. If an election is to be conducted using
9.22 ranked-choice voting, the equipment must also be tested to ensure that each ranking
9.23 for each candidate is recorded properly.

9.24 (b) If any error is detected, the cause must be ascertained and corrected and an
9.25 errorless count must be made before the voting system may be used in the election.

9.26 (c) After the completion of the test, the programs used and ballot cards must be
9.27 sealed, retained, and disposed of as provided for paper ballots.

9.28 Sec. 15. **[206.892] POSTELECTION AUDIT OF VOTING SYSTEMS;**
9.29 **RANKED-CHOICE VOTING ELECTIONS.**

9.30 Subdivision 1. Definition. For purposes of this section, "postelection audit official"
9.31 means the election administration official who is responsible for the conduct of elections
9.32 in the jurisdiction being audited under this section.

9.33 Subd. 2. Selection for audit; notice. Thirty days before an election that will
9.34 be conducted using the ranked-choice voting method pursuant to chapter 204E, the

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10.1 postelection audit official must set the date, time, and place for postelection audit. Within
10.2 four days after the election, the postelection audit official must select the precincts to be
10.3 audited. Jurisdictions with fewer than 50,000 registered voters must select at least two
10.4 precincts for postelection audit. Jurisdictions with between 50,000 and 100,000 registered
10.5 voters must select at least three precincts to be audited. Jurisdictions with over 100,000
10.6 registered voters must select at least four precincts to be audited. The precincts must be
10.7 selected by lot at a public meeting. At least one precinct selected in each county must have
10.8 had more than 150 votes cast at the election. The postelection audit official must notify the
10.9 secretary of state of the precincts that have been chosen for audit and the time and place
10.10 the postelection audit for that jurisdiction will be conducted, as soon as the decisions are
10.11 made. The secretary of state must post this information on the secretary of state's Web site.

10.12 Subd. 3. **Scope and conduct of audit.** The postelection audit must be conducted
10.13 of the votes cast for at least one single-seat ranked-choice voting election, if applicable,
10.14 and at least one multiple-seat ranked-choice voting election, if applicable. The audit must
10.15 be conducted of elections decided most closely in the final round, by percentage. The
10.16 postelection audit official may conduct a postelection audit of the votes cast for additional
10.17 offices. The postelection audit must be conducted in public at the location where the voted
10.18 ballots have been securely stored after the general election or at another location chosen
10.19 by the postelection audit official. The postelection audit official for each precinct selected
10.20 must conduct the postelection audit and may be assisted by election judges designated
10.21 by the postelection audit official for this purpose. The party balance requirement of
10.22 section 204B.19 applies to election judges designated for the audit. The postelection audit
10.23 must consist of a manual count of the ballots used in the precincts selected and must be
10.24 performed in the manner provided by section 204C.21. To the extent practicable, the
10.25 postelection audit must be conducted in the manner provided for recounts under section
10.26 204C.361. The postelection audit must also include testing of the accumulation software,
10.27 using stored electronic data for those precincts that are not audited by manual count. The
10.28 audit must be completed no later than two days before the meeting of the canvassing
10.29 board to certify the results of the election.

10.30 Subd. 4. **Standard of acceptable performance by voting system.** A comparison
10.31 of the results compiled by the voting system with the postelection audit described in this
10.32 section must show that the results of the electronic voting system differed by no more than
10.33 one-half of one percent from the manual count of the offices audited. Valid votes that have
10.34 been marked by the voter outside the vote targets or using a manual marking device that
10.35 cannot be read by the voting system must not be included in making the determination
10.36 whether the voting system has met the standard of acceptable performance for any precinct.

11.1 Subd. 5. **Additional review.** (a) If the postelection audit in one of the audited
11.2 precincts reveals a difference greater than one-half of one percent or greater than two votes
11.3 in a precinct where 400 or fewer voters cast ballots, the postelection audit official must,
11.4 within two days, conduct an additional audit of the races indicated in subdivision 3 in at
11.5 least three precincts in the same jurisdiction where the discrepancy was discovered. The
11.6 postelection audit official must immediately publicly select by lot the additional precincts
11.7 to be audited. The postelection audit official must complete the additional audit within
11.8 two days after the precincts are selected and report the results immediately to the county
11.9 auditor. If the second audit in any of the reviewed precincts also indicates a difference in
11.10 the vote totals compiled by the voting system that is greater than one-half of one percent
11.11 from the result indicated by the postelection audit or greater than two votes in a precinct
11.12 where 400 or fewer voters cast ballots, the postelection audit official must conduct an audit
11.13 of the ballots from all the remaining precincts in the jurisdiction for the races indicated
11.14 in subdivision 3. This audit must be completed and the results must be reported to the
11.15 secretary of state within one week of completing the second audit.

11.16 (b) If the results from the jurisdictionwide audits clearly indicate that an error in vote
11.17 counting has occurred, the secretary of state must notify the postelection audit official that
11.18 they must conduct a manual recount of all the ballots in the jurisdiction for the affected
11.19 office using the procedure established in section 204C.35. The recount must be completed
11.20 and the results reported to the appropriate canvassing board within two weeks of receiving
11.21 notice from the secretary of state.

11.22 Subd. 6. **Report of results.** Upon completion of the postelection audit, the
11.23 postelection audit official must immediately report the results to the county auditor. The
11.24 postelection audit official must then immediately submit the results of the postelection
11.25 audit electronically or in writing to the secretary of state not later than two days before the
11.26 canvassing board meets to canvass the election.

11.27 Subd. 7. **Update of vote totals.** If the postelection audit under this section results in
11.28 a change in the number of votes counted for any candidate, the revised vote totals must
11.29 be incorporated in the official result from those precincts.

11.30 Subd. 8. **Effect on voting systems.** If a voting system is found to have failed
11.31 to record votes accurately and in the manner provided by the Minnesota election law,
11.32 the voting system may not be used at another election until it has been examined and
11.33 recertified by the secretary of state. If the voting system failure is attributable to either its
11.34 design or to actions of the vendor, the vendor must forfeit the vendor bond required by
11.35 section 206.57 and the performance bond required by section 206.66.

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12.1 Subd. 9. **Costs of audit.** The costs of the postelection audit required by this section
12.2 must be allocated as follows:

12.3 (1) the governing body responsible for each precinct selected for an audit must pay
12.4 the costs incurred for the audit conducted under subdivision 2 or 5, paragraph (a);

12.5 (2) the vendor of the voting system must pay any costs incurred by the secretary
12.6 of state to examine and recertify the voting system; and

12.7 (3) the secretary of state must reimburse local units of government for the costs of
12.8 any recount required under subdivision 5, paragraph (b).

12.9 Subd. 10. **Time for filing election contest.** The appropriate canvass is not
12.10 completed and the time for notice of a contest of election does not begin to run until all
12.11 audits under this section have been completed.

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State of Minnesota
HOUSE OF REPRESENTATIVES

EIGHTY-FIFTH
SESSION

HOUSE FILE No. 3006

February 14, 2008

Authored by Simon, Hilty and Masin

The bill was read for the first time and referred to the Committee on Governmental Operations, Reform, Technology and Elections

1.1 A bill for an act
1.2 relating to elections; establishing procedures for home rule charter jurisdictions
1.3 that adopt ranked-choice voting; amending Minnesota Statutes 2006, sections
1.4 205.13, subdivision 2; 206.83; proposing coding for new law in Minnesota
1.5 Statutes, chapter 206; proposing coding for new law as Minnesota Statutes,
1.6 chapter 204E.

