# PREFERENCE COUNTING IN LOCAL GOVERNMENT ELECTIONS IN NSW

**Organisation:** NSW Electoral Commission

**Date Received:** 29 September 2017

The Hon Dr Peter Phelps MLC
Chair
Joint Standing Committee on Electoral Matters
Parliament House
1 Macquarie Street
SYDNEY NSW 2000

Our ref: LM2017/295

Dear Dr Phelps

**Inquiry into preference counting in local government elections in NSW**

Thank you for the opportunity to provide a submission to the current inquiry of the Joint Standing Committee on Electoral Matters into preference counting in local government elections.
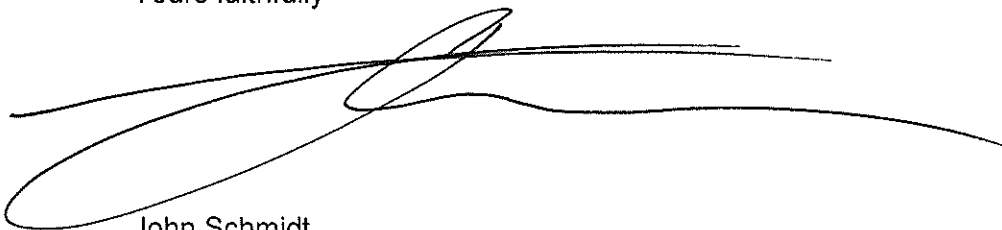
The attached submission addresses each of the Inquiry's Terms of Reference in turn, namely:

    a)  the current system of 'random selection' in the counting of preferences in local government elections;

    b)  whether this system delivers fair results in all cases for candidates;

    c)  whether there are any alternative methods of ballot counting which would produce more accurate preference flows; and

    d)  any other related matter.

If you have any queries, please contact Mr Mel Keenan, Director - Legal and Governance, on

Yours faithfully

John Schmidt
**Electoral Commissioner**

# Submission of the
# NSW Electoral Commission

## 'Random selection' in counting of preferences in local government elections

1. In New South Wales, two voting systems are used to elect candidates to local councils, namely:
   - optional preferential; and
   - proportional representation, specifically the single transferable vote.[1]

2. Where only one councillor is to be elected to a council area or ward, the optional preferential system is used. Where two or more councillors are to be elected, the proportional representation system is used. The issue of random selection in the counting of preferences arises only under the proportional representation system.

## Counting local government proportional representation elections

3. Schedule 5 to the *Local Government (General) Regulation 2005* [the Regulation] sets out the method for counting votes under the proportional representation system.

4. In summary, the stages of a proportional representation count are:

   i. Sort and count ballot papers according to first preference;
   ii. Calculate the quota;
   iii. Distribute surplus votes from any candidates who reach the quota and are elected;
   iv. Exclude lowest candidates and distribute their ballot papers; and
   v. Repeat the third and fourth steps until all vacancies are filled.

5. A transfer of votes is not made unless the surplus of any elected candidate, together with any other surpluses not transferred, exceeds the difference between the two lowest continuing candidates on the poll.[2]

## Calculating the quota

6. To be elected, candidates generally must gain a quota of the formal votes.[3] The quota cannot be calculated until the total number of formal first preference votes is known. Once this figure is identified, the quota is calculated by dividing the number of formal votes by one more than the number of vacancies and then adding one. For example, if there are 7,106 formal votes and three vacancies to be filled, the quota is:

   7,106 formal votes ÷ 4 = 1,776 + 1 = 1,777

7. Therefore, a candidate needs at least 1,777 votes to be elected.

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[1] *Local Government Act 1993*, s 285
[2] *Local Government (General) Regulation 2005*, schedule 5, cl 6(1)(i)
[3] Candidates can also be elected if the remaining number of candidates in the count equals the number of vacant positions still to be filled.

8. By way of example, using the sample figures above, five candidates are running for the three vacancies; to be elected they require 1,777 votes. After the first preferences are sorted and counted the votes have been allocated as follows:

| | |
|---|---|
| Candidate A | 1,445 votes |
| Candidate B | 2,274 votes |
| Candidate C | 1,623 votes |
| Candidate D | 1,206 votes |
| Candidate E | 558 votes |

9. Candidate B has 2,274 votes, more than the quota, so they are elected. They only required 1,777 votes but received 2,274, leaving a surplus of 497 votes. This surplus of votes is given to the remaining candidates.

