REPORT ON PROCEEDINGS BEFORE

Joint Standing Committee on Electoral Matters

inquiry into Preference counting in local government elections in NSW

At Jubilee Room, Parliament House, Sydney, on Monday 9 October 2017

The Committee met at 10:00

PRESENT

The Hon. Dr Peter Phelps (Chair)

Mr Adam Crouch

The Hon. Ben Franklin

Mr Andrew Fraser

The Hon. Courtney Houssos

The Hon. Peter Primrose

Mr Jai Rowell

Mr Mark Taylor

Ms Anna Watson

**BEN RAUE**, Electoral Analyst, affirmed and examined

The CHAIR: Good morning and welcome to the inquiry into preference counting in local government elections in New South Wales. I now declare the hearing open. I thank all witnesses for appearing before the Joint Standing Committee on Electoral Matters today to give their evidence. Mr Raue, before we proceed, do you have any questions about the hearing process?

Mr RAUE: No, I do not think so.

The CHAIR: In what capacity are you appearing before the Committee?

Mr RAUE: I run The Tally Room website, so I am an electoral analyst who follows these matters.

The CHAIR: Would you like to make an opening statement before the commencement of questions?

Mr RAUE: Yes, I thought I would quickly summarise the main points in my submission, and there is one point that was probably not covered in my submission, so I will run through those. The primary thing that is a real problem with the random sampling system that we use for local government elections is also a problem for Legislative Council election. I understand that the process of changing that system is very different; we are talking about local government elections, but the principle is the same. The problem is that a recount may not necessarily produce a better result than the first result, and effectively it means that the result of a council election is not necessarily reproducible. You can have a situation where someone is declared elected, but we do not know if that was a correct result or just the result of a random chance. We have seen lots of examples of people who were elected even though probabilistically they had a less than 50 per cent chance of being elected and they just got a lucky draw in terms of which ballots were pulled out.

It is interesting to think about the example of the Greystanes ward in Cumberland Council, which happened recently. There was a 32-vote turnaround between the first count and the second count, and that changed the results of who was elected. A batch of ballots were found that were incorrectly classified as Liberal votes, when they should have been Independent votes. That was not actually enough to make a difference, and what made a difference was that when the Liberal was elected the second time, a much larger share of his votes that were passed on had further preferences beyond the Liberal ticket than in the first count. That made the difference; it was not that the proportion between Labor and the Independent were different. There were just a lot more of those votes and they favoured the Independent; that was the difference. To be honest, I cannot really say which of those results was the correct result. I think that is a problem more than which person was elected—the fact that we are not sure that that was the correct result. Lack of reproducibility is a big thing that we need to think about.

I also want to raise one thing about the issue of random sampling, which is that I think it is particularly a problem in smaller and rural councils. There are a couple of reasons; they tend not to have wards, which means that you are electing a lot more people in one area. They tend to have smaller populations, which can make the random sampling issue worse. Also, it is more of a problem when candidates are all Independents; if the vote is flowing down a party ticket then random sampling is not an issue until those votes leave that party ticket. It is interesting to think about the disproportionate effect of that and how it can have a big impact in small regional local councils. There is a conversation around the method that could replace it. I do not necessarily say that there is only one method we should use; probably the Weighted Inclusive Gregory method is the best, though. I think it would be a good idea if the process of implementing a new formula is as open as possible. It would be a problem if a new set of regulations or legislation—I am not sure where it would go—was written that made it unclear or made it hard to understand how the system worked. It would be good for that to be as open as possible before it is implemented.

One idea that was suggested to me that I think would be great would be ideally for the Electoral Commission to do it publicly. We now have preference data from the 2012, 2016 and 2017 council elections, and a new system could be run against those. That would give us a range of all the possible weird things that could happen to the system. The only other thing I want to raise that I think is worth thinking about is how all of this has an impact on scrutineering and how people can inspect what happens with the vote. We now have a system that I think is generally superior of using computer counts, but it does make it much harder for candidates and parties to observe what is happening, to monitor the results and to make sure that the result is verified and correct. There are lots of ways we could improve on that, and I would be happy to talk further about the idea of some kind of independent verification, which allows a comparison of the papers and the data to check that they are correct. I can talk about that, if you wish.

The Hon. PETER PRIMROSE: I have a number of questions. If the Government ever gets around to doing it, we are going to get regulations in relation to our countback system for casual vacancies in local government. Can you tell me how you think what is occurring currently, as opposed to what is being proposed, will impact, if at all, on the countback system?

Mr RAUE: I am not sure if there are two different ways in which a countback can be conducted—whether there is a complete countback or there is just a countback of the votes that were used to elect the person. I am not sure which system or whether there has been a decision on that. I do not think so.

The Hon. PETER PRIMROSE: We do not know either.

Mr RAUE: Okay. I think it would make it easier if we had a system where every vote is flowing. What I would actually say is that using random sampling would make it very difficult, if not impossible, to do a full recount of the whole ballot. If you wanted to use the system, which I think is probably superior, where all votes are recounted with the candidate, who has resigned for whatever reason, removed, that would be much easier to do if you had a fractional transfer system because you could count all votes. I think the issue of reproducibility, which comes up when there is a council recount, could just as much come up if you were trying to do a countback. You may get different votes that come out and you may produce results where a different candidate gets elected for a different seat; it may not even be for the seat that is being filled. But it makes it much less reliable having the system that we have now. I think it would make it much easier and would give the Government a better range of options in terms of which countback method to use if we used the system of fractional transfer instead of random.

The CHAIR: I am pretty free form. If anybody wants to ask supplementary questions based on answers immediately given, please do so.

The Hon. COURTNEY HOUSSOS: Thank you for coming in this morning and thank you for your submission, which is really thorough and very useful for us as a Committee. You particularly said that we should use the Weighted Inclusive Gregory method. Why do you think we should be using that particular method?

Mr RAUE: I referred to that in comparison to the Inclusive Gregory method without the weighted part. Inclusive Gregory is used for the Senate and Weighted Inclusive Gregory is used for the Western Australian Legislative Council, among others. The main difference comes up when a ballot paper gets a second transfer value applied to it: If it is used to elect one person and then used to elect a second person. Basically the Senate system, Inclusive Gregory, was implemented at a time when we still used paper but we manually distributed the preferences rather than using an electronic count. It basically treats all of the ballot papers that have arrived at a candidate equally whether or not they already had elected someone else before.

It is a minor issue, but it could play a role particularly in elections where there are lots of parties and you could see situations where preferences could elect. A vote could end up passing through multiple candidates. It can make a difference about which votes counted for more. The best example of this being a problem in the Senate was in 2013. There were votes that elected Penny Wong, the Labor candidate, and then they passed to the second Labor candidate, who was then excluded, and then they passed to The Greens Senator Hanson-Young; thence Senator Hanson-Young was re-elected on the basis of those votes. Her surplus included The Greens primary votes and they also included Labor primary votes that had already been used to elect Senator Wong.

Those Labor primary votes already had been reduced in value once because they already had elected someone. If it was Weighted Inclusive Gregory, you would apply a second formula on top of that one so the Labor votes would be worth less than The Greens votes because The Greens votes had elected one person and the Labor votes had elected two people whereas in the Senate system all of those ballots are treated equally. Effectively, when Senator Hanson-Young's preferences flowed on, the vast majority of the value that passed on had come from the Labor votes, not from The Greens votes, even though most of her value was in The Greens votes. It is a bit of an arcane point and mostly it does not have an effect. We have noticed it is possibly becoming more of an issue in the Senate and in the Victorian upper House because there have been more parties getting elected.

We are now having situations where more than one minor party is winning, so I could imagine it being more of an issue for a local council where there are no parties or there are three or four big groups, or things like that. We just have more diversity of different types of election results at a council level. It is not a typical kind of Liberal and Labor and one other person type of situation. In that sense it really only kicks in if a vote is passing through multiple people to get elected, but it can make a bit of a difference in terms of which votes get passed on.

The CHAIR: Just on that point, Mr Raue, it is fair to say that the proportional representation counting systems around Australia to a large extent are historical legacies of whatever was the technical capacity of the time.

Mr RAUE: Yes.

The CHAIR: Hence we have a system which is pre-computerised and Western Australia has quite an advanced system. The Senate of course was at a time when computerisation was starting but still not so fully developed as to obviate the need for paper manual counts. It would be fair to say that in many instances around Australia the technical capacity of the time set the counting system.

Mr RAUE: Absolutely and it is definitely a system in which a fairer account can be conducted now that we have computer technology that allows us to do that, particularly if we have kind of accepted than it is now a reality that all of these counts will happen on computers. We can come up with various methods to make sure that that is fair and verifiable. I think it is a correct move to use more technology in the count, if not in other parts of the electoral process and, yes, it definitely makes a difference at what point in time a particular regulation or legislation was written.

The CHAIR: Does Weighted Inclusive Gregory advantage people who then choose to vote below the line and not follow a "1" above the line ticket?

Mr RAUE: I think actually comparing Weighted Inclusive to Inclusive Gregory would favour voters whose vote had passed through fewer candidates to get elected.

The CHAIR: I will give you an example: It happened in New South Wales at the last Senate election where Coalition voters deliberately preferenced below the line for a lower-ranked candidate, who was actually excluded after a higher-ranked candidate on that ticket. Would a weighted inclusive system benefit that person, or would it benefit the ticket alignment as determined by the party?

Mr RAUE: I see what you are saying. To repeat I think what you mean in terms of the strategy is that if you vote for a lower candidate in a group, effectively your vote is not involved in electing the first one or two people.

The CHAIR: That is right. I am talking about tactical voters who tactically vote below the line because of a particular person or because they reverse preference up the ticket.

Mr RAUE: It could favour them because the other votes cast for that party that have been voted above the line—

The CHAIR: Would be worth less.

Mr RAUE: In an area where two Liberals were elected effectively on a primary vote, those other people's votes would be reduced in value for the first and second whereas this person's vote would not be. Inclusive Gregory would treat those two different voters the same whereas Weighted Inclusive Gregory would give more value to the voter in that situation. I would say, though, that I do not think there are many people who would do that. I think it is much more likely to come into play when you have a situation like the one I described before where a vote has selected someone in one group and then passed on to a different group, and then helped to elect someone in that group. I think the vast majority of people still vote above the line. So I think, yes, it would help. It would give a slight advantage to someone in that situation.