1.7 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

1.8 Section 1. **[204E.01] APPLICABILITY.**

1.9 (a) This chapter applies to all elections conducted using ranked-choice voting. All
1.10 other provisions of Minnesota Statutes also apply, to the extent they are not inconsistent
1.11 with this chapter.

1.12 (b) Except as otherwise provided, a jurisdiction that chooses to adopt ranked-choice
1.13 voting pursuant to section 204E.03 must conduct the elections according to the method
1.14 and procedures established by this chapter.

1.15 Sec. 2. **[204E.02] DEFINITIONS.**

1.16 Subdivision 1. **Scope.** The definitions in this section apply to this chapter.

1.17 Subd. 2. **Batch elimination.** "Batch elimination" means a simultaneous defeat of
1.18 multiple continuing candidates that have no mathematical chance of being elected.

1.19 Subd. 3. **Continuing candidate.** "Continuing candidate" means a candidate who
1.20 has been neither elected nor defeated.

1.21 Subd. 4. **Defective ballot.** "Defective ballot" means a ballot in which a first ranking
1.22 is not indicated or if more than one candidate is given a first ranking.

1.23 Subd. 5. **Duplicate ranking.** "Duplicate ranking" occurs when a voter ranks the
1.24 same candidate at multiple rankings.

2.1 Subd. 6. **Exhausted ballot.** "Exhausted ballot" means a ballot that cannot be
2.2 transferred to a lower ranked candidate because the next ranking is blank or there is more
2.3 than one candidate given the next ranking.

2.4 Subd. 7. **Highest continuing ranking.** "Highest continuing ranking" means the
2.5 ranking on a voter's ballot with the lowest numerical value for a continuing candidate.

2.6 Subd. 8. **Overvote.** An "overvote" occurs when a voter ranks more than one
2.7 candidate at the same ranking.

2.8 Subd. 9. **Ranked-choice voting.** "Ranked-choice voting" means an election method
2.9 in which voters rank candidates for an office in order of their preference and the ballots are
2.10 counted in rounds that, in the case of a single-seat election, simulate a series of runoffs
2.11 until one candidate meets the threshold, or until two candidates remain and the candidate
2.12 with the greatest number of votes is declared elected. In the case of multiple-seat elections,
2.13 the series of runoffs are simulated until all seats to be elected have been filled.

2.14 Subd. 10. **Ranked-choice voting tabulation center.** "Ranked-choice voting
2.15 tabulation center" means the place selected for the automatic or manual processing and
2.16 tabulation of ballots.

2.17 Subd. 11. **Ranking.** "Ranking" means the number assigned by a voter to a candidate
2.18 to express the voter's preference for that candidate. Ranking number one is the highest
2.19 ranking. A ranking of lower numerical value indicates a greater preference for a candidate
2.20 than a ranking of higher numerical value.

2.21 Subd. 12. **Round.** "Round" means an instance of the sequence of voting tabulation
2.22 steps established in sections 204E.06 and 204E.07.

2.23 Subd. 13. **Skipped ranking.** "Skipped ranking" occurs when a voter leaves a
2.24 ranking blank and ranks a candidate at a subsequent ranking.

2.25 Subd. 14. **Surplus.** "Surplus" means the total number of votes cast for an elected
2.26 candidate in excess of the threshold.

2.27 Subd. 15. **Surplus fraction of a vote.** "Surplus fraction of a vote" means the surplus
2.28 divided by the total votes cast for the elected candidate, calculated to four decimal places.
2.29 Surplus fraction of a vote = (Surplus)/(Total votes cast for elected candidate).

2.30 Subd. 16. **Threshold.** "Threshold" means the number of votes sufficient for a
2.31 candidate to be elected. In any given election, the threshold equals the total votes counted
2.32 in the first round after removing defective ballots, divided by the sum of one plus the
2.33 number of offices to be filled and adding one to the quotient, disregarding any fractions.
2.34 Threshold = (Total votes cast)/(Seats to be elected + 1) + 1.

2.35 Subd. 17. **Transferable vote.** "Transferable vote" means a vote or a fraction of a
2.36 vote for a candidate who has been either elected or defeated.

3.1 Subd. 18. **Undervote.** An "undervote" occurs when a voter does not rank any
3.2 candidates for an office.

3.3 **Sec. 3. [204E.03] IMPLEMENTATION OF RANKED-CHOICE VOTING.**

3.4 (a) A home rule charter city or county that adopts the use of ranked-choice voting
3.5 in local elections must adopt a charter amendment no later than 30 days before the first
3.6 day for filing affidavits of candidacy for the office for which ranked-choice voting is to be
3.7 used as the method of election.

3.8 (b) The use of ranked-choice voting may be eliminated through repeal of the charter
3.9 amendment no later than 30 days before the first day for filing affidavits of candidacy for
3.10 offices for which ranked-choice voting is used as the method of election.

3.11 (c) The chief election official in the jurisdiction must notify the secretary of state
3.12 and, if applicable, the county auditor within 30 days following adoption or repeal of
3.13 the charter amendment.

3.14 **Sec. 4. [204E.04] BALLOTS.**

3.15 Subdivision 1. **Ballot format.** (a) A ballot must allow a voter to rank at least
3.16 three candidates for each office in order of preference and must also allow the voter to
3.17 add write-in candidates.

3.18 (b) A jurisdiction may use ballots compatible with alphanumeric character
3.19 recognition voting equipment.

3.20 Subd. 2. **Mixed-election method ballots.** If elections are held in which
3.21 ranked-choice voting is used in addition to other methods of voting, the ranked-choice
3.22 voting and non-ranked-choice voting elections must be on the same ballot card if possible,
3.23 with ranked-choice voting and non-ranked-choice voting portions clearly separated on the
3.24 ballot card. A separate ballot card may be used if necessary. A jurisdiction may deviate
3.25 from the standard ballot order of offices to allow separation of ranked-choice voting
3.26 and non-ranked-choice voting elections.

3.27 Subd. 3. **Ballot instructions.** (a) In an election held using optical-scan voting
3.28 technology, the ballot must include instructions to voters appearing substantially as
3.29 follows:

3.30 "INSTRUCTIONS: Mark your first choice in the first column by completely filling
3.31 in the oval next to your choice, as shown in the picture. To indicate a second choice, select
3.32 a different candidate in the second column. To indicate a third choice, select a different
3.33 candidate in the third column.

3.34 1. Rank candidates in order of your preference.

4.1 2. You may rank as few candidates as you wish or as many as is allowed.

4.2 3. Do not skip rankings.

4.3 4. Do not give the same ranking to more than one candidate.

4.4 5. Do not rank the same candidate more than once."

4.5 (b) In an election held using alphanumeric character recognition technology,
4.6 the ballot must contain the instructions as provided in paragraph (a), provided that the
4.7 instructions may be modified where necessary to reflect the appearance and layout of
4.8 the ballot.