## Distributing the surplus

10. To decide which of Candidate B's 497 votes are surplus, <u>all</u> of Candidate B's 2,274 ballot papers are distributed to the remaining candidates according to where the elector has put their second preference. However, they are not distributed as whole votes. They are distributed at a reduced transfer value which is equivalent to a total of 497 whole votes.

11. The transfer value is calculated by dividing the number of surplus votes a candidate has by the number of ballot papers the candidate has. Thus, in this example the transfer value is:

497 (surplus votes) ÷ 2,274 (ballot papers) = 0.2185

12. All of Candidate B's ballot papers are distributed to the remaining candidates but at a reduced value of 0.2185. To illustrate how this process works, preferences will be distributed to one candidate.

13. When all of Candidates B's ballot papers are examined again, 601 of them had a second preference for Candidate A. Because each ballot paper is only worth 0.2185, that is the same as only 131 votes.

14. Thus only 131 of these 601 ballot papers are kept by Candidate A. These 131 ballot papers are selected at random.

15. The rest of the ballot papers (that is 470 ballot papers) go back to Candidate B to be kept as part of the 1,777 ballot papers that got Candidate B elected.

16. In summary, a distribution of surplus votes follows these steps:
   - where a candidate is elected on first preferences alone, all of the elected candidates ballot papers are looked at and distributed;
   - where a candidate is elected on a combination of first preference votes and one or more subsequent transfer of surplus votes, only the ballot papers in the last transfer are re-examined and distributed to the continuing candidates;
   - a transfer value is calculated to determine how many actual votes each remaining candidate will receive;
   - this number of ballot papers are selected at random and given to that remaining candidate;
   - the rest of the ballot papers go back to the elected candidate to be held as their quota.

17. This process is repeated until candidates reach the quota and are elected. Each time any surplus votes above the quota are distributed to the remaining candidates.

18. Candidates with the lowest number of votes are then excluded and their ballot papers are redistributed according to the next choice shown. This process continues until all the vacancies are filled.

19. Not every candidate elected would normally achieve a quota under this counting method.

## Proportional Representation Computer Count System

20. For local government elections administered by the NSWEC,[4] the Proportional Representation Computer Count [PRCC] system is the software program used to conduct the count. Ballot paper preferences are entered into the program, which then distributes the preferences to determine the elected candidates. Whenever software changes are made to the PRCC system, the system is audited by independent experts and certified that the system conforms to legislation. System changes are usually only carried out in the lead up to major election events, which means that the system is usually re-certified before each major election. In the case of local government elections for councillors, the PRCC system is certified against the provisions in Schedule 5 to the Regulation.

## Declaring the result

21. For an election administered by the NSWEC, the results of the election must be published on the Commission's website and notice of the results published in a newspaper circulated generally in New South Wales.[5] In addition, for each ordinary election of councillors and for each first election for an area after its constitution, the NSW Electoral Commission must prepare a written report on the conduct of the election within 6 months of the election day concerned.[6]

# Whether this system delivers fair results in all cases for candidates

22. The NSWEC does not believe that it is appropriate for it to comment on the 'fairness' of the current voting system. The role of the Electoral Commissioner is to impartially conduct local government elections in accordance with whatever voting system is legislated. Having said this, set out below is background information concerning the Electoral Commissioner's practice and experience under the current system.

23. At the end of an election the NSWEC publishes the preference files which show the preference markings for all ballot papers used in the count. Publishing this file allows anybody to recreate the count process to validate the results that were obtained. The publishing of these files has enabled political commentators and academics to run the count process hundreds and in some cases millions of times using their own software. This has identified instances where the random selection of ballots has a statistical chance to alter the outcome of an election.

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[4] Section 296AA of the *Local Government Act 1993* provides that a local council may resolve to administer its own elections. Section 296(7) provides that the Electoral Commissioner is to administer the first election for an area after its constitution.
[5] *Local Government (General) Regulation 2005*, cl 356
[6] *Local Government (General) Regulation 2005*, cl 393AA

24. The publishing of the preference files has also enabled academics to identify potential errors in the PRCC system which were not identified during certification. Two such errors have been identified to date. One error, identified in 2015, impacted the statistical likelihood of the outcome of a council election in 2012. The other error identified at the end of 2016 impacted the order of exclusion of two candidates with the same small number of votes in the 2016 local government elections, but had no impact on the result. Both errors were rectified as soon as they were reported to the NSWEC.