The CHAIR: Because we have to deal with political considerations too and accusations of big parties ganging up on little parties on a fairly regular basis, an Unweighted Inclusive Gregory would tend to favour the major parties or established parties, would it not, because generally speaking the Coalition parties and the Labor Party would get more than one quota and would be able to then cascade down the line and have an additional advantage to their electoral chances.

Mr RAUE: That would be correct. If you take the assumption that the number of preferences being passed on may not be large but the actual number of ballot papers upon which those votes are based is larger because they may have elected multiple candidates beforehand. That Senate example is a good example. It would be more the case if you had an election where, say, four or five Labor councillors have been elected and one Green, or something like that. Probably the best example I can think of is that I grew up in Campbelltown and Campbelltown has a particular situation.

The CHAIR: So did I.

Mr RAUE: You could have a situation where a vote is passed through electing two or three Liberals or five or six Labor councillors and then it passes on. You want those to be reduced in value because they have already been involved in electing a large number of people.

The CHAIR: What about the counter argument, that is, my concern about the particular person on the ticket is irrelevant and I would like my preferences to flow through to an established political party within that ticket?

Mr RAUE: If you voted for that ticket your vote is only passing on at the point where—

The CHAIR: I am not disagreeing; I am putting forward the counter argument which will eventually come, that is, that people in the PR system generally are not voting for individuals on that ticket; they are voting for a particular political ideology that they hope to see implemented, and so it should not be reduced.

Mr RAUE: I think the counter argument would be that this comes into effect only when the vote leaves that group so it is no longer a question about where their vote is. It does not affect who the vote ends up with; it affects which of the votes that that candidate has with them are worth more. In the example of a Campbelltown Council election we say that a bundle of Labor votes elected a cascade of five or six candidates and they have effectively been reduced in value. There might be a single surplus that has elected an Independent and those votes end up in the same place. The unweighted system would put a lot more value on those Labor votes because there is a larger population group, even though the reason they have been reduced in value is that they have had their say multiple times. I think it is more about the relative say that individual voters have, and saying that the transfer value is there for a reason. It is reducing the value of the person's vote because they have had their say already. Effectively that is what a transfer value is; it is discounting a vote's value because it has already had a say in electing someone.

The Hon. COURTNEY HOUSSOS: In your earlier comments you said that computer counting will bring fairer and more accurate election results. However you raised some concerns about scrutineering. As we transition from a traditional person watching over counting ballot papers to entering them into a computer system there are some issues around scrutiny. Will you explain some of those?

Mr RAUE: If you assume that the votes have been accurately data entered and that the computer counting system is fair it is definitely superior. I think largely that is the case now but it is important that we have the ability to verify that and that we do not just work on trust. No other part of our electoral system works on trust in that way. We have a system of scrutineering for a reason. It is about trust and it is also about having genuinely independent observers who can find errors and improve the process. We can do a lot of things that would improve the transparency of the process. I thought the point raised by Ian Brightwell in his submission was good in that his was a suggestion that there would be random batches of the physical ballot papers that would be pulled out, presumably late in the counting process. An Electoral Commission staff member would look at each individual ballot in that batch, look at the equivalent data for that ballot paper and be able to compare them and scrutineers can watch that and check it.

That would be far too intensive to do for every ballot because dozens and dozens of people are working simultaneously. In the case of a Legislative Council count, which is the same principle as the council but obviously it takes longer—it already takes weeks—it would be inefficient to do that in a way that political parties could scrutineer every ballot. If it is a random process that can check the veracity of the system I think that would be a good step. I think we should also think about ways in which data can be released before the final count. For the Australian Capital Territory Legislative Assembly elections, every night they do an interim distribution of preferences. They take the data that has been entered so far and they push the button every day and they say, "At the moment these are people who are on track to win."

The CHAIR: All it does is improve the morale of those number fives on the ticket, only to have them suddenly crushed by 6.30 the following evening.

Mr RAUE: It is an interesting equivalent. In the lower House election we have an indicative two-candidate preferred and we effectively are distributing the preferences as we go. It is not final and that may well change but it gives us some sense of where things are at. Effectively part of the problem is that preferences are all locked in a box until they all pop out at the end of the count. Obviously it would be nice for candidates and parties to have that information but I think it also has value for allowing the ability to find if there are errors in the data. A lot of the public verification is about being able to look and see whether there are weird patterns. Maybe a bundle of 100 ballots flowed in a weird way and maybe that is because they are not Labor votes, they are Liberal votes and they have been put in the wrong pile.

Those kinds of issues are often found. Distributing the preferences could be a solution. I would accept that it is less of an issue for a local council election because in local council results there is generally not a massive gap between when they have been data entered and when they have been published. But I think generally that sort of stuff would be a good principle. Possibly just publishing the data as they go could also be good. I am not going to say that I have a perfect solution to the problem. I think it is something that we are grappling with and that we should think more about how we do it. I think we should be looking for solutions to make it easier to scrutineer because I think scrutineering and public observation of counting is really important.

The Hon. COURTNEY HOUSSOS: I totally agree with you. It is challenge and it is definitely something that this Committee has considered as we look at more computerised options.

Mr RAUE: Effectively the horse has bolted on computerisation, like it has mostly already happened for proportional representation counts. I know that in 2015 the lower House was also data entered. I did not follow that close enough to know whether there were the same issues with scrutineering. I know some of the issues are less to do with the computers and more to do with the fact that the ballot papers are huge and it takes a long time, and you are in a warehouse with 100 data entry workers. It is very hard even for the larger parties to have enough people to effectively scrutineer. I do not know if those same issues apply to the Legislative Assembly data entry but some of them could. It is a problem to grapple with.

The Hon. BEN FRANKLIN: I refer to your point about verifiability. Let us say that you do take out 100 random ballots and they can be examined by both the commission and the scrutineers. What then happen if there are mistakes, in your view?

Mr RAUE: I think that is a question that would be a useful data point if it came time to consider whether a recount would be necessary. If you think about the House of Representatives count, it does not happen entirely using computers; it mostly happens by hand. We apply different standards of accuracy based on whether or not the result is close. There is the ability to do recounts when a result is very close. The issue may not be if there are a few errors we have to do the count all over again. It could be that that would be a useful data point when trying to determine whether a recount is necessary or helpful if a result was very close. Thank God we have never had a Legislative Council result that has been so close as to require a recount. Hopefully we would not because we use a preference system that makes that less likely to happen.

The kinds of problems that happened in Western Australia had a lot to do with the preference system that the Senate used at the time. Hopefully we will never have that but we do have recounts for local council elections. I think it would be a relevant data point if there were a lot of errors, or even if there were a few errors, but it was enough to make a difference. That would be relevant. I think it is also about trust; it is about being able to say that the system has produced a fair result. I would not necessarily say that it means that would occur if there were a lot of errors. If there were a lot of errors that would be something to talk about. I think that would be unlikely to happen but it would be useful information for public trust. If a result was very close it would be relevant information in determining whether a recount should be conducted.

The Hon. BEN FRANKLIN: You have worked as an independent and well-respected psephologist for a long time—for well over a decade?

Mr RAUE: Not well over; about 10 years.

The CHAIR: He is not that old.

The Hon. BEN FRANKLIN: I go to your website. I think it is a terrific website.

The CHAIR: It is a great website and thank you very much for doing it.

The Hon. BEN FRANKLIN: It is absolutely in the public good. You suggest that we should be going down this line purely in the interest of fairness to get a more accurate result, is that correct?

Mr RAUE: Yes.

The Hon. BEN FRANKLIN: Would you agree that, particularly in smaller rural and regional councils where there can be a much smaller group of voters, as you alluded to in your opening statement, the results could come down to a smaller number of votes more regularly and therefore this would be even more important?

Mr RAUE: Absolutely. I am not saying it is not important for big urban councils, it definitely is. Greystanes is an example of that. I think it is more of a problem for small regional councils, partly for the volume of votes being cast, but also for the fact that they tend to have a ward structure and a party system that makes it more likely to be a problem.

The Hon. BEN FRANKLIN: Can you posit any reasons why we should not do this?

Mr RAUE: I know that this system was introduced in the first place to allow manual counts to be conducted and I would expect if there are arguments against it they would be about the ability to conduct manual counts without using computers. I do not find that particularly compelling. I think conducting manual counts fairly and accurately is very hard and we have enough trouble training electoral administrators to do the quite difficult work that they already do when we have a large number of staff employed at short notice. Putting the extra burden on them of needing to understand the proportional representation system well enough to know exactly how to calculate the transfer value and which votes to distribute and how exhaustion and exclusion works and all those kinds of things is a burden we should not put on them.

But I could imagine the argument is basically a cost argument, that people would want to have the option of manual counting. Having said that, I have been involved in manual counts for student elections and political party elections that used a weighted system and it can be done. But it does rely on having people who know the system well and can conduct it and do that. When you have a large number of local councils having elections simultaneously that is a lot of people to find who would have that level of knowledge to be able to conduct it fairly. If there are errors sometimes they are hard to find.

The Hon. BEN FRANKLIN: You would agree that with the number of elections being conducted it would be practically impossible to find that number of people with the required expertise to do it manually?

Mr RAUE: Yes, I think so. Maybe you could do it for the big councils in Sydney, but again we are not going to be doing manual counts for them anyway. This would be more relevant for a small local council in a small regional town. I think they would have a lot of trouble finding people to be confident that that was done correctly. Even if you found the people who understood the system, we all make mistakes and I think it is a system that is prone to error. Generally yes, it does close the door on manual counting to a certain extent, but that door is already closing anyway.

The CHAIR: You mentioned that it is potentially a greater problem in smaller shire elections but, as you point out, there were instances not just in Greystanes but also in Parramatta and Mosman where—it is wrong to say that the wrong person was elected—the more statistically unlikely person to have been elected was elected. Is that a fair comment to make?

Mr RAUE: Yes. We cannot say that the right person was elected is maybe a fairer thing to say than to say the wrong person was elected, and that is a bit of a scary thought when it comes to electing someone to a public body.

The CHAIR: It is the systemic problem with random selection. That is, theoretically there is no right candidate to be elected; it is how the algorithm picked which preferences to take notice of.

Mr RAUE: Yes. I am not a computer expert but I am aware that there are also computing problems with conducting random samples. It is actually quite a difficult problem for a computer, but you should talk to people who are IT experts about that as well.