4.9 **Sec. 5. [204E.05] RANKED-CHOICE VOTING TABULATION CENTER.**

4.10 The chief election official in the jurisdiction shall designate one location to serve as
4.11 the ranked-choice voting tabulation center. The center must be accessible to the public for
4.12 the purpose of observing the vote tabulation. Tabulation of votes must be conducted as
4.13 described in sections 204E.06 and 204E.07.

4.14 **Sec. 6. [204E.06] TABULATION OF VOTES; SINGLE-SEAT ELECTIONS.**

4.15 Subdivision 1. **Applicability.** This section applies to a ranked-choice voting election
4.16 in which one seat in office is to be filled from a single set of candidates on the ballot. The
4.17 method of tabulating ranked-choice votes for single-seat elections as described in this
4.18 section must be known as the "single-seat single transferable vote" method of tabulation.

4.19 Subd. 2. **Precinct tabulation.** When the hours for voting have ended and all voting
4.20 has concluded, the election judges in each precinct shall record and publicly declare the
4.21 number of votes at each ranking on the ballot. The election judges must then securely
4.22 transfer all electronic voting data, if applicable, from the precinct to the ranked-choice
4.23 voting tabulation center designated pursuant to section 204E.05.

4.24 Subd. 3. **Ranked-choice voting tabulation center.** (a) Tabulation of votes at the
4.25 ranked-choice voting tabulation center must proceed in rounds. First the threshold must
4.26 be calculated and publicly declared. After calculation of the threshold, each round must
4.27 proceed sequentially as follows:

4.28 (1) The number of votes cast for each candidate, as indicated by the highest
4.29 continuing ranking on each ballot, must be counted. If a candidate's vote total is equal to or
4.30 greater than the threshold, the tabulation is complete. If no candidate's vote total is equal
4.31 to or greater than the threshold, the tabulation must continue as described in clause (2).

4.32 (2) Candidates appearing on the ballot who do not receive any votes are defeated
4.33 immediately, before any transfers.

5.1 (3) All candidates are defeated whose vote total, plus all potentially transferable
 5.2 votes from candidates with fewer votes, is less than the vote total of the candidate with the
 5.3 next higher number of votes, such that it is mathematically impossible for that candidate
 5.4 to be elected. All candidates for whom it is mathematically impossible to be elected
 5.5 must be considered defeated simultaneously.

5.6 (4) The candidate with the fewest votes is defeated. Votes for the defeated candidate
 5.7 must be transferred to each ballot's next-ranked continuing candidate. Ties between
 5.8 candidates with the fewest votes must immediately and publicly be decided by lot by the
 5.9 chief election administrator at the tabulation center. The candidate chosen by lot must
 5.10 be defeated. The result of the tie resolution must be recorded and reused in the event of
 5.11 a recount.

5.12 (5) The procedures in clauses (1) to (4) must be repeated until one candidate reaches
 5.13 the threshold, or until only two continuing candidates remain. If only two candidates
 5.14 remain, the candidate with the most votes must be elected. In the case of a tie between two
 5.15 continuing candidates, the tie must be decided by lot as provided in section 204C.34. The
 5.16 result of the tie resolution must be recorded and reused in the event of a recount.

5.17 (b) If any ballot cannot be advanced because no further continuing candidates
 5.18 are ranked on that ballot, or because a voter has skipped a ranking or ranked the same
 5.19 candidate in two or more rankings, that ballot must immediately be declared "exhausted."
 5.20 Any ballot that has been declared an undervote, overvote, or exhausted must not count
 5.21 towards any candidate in that round or in subsequent rounds.

5.22 **Sec. 7. [204E.07] TABULATION OF VOTES; MULTIPLE-SEAT ELECTIONS.**

5.23 Subdivision 1. **Applicability.** This section applies to a ranked-choice voting election
 5.24 in which more than one seat in office is to be filled from a single set of candidates on
 5.25 the ballot. The method of tabulating ranked-choice votes for multiple-seat elections as
 5.26 described in this section must be known as the "multiple-seat single transferable vote"
 5.27 method of tabulation.

5.28 Subd. 2. **Precinct tabulation.** When the hours for voting have ended and all voting
 5.29 has concluded, the election judges in each precinct must record and publicly declare the
 5.30 number of votes at each ranking on the ballot. The election judges must then securely
 5.31 transfer all electronic voting data, if applicable, from the precinct to the ranked-choice
 5.32 voting tabulation center designated pursuant to section 204E.05.

5.33 Subd. 3. **Ranked-choice voting tabulation center.** (a) Tabulation of votes at the
 5.34 ranked-choice voting tabulation center must proceed in rounds. First the threshold must

6.1 be calculated and publicly declared. After calculation of the threshold, each round must
6.2 proceed sequentially as follows:

6.3 (1) The number of votes cast for each candidate, as indicated by the highest ranked
6.4 continuing candidate on each ballot, must be counted. If the number of candidates whose
6.5 vote totals equal or exceed the threshold is equal to the number of seats to be filled, the
6.6 tabulation is complete.

6.7 (2) Surplus votes for any candidates whose vote total is equal to or greater than
6.8 the threshold must be calculated.

6.9 (3) Candidates appearing on the ballot who do not receive any votes are defeated
6.10 immediately, before any transfers.

6.11 (4) After any surplus votes are calculated but not yet transferred, a candidate is
6.12 defeated whose vote total, plus all potentially transferable votes from elected candidates
6.13 and candidates with fewer votes, is less than the vote total of the candidate with the next
6.14 higher number of votes, such that it is mathematically impossible for that candidate to be
6.15 elected. All candidates for whom it is mathematically impossible to be elected must be
6.16 defeated simultaneously.

6.17 (5) The surplus fraction of each vote cast for an elected candidate must be transferred
6.18 to the next continuing candidate on that ballot. If two or more candidates have vote totals
6.19 that equal or exceed the threshold, the surplus fraction of the votes cast for the elected
6.20 candidate with the most votes must be transferred to the next continuing candidate on
6.21 each ballot. The surplus fraction of votes cast for other elected candidates, in order of
6.22 vote totals, must then be transferred to the next continuing candidate on each ballot. A
6.23 tie between two or more candidates must immediately and publicly be resolved by lot by
6.24 the chief election administrator at the tabulation center. The candidate chosen by lot
6.25 must be defeated. The result of the tie resolution must be recorded and reused in the
6.26 event of a recount.

6.27 (6) If there are no transferable surplus votes, the candidate with the fewest votes
6.28 is defeated. Votes for the defeated candidate are transferred to each ballot's next-ranked
6.29 continuing candidate. Ties between candidates with the fewest votes must be decided by
6.30 lot, and the candidate chosen by lot must be defeated. The result of the tie resolution must
6.31 be recorded and reused in the event of a recount.

6.32 (7) The procedures in clauses (1) to (6) must be repeated until the number of
6.33 candidates whose vote totals equal or exceed the threshold is equal to the number of seats
6.34 to be filled, or until the number of continuing candidates is equal to the number of offices
6.35 yet to be elected. If the number of continuing candidates is equal to the number of offices
6.36 yet to be elected, the remaining continuing candidate must be declared elected. In the case

7.1 of a tie between two continuing candidates, the tie must be decided by lot as provided in
7.2 section 204C.34, and the candidate chosen by lot must be defeated. The result of the tie
7.3 resolution must be recorded and repeated in the event of a recount.