25. In a January 2016 blog article, Mr Antony Green considered the role of random distribution in a number of cases at the 2012 local government elections. Mr Green did not impugn the fairness or appropriateness of the results, but concluded that, while all the councillors were properly elected according to law, the counts were not necessarily reproducible. Mr Green commented:

> The NSW Electoral Commission and its computer system cannot count the votes in a manner that is accurate and reproducible because the current law states that random sampling must be used.[7]

26. Mr Green proposed that 'the law be changed to allow computers to produce a count that is accurate and repeatable rather than just conducted according to law.'[8]

27. The Regulation provides that, at any time before the declaration of the poll, a candidate may request a recount of the ballot papers used in the ward or area for which they nominated,[9] or the Election Manager may direct the Returning Officer to recount any ballot papers used in the election.[10] Amongst other things, a candidate's request for a recount must be lodged within 24 hours after the candidate has been informed of the result of the count, and set out the reasons for the request.

28. After examining the request, the Election Manager may decide to direct a recount or decline to do so. Regardless of whether the Election Manager declines to direct a recount, a recount must be conducted if the candidate pays a deposit to cover the cost of the recount.

29. In the recent tranche of local government elections held on 9 September 2017, eleven requests for recounts were received from candidates. Of these requests, two recounts ultimately were conducted. One recount was directed by the Electoral Commissioner and resulted in a change to the elected candidates. The other recount was paid for by a candidate and did not result in any change. Two case studies are attached at Appendix A which provide more detail concerning these recounts.

30. The following table lists those councils and wards where a recount was requested, together with the outcome:

**Requests for recounts at the 2017 Local Government elections**

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[7] Antony Green, ABC Elections, *NSW electoral law and the problem of randomly elected candidates*, viewed at http://blogs.abc.net.au/antonygreen/2016/01/nsw-electoral-law-and-the-problem-of-randomly-elected-candidates.html

[8] Antony Green, *op.cit*, viewed at http://blogs.abc.net.au/antonygreen/2016/01/nsw-electoral-law-and-the-problem-of-randomly-elected-candidates.html

[9] *Local Government (General) Regulation 2005*, cl 353(1)(a)

[10] *Local Government (General) Regulation 2005*, cl 353(1)(b)

| 2017 Council | Outcome |
|---|---|
| Oberon | Electoral Commissioner declined to direct a recount. |
| Cumberland - Greystanes ward (Candidate A) | See decision directly below. |
| Cumberland - Greystanes ward (Candidate B) | Approved by Electoral Commissioner. Recount conducted on Monday 18 September 2017 and resulted in a different candidate being elected. See Appendix A for further detail. |
| Parramatta – Parramatta ward | Electoral Commissioner declined to direct a recount. Candidate paid for a recount. Recount conducted on Tuesday 19 September 2017 and resulted in no change to the elected candidates. See Appendix A for further detail. |
| Bayside – Mascot ward | Electoral Commissioner declined to direct a recount. |
| Central Coast – Budgewoi ward | Electoral Commissioner declined to direct a recount. |
| North Sydney – Victoria ward | Electoral Commissioner declined to direct a recount. |
| Northern Beaches – Pittwater ward | Electoral Commissioner declined to direct a recount. |
| Hornsby – B ward | Electoral Commissioner declined to direct a recount. |
| Hornsby – C ward | Electoral Commissioner declined to direct a recount. |
| Mid Coast | Electoral Commissioner declined to direct recount. |

31. There was significant media coverage at the time of the September 2017 local government elections relating to the random distribution process. Some candidates who sought a recount made reference to media commentary concerning the NSWEC's PRCC system and the 'randomisation' element in the distribution of preferences.

32. In light of this media commentary and observations by candidates, it would appear that there is a lack of knowledge in the community as to how the currently legislated vote counting system, particularly the random distribution process, works. There is a risk that the perceived 'lottery' nature of the random distribution process could undermine elector confidence in the electoral process and its results.

# Whether there are any alternative methods of ballot counting which would produce more accurate preference flows

33. Most Australian jurisdictions use a different method for the distribution of preferences under proportional representative electoral systems.

34. The Commonwealth Senate, Victorian Legislative Council, South Australian Legislative Council and Western Australian Legislative Council all use a method known as fractional transfers.[11]

## Fractional transfer

35. Under the fractional transfer method, all the ballot papers of the elected candidate are used to distribute the surplus. They are distributed at a reduced rate known as the transfer value. Due to all of the elected candidate's ballot papers being used to distribute the surplus, an advantage of the fractional transfer method is that if the counts are repeated the results will always be the same.

36. The first step is to calculate the transfer value using the following formula:

Surplus / Number of votes for candidate = Transfer value

37. The following is an example from the Australian Electoral Commission which explains the method of transferring the surplus for Commonwealth Senate elections.