The CHAIR: To make it clear, it is not a problem with the Electoral Commission or any private companies in the conduct of these elections. The problem is the rules which the Parliament has set for them have meant that there is the possibility where a person might only have a one in eight chance of being elected under a random sampling method but because of the particular sampling that took place they were elected.

Mr RAUE: Absolutely. This is not an error in the count. This is the count being run correctly according to the rules and producing an aberrant result.

The CHAIR: If we were to move to the Weighted Inclusive Gregory method or the Unweighted Inclusive Gregory method, would you have a situation where after the data has been entered you could press the button as many times as you like and you would get absolutely reproducible results on every occasion?

Mr RAUE: That is right, if none of the underlying data has changed. Obviously, you can have a recount and you can find errors in the count and that might change things, but as long as the data has not changed every time you would get the same result.

The CHAIR: The problem we have with the current system is its lack of reproducibility. In other words, every time you hit the button you might get exactly the same result or you might not.

Mr RAUE: That is right.

The Hon. BEN FRANKLIN: Would you agree that that would undermine confidence in the electoral system?

Mr RAUE: Yes, I think it does. I think the only reason it has not undermined confidence more is because it is quite obscure and difficult to understand and it is not immediately obvious that the wrong result has been produced.

The Hon. BEN FRANKLIN: Perhaps has the potential to undermine confidence?

Mr RAUE: Yes, absolutely.

The CHAIR: In one of your earlier answers you mentioned the so-called rural problem, independent small population and wards. Did you mean the lack of wards?

Mr RAUE: I meant the fact that most councils in urban New South Wales have wards. Most councils outside New South Wales are unitary and a unitary system has more of the potential for this problem because this problem kicks in when someone has been elected and their votes pass on to someone else. Most councils in Sydney have three-member wards. Usually what happens is two people get elected on the first count and then one person gets elected a lot later. There are a lot less preferences flowing that matter. For example, if a vote elects a Labor candidate and the second Labor candidate is in the count to the end, this issue will probably never kick in, at least it will not for any above the line votes. It is much more likely to kick in when you are electing seven, nine or 11 people. That is why I use the example of Campbelltown because it is one of the only councils in Sydney that works that way. Most councils in rural areas, particularly small rural areas, use that system.

Mr ANDREW FRASER: Do you think the preferential system is the best way to go, or first past the post?

Mr RAUE: I think a preferential system is better, for a bunch of reasons. It makes tactical voting less of an issue. It is still theoretically possible to tactically vote but you need to have a lot of information about how the system works and there is still a good chance that it will backfire, whereas first past the post can encourage tactical voting. It can produce results where the majority of the council does not reflect the majority of the community. Or alternatively, in order to have first past the post you either have single member wards or you have multi-member wards. A multi-member ward system could produce very odd results. An example I give is Alice Springs used to use a version of first past the post. Effectively the ticket that got the most primary votes—but it could be 30 per cent or 40 per cent—would basically win every seat on the council because those votes would get counted again and again and again. It produces a result where you can have minority rule or you can have a bare majority win basically every seat on a council.

I think there are proportional problems but also if you were to have single member wards, which would be the other way to do it, those wards would be very, very small and probably smaller than is reasonable. I do not think that makes sense for a lot of country towns where you might have a ward that only represents a few hundred people. There are a lot of reasons why I think first past the post does not work. I understand that proportional representation is more complicated but the basics of the system are simple enough for people to understand, which is you need a particular number of votes to get elected and that number of votes is roughly the proportion of the council that you would represent. I think it is a fair system. I like as well that it works. Most proportional representation systems around the world rely on political parties. You need political parties in the system for it to work, but the system we use does not rely on political parties. It works perfectly well in a council where there are no parties, not even informal parties, there is just a bunch of Independents running. I think that is really good too. I think the proportional system we have is a good one and generally it produces good results. It just has a few flaws around the edges.

Mr ANDREW FRASER: But in a number of regional areas there are no wards and very little in the way of political representation, I think it is based on the major parties. If you were to elect people and you had nine ticks or nine crosses, do you not think that would end up with a fairer result than the system that is there now? I put it to you that the vast majority of people in the Coffs Harbour local government area would not have a clue about how the preferential system works.

Mr RAUE: But I do not think they need to know. It is great if people have more knowledge—I am all for more knowledge. But I think, as long as people understand that you number the boxes in the order that you prefer the candidates, that is all that people really need to understand. I think that would effectively be approval voting, ticking nine boxes, and would tend to produce a result where some people's votes would elect multiple candidates and other people's votes would not elect anyone. I know that a lot of local councils do not have partisan elections but I still think that there are differences of opinion and there are different interests to be represented in the community. And if you have a system where you tick nine boxes and the nine candidates with the most votes get elected, you will tend to produce a system where the majority, or even a large minority, that group of people ends up electing most of their candidates. That is the example we see in a place like Alice Springs where we would see results where large parts of that community would have no-one on the council that would represent them.

Mr ADAM CROUCH: Can I just bring you back to something you said earlier about the lack of experience and understanding of the random sampling conducted. Obviously, you have some councils that run their own elections, separate to the Electoral Commission. Do you believe that given that inexperience or lack of understanding and lack of resources a council running its own election could be more at risk of having incorrect random sampling than, say, someone going through the Electoral Commission?

Mr RAUE: If they were using a manual count I would be more concerned about it. I am particularly concerned about very small councils having problems with that. I am not privy to knowing how many errors have been caught in the past but I know there have been errors in the past that have been caught by the Electoral Commission and fixed because of manual counting. I cannot really talk about how many they are because I do not work in that area, I am just aware that that has happened. I have other issues with private companies or local councils running their own elections and I think generally it would be a good practice to say that the Electoral Commission should run all elections to its standard and if the issue is cost for councils, then I think it is a reasonable cost for the State to contribute to but that is a different issue. It is not really about that. If they are using an electronic counting system—and I believe a majority of the councils that did not use the Electoral Commission still did data entry into a computer that calculated the result—I do not think this is a problem for that but if they are using manual counts, it could be a problem.

Mr JAI ROWELL: One question, maybe off topic: I think you have covered brilliantly all the issues that we are trying to flesh out today and congratulations on The Tally Room website. As an old Macarthur boy we have been watching you going through the ranks, so well done. I am only going to ask this question once because we have asked this question at other Committee hearings with other people. Do you have a view on voter ID for elections?

Mr RAUE: I think the problem it is trying to solve is not a big problem. The problem of fraud in elections is much more likely to be in other areas, like postal vote fraud and things like that and I do not think that there is that much of a problem that it is trying to solve. I think for most people it is not a problem but I think around the edges it will mean that some people do not get a chance to vote. I am generally not a fan of voter ID. I think there are ways you can do it that are less onerous and cause fewer of those problems. But I think the issue of impersonation of another person to vote is not such a big problem and I think you can come up with other solutions to that problem that do not make it harder for people to vote, like electronically linking rolls so that you know when someone has voted once already and you can prevent them from voting a second time and things like that.

The CHAIR: The issues that you have raised in relation to local council counting of votes also, would you agree, has applicability to the Legislative Council's counting of votes?

Mr RAUE: I absolutely agree and I think it is a problem that, back in the day, they decided to embed all this information in the Constitution.

The CHAIR: Because Neville Wran legitimately had a reason to believe that the next time the conservative parties got in they would dodge the system.

Mr RAUE: Well maybe that is a reason to say that the broad principles should be in the Constitution but the specific details should not be. But it is obviously much easier to change it for local council than the Legislative Council, but all the points I have made apply to the Legislative Council except the points about small regional councils. Thankfully, the volume of votes in upper House elections and the fact that a lot of the votes pass down party tickets means you do not have as much of the vote electing a Labor candidate, then a Liberal candidate, then an Independent and then a Green. Because those sorts of things do not happen as much has meant it has not been as much of a problem. But if we had a very close Legislative Council result, which we could, then it could produce a situation where we are not sure that the last person elected was the correct winner, so I know it is much, much more difficult to change. I would like to think that whatever changes we made to the council system were done in a way that allowed us to observe it and, if it works well, we then have an example that we can use to say we should do the same thing for the upper House.

The CHAIR: Does the fact that the Legislative Council has a significantly lower quota have any influence also on the problem which we face of random selection? For example, in a nine‑member council electorate you would require 10 per cent for a quota, whereas here you only need 4.4 per cent.

Mr RAUE: That is a good point that I had not really thought about but you are right that preferences generally play less of a role in a Legislative Council election because you do not need as many votes to get elected. So a lot more of the votes just elect someone on a primary vote and there is a smaller number at the end that play a role. Whereas if you think about it in the Greystanes Ward you had a Labor candidate elected and a Liberal candidate and an Independent candidate and that was it. So the proportion that ends up flowing around the table, metaphorically, as preferences, is much larger than in a Legislative Council election.

The Hon. PETER PRIMROSE: I ask you to take it on notice to think about and elaborate on the point that you raised previously about independent verification. I had the opportunity to scrutineer at the recent council election and found it virtually impossible. Between the batching and 60 data entry people putting the data in it was difficult, if not impossible, to scrutineer the thing. I trust the Electoral Commission staff and the way they operated. I have no reason not to. But, as you say, our system does not operate on trust; it operates on the basis of verification—people observing what is happening. Could you go away and think about other points that we might be able to put into a submission that you would recommend we put in our final report about how we might improve that scrutineering independent verification process? You have already mentioned a couple of them, such as the random sampling. I am just wondering if you could ponder it a bit more and come back to us if there are any other proposals so the Committee can consider them.

Mr RAUE: I would be happy to.

The CHAIR: Thank you for appearing before the Committee today. We hope to see you on many future occasions. We may send you some additional questions in writing, other than those by Mr Primrose. Your replies will form part of your evidence and be made public. Would you be happy to provide a written reply to any further questions within 21 days?

Mr RAUE: Absolutely.

The CHAIR: On behalf of all members of all political persuasions and political parties, I thank you again for the work you do on The Tally Room. Psephologists add greatly to the level of political debate in this State and across the nation.

Mr RAUE: Thank you.

**(The witness withdrew)**

**VANESSA TEAGUE**, Department of Computing and Information Services, University of Melbourne, affirmed and examined

The CHAIR: Before we start would you like to make any opening statement?