7.4 (b) If any ballot cannot be advanced because no further candidates are ranked on that
7.5 ballot, that ballot must immediately be declared "exhausted." Any ballot that has been
7.6 declared an undervote, overvote, or exhausted must remain so and shall not count towards
7.7 any candidate in that round or in subsequent rounds.

7.8 Subd. 4. **Alternate counting methods.** Notwithstanding subdivision 1, a
7.9 jurisdiction may use a different ranked-choice counting method for multiple-winner
7.10 elections upon application to and approval of the secretary of state. The secretary of state
7.11 must adopt rules governing the approval of alternate counting method applications.

7.12 **Sec. 8. [204E.08] WRITE-IN PROCEDURES.**

7.13 In the event that votes cast for the write-in category are not eliminated as provided in
7.14 section 204E.06, subdivision 2, or 204E.07, subdivision 3, each ballot must be examined
7.15 by the elections administrator and the results must be entered into the ranked-choice
7.16 voting tabulation software.

7.17 **Sec. 9. [204E.09] REPORTING RESULTS.**

7.18 (a) Each precinct must print a precinct summary statement, which must include the
7.19 number of votes in each ranking for each candidate.

7.20 (b) The ranked-choice voting tabulation center must print a summary statement,
7.21 which must include the following information: total votes cast; number of undervotes;
7.22 number of defective and spoiled ballots; threshold calculation; total first choice rankings
7.23 for all candidates; round-by-round tabulation results, including simultaneous batch
7.24 eliminations, surplus transfers, and defeated candidate transfers; and exhausted ballots
7.25 at each round.

7.26 (c) The election abstract must include the information required in the ranked-choice
7.27 voting tabulation center summary statement, with the addition of the number of registered
7.28 voters by precinct, the number of same day voter registrations, and the number of absentee
7.29 voters.

7.30 **Sec. 10. [204E.12] RECOUNTS.**

7.31 (a) A candidate defeated in the final round of tabulation may request a recount
7.32 as provided in section 204C.36.

8.1 (b) A candidate defeated in an earlier round of tabulation may request a recount at
8.2 the candidate's own expense. The candidate is responsible for all expenses associated
8.3 with the recount regardless of the vote difference between the candidates in the round in
8.4 which the requesting candidate was defeated.

8.5 Sec. 11. **[204E.13] RULES.**

8.6 The secretary of state may adopt rules necessary to implement the requirements
8.7 and procedures established by this chapter.

8.8 Sec. 12. Minnesota Statutes 2006, section 205.13, subdivision 2, is amended to read:

8.9 Subd. 2. **Notice of filing dates.** At least two weeks before the first day to file
8.10 affidavits of candidacy, the municipal clerk shall publish a notice stating the first and last
8.11 dates on which affidavits of candidacy may be filed in the clerk's office and the closing
8.12 time for filing on the last day for filing. The clerk shall post a similar notice at least
8.13 ten days before the first day to file affidavits of candidacy. The notice must indicate the
8.14 method of election to be used for the offices on the ballot. If ranked-choice voting is to be
8.15 used for a multiple-winner election and the method of tabulating votes is different from
8.16 that described in section 204E.07, the notice must also indicate the date on which the
8.17 secretary of state approved the alternate tabulation method and a location at which a full
8.18 copy of the tabulation procedures to be used may be inspected.

8.19 Sec. 13. **[206.802] ELECTRONIC VOTING SYSTEMS; PURCHASING.**

8.20 Any new voting equipment purchased for use in Minnesota for the purpose of
8.21 replacing a voting system must have the ability to:

8.22 (1) capture and store ballot data;

8.23 (2) keep data anonymous;

8.24 (3) accept ranked or cumulative voting data under a variety of tabulation rules;

8.25 (4) be programmable to follow all other specifications of the ranked-choice voting
8.26 system as provided in chapter 204E;

8.27 (5) provide a minimum of three rankings for ranked-choice voting elections;

8.28 (6) notify voters of the following errors: overvotes, skipped rankings, and duplicate
8.29 rankings in a ranked-choice voting election; and

8.30 (7) be programmable to print a zero tape indicating all rankings for all candidates in
8.31 a ranked-choice voting election.

9.1 **EFFECTIVE DATE.** This section is effective upon certification by the secretary
9.2 of state that equipment meeting the standards required by this section is available for
9.3 purchase and implementation.

9.4 Sec. 14. Minnesota Statutes 2006, section 206.83, is amended to read:

9.5 **206.83 TESTING OF VOTING SYSTEMS.**

9.6 (a) Within 14 days before election day, the official in charge of elections shall
9.7 have the voting system tested to ascertain that the system will correctly mark ballots
9.8 using all methods supported by the system, including ranked-choice voting if applicable,
9.9 and through assistive technology, and count the votes cast for all candidates and on all
9.10 questions. Public notice of the time and place of the test must be given at least two days
9.11 in advance by publication once in official newspapers. The test must be observed by at
9.12 least two election judges, who are not of the same major political party, and must be open
9.13 to representatives of the political parties, candidates, the press, and the public. The test
9.14 must be conducted by (1) processing a preaudited group of ballots punched or marked to
9.15 record a predetermined number of valid votes for each candidate and on each question,
9.16 and must include for each office one or more ballot cards which have votes in excess of
9.17 the number allowed by law in order to test the ability of the voting system tabulator and
9.18 electronic ballot marker to reject those votes; and (2) processing an additional test deck
9.19 of ballots marked using the electronic ballot marker for the precinct, including ballots
9.20 marked using the electronic ballot display, audio ballot reader, and any assistive voting
9.21 technology used with the electronic ballot marker. If an election is to be conducted using
9.22 ranked-choice voting, the equipment must also be tested to ensure that each ranking
9.23 for each candidate is recorded properly.

9.24 (b) If any error is detected, the cause must be ascertained and corrected and an
9.25 errorless count must be made before the voting system may be used in the election.

9.26 (c) After the completion of the test, the programs used and ballot cards must be
9.27 sealed, retained, and disposed of as provided for paper ballots.

9.28 Sec. 15. **[206.892] POSTELECTION AUDIT OF VOTING SYSTEMS;**
9.29 **RANKED-CHOICE VOTING ELECTIONS.**

9.30 Subdivision 1. **Definition.** For purposes of this section, "postelection audit official"
9.31 means the election administration official who is responsible for the conduct of elections
9.32 in the jurisdiction being audited under this section.

9.33 Subd. 2. **Selection for audit; notice.** Thirty days before an election that will
9.34 be conducted using the ranked-choice voting method pursuant to chapter 204E, the

10.1 postelection audit official must set the date, time, and place for postelection audit. Within
10.2 four days after the election, the postelection audit official must select the precincts to be
10.3 audited. Jurisdictions with fewer than 50,000 registered voters must select at least two
10.4 precincts for postelection audit. Jurisdictions with between 50,000 and 100,000 registered
10.5 voters must select at least three precincts to be audited. Jurisdictions with over 100,000
10.6 registered voters must select at least four precincts to be audited. The precincts must be
10.7 selected by lot at a public meeting. At least one precinct selected in each county must have
10.8 had more than 150 votes cast at the election. The postelection audit official must notify the
10.9 secretary of state of the precincts that have been chosen for audit and the time and place
10.10 the postelection audit for that jurisdiction will be conducted, as soon as the decisions are
10.11 made. The secretary of state must post this information on the secretary of state's Web site.