Candidate A gains 1,000,000 votes. If the required quota was 600,000 the surplus would be 400,000.

The transfer value for candidate A's votes would be:

400,000 / 1,000,000 = 0.4

Candidate A's ballot papers (1,000,000) are then re-examined in order to determine the number of votes for second choice candidates.

If candidate A's ballot papers gave 900,000 second preferences to candidate B, then candidate B would receive 360,000 votes (900,000 multiplied by the transfer value of 0.4). These votes would be added to the votes candidate B received in the first count.

If, on receipt of candidate A's surplus votes, candidate B has then reached the quota, they are elected. If candidate B has any surplus votes, a transfer value would be calculated and votes would be transferred in the same way.

As surplus votes are transferred, other candidates may be elected. However, if all surplus votes from elected candidates are transferred and there are still unfilled positions, further counting is undertaken.[12]

38. As mentioned above, if all surplus votes from elected candidates are transferred and there remains unfilled positions, further counting is undertaken. The candidate with the

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[11] ECANZ, *op.cit,* at http://www.ecanz.gov.au/systems/proportional/
[12] Australian Electoral Commission, Counting the votes for the Senate, viewed at http://www.aec.gov.au/Voting/counting/senate_count.htm

lowest votes is excluded from the count and their ballot papers are distributed based on preferences. If as a result of this process a candidate obtains a quota and is elected, that candidates surplus votes (if any) are distributed following the method above. This process is followed before any other candidates are excluded.

39. If vacancies remain and there are not enough votes left in the count then candidates may be elected as follows:
   - if one Senate position remains to be filled, and two candidates remain, the candidate with the highest number of votes is elected irrespective of whether they have reached the quota; or
   - if the number of continuing candidates is equal to the number of remaining vacancies, those candidates are elected.[13]

# Any other related matter

## Countback provisions

40. In 2014 the LG Act was amended to insert provisions allowing for a countback election to be held instead of a by-election in certain circumstances.[14] At present, the provisions are not in operation.[15]

41. Once operational, the provisions will permit casual vacancies in the office of councillor to be filled by a countback election. The casual vacancy must be within 18 months of an ordinary election, and the council in question must have resolved to fill any such vacancies by way of a countback election.[16] In addition, the provisions do not apply to a casual vacancy if the councillor who is vacating the office was elected using the optional preferential voting system or in an uncontested election.[17]

42. Where there is a need for a recount, the random selection method of distributing surplus votes may result in changes to the number of votes received by candidates. Therefore if a countback is conducted using a new random distribution it could be possible that an existing councillor is no longer shown as elected. One mechanism to avoid such an outcome would be to record and maintain the previous random distribution so that the same distribution can be used for any future countback.

43. The NSWEC's PRCC system can be configured to record the randomised distribution of preferences used to elect candidates this record could then be used to conduct a countback using the same distributions.

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[13] Australian Electoral Commission, *op.cit*, viewed at http://www.aec.gov.au/Voting/counting/senate_count.htm
[14] *Local Government Act 1993,* s 291A. Section 291A was inserted by the *Local Government Amendment (Elections) Act 2014*
[15] Section 291A(6) provides that the countback section does not apply to a casual vacancy in the office of a councillor if the vacancy occurs before the day prescribed for the purposes of the section by the regulations. To date, the regulations have not prescribed a day for the purposes of s 291A.
[16] *Local Government Act 1993*, s 291A(1)
[17] *Local Government Act 1993*, s 291A(2)

## CASE STUDY – CITY OF PARRAMATTA COUNCIL (PARRAMATTA WARD)

Candidate B, who was unsuccessful after the initial count, requested a recount. The Electoral Commissioner declined to direct that a recount be conducted. Pursuant to the *Local Government (General) Regulation 2005*, Candidate B paid a deposit to cover the cost of conducting the recount. The recount was conducted on 19 September 2017 and resulted in no change to the elected candidates.

**First count conducted on 15 September 2017**

There were three councillors to be elected.

19,914 formal votes were counted and there were 1,277 informal ballot papers. The quota to be elected was 4,979.

17 counts were required to elect the three councillors. Two candidates were elected after the first count. Both candidates gained votes above the quota and their surplus votes distributed to the remaining candidates according to their transfer value.

At count three no candidate was elected. There was also no surplus votes available for transfer. The candidate with the fewest votes was excluded and all their ballot papers transferred to the next available preference. This process proceeded for the next 16 counts.