Dr TEAGUE: Yes, I will summarise the submission that we made. It seems to me that in the case of New South Wales counting there are two separate questions you could ask. One is whether the algorithm specified for counting the votes is a good algorithm and how it could be improved. The second question is whether the process, in particular the electronic process for counting the votes, does so in an accurate and verifiable way. There is room for significant improvement in both cases. In the case of the algorithm, I think we all agree it would be better without randomness. It would also be better without the last parcel computation. You could look to the Senate and to the Victorian counting rules as a model of how to significantly simplify that process. We can talk about that in as much detail as you like. On the issue of the electronic process, there are two significant ways it could be greatly improved. There are two steps to the electronic counting process. The first step is the digitisation of the paper votes in which the pencil marks on paper get translated into electronic data. The second step is the counting of the electronic votes, possibly including the use of randomness.

It seems to me in the case of the digitisation the verifiability of that process would be greatly improved by an opportunity for the scrutineers to observe an audit of the paper evidence against the electronic data. We suggested very much the same thing with the Senate, and if there was any kind of software error or any kind of a problem in that electronic process, an audit would have some probability of picking it up. The second issue about the accuracy of the counting process is that we found a number of bugs in the NSW Electoral Commission's electronic counting software. We know the bugs are there because we can see particular transcripts that have errors. The most important one has been fixed, but if the source code was openly available everybody would be able to scrutinise it in advance and the bugs would have a much better chance of being picked up before they make a difference in an election.

If you cannot get rid of randomness, particularly in the Legislative Council, it would provide a way of giving a transparent explanation of how the randomness had been generated and used. Again, I can talk about that in as much detail as you like. We all agree it would be better to get rid of randomness altogether, but we all recognise that changing the Legislative Council counting rules is tough. A decent fallback would possibly be to get rid of randomness in the local government counting rules and if you could not get rid of randomness in the Legislative Council counting rules, to open the source code and have a public demonstration of the selection of the randomness that would seed the electronic process. Open the source code, make all the data available and let everybody else go through from the random seed and reproduce the electronic count.

Do you want me to say that again slowly? The point is to separate out the input of randomness into the electronic process from the rest of the algorithmic process that is actually pseudo random. The way that randomised processes are implemented on a computer is not that fresh randomness is generated every time the computer needs to make a random choice, but that a random input comes in at the very beginning of the computation and then the algorithm is called pseudo random. It looks random, but it is entirely determined from the initial seed. I am suggesting that if the Electoral Commission made its counting code completely open and if it made a public display of choosing the input randomly—tossing dice or using TattsLotto, or whatever—everybody could perfectly reproduce the pseudo random process of going through the election count and that would be a good fallback to prove that the random choices had been fairly made if you could not get rid of randomness from the Legislative Council count.

The Hon. BEN FRANKLIN: That is not the big issue, though, is it? That is 10 per cent of it.

Dr TEAGUE: Sure, I am assuming that we all agree that getting rid of randomness in the local government count is the go.

The Hon. BEN FRANKLIN: I want to make sure that is not your preferred option?

Dr TEAGUE: No, absolutely not. Get rid of randomness if we possibly can.

The CHAIR: You are saying theoretically that results could be reproducible, but only with that particular seed?

Dr TEAGUE: Yes.

The CHAIR: Change the seed from Phelps to Primrose and you get a different result, do you not?

Dr TEAGUE: There are two steps. One is proving that you have chosen the seed fairly and the second step is proving that, given that seed, everybody reproduces the same count. I completely agree. I am sorry if I did not say that clearly enough. Getting rid of randomness altogether would be the ideal option, certainly for local government, which is easy to change. Simplifying the counting of local government and getting rid of randomness altogether is definitely the way to go.

The CHAIR: With your information technology [IT] experience, what would be the problems that would need to be overcome if you had a system of paper ballots that were then electronically scanned, those which were not clear were then spewed out of the system and manually entered, and then random audits take place of ballots and data entered onto those which the machine believed to have been accurately scanned? Would there be any problem with that system?

Dr TEAGUE: That is a good system. That is what we have advocated in the Senate and that I would advocate you do.

The CHAIR: The people who are doing that, auditing of optical character recognition [OCR], would they necessarily have to be someone other than the Electoral Commission?

Dr TEAGUE: Again, I think it would have to be observable by scrutineers and the key thing to demonstrate would be that the randomness in that auditing process is properly chosen. There would have to be some kind of public algorithm to say, "We have chosen to audit ballot number 63, now number 72, now number 12." It is important that the people being audited, if you like, are not also the people who make the selections about the random ballots to be audited.

The CHAIR: Okay.

Dr TEAGUE: That is easy enough to do. There is code on the web from the American experience that simply gives everybody some open source code and everybody can run the code and generate the pseudo random sequence of ballots to be audited.

The CHAIR: What you are talking about here is that people would be able to know which particular ballots were being checked to make sure they had been correctly entered?

Dr TEAGUE: Yes.

The CHAIR: Rather than somebody popping along at 12.10 p.m. and saying, "We will do some quality assessment on the next 250 ballot papers?"

Dr TEAGUE: Right.

Ms ANNA WATSON: Dr Teague, what are the main strengths of using the Victorian counting method for its Legislative Council?

Dr TEAGUE: There are two big differences between the New South Wales method and the Victorian method. One is the use of randomness. The other is that the New South Wales method looks only at the last parcel not at all the votes that are being counted towards the candidate at the time they have just been elected. Both of those introduce a distortion because you are only redistributing some of the votes not all of the votes that had been sitting on that candidate's pile at the time they were elected. In Victoria, and it is the same in the Senate, when you get a seat, you have some excess over a quota. In a sense, you deserve those excess votes to be redistributed according to their next preference.

There is a pile of votes. The question is: Which ones are the excess and which ones stay with that candidate? The answer in Victoria and in the Senate is we take the whole pile of votes and we change their value so that all of them have a slightly smaller—in some cases much smaller—value so that the total value of the pile equals the excess and then we redistribute the whole pile. That is a good thing for a number of reasons. It means that in some sense every vote that had been counted towards that candidate is treated equally, as opposed to the New South Wales situation where you look only at the last parcel and then from the last parcel you take a random sample.

The Hon. BEN FRANKLIN: One of your obvious bugbears is opening up source codes, which is delightful. I love that every time we hear from you we hear about that. Could you give us some examples, ideally Australian but if necessary international, of where source code has been opened up effectively by the Electoral Commission or equivalent and there has not been anything we should be concerned about in that process?

Dr TEAGUE: In the counting rules the Victorian counting code and the Australian Capital Territory [ACT] counting code are both openly available on the websites of the respective commissions. The Senate code is not, and that has been somewhat controversial. I do not know of any issues that have come about from Victoria. In the case of the ACT some academics at the Australian National University found some errors in the code when they put it on the web. That is a good thing to have that openness.

The Hon. BEN FRANKLIN: Were they rectified?

Dr TEAGUE: I believe the first one was rectified; I am not sure about the second or third. It seems to be only a good thing. I am not aware of any bad thing ever happening.

The Hon. BEN FRANKLIN: Internationally is this a normal situation where the source code is made open, or is it the exception?

Dr TEAGUE: Australia is unusual in having such a complicated counting algorithm. If you ask a question about open source code it would be more for electronic voting systems. Most other people just do not need to count. They do not have a complex counting algorithm. The answer is it is mixed. What has tended to happen is that when source code has been made openly available people have found errors or security holes that have been fixed.

The Hon. BEN FRANKLIN: Which is a good thing?

Dr TEAGUE: Which is a good thing.

The CHAIR: The examples in the second part of your paper refer to the errors in the 2016 New South Wales local government elections. You identified two different errors and you set it out nicely. Given that the Electoral Commission is going to be in this afternoon, could you briefly explain to the Committee what these errors were, how you identified them and what significance you think they have in the counting of votes?

Dr TEAGUE: Yes. Do you mean—

The CHAIR: The ties for elimination, how they work out and who is eliminated in a tie. The second one was the rounding of votes.

Dr TEAGUE: These are the arcane geek details that only a certain personality type cares about, but they do matter. We have seen that they can alter the elimination order of candidates. Anything that can alter the elimination order of candidates has the potential to alter who wins.

The CHAIR: On that point, if we were to move to a system where we do not have random preferencing we would have a situation where this is equally applicable where every vote is counted. If you are incorrectly excluding tied people it is a more fundamental problem than simply the matter we have relating to random selection.

Dr TEAGUE: Yes, that is exactly right. That is why I separated them at the beginning. The issue of bugs in the software is quite separate from the issue of whether or not the algorithm is a good algorithm. We found three bugs in the software that are independent of getting rid of randomness in the algorithm. The first one was fixed in 2012. It related to the computation of the last parcel. The second two we found in the 2016 count and one of them relates to three-way ties. First of all, what happens in the case of a two-way tie is quite clear. If two candidates are tied for elimination you go backwards to the point where they were last unequal and you choose whichever was lower and you eliminate that person. That is clear.

What is not clear is if three candidates are tied and you want to trace back again, but now it becomes unclear where you stop. Because, for example, what happens if you reach an earlier point in the elimination in which there are two candidates with an equal low score and one candidate is higher. Are you supposed to toss a coin? Are you supposed to trace back until those two are unequal? The legislation is not entirely clear, but it is clear on what happens in one particular case and that is the case in which as you trace backwards you get to the point where one candidate has a lower score and the other two are both higher. If that is the last time they are unequal it is clear that in that situation the candidate with the lowest score should be eliminated. In the 2016 count we found there were situations where that had occurred but that candidate had not been eliminated. That is a software error relating to that particular clause in the counting rules. That is the first one. We notified the Electoral Commission in this case only a few day after the results were announced because we had the code ready to go and we got a form letter.

The CHAIR: "Thanks for your interest. It has been duly filed"?

Dr TEAGUE: Exactly that. We did not hear more about it. The second error relates to rounding. I do not know how much detail you want, but I will go back to this idea of redistributing the large pile of ballots. When a candidate has been elected they have an excess over the quota and we want to redistribute their votes. It is not as simple as taking a random sample from that whole pile. What we do is we look at the next continuing preference in each of those votes and we distribute each of them completely to the appropriate candidate. Imagine a whole lot of little piles for the next preference for each candidate to whom those votes would be redistributed. Now we take a random sample from within each of those piles but there is a problem, which is that might not be a whole number.

In New South Wales you only ever distribute votes that are a whole number of votes. We have to round either up or down to get a whole number of votes that is roughly proportional to the right fraction that we are trying to redistribute. The principle, the condition that is supposed to be true, is that in our rounding we try not to make votes appear or disappear. In other words, we try to preserve the total number of votes in the count. The counting rules, which are quite fiddly, are carefully set up to make a first sensible approximation and then you have to tweak it a little bit to make sure in rounding you have not accidentally added or removed votes from the total quantity. It is in this tweak where you have to take into account the whole number that you start with, in the case that you are breaking ties, in order to round up or down appropriately. Do you want any more detail than that?

The CHAIR: No.

The Hon. BEN FRANKLIN: Obviously the examples that you cited are relatively small numbers and for larger metropolitan councils they would make no impact on the final outcome. Would you agree that it is important to clarify these issues now because particularly in smaller councils, which are often rural and regional councils, they may make an impact in order exclusion?

Dr TEAGUE: Yes, indeed. Even though they sound like very obscure issues, they certainly could exist in those terms.

The Hon. COURTNEY HOUSSOS: We have heard that there are different preferences for the way that we should do the fractional transfers. We have heard about the weighted Gregory method and the unweighted Gregory method. Do you and your colleagues have a view on that?

Dr TEAGUE: Yes, that is a good question. There is a lot of literature about this. I certainly agree that the unweighted transfer method that is used in the Senate and in Victoria is not ideal, and so the weighted Gregory method is definitely an improvement. I am sure you have already heard that if you take the whole pile, there might be different weighted groups that come into that pile, and the approximation in the Senate and in Victoria, where you assume that they are all the same and make them all the same weight on the way out, obviously distorts the relative weight of those votes, which is wrong. Definitely a weighted transfer is better than an unweighted transfer. The question is: How much of the more interesting and, arguably, even more fair kinds of methods should you investigate and consider? The answer is: I think they are really interesting; I do not have a firm particular view. You may be the only people who have considered this seriously in the post-computer counting era. I would not necessarily want to pick one or the other, but I would encourage you to take suggestions from people.

The Hon. COURTNEY HOUSSOS: You make an interesting point that we are the first ones to consider this in a post-computer counting era. Following on from that, are there any issues with any of the systems that you are aware of in the way that they are counted by computers?

Dr TEAGUE: Yes, I think that almost everybody seems to have a set of rules that are designed for hand counting. The unfortunate thing is that things that make a hand count a bit easier, like the last parcel and the random sampling and the unweighted Gregory transfer, are not only unnecessary but actually complicate the algorithm. In fact, it could go back to a much simpler and more elegant counting method to just get rid of all these extra approximations that have been produced. There is no reason that a computer cannot keep track of all the different weights in the pile and then just multiply them by the appropriate factor. It was only ever done that way, I think, to make it easier to count by hand.

The Hon. COURTNEY HOUSSOS: My colleague made the point this morning that sometimes our electoral system is a historical legacy rather than necessarily the best possible counting method.

The CHAIR: The previous witness mentioned daily preference distribution—in other words, hitting the button at the end of every day just to give some surety as to where preferences might be flowing. What do you think of that idea as an alternative method?

Dr TEAGUE: I am not sure what that would be testing. What was the purpose?

The CHAIR: If there were marked differences between one day and the next that might flag a possible problem within the counting process itself.

Dr TEAGUE: I guess my concern would be that I don’t want information about the outcome to leak while people are still voting.

The CHAIR: No, it would be after the process but during the actual count, as is done in the ACT.

Ms ANNA WATSON: It is if you got the same numbers, so it is consistent.

Dr TEAGUE: I see; you are releasing partial data and counting them as they come in.

The Hon. COURTNEY HOUSSOS: Post election.

Dr TEAGUE: I do not think there is anything wrong with it, but I also do not see what it would prove. Maybe I do not understand something that is being suggested.

The Hon. BEN FRANKLIN: It helps psephological analysis.

The CHAIR: That is right. Where are the early votes going? Where do the special votes count?

Dr TEAGUE: On that point, it is interesting to look at different kinds of votes when they publish the preference data to see which ones came from the internet voting system and which ones came from which ward or whatever. That I can see helping psephological analysis.

The Hon. COURTNEY HOUSSOS: One of the issues we have talked about is scrutineering increasingly computerised elections. The idea is that the more regular release of data would allow people who are able to do that analysis through their own computer methods to potentially identify issues while the count is still occurring, rather than after the count has concluded. In the era where our scrutineers traditionally watched over the shoulders of people as they allocated the votes, this is potentially a technological advancement.

Dr TEAGUE: I kind of see the point, but it also seems that there are a lot of issues that still would not be scrutinisable—in particular, if there was a problem with the input data process, say one in 100 votes for a particular candidate was dropped. I do not see that this process would help you to notice that. The only thing that would really help you to notice that is an audit going back to the paper evidence.

The Hon. PETER PRIMROSE: Over the years, in manual counting and sitting there, you notice quite regularly that someone accidentally—and I stress that—will put a vote onto a wrong pile. As a scrutineer, you say that you have a problem with that. I recently scrutineered for the latest council elections, and when they were being batched you cannot look at the papers because 90 per cent of the time all they are doing is counting the votes and they do not even flip them over. We are told that is not the time to challenge, and you cannot challenge because they do not flip them over. They are then simply put into a manila folder and go to one of 60 people entering the data at screens, which makes it virtually impossible to watch. Leaving aside what actually happens inside the computer, are there any studies on errors made in data entry?

Dr TEAGUE: This is an excellent question, and the answer is no, as far as I know. If there are studies, they have never seen the light of day. Again, this is a problem that only Australians have. There are analogous kinds of issues in the United States, where they are doing optical scans of their votes. Their elections are a lot simpler because they are just selecting one favourite candidate, although sometimes they are voting on a lot of issues at once. There is a lot of literature in the United States about auditing the outcome relative to the paper votes. I think that is really the only thing that you can do; I do not think you can hope to stand behind a computer and have any idea of what is going on inside the computer.

The Hon. PETER PRIMROSE: You cannot; it is impossible.

The CHAIR: Dr Teague, what if you had political scrutineers appointed by the parties or independent candidates who four or five times during the count and at random were present when an analysis was done of 100 or 200 optical character recognition [OCR] votes. They would then see whether the input into the system was accurate. Would that not be an effective way of having a random sample of a system to determine whether there are any systemic problems at that point?

Dr TEAGUE: Are you talking about random sampling back to paper votes?

The CHAIR: A random examination of the data entry itself, whether by OCR or human input. You could then determine for the last 100 votes whether the input into the system has been accurate.

Dr TEAGUE: And compare the input to the paper ballots?

The CHAIR: Yes.

Dr TEAGUE: Yes, I agree.

The CHAIR: It is not an insuperable problem; it is simply a matter of an election company or the Electoral Commission scheduling certain times at which interested scrutineers—academics even—could see the result of any data input.

Dr TEAGUE: Yes, I agree, but it is not quite as simple as it seems for a couple of reasons.

The CHAIR: It sounded too simple to be true.

Dr TEAGUE: First of all, it is an auditing process. You want to make sure that the thing to be audited is publicly committed to. You do not want to conduct a careful audit of the process only to find a software bug that messes up the upload of that carefully audited data before it gets input into the count. That thing that you are auditing against has to be publicly committed to. That is the first thing. There is nothing wrong with publicly committing to it in a partial way, although then again you have issues about not necessarily wanting to reveal things about how the count is going before people have voted. But that is probably something we can deal with.

At the very least you want to make sure that data that is about to be audited is given to the scrutineers in a way that, if there is a problem with the upload of that data, they can tell. That is fine: I think that is doable. Then you can conduct your audit of the paper evidence, of course. Then you need to ask statistical kinds of questions. I had a certain number of ballots; I have audited a certain number of them at random; what can I say about the confidence that I have that, if there had been a big enough problem to change the election, I would have detected it, based on the amount of random auditing I did?

There is vast literature about this that comes out of the United States. Unfortunately, that vast literature is mostly for the very simple American counting case. I did a little bit of work on the European style party list systems and some rigorous methods for auditing of those. Auditing for our very complex electoral systems is very challenging. We have a paper about auditing the Senate process but the actual algorithmics of how you go through not just the mechanism of conducting the audit but the mathematics of inferring the confidence that there was not a big enough rate of error to change the outcome is actually quite hard.

I think it is well worth doing. I think that to get a high level of confidence for the very close margins that you sometimes have in New South Wales local government elections would be quite hard. What you might be able to do is get quite a high level of confidence with not too much auditing for those councils that happen to have a comfortable margin but recognise that for some of those councils that have a very narrow margin it might be necessary to go back to a manual check of the whole input set of ballots.

The CHAIR: You would not know that before the fact, though.

Dr TEAGUE: You would not know that before the fact, no, right—exactly. But you do not know anything about statistical inference before the fact because the critical parameter for the audit is the margin. If it is a very comfortable win, you do not have to do very much auditing in order to be confident that it was right. If it is a very, very narrow win, you might have to do a lot of random sampling until you can be confident that that very narrow win has been accurately checked.

Mr ADAM CROUCH: Dr Teague, thank you very much for your submission. I put a question to an earlier witness about some local governments not utilising the Electoral Commission system for conducting local government elections. In your submission you noted that you are unable to give information about that. First, do you have concerns about errors going undetected in those particular council elections? Secondly, do you envisage it being an extensive problem, should the number of councils that choose to do their own elections increase? Thirdly, what would be possible and how would we go about collecting that data if it has been done independently of the Electoral Commission?

Dr TEAGUE: This is a really good question. All of the errors and problems that we have found have been in NSW Electoral Commission administered counts, but to a large extent that is because the NSW Electoral Commission administered counts are much more transparent than the others. It is because they put their data up that the data can be examined and, if there are errors, those errors can be found. I know nothing at all about those councils that run their own counts. The fact that nothing is known should not be taken as an indication that there are not problems; quite the contrary.

Everything that I have said about how the count should be conducted in a transparent fashion absolutely applies to them as well. It is a really good thing to put the data on the web and all the other suggestions I have made about the NSW Electoral Commission process apply to that as well. I would not necessarily divide it between the NSW Electoral Commission conducting the process versus some other independent party conducting the process, although I certainly think there are issues with councils conducting their own process, but I would talk about whether the process is a transparent one that allows scrutineers to check that is being run correctly.

Mr ADAM CROUCH: Also it comes back to your issue about the source coding being available for public scrutiny. There is no access to any of that information for councils that have run their own elections, effectively.

Dr TEAGUE: It is certainly not easy to find. If there is, I have never been able to find it.

The Hon. BEN FRANKLIN: Would you consider taking on notice what you might suggest would be the minimum requirements of what should be publicly available in terms not just of councils that run their own or the Australian Election Company, or whoever it happens to be, but as a minimum, what information should be available online so that it can be checked, assessed and analysed as well? Obviously, the Electoral Commission does a good job on that, I suspect, in New South Wales. That is certainly my experience and you have given evidence to that effect too, but could you give us your views about what the minimum should be? For example, do you believe that those minimums should be legislated so that that information should be provided?

Dr TEAGUE: I think that is probably a good idea. I would not necessarily frame it just in terms of what information should be available online. I would also ask what should be shown to scutineers during the process too.

The Hon. BEN FRANKLIN: Understood. If you could provide us on notice with your thoughts on those issues, that would be great.

Dr TEAGUE: Yes, certainly.

The Hon. BEN FRANKLIN: My second point is about the opening up of the source code. Could you provide us on notice with some examples of where the source code was opened up and where bugs or errors were ascertained and where they were then fixed? That would be appreciated.

Dr TEAGUE: Certainly. The only one that I know about in detail is the Australian Capital Territory and the Australian National University academics who fixed the counting bug there.

The Hon. BEN FRANKLIN: If you do find any others, could you let us know?

The CHAIR: And you should not limit yourself to Australia. If there are examples from overseas where open sourcing of code has proved to be advantageous to rectifying issues, that would be good, too.

The Hon. BEN FRANKLIN: I think the Committee increasingly is getting more interested in this issue.

Dr TEAGUE: Yes, good. I can find something on this.

The Hon. BEN FRANKLIN: Your assistance would be appreciated.

Dr TEAGUE: Excellent.

The CHAIR: Dr Teague, thank you very much for appearing before us. It is always a pleasure to have you here. You always make us think. Sometimes you confuse us a little. We may be sending you some additional questions in writing. Your replies would form part of your evidence and be made public. Would you be happy to provide written replies to any questions on notice within 21 days?

Dr TEAGUE: Yes.

The CHAIR: Thank you very much, and thank you for appearing before our Committee again.

**(The witness withdrew)**

**(Short adjournment)**

**LEIGH DUKE ELLIS**, Technical Manager, Australian Election Company, sworn and examined

The CHAIR: In what capacity do you appear before this Committee?

Mr ELLIS: I am a technical manager with the Australian Election Company which has conducted several local government elections in New South Wales. As such I have been called before this Committee.

The CHAIR: Do you want to make an opening statement?

Mr ELLIS: I probably cannot add too much more to what we have said in our brief presentation. We totally agree that random sampling is perhaps not an accurate representation of what could happen. What impact it has had on past elections we do not really know but we believe it would be preferable to consider all preferences rather than taking a random sample of preferences. The downside of that, as we have mentioned here, is that some of the smaller councils in New South Wales do manual counts. If you move away from random sampling the calculations for transfer values become quite arduous. You are working out a transfer value on a transfer value, so you are getting fractions of a fraction of a vote to work with. It becomes a bit of a mathematical nightmare.

We think it would be difficult for them to do manually but maybe that is not a great impediment to changing the rules. Perhaps the Electoral Commission could help them out in all cases or something along those lines, I do not know. We assert that the proportional count system is the best and we believe that to be the case wherever party politics are involved. I think it is across the board in all States and at the Federal level too that everybody is in agreement that that is the best count methodology rather than any of the preferential systems. Apart from that I cannot really add a lot to what we have said here. There are a couple of oddities in the regulations at the moment which I could mention if you were interested.

The CHAIR: Yes please.

Mr ELLIS: It appears that the Local Government (General) Regulation, which governs the counting for local governments, were largely drafted from the sixth schedule to the Constitution Act. They are mainly in alignment but there are just one or two minor differences. I do not know whether they are particularly significant but I would like to mention them. In the Legislative Council count rules the calculation of transfer value does not give you any idea of how many digits you need to take that transfer value to. Schedule 5 of the Local Government Act says that you can calculate a fraction or take it to four decimal digits. It does not say which one you have to use and it does not say if you use a fraction whether it should be more or less than four decimal digits. I believe the Senate goes to eight decimal digits when calculating transfer value and this is probably more because of the number of votes involved.

I think the NSW Electoral Commission may use six digits for the Legislative Council but I am not sure of that. There is a difference in methodology there, minor though it may be, but it still could have an impact on results. It only takes a fraction of a vote to get a vote one way or the other and it can make a difference. I would suggest that if you are going to go with computer counting for everybody I think it should perhaps go up to something like the Senate figure which is eight decimal digits. That is my opinion anyway. Secondly, there was a slight difference in the surplus transfers between the two counting methodologies. In the local government one only the ballot papers used in the last transfer are considered in working out the transfer value, whereas in the first count for the Legislative Council it says, "Those papers which have been transferred to any elected candidate from a candidate previously elected shall be taken into consideration." Now that could be more than one set of ballot papers because it is conceivable that you can have two candidates achieving a quota on first preferences. So that is a minor difference between the two. I do not know whether or not you want to keep them in line.

The CHAIR: That is good. Thank you for pointing that out. Did you conduct the local government elections in New South Wales last year or this year?

Mr ELLIS: We have just done one from April, just completed it recently.

The CHAIR: And last year?

Mr ELLIS: Last year we did, I believe, four councils.

The CHAIR: Have you conducted proportional representation ballots for local governments in other States?

Mr ELLIS: No.

The CHAIR: Or large-scale proportional representation ballots elsewhere for private firms?

Mr ELLIS: Personally, for many years between about 1980 and 2002, I worked on a contract basis for the Australian Electoral Commission. In that time I was largely employed in developing count software for various organisations, mainly unions but other non-parliamentary elections as well. At one stage during that period we set up some software to do a Senate count and we did actually run a Senate count from a past Senate. I do not know particularly which year it was. We did comparisons of the manual results compared with the computer results and we did find discrepancies. These discrepancies were tracked down and found to be manual errors. In the long-term they would not have made any difference to the result but it is nearly impossible to do something like a Senate count manually and not have an error in it. It is just unthinkable.

The CHAIR: What is the actual process which your organisation used for counting in Maitland and the four others? Did you do optical character recognition [OCR] or was it all manual data entry?

Mr ELLIS: We do it with a bit of a combination of both. We use scanning, OCR, and it has a second stage to it where the papers are run through a set of business rules. If anything appears to be out of the ordinary, such as figures outside the box, it goes through a manual process and there is a manual operator who does the corrections. If it is thought to be informal it is also checked manually to make sure that is the case. We first did this in 2012 and it was not the best, I must admit. It was just so slow. We were thinking that the scanning process would be so quick that we could just run through them and extract a result virtually instantaneously. But because of the volume involved—we scanned everything, we scanned above the line, below the line, informals, the whole lot—it just turned out to be too time consuming and as such a lot of the councils were not particularly happy with the timing of the result. We have since taken the approach, which I believe the NSW Electoral Commission uses, any obviously informal ballot papers we do not scan, such as blanks—there are quite a few of those—and anything that is obviously informal. Also anything with just a "1" above the line we do not scan because we can just enter them as a number of ballot papers and process them as a bulk lot.

The CHAIR: Do you have any internal audit process for the scans to make sure that the OCR is getting the result correct?

Mr ELLIS: No. We had the whole system audited at one stage by Deloittes. It cost us something like $30,000 to have the software developed and Deloittes charged us another $60,000 to audit it.

The CHAIR: Welcome to the world of accounting.

Mr ELLIS: They employed actuaries and did all sorts of volume testing and that sort of thing. We have a $90,000 investment there in software. We have been asked in the past. In 2012 the Labor Party wanted to look at the informal ballot papers and we had the facility to pull images of ballot papers out for them to look at. They were quite impressed with that at the time. We thought that was a reasonable thing to do. Typically, it is not the ones that are in the count that are challenged, it is the ones we deemed to be informal.

The CHAIR: Do you receive the code you use for conducting the count from the Electoral Commission or do you have to develop it yourselves?

Mr ELLIS: No, we had it developed ourselves. We have quite a significant investment in it.

The CHAIR: Does that random selection component of your code have to follow any particular guidelines set down by the Electoral Commission?

Mr ELLIS: It does not. It is something that we developed ourselves. I believe it is on a time basis, an algorithm.

The CHAIR: If any changes were to be made that would presumably require rewriting of your ballot counting software?

Mr ELLIS: It would be a significant change, yes.

The CHAIR: And would that be such a significant change that you could not afford it as a company?

Mr ELLIS: We would have to afford it. We would have to just. We would not have any option. It is a difficult thing to do. It is not just a matter of picking more ballot papers out of the pile. It becomes, as I say, calculating transfer values on transfer values, which is, in effect, that you assign each paper a transfer value and every time it moves to a different candidate its transfer value becomes reduced, if that makes sense to everybody. So, instead of one vote now, you have 0.0085 of a vote, type of thing.

The CHAIR: It is also fair to say, though, that it might represent a business opportunity for you because, as you indicated, having to do those complex calculations, the idea of an old-style manual counting is pretty much practically out of the question.

Mr ELLIS: It is difficult.

The CHAIR: And very few councils are going to be willing to spend a large amount of money for their own software for once in a cycle.

Mr ELLIS: I would not think so, no. We went to a lot of trouble to have it audited and, as I said, we spent approximately $60,000 to have Deloittes do it for us and come up with a letter. It is an expensive hobby.

Mr ADAM CROUCH: How long ago was that audit conducted on the system?

Mr ELLIS: It was prior to the 2012 election so it was the beginning of 2012. I have the letter on file from Deloittes.

The Hon. COURTNEY HOUSSOS: Obviously, you have commercial‑in‑confidence data in that situation that you cannot release publicly.

Mr ELLIS: Yes.

The Hon. COURTNEY HOUSSOS: How much of the actual data do you provide publicly to either candidates, to parties or to the general public?

Mr ELLIS: In the current New South Wales local government election there is an audit trail that comes out of the count process and it has got each step to the count, it has figures provided, what transfers went to where, and it also references sections of the Act or the regulations in this case, that caused it to do this. It is quite a good looking document, if you wanted to have a look at it. The election manager at Maitland has them and I also have them here, of course. If you wanted to put an example on the record at any stage I can do that easily.