10.12 Subd. 3. **Scope and conduct of audit.** The postelection audit must be conducted
10.13 of the votes cast for at least one single-seat ranked-choice voting election, if applicable,
10.14 and at least one multiple-seat ranked-choice voting election, if applicable. The audit must
10.15 be conducted of elections decided most closely in the final round, by percentage. The
10.16 postelection audit official may conduct a postelection audit of the votes cast for additional
10.17 offices. The postelection audit must be conducted in public at the location where the voted
10.18 ballots have been securely stored after the general election or at another location chosen
10.19 by the postelection audit official. The postelection audit official for each precinct selected
10.20 must conduct the postelection audit and may be assisted by election judges designated
10.21 by the postelection audit official for this purpose. The party balance requirement of
10.22 section 204B.19 applies to election judges designated for the audit. The postelection audit
10.23 must consist of a manual count of the ballots used in the precincts selected and must be
10.24 performed in the manner provided by section 204C.21. To the extent practicable, the
10.25 postelection audit must be conducted in the manner provided for recounts under section
10.26 204C.361. The postelection audit must also include testing of the accumulation software,
10.27 using stored electronic data for those precincts that are not audited by manual count. The
10.28 audit must be completed no later than two days before the meeting of the canvassing
10.29 board to certify the results of the election.

10.30 Subd. 4. **Standard of acceptable performance by voting system.** A comparison
10.31 of the results compiled by the voting system with the postelection audit described in this
10.32 section must show that the results of the electronic voting system differed by no more than
10.33 one-half of one percent from the manual count of the offices audited. Valid votes that have
10.34 been marked by the voter outside the vote targets or using a manual marking device that
10.35 cannot be read by the voting system must not be included in making the determination
10.36 whether the voting system has met the standard of acceptable performance for any precinct.

11.1 Subd. 5. **Additional review.** (a) If the postelection audit in one of the audited
11.2 precincts reveals a difference greater than one-half of one percent or greater than two votes
11.3 in a precinct where 400 or fewer voters cast ballots, the postelection audit official must,
11.4 within two days, conduct an additional audit of the races indicated in subdivision 3 in at
11.5 least three precincts in the same jurisdiction where the discrepancy was discovered. The
11.6 postelection audit official must immediately publicly select by lot the additional precincts
11.7 to be audited. The postelection audit official must complete the additional audit within
11.8 two days after the precincts are selected and report the results immediately to the county
11.9 auditor. If the second audit in any of the reviewed precincts also indicates a difference in
11.10 the vote totals compiled by the voting system that is greater than one-half of one percent
11.11 from the result indicated by the postelection audit or greater than two votes in a precinct
11.12 where 400 or fewer voters cast ballots, the postelection audit official must conduct an audit
11.13 of the ballots from all the remaining precincts in the jurisdiction for the races indicated
11.14 in subdivision 3. This audit must be completed and the results must be reported to the
11.15 secretary of state within one week of completing the second audit.

11.16 (b) If the results from the jurisdictionwide audits clearly indicate that an error in vote
11.17 counting has occurred, the secretary of state must notify the postelection audit official that
11.18 they must conduct a manual recount of all the ballots in the jurisdiction for the affected
11.19 office using the procedure established in section 204C.35. The recount must be completed
11.20 and the results reported to the appropriate canvassing board within two weeks of receiving
11.21 notice from the secretary of state.

11.22 Subd. 6. **Report of results.** Upon completion of the postelection audit, the
11.23 postelection audit official must immediately report the results to the county auditor. The
11.24 postelection audit official must then immediately submit the results of the postelection
11.25 audit electronically or in writing to the secretary of state not later than two days before the
11.26 canvassing board meets to canvass the election.

11.27 Subd. 7. **Update of vote totals.** If the postelection audit under this section results in
11.28 a change in the number of votes counted for any candidate, the revised vote totals must
11.29 be incorporated in the official result from those precincts.

11.30 Subd. 8. **Effect on voting systems.** If a voting system is found to have failed
11.31 to record votes accurately and in the manner provided by the Minnesota election law,
11.32 the voting system may not be used at another election until it has been examined and
11.33 recertified by the secretary of state. If the voting system failure is attributable to either its
11.34 design or to actions of the vendor, the vendor must forfeit the vendor bond required by
11.35 section 206.57 and the performance bond required by section 206.66.

12.1 Subd. 9. **Costs of audit.** The costs of the postelection audit required by this section
12.2 must be allocated as follows:

12.3 (1) the governing body responsible for each precinct selected for an audit must pay
12.4 the costs incurred for the audit conducted under subdivision 2 or 5, paragraph (a);

12.5 (2) the vendor of the voting system must pay any costs incurred by the secretary
12.6 of state to examine and recertify the voting system; and

12.7 (3) the secretary of state must reimburse local units of government for the costs of
12.8 any recount required under subdivision 5, paragraph (b).

12.9 Subd. 10. **Time for filing election contest.** The appropriate canvass is not
12.10 completed and the time for notice of a contest of election does not begin to run until all
12.11 audits under this section have been completed.

Ranked Voting Guidelines

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Summary

This document specifies guidelines for the conduct of ranked voting elections, where ranked voting includes both instant runoff voting (IRV) for single-winner contests and choice voting for multiple-winner contests. This document includes ballot, tabulation, reporting, manual audit, and recount guidelines. The guidelines for computer tabulation and hand tabulation are treated separately where appropriate.

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1 Introduction

1.1 Overview

Instant runoff voting (IRV) and choice voting are ranked voting methods designed to maximize representation of voters. This document provides procedural guidelines for conducting elections using these ranked voting methods. In California, these guidelines are consistent with the IRV roadmap of Alameda County [AC] and the ranked voting provisions in the charters of Oakland [Oak] and San Francisco [SF]. However, any jurisdiction may adopt these procedures.

1.2 Instant runoff voting

Instant runoff voting is used for single seat contests. In the United States, jurisdictions including Oakland and San Francisco refer to IRV as “ranked choice voting.” Internationally, some countries call IRV “the alternative vote,” and others call it “preferential voting.”

IRV is a majoritarian voting method because, in the end, over 50% of participating voters elect the winner. IRV simulates a series of runoff elections in a single election. In each round of the “instant runoff,” last place candidates with no chance of winning are eliminated. Voters for those candidates have their ballot count towards their next choice in the following round.

1.3 Choice voting

Choice voting is used for multiple seat contests. Choice voting is also known as “the single transferable vote” (STV) and preference voting. Choice voting is a proportional method because all of the winners are elected with approximately equal percentages of the total vote. The percentage a candidate needs to win (called the “winning threshold”) is the fewest number of votes that only the winning number of candidates can win. For example, a candidate in a 3-seat choice voting contest needs just over 25% to win. Together, the three winners of such a contest represent over 75% of the participating voters. Choice voting is designed to have as many voters as possible have their one vote count towards the election of a candidate.