By count 17, Candidate A was elected. The margin between Candidate A and the last excluded candidate, Candidate B, was 135.

Whilst they did not reach the quota, Candidate A had a progressive total of votes of 3,094. The other remaining candidate, Candidate B, had a progressive total of 2,959.

**Second count conducted on 19 September 2017**

All ballot papers retrieved from secure storage and re-examined in front of scrutineers.

19,923 formal votes were counted and there were 1,269 informal ballot papers. At the initial count conducted on 15 September, the total of formal and informal votes combined was 21,191. At the recount the combined total was 21,192. The additional ballot paper was due to a miscount in the first count of the SATL ballot papers. The SATL ballot papers are check counted twice during the batching process and are bulk entered into the PRCC system.

The quota to be elected was 4,981.

Like the initial count, 17 counts were required to elect the three councillors. Two candidates were elected after the first count. Both candidates gained votes above the quota and their surplus votes distributed to the remaining candidates according to their transfer value.

At count three no candidate was elected. There was also no surplus votes available for transfer. The candidate with the fewest votes was excluded and all their ballot papers transferred to the next available preference. This process proceeded for the next 16 counts.

By count 17, like the initial count, Candidate A was elected. At the second count the margin between Candidate A and the last excluded candidate, Candidate B, increased from 135 to 151.

Whilst they did not reach the quota, Candidate A had a progressive total of votes of 3,108. The other remaining candidate, Candidate B, had a progressive total of 2,957.

**Comment**

This recount resulted in no change to the elected candidates of the initial count. However, one change was the margin of votes by which Candidate A was elected and Candidate B was excluded.

The difference in informal votes between the first count (1,277) and the second count (1,269) was due to the re-examination of all data entry ballot papers and the Returning officer making another determination on any challenged preference. This reduced the number of informal ballot papers by 8. The randomisation of preferences most likely played a role in the increase in the margin of votes by which Candidate A was elected.

## CASE STUDY - CUMBERLAND COUNCIL (GREYSTANES WARD)

Candidate B, who was unsuccessful after the initial count, requested a recount and the Electoral Commissioner directed that a recount be conducted. Candidate B was elected at the recount by 17 votes.

**First count conducted on 14 September 2017**

There were three councillors to be elected.

19,422 formal votes were counted and there were 1,547 informal ballot papers. The quota to be elected was 4,856.

12 counts were required to elect the three councillors. Two candidates were elected after the first count. Both candidates gained votes above the quota and their surplus votes distributed to the remaining candidates according to their transfer value.

At count three no candidate was elected. There was also no surplus votes available for transfer. The candidate with the fewest votes was excluded and all their ballot papers transferred to the next available preference. This process proceeded for the next 11 counts.

By count 12, Candidate A was elected. The margin between Candidate A and the last excluded candidate was 15.

Whilst they did not reach the quota, Candidate A had a progressive total of votes of 3,963. The other remaining candidate, Candidate B, had a progressive total of 3,948.

**Second count conducted on 18 September 2017**

All ballot papers retrieved from secure storage and re-examined in front of scrutineers.

19,422 formal votes were counted and there were 1,549 informal ballot papers. At the initial count conducted on 15 September, the total of formal and informal votes combined was 20,969. At the recount the combined total was 20, 971. The two additional ballot papers were due to a miscount in the first count of the SATL ballot papers. The SATL ballot papers are check counted twice during the batching process and are bulk entered into the PRCC system.

The quota remained the same.

## Appendix A - Case studies of recounts conducted for the 2017 Local Government Elections

Like the initial count, 12 counts were required to elect the three councillors. Two candidates were elected after the first count. Both candidates gained votes above the quota and their surplus votes distributed to the remaining candidates according to their transfer value.

At count three no candidate was elected. There was also no surplus votes available for transfer. The candidate with the fewest votes was excluded and all their ballot papers transferred to the next available preference. This process proceeded for the next 11 counts.

By count 12, Candidate B was elected. The margin between Candidate B and the last excluded candidate was 17.

Whilst they did not reach the quota, Candidate B had a progressive total of votes of 3,996. The other remaining candidate, Candidate A, had a progressive total of 3,979.

**Comment**

This recount resulted in a change to the elected candidates.

The difference in informal votes between the first count (1,547) and the second count (1,549) was due to the re-examination of all data entry ballot papers and the Returning officer making another determination on any challenged preference. This increased the number of informal ballot papers by 2.

As there was no significant difference between the formal votes and informal ballot papers between the initial count and the recount, the randomisation of preferences most likely played a role in changing the outcome of the election.