The Hon. COURTNEY HOUSSOS: Is that data put on a website?

Mr ELLIS: I am not sure what the election manager has done about that, I do not know. But we are quite happy to do it, it is not a problem, not an issue.

The CHAIR: Would you be happy to table that document if you have it with you?

Mr ELLIS: I have not got a hard copy of it.

The CHAIR: Would you be able to provide it on notice?

Mr ELLIS: Yes. Just one of the counts. You would not want all four, presumably. There are four wards.

The CHAIR: Does the Electoral Commission do anything comparable to that?

Mr ELLIS: I do not know, I am not aware of that, I am not sure. It is an interesting document, people pore over it and say, "Yes, that looks good". We have not had too many queries in the past, we have had one or two but just people that do not understand the regulations more than anything else.

The Hon. COURTNEY HOUSSOS: One proposal given to us by one of the people this morning was that we should receive daily counts of where the data is at. Would you be able to provide that or would that be an onerous thing for you to provide?

Mr ELLIS: You said daily counts?

The Hon. COURTNEY HOUSSOS: Like a daily update of where you are up to in the count, after election day.

Mr MARK TAYLOR: Post-election.

Mr ELLIS: We do post them on the internet, our election night figures, if that is what you are referring to.

The CHAIR: How long did the full count take for Maitland, for example?

Mr ELLIS: We had it finished in two days. But the big hold-up is the mayoral count. That is an issue with council elections too. Candidates are allowed to stand for mayor as well as a councillor position.

The CHAIR: Then when they get elected, everyone has to shuffle up.

Mr ELLIS: Then you have got to shuffle them up. You cannot do the councillor count until you have done the mayoral count. That is quite a nuisance actually.

The Hon. COURTNEY HOUSSOS: Perhaps not one that we will be removing from them.

Mr ELLIS: It seems that people should have the courage of their convictions perhaps.

The Hon. COURTNEY HOUSSOS: Absolutely—an excellent result in Maitland, I should say. I should say "political" result, I am not going to comment on the process itself, I do not know. We have received a lot of information asking for more transparency and for more information to be publicly released. Do you have any specific comments to make about that as one of the very few private companies running elections in New South Wales?

Mr ELLIS: We have no problem providing any figures to anybody at any time. We encourage it.

The CHAIR: I think it goes a little further than that. People like Dr Teague have asked to see the source code.

Mr ELLIS: We would have a problem with that because we have got so much money invested and that would be an issue for us.

The CHAIR: You are not enamoured of her argument that by having an extra set of eyes go over it they would perhaps be able to find errors and inconsistencies in the code?

Mr ELLIS: I would just be worried about how far it went and who else was using it. That would be a worry to us. As I say, we have had Deloittes go over it very, very thoroughly and several actuaries, I believe.

The Hon. COURTNEY HOUSSOS: Let me pose a different question to you. If you were able to access the NSW Electoral Commission's source code, would you be inclined to use it or would that alter the way that you ran your elections? You can take that on notice, if you like.

Mr ELLIS: I believe we would use our own. We have got more confidence in our own than we would have in the Electoral Commission's, frankly.

The Hon. COURTNEY HOUSSOS: Even if we were to change the legislation around random sampling and remove that and you would then be required to recreate your algorithm—

Mr ELLIS: That could change our minds, obviously, depending on what changes were made and what it was going to cost us.

The Hon. PETER PRIMROSE: Can I ask what your concerns are with the Electoral Commission's code?

Mr ELLIS: We did, at one stage, find a problem with it which was in some of the examples they were providing it did not seem to do quite the right thing, we thought. And that was back in 2012. It was brought to their attention and I believe they changed a couple of things. The other problem is that we are not completely convinced that they have gone through the same auditing process as we did. We have a letter.

The Hon. PETER PRIMROSE: You mentioned that your audit took place before the 2012 election, five years ago.

Mr ELLIS: That is correct, yes.

The Hon. PETER PRIMROSE: Has anyone updated it since?

Mr ELLIS: It has not been changed since then, no. We have not had cause to change it.

The Hon. BEN FRANKLIN: I move back to the issue of publication of results. I think that the points of previous witnesses, and I suspect future witnesses, might be that they would like to have as much information as possible available in the public domain. The NSW Electoral Commission does put up a range of information. In my investigations in elections run by your organisation we perhaps do not have the same level of information in the public domain. I appreciate what you have said, which is that you have that information and you are happy to provide it to people. Would you consider, potentially, increasing the amount of information that you would provide into the public domain along a similar sort of line as the NSW Electoral Commission?

Mr ELLIS: We definitely would consider it. We are quite happy to do it. Our major issue would be that we have limited resources obviously and the Electoral Commission has vast resources and runs 150-odd elections compared with we did 10 in 2012 and four in 2016. We had a lot more lined up in 2016 but the amalgamations killed a lot of them because we were not allowed to run them on amalgamated councils.

The Hon. BEN FRANKLIN: Would you agree that maintaining confidence in the electoral system, as a broad concept, is important?

Mr ELLIS: Definitely, yes.

The Hon. BEN FRANKLIN: And that people being able to see what is happening in a transparent and accountable way is important as well?

Mr ELLIS: Yes, definitely. We are all for transparency.

The CHAIR: On that point, how does your company deal with political party scrutineers during your counting process?

Mr ELLIS: As you know, it is difficult to scrutineer.

The CHAIR: I know. For any proportional representation—

Mr ELLIS: It is not an easy thing.

The CHAIR: It is not.

Mr ELLIS: They are obviously at the polling booths on polling night. Our next stage is we get them back to the returning officer's office and we do a recount of the polling night figures. There are always adjustments—a batch has gone to the wrong pile, or whatever. They are able to attend and scrutineer that, which is fine. When it comes to scanning, they can look over the operators' shoulders. It is not quite so bad because we had 10 councils in 2012 but we had only four last time in 2016, so it is not really hard to work out which screen is processing Penrith, Maitland, Coffs Harbour, Newcastle papers, or whatever. They can check what the operators are doing because the operators are making decisions on what is formal and what is not. Ultimately, if they want, we can provide them with actual images and a monitor to look at the informal papers.

The CHAIR: Could scrutineers, for example, say, "Could I have a look at the screen images, the actual papers, and the data component for the period from 12.15 to 12.30 on Monday when the count was undertaken?"

Mr ELLIS: We can do it.

The CHAIR: That could be done?

Mr ELLIS: Yes.

The CHAIR: And you would be happy to accommodate that?

Mr ELLIS: Yes, we could do that.

Mr ADAM CROUCH: Has that request taken place? One of the discussions was the fact that scrutineers should be able to do that tabulation between the OCR, the manual entry and also collecting the paper ballots. For example, has that been done for Maitland?

Mr ELLIS: No.

Mr ADAM CROUCH: But it could be done?

Mr ELLIS: We did it on one of them for 2012. As I said, the Labor Party requested to have a look at all the informal ballot papers and we provided them with—

The CHAIR: They are very suspicious people.

The Hon. PETER PRIMROSE: Cautious.

Mr ADAM CROUCH: Does your company undertake a similar process? As you said, you did a detailed audit in 2012. Again using Maitland as an example, will your own people take away a random sample of ballots and compare the paper ballots against the OCR ballot to see whether the system has any particular issues?

Mr ELLIS: We have not done that. We check the polling booth numbers, first preferences. We check that for each polling booth that the scanned figures match the manual figures on the night. If they are six or seven out we would accept that as the scanned figures are more accurate. If they were 20 out, or something, we would go through them.

Mr ADAM CROUCH: There is a point at which your people would say there is too large a discrepancy?

Mr ELLIS: That is right.

Mr ADAM CROUCH: Is that a random figure?

Mr ELLIS: Typically it is up to the returning officer. All our returning officers are ex-divisional returning officers for the AEC.

The CHAIR: Did you say that the OCR accuracy is greater than the manual entry accuracy?

Mr ELLIS: We have found that, yes.

The CHAIR: To what degree are we talking about?

Mr ELLIS: I cannot put an exact figure on it, but you might have four, five or six votes difference in a polling place that takes 500 votes—perhaps 1 per cent.

The CHAIR: A 1 per cent human error rate, less than that—99 per cent is as good as computers.

Mr ELLIS: It is interesting, but it always happens.

The CHAIR: At this stage is OCR now so advanced that it is better than human manual count, or only up to a certain level?

Mr ELLIS: There is a manual intervention with the OCR. It is a bit of both worlds. It is not pure OCR. You could not run 1,000 ballot papers through and expect it to get the right answer.

The CHAIR: What is the human component of the OCR? Work me through the process.

Mr ELLIS: The OCR does its best to recognise the characters. For people who write illegibly, some characters—

The CHAIR: The famous European one issue. No, that is a seven. No, that is a European one.

Mr ELLIS: You run into trouble. A lot of people in some of the councils we have been dealing with have a non-English speaking background, like Fairfield, Penrith and those sorts of places. Their writing is not that good. Our software has a set of business rules. First, it checks that everything is inside the box. If it is not, it gets the operator to look at it. It then goes through a check to make sure it is a formal vote. If there is something above the line and below the line, it will get the operator to look at it. It is unusual, but it does happen. People go one to five above the line and six to 10 below the line.

The CHAIR: Is that the only instance where there is a material issue? What happens if it reads two sevens?

Mr ELLIS: If it reads two sevens it will stop as well. It virtually checks for formality, as a normal person would, with the additional character recognition inside the box. If it is outside the box we would want to have a look at it.

Mr ADAM CROUCH: Going back to Maitland as an example, post the election result, will your people do their own random sampling to ensure your system is working as correctly and as accurately as you would like? You have the ballots. Do you do your own samples to check it is working?

Mr ELLIS: We have not, no.

Mr ADAM CROUCH: We have talked about the public confidence. We heard earlier that there is a lot of openness about the Electoral Commission system. You have third parties scrutinising the way the coding is written. Obviously yours does not. In addition to publishing the outcomes, as you said you would be happy to do—Dr Phelps commented on the difference in the error rate between human entry versus OCR. That could be information that people who study this information want to see?

Mr ELLIS: It sort of is available at the moment by virtue of the fact that we have the election night for the recheck figures up on the web, plus this report also shows you the figures. There is a comparison there, but we have not chased down any differences, put it that way.

Mr ADAM CROUCH: Your source code is obviously different to the source code of the NSW Electoral Commission?

Mr ELLIS: It is, yes.