2 Ranked Voting Elections

2.1 General provisions

Ranked voting elections to fill one or more seats shall conform to the guidelines in this document wherever possible.

2.2 Definitions

The following definitions shall apply to this document.

- (1) “**Ballot group**” means a subset of ballots cast in an election, such as all ballots cast by voters in one precinct, or all ballots cast on one direct recording electronic (DRE) voting machine (cf. [EC]). Election officials use ballot groups for hand tabulation, auditing, reporting, and recount purposes.
- (2) “**Choice voting**” means ranked voting for multiple-winner contests.
- (3) “**Continuing candidate**” means a candidate who has not been eliminated.
- (4) “**Continuing total**” means the sum of all continuing candidate totals.
- (5) “**Instant runoff voting**” means ranked voting for single-winner contests.
- (6) “**Ranked vote,**” or simply vote, means the selections made by a voter at every available ranking for a single ranked voting contest.
- (7) “**Round**” means a stage of the tabulation of a ranked voting contest in which votes may be transferred and counted, and candidates elected or eliminated.

3 Ballots

3.1 Voter instructions

Ballot instructions shall direct voters to rank candidates in order of preference by choosing a first choice candidate, a different candidate for the second choice, a different candidate for the third choice, and so on. The instructions shall say that voters can rank as few or as many candidates as they want, up to the allowed limit. The instructions should convey that ranking additional choices will not hurt a voter’s higher-ranked choices.

3.2 Number of rankings

The ballot format should allow voters to rank all the candidates appearing on the ballot for that contest. In addition, the ballot format should allow voters to rank a number of qualified write-in candidates equal to at least two or the number of seats, whichever is greater.

3.3 Exceptions for equipment limitations

If the voting equipment or procedures available to the jurisdiction cannot feasibly accommodate the number of rankings in [Section 3.2](#), the number of rankings and write-in rankings may be limited to the maximum number feasible. However, the total number of rankings per ranked voting contest shall never be less than three, and voters shall always be allowed to rank at least two qualified write-in candidates per ranked voting contest.

3.4 Uniformity across ballot types

If more than one type of voting equipment or ballot will be used in a ranked voting contest, all equipment and ballot types used shall provide substantially similar instructions and shall allow voters to rank the same number of candidates and write-ins.

4 General Tabulation Provisions

4.1 Determination of winners

To determine the winners of a ranked voting contest, apply to the ballots the tabulation method of [Section 5](#) or [Section 6](#), depending on whether the number of seats to fill is one or more than one, respectively.

4.2 Summary reports

Election officials shall make available to the public a summary report for each ranked voting contest. The report shall display, in grid form, the following for each round: the winning threshold; the candidate totals; the continuing total; and the undervote, overvote, and exhausted vote totals. The summary report may also display, for each round, the net change of each of these values from the previous round. The summary report may also display, beside each candidate total, the candidate total as a percentage of the continuing total. Election officials shall release preliminary summary reports and are encouraged to update them regularly as more ballots are processed. Election officials should make the first preliminary summary report available on election day, if possible.

4.3 Skipped rankings

When a skipped ranking is encountered on a ballot during the tabulation of a ranked voting contest, that ballot shall count towards the next non-skipped ranking.

4.4 Undervotes, overvotes, and exhausted votes

The following rules shall be applied during the tabulation of a ranked voting contest. In the event that a ranked vote has no candidates selected at any ranking, that ballot shall

count as an “undervote.” In the event that a ranked vote advances to a ranking with more than one candidate selected, that ballot shall count as an “overvote.” In the event that a ranked vote is neither an undervote, overvote, nor counting towards a candidate, that ballot shall count as an “exhausted vote.” Any ballot counting as an undervote, overvote, or exhausted vote shall remain so and shall not count towards any candidate in that round or in subsequent rounds.

4.5 Resolving ties

4.5.1 Standard method

In the event that a tie occurs during the tabulation of a ranked voting contest, the tie shall be resolved in public by lot.

4.5.2 Alternative method*

The following method may be used in place of the method above to resolve those ties not covered by state law that may occur during the tabulation of a ranked voting contest. Prior to election day, election officials shall draw the names of all candidates and qualified write-in candidates at random during a public ceremony. Election officials shall make the drawn order public prior to election day. In the event that a tie occurs during the tabulation, election officials shall resolve the tie in favor of the candidates appearing earliest on the publicized list. **[We do not know if the method described in this paragraph is a legal way to resolve ties under state law. This needs to be checked before including this paragraph.]*

4.6 Publicizing tabulation procedures

In advance of the election, election officials shall make available to the public a description of the tabulation procedures for each ranked voting contest. The description shall be precise enough to permit the creation of a computer program that implements the tabulation algorithm actually used. Alternatively, the public description may include a computer program with source code that carries out the tabulation algorithm actually used.

5 Instant runoff voting

5.1 Overview

Instant runoff voting is a majoritarian voting method designed to accommodate more than two candidates seeking a single seat. The ballots are counted in a series of rounds. Every voter has one vote in each round of counting, but can rank more than one candidate. The weakest candidate is eliminated after each round of counting, and each ballot cast for that candidate is counted in the next round for the candidate ranked next on that ballot. Once the field is reduced to two, the candidate with more votes is declared the winner.

5.2 Tabulation method

Election officials shall tabulate the ballots in rounds, according to the following steps.

(1) **Initial counting.**

Begin round one.

Count each ballot as a vote for the first choice candidate on that ballot.

(2) **Determine if there is a winner.**

If there are exactly two continuing candidates, declare the candidate with the larger total the winner and end the tabulation.

Otherwise, begin a new round and proceed to the next step.

(3) **Eliminate last-place candidate.**

Eliminate the continuing candidate with the smallest total. For each ballot that counted towards the eliminated candidate, count it towards the vote total of the highest-ranking continuing candidate on that ballot.

(4) **Subsequent counting.**

Go to Step (2), and continue counting ballots in this fashion, transferring votes from eliminated candidates, round after round, until only two candidates remain and the candidate with the larger vote total is declared the winner.

5.3 Elimination of more than one candidate at a time

In order to reduce the occurrence of ties that need to be broken, candidates who have no mathematical chance of winning shall be eliminated simultaneously as follows. Before Step (3), in the event that any candidate total exceeds the sum of the totals of all continuing candidates with a smaller total, eliminate all the candidates with a smaller total, count those ballots as in Step (3), and proceed to Step (4). When applying simultaneous elimination, eliminate the largest group possible that leaves at least two continuing candidates.

5.4 Voting equipment accommodation

Tabulation equipment, including software, that terminates the count as soon as one candidate has a majority of the continuing total shall be considered to be in substantial compliance with these procedures for the purposes of [Section 10](#). However, continuing the tabulation until only two candidates remain is encouraged.

6 Choice voting

6.1 Overview

Choice voting is a proportional voting method for contests with more than one seat. The ballots are counted in a series of rounds. Every voter has one vote in each round of counting, but can rank more than one candidate. Candidates win if they reach a winning threshold. In each round, votes in excess of the winning threshold are called surplus votes and are later counted at a fractional value towards the next choices on those ballots. Moreover, in each round, the candidates that cannot win are eliminated, and each ballot cast for those candidates is counted in the next round for the candidate ranked next on that ballot.

6.2 Definitions

The following definitions shall apply to this section.

- (1) “**Candidate surplus**” means the candidate total minus the winning threshold if the candidate has been declared a winner.
- (2) “**Surplus total**” means the sum of all candidate surpluses.
- (3) “**Winning threshold**” means the smallest whole number larger than the result obtained by dividing the sum of all candidate totals (the continuing total) by one more than the number of seats. For example, if the number of seats is two and the continuing total is 900, then the winning threshold is 301.

6.3 Precision

All vote totals shall have the same number of digits after the decimal point. This number of digits shall be determined prior to the election and made public in accordance with [Section 4.6](#).

6.4 Tabulation method

Election officials shall tabulate the ballots in rounds, according to the following steps.

- (1) **Initial counting.**

Begin round one.

Count each ballot as one vote for the first choice candidate on that ballot.

Compute the winning threshold.

(2) Determine if there are winners.

Declare as a winner any candidate whose total equals or exceeds the winning threshold. If the number of candidates declared winners equals the number of seats, end the tabulation.

Otherwise, begin a new round and proceed to the next step.

(3) Transfer surplus from winning candidate.

If some candidate has a surplus of votes above the winning threshold, then for each ballot counting towards the winning candidate with the largest surplus, count it towards the vote total of the highest-ranking continuing candidate on that ballot that has not been declared a winner. Count each ballot at a fractional amount equal to its current value times the surplus of the winning candidate divided by the total of the winning candidate.

(4) Eliminate last-place candidate.

If no candidate has a surplus, then eliminate the candidate with the smallest vote total. For each ballot that counted towards the eliminated candidate, count it towards the vote total of the highest-ranking continuing candidate on that ballot that has not been declared a winner. Count each ballot at its current value. If at least one candidate has already been declared as a winner, keep the winning threshold the same. Otherwise, recompute the winning threshold to account for the new continuing total.

(5) Subsequent counting.

Go to Step (2), and continue counting ballots in this fashion, transferring surplus votes of winning candidates followed by votes from eliminated candidates, round after round, until all seats are filled.

6.5 Elimination of more than one candidate at a time

6.5.1 To reduce the occurrence of ties

In order to reduce the occurrence of ties that need to be broken, candidates who have no mathematical chance of winning shall be eliminated simultaneously as follows. Before Step (4), in the event that no candidate has a surplus and some candidate total exceeds the sum of the totals of all continuing candidates with a smaller total, eliminate all the candidates with a smaller total, count those ballots as in Step (4), and proceed to Step (5). When applying simultaneous elimination, eliminate the largest group possible that leaves at least as many continuing candidates as there are seats.

6.5.2 For easier tabulation

In order to keep votes whole as much as possible, simultaneous eliminations may be performed as follows. Before Step (3), in the event that any candidate total exceeds the

surplus total plus the sum of the totals of all continuing candidates with a smaller total, eliminate all the candidates with a smaller total, count those ballots as in Step (4), and proceed to Step (5). When applying simultaneous elimination, eliminate the largest group possible that leaves at least as many continuing candidates as there are seats.

6.6 Order of winners

The candidates declared as winners in Step (3) of [Section 6.4](#) shall be declared winners in order of their vote totals, with candidates having the largest totals declared winners first.

6.7 Termination of tabulation

In Step (2) of [Section 6.4](#), if the number of continuing candidates equals the number of seats, then declare all continuing candidates as winners. If the number of continuing candidates equals one more than the number of seats, then declare all continuing candidates as winners except for the continuing candidate with the smallest vote total.

7 Computer Tabulation Provisions

7.1 General provisions

This section shall apply only to ranked voting contests tabulated by computer.

7.2 Definitions

The following definitions shall apply to this section.

- (1) **“Image,”** or ranked vote image, means any alpha-numeric representation of a ranked vote.
- (2) **“Raw image”** means an image captured from a ranked vote, recorded, and tallied during the tabulation.

7.3 Automatically captured ranked votes

Raw images captured from ranked votes using only automatic means, such as by optically scanning a cast paper ballot, shall indicate all candidate selections at each ranking, including skipped rankings, multiple selections of the same candidate, and multiple selections of candidates at a single ranking.

7.4 Basis for tabulation

The list of raw images shall be used as the basis for the tabulation of a ranked voting contest. The list of raw images shall be preserved on a digital medium at least until after the end of the terms of the offices being elected, and until after the end of the statute of limitation for any civil or criminal action that may arise from conduct related to casting or tabulating votes in the election, or longer, as may be provided by law.

7.5 Ranked vote image reports

7.5.1 Time and mode of release

An image report for each ranked voting contest shall be made available to the public via the Internet and by other means. Preliminary image reports shall be released and updated regularly as more ballots are processed. The first image report shall be made available on election night, if feasible. Each image report shall be accompanied by a preliminary summary report obtained by tabulating the ranked votes corresponding to the images in the image report.

7.5.2 Content

Each image report shall contain a vote image for each ballot processed up to that point. Each image in the report shall be accompanied by a label indicating whether the image was created using automatic means, such as by optically scanning a cast paper ballot, or using manual means, and by labels sufficient to designate the ballot group of that ballot, which may include labels for the precinct of origin, whether the ballot was cast absentee, and labels for any other characteristics necessary for the conduct of the public manual audit. It shall be possible to generate the summary report by tabulating the images contained therein using the tabulation method publicized in accordance with [Section 4.6](#).

7.5.3 Ballot secrecy

The order in which images are listed in each image report shall not be related to the order in which the corresponding ballots were cast. To ensure ballot secrecy, each image in an image report can, but need not, be identical to its corresponding raw image tabulated in accordance with [Section 7.4](#).

7.5.4 Format

Each image report shall be made available in a human-readable plain-text format. The format shall be consistent and easily described, such as comma-delimited. To permit the preparation of a computer program that can process the images in each image report, a precise description of the format of the image report shall be made available to the public in advance of the election.

7.5.5 Rules for converting ranked votes

The rules for converting ranked votes to images presentable to the public in an image report shall be made available to the public in advance of the election. The rules shall cover manually and automatically-captured images, as well as the treatment of remade ballots. The rules shall include the transcription rules for marks for write-in candidates, rankings containing more than one mark, write-in marks for ballot-qualified candidates, and other special cases. The rules shall also include any transformation rules used to protect ballot secrecy.

7.6 Public manual audit

The final image report shall be released prior to the random selection of ballots for the public manual audit. The public manual audit shall check that the images in the final image report match the ranked votes for the ballots in the randomly selected ballot groups, after applying the rules of [Section 7.5.5](#) as necessary.

7.7 Recounts

A full or partial recount shall proceed by recreating the raw images from the original ranked votes in all of, or a designated portion of, the ballot groups. The images for these ballot groups shall be replaced in the list of raw images, and the list of raw images shall be retabulated. Image reports and summary reports shall be rereleased for these retabulations using the same procedures as for the original count.

7.8 Statement of votes cast

The statement of votes cast for a ranked voting contest shall include a summary report and the tabulation method description. An electronic statement of votes cast shall also include the final image report.

8 Hand Tabulation Provisions

8.1 General provisions

This section shall apply only to ranked voting contests tabulated by hand.