Ms ANNA WATSON: You said it is different?

Mr ELLIS: It is, it is completely different.

The Hon. BEN FRANKLIN: Going back to the source code issue, I understand you are a private company and you have intellectual property, but when balancing that against confidence in the electoral system, would your company consider providing, confidentially, the source code to an external organisation, possibly Dr Teague's faculty, or whatever, so that an independent external organisation could potentially run some checks? Obviously you would have some guarantees in place such as signing confidentiality agreements to keep confidence in the system and guarantee it would not be released so that your business model was preserved?

Mr ELLIS: I do not believe that would be an issue. I would have to run it past our principal, who is the owner of the business.

The Hon. BEN FRANKLIN: Conceptually, that is not something you would rule out immediately?

Mr ELLIS: It does not sound out of the question to me. We are very confident in the code.

The Hon. BEN FRANKLIN: I am in no way suggesting that there is an issue with your system.

The CHAIR: You said it cost $30,000 to develop your software originally.

Mr ELLIS: Yes.

The CHAIR: Were we to move to a system where we no longer had random selection for preference distribution, would you be able to amend your existing software? Would it be an amendment or would it require a rewrite?

Mr ELLIS: It would be an amendment. It is a significant amendment, though, it is not just a matter of taking every ballot paper instead of half a dozen. It is a matter of working out a whole new scheme for working out transfer values.

The CHAIR: Thank you very much, Mr Ellis.

Mr ELLIS: It is a pleasure.

The CHAIR: We may have some additional questions in writing for you following on from today's testimony and perhaps the testimony of others afterwards. Your replies would form part of the evidence and be made public. Would you be happy to provide a written reply to any questions on notice within 21 days?

Mr ELLIS: Certainly.

The CHAIR: Thank you for your time.

(The witness withdrew)

**ANTONY JOHN GREEN**, affirmed and examined

The CHAIR: I welcome Mr Antony Green to the hearing. Thank you for appearing. Do you have any questions about the inquiry process?

Mr GREEN: No, I well understand the process. I am appearing as a private citizen. I work for the ABC but I wish to make it clear that these are my opinions and not the views of the corporation.

The CHAIR: Do you have an opening statement?

Mr GREEN: Because members have not had a chance to look at my submission I will talk briefly to it. On page 3 I point out that under the system we use for local government there are votes that make up a quota which comes from three sources. The first preference votes for the candidate, preferences from excluded candidates and the third category, which does not apply in single member electoral preferential systems, are votes that are surplus to quota votes of candidates already elected. It is the third category which makes the count much more complex and introduces the problem of random sampling done in New South Wales or reduced vote fractional transfers in other States.

When you design a system like this there are three things you have to look at. I set them out on page 3. First, at what value should preferences or ballot papers be distributed from an elected candidate? Secondly, which ballot papers should be looked at in determining which preferences to distribute from a surplus to an elected candidate? The third thing is a bit more obscure and I will raise it later, which is: What is the size of the surplus? That relates to the method you use to exclude candidates at other points in the count. You have to introduce the concept of a transfer value. A transfer value is something that determines the connection between a vote and a ballot paper.

I raise an example on page 4. If you have an election with a quota of 1,000 and a candidate has 1,250 votes, they basically have 1,000 votes for a quota and 250 votes for a surplus, so which 250 votes do you get? There are two methods to do that. The first is to calculate the transfer value, which in that case is 250 divided by 1,250, which is 0.2 or 20 per cent. There are then two things you can do with that transfer value. You can randomly sample 20 per cent of the ballot papers and transfer them at full value or you transfer all of the ballot papers but at the reduced transfer value. New South Wales uses the first option, which is to randomly sample the ballot papers and transfer at full value.

Random sampling is a method of simplifying a manual count. You never have to deal with ballot papers at a reduced value. Once you have done your transfer value, transferred the ballot papers at full value, the ballot paper equals a vote and there is no question that at all points in the count every vote has the same value, which is one. It is a huge simplification for the process. It also allows you to leave certain votes aside as already being dealt with. They have already elected a candidate and are therefore no longer in the count. It is a thing you introduce to make the manual count easier. It also tends to be a one pass process. It is very difficult to recount the votes. You have to recount the votes and argue on the first preferences again because the problem with random sampling is in a very close contest your random sample may alter the result.

As I said in my post, the process is not necessarily repeatable. In computerising the count what they have done is take this random process and instead of having an accurate and repeatable count you have an accurate count, but you cannot guarantee it is repeatable because if you do the count again, even with the same votes, you might get a different random sample. If you are going to do away with this sort of count what should you do? The best thing to do is to move to fractional transfer values and get rid of the random sampling. The example I compare this to is the Australian Capital Territory [ACT]. They already use the same last bundle, or Gregory method, to determine what votes to look at and they use the same transfer value where you exclude the exhausted votes first. The ACT already uses both of those things without random sampling. Our system could work the same; you just use the fractional transfer method.

You then have to make a number of changes to the regulations because that has implications. The first is, you are letting into the count fractional transfer votes and when you do that you have to decide when you exclude a candidate do you exclude all the votes at once or do you do them in separate bundles? The Commonwealth and most of the States use a method where they first distribute all votes at full value and the next bundle is the next highest transfer value and you do them in descending order. If you look at the Senate count you will often find there will be five or six counts done for every exclusion and that accounts for the different transfer values. The Australian Capital Territory does that as well.

You have to deal with the fact that New South Wales excludes those exhausted preferences at the start of the count when you calculate the transfer value. That means in certain circumstances the surplus will be larger than the number of votes you have left in the count because of exhausted votes. In that case you have to cap the transfer value. You cannot have a vote increasing in value. Under random sampling it is capped at one; you cannot go more than face value of the ballot paper. In the ACT it is capped at the transfer value the vote arrived at. It cannot arrive at 0.25 and come out at 0.5 as that increases the value of the vote. So you have to cap it in the case where you exclude the transfer, the exhausted ballots. Tasmania has a similar system. They do not exclude exhausted votes and they do not have to cap the transfer values.

There is then the question of expansion on the Gregory method. There have been arguments on Gregory versus Inclusive Gregory and Weighted Inclusive Gregory. I have an example on page 8 that I will talk through that might help you to understand. The Inclusive Gregory method uses the devise of the total number of ballot papers that a candidate has at any stage, whereas the Weighted Inclusive Gregory does it on the basis of the number of the votes. I am saying a vote equals a ballot times the transfer value. That can have a significant impact. The example I use is there is a quota of 100,000 and party A has 230,000 votes and party B has 90,000 votes, so party A elects two candidates and then has 30,000 votes as a surplus and, say, they go to party B. Under the Gregory or the New South Wales system the only bundle looked at is the 30,000 votes that are transferred, so all of the votes in the surplus from party A and none of party B's 90,000 votes are looked at. The Gregory method is that only the party with the surplus of votes is looked at.

Under the Weighted Inclusive Gregory, those 30,000 votes coming across would create a surplus of 20,000. The Gregory method goes to the ballot papers that capture the transfer value, so suddenly the 30,000 votes from party A become 230,000 ballot papers. The distortion that is created there is the surplus now consists of another party's preferences, whereas a Weighted Inclusive Gregory method only puts in the 30,000 votes. To make sure that that does make a difference, at the top of page 9 of my submission, in the Inclusive Gregory method, the surplus of party B would only have 5,625 of party B's ballot preferences and 14,375 from party A. The whole thing has been distorted towards the party that sent across the ballot papers, whereas if the Weighted Inclusive Gregory was used, there would be 15,000 votes from party B and 5,000 from party A.

In many cases this is a theoretical example; the only case I can come up with is the last Victorian election in the North Metropolitan region where the fact that one method was used over the other changed the result. A different method would have produced a different result. In my view, if you go down the path of looking at all ballot papers rather than just the lowest bundle, the Weighted Inclusive Gregory is the best way to go, because it does not distort the vote for a party with a huge surplus. The basic Inclusive Gregory method has a bias in favour of a party that gets a huge vote, as opposed to a party with a small vote. This really only affects the count where someone reaches a quota in the middle of a count, but it still has an important impact.

The last thing I will raise is bundling or segmenting the count. Because there are votes of different transfer values in the count, when a candidate is excluded, they may have votes with a number of different transfer values and you have to make a decision whether to distribute them all at once, whether to distribute them transfer value by transfer value to bunch them up, or as they do in South Australia and Western Australia whether to distribute them in the order they are received. In that case each individual receipt of a bundle of votes from another candidate is recorded, so when that candidate is excluded in the count, you get their first preferences and their second bundle of preferences received from somebody else and then the third bundle that has no interest in the transfer value, it is just entirely the order that matters.

That did have an impact in the last Western Australian election, where in the middle of the process The Greens reached a certain quota and under the Senate counting system, what would have happened from that point on was that the Liberal Party would have won the last seat because The Greens candidate, even though elected, would have continued to receive preferences. Because individual bundling was used, the count stopped at that point when The Greens had a very small surplus and the preferences of the candidates whose preferences continued elected One Nation instead. By bundling and splitting up the exclusion by transfer value, if you exclude all of a candidate's votes at once and if somebody is declared elected in the middle of that count, they may have a very large surplus. In that case, the excluded candidates' further preferences and the elected candidates' further preferences all get included in the bundle. If you do the bundles in smaller lots then if somebody reaches a quota in mid-count their surplus is going to be smaller and the preferences are treated differently, depending on their source.

There is no theoretical way of saying one method is better than another. In some ways the bundling method is used to overcome the weighting problems of the Inclusive Gregory method. If you make the bundles smaller, your bias problem in the sample becomes less of an issue. But realistically there is no way of saying that one system is better than the other. Given I have two examples in my submission of where our choice of the rules has impacted, it is something you should consider and decide what you will do. The other thing to say is that if you are doing these counts by computer whatever method you adopt is much easier to do, because you will not have to move around vast numbers of ballot papers. I remember in the old days when ballots were counted by hand, the sheer number of ballot papers moved around was extraordinary. Those are my initial comments. The final thing I would say is simply there is no reason to use random sampling when you are computerising the count. It is simply a matter of deciding which system you want to move to and how you want to change the system. But you should not continue with the random sampling.

The CHAIR: Once again, in the recent election at Greystanes the problem of random sampling occurred, as it did in Parramatta and Mosman, and probably in other instances where this method has been used. Is it fair to say that if we do not change this system the problem