8.2 Comprehensive reports

Election officials shall make available to the public, via the Internet and by other means, a comprehensive report for each ranked voting contest. The comprehensive report shall list, for each round, the total vote from each ballot group counting towards each candidate total and counting towards the undervote total, overvote total, and exhausted vote total.

8.3 Public manual audit

For the public manual audit, election officials shall generate a comprehensive report and make it available to the public prior to the random selection of ballot groups to be checked by the public manual audit. The public manual audit shall verify for the randomly selected ballot groups the vote totals reported in the comprehensive report.

8.4 Recounts

A recount shall proceed by recounting the totals reported in the comprehensive report for all of, or a designated portion of, the ballot groups, beginning with the first round totals and continuing with later round totals as necessary.

8.5 Statement of votes cast

A statement of votes cast for a ranked voting contest shall include a summary report, a comprehensive report, and the tabulation method description.

9 Voter Education

Any jurisdiction using ranked voting shall conduct a voter education campaign to familiarize voters with ranked voting. Voter education shall include outreach to speakers of all languages used on ballots in the jurisdiction.

10 Changes to Procedures

Election officials may change the procedures described in this document to accommodate the voting equipment available, provided that the new procedures are in substantial compliance with the procedures described here, the smallest feasible number of changes is made, and the changes to the tabulation procedures are made public in accordance with [Section 4.6](#).

11 Voting Integrity and Ballot Secrecy

The procedures described in this document provide a robust audit framework that supports software independence and maximum transparency, while still protecting ballot secrecy. One component of this audit framework is to make both the tabulation algorithm and input to that algorithm public, for computer-tabulated elections. This allows anyone to verify that the computer is carrying out the tabulation algorithm correctly. The input data made public is called an image report. The second component of this framework is to randomly audit the final image report in a public manual process. The manual audit directly checks that

the publicly released data matches the original paper ballots and/or voter-verified paper audit trails (VVPATs). Taken together, these steps ensure election integrity. The third component protects ballot secrecy. The notions of raw and publicly reported images in [Section 7](#) ensure that votes can always remain anonymous.

References

- [EC] California Elections Code, Section 15360, as of March 2007.
- [Oak] “The Charter of the City of Oakland,” Article XI: Elections, following passage of Measure O charter amendment in November 2006 entitled “Ranked Choice / Instant Runoff Voting.”
- [SF] “City and County of San Francisco 1996 Charter,” Article XIII: Elections, Sec. 13.102. Instant Runoff Elections, as of March 2007.
- [AC] “Final Draft IRV Roadmap,” Alameda County Acting Registrar of Voters Elaine Ginnold and Alameda County Instant Runoff Voting Task Force, August 12, 2005.

Appendix V: FairVote Comments on TGDC's VVSG

Specific Recommendations to the VVSG

4.4.1-A.9 IVVR vote-capture device, IVVR unambiguous interpretation of cast vote

Each IVVR SHALL contain a human-readable summary of the electronic CVR. In addition, all IVVR SHALL contain audit-related information including:

- a. Polling place;
- b. Reporting context;
- c. ballot configuration;
- d. Date of election; and
- e. Complete summary of voter's choices.

In regards to 4.4.1-A.9, FairVote believes the requirement that an optical scan or other electronic vote capture device store a Cast Vote Record (CVR)- that is a ballot image rather than tabulating voter selections- is a positive development in the VVSG. However, we disagree with the use of the word "summary" in describing the complete record of voter choices. Instead, we suggest replacing the word "summary" with "record."

Secondly, while the requirements for IVVR systems, such as VVPAT, clearly require that the CVR contain a complete record of each choice made by the voter, it is not clear in the current TGDC's recommended VVSG that ALL systems are required to store this information. We believe all vote capture devices should store and output Cast Vote Records that include a separate record for each contest and each "ballot" with a complete record of each choice made by the voter.

7.7.2-A.17 Tabulator, ranked order voting

Tabulators of the ranked order voting device class SHALL be capable of determining the results of a ranked order contest for each round of voting.

Instead of the current guideline, this should read:

"Tabulators of the ranked order voting device class SHALL be capable of determining the results of a ranked order contest for each round of vote tabulation."

We believe this is the correct wording since there is only a single round of voting in a ranked order voting election, but potentially more than one round of vote tabulation.

7.7.2.5 Logic for ranked order voting

Although we agree that it might be premature to standardize algorithms and other logic for ranked choice voting systems, it is overdue for the EAC to convene an advisory or working group to explore options and begin the process of developing standards. Major voting machine vendors such as ES&S and Sequoia already have, or are currently in the process of having voting systems for ranked voting tested and certified by laboratories. The absence of federal guidelines in this area is a major problem for both vendors and jurisdictions that have adopted ranked voting methods. It would be appropriate to have a two-step set of guidelines; containing both minimum standards for retrofitting legacy equipment, and best-practice standards for future products. Premier Election

Systems (Diebold), ES&S, and Sequoia have all produced firmware to handle ranked voting on some of their existing machines. However, none of these machines are using what the advocacy community considers to be best practices. For example, ideally the output from the vote capture device should be a true representation of all voter choices made, regardless of validity (e.g. rather than inserting a generic "over-vote" code the output should show exactly what choices the voter made), and leave it to the subsequent step of vote tallying software to interpret those voter "marks." All three of these vendors have produced firmware for their optical scan machines that somewhat "cleans" the data that it outputs (such as skipped rankings or duplicate rankings, etc.). This makes auditing a ranked ballot election problematic, as there is no longer a one-to-one match up of ballot to data record. Thus a best practice for future systems would require that the vote capture device store anonymous un-interpreted ballot images from each voter. Also the output file should be in a common record format, such as a comma delimited text file rather than a proprietary format, to allow double checking algorithms by running the ranked ballot election through software other than just that provided by the vendor.

7.8.3.3-D Ranked order voting, report results

Systems conforming to the ranked order voting class SHALL report the contest choice vote totals for each ranked order contest for each round of voting/counting at the system extent level.

Currently, these guidelines may be sufficient for ranked choice voting jurisdictions to report results. However, we believe these guidelines should eventually require polling sites or at least on the precinct level to report the number of first preferences for each contest choice. In the long term, the precinct machine should be able to print a total of each of the rankings received by each of the contest choices. This information is not useful for tallying the election, to know who won, but is a security function to allow a complete audit after the election is completed. None of the major vendors currently have this capacity, but future systems should be required to have this capability.

Glossary Definitions

Voting system: Equipment (including hardware, firmware, and software), materials, and documentation used to define elections and ballot styles, configure voting equipment, identify and validate voting equipment configurations, perform logic and accuracy tests, activate ballots, capture votes, count votes, reconcile ballots needing special treatment, generate reports, transmit election data, archive election data, and audit elections. See also, voting process.

We believe this definition needs further clarification. Does a voting system as defined need to contain all of the above elements or could a voting system still be defined as such without the capabilities (i.e.) of transmitting election data. Additionally, in section 6.1-C

6.1-C Voting system, minimum devices included

Voting systems SHALL contain at least one [EMS](#) and at least one [vote-capture device](#).

a "voting system" if further defined as requiring both and EMS and a vote capture device. The EAC should provide a clear and concise definition of what a voting system entails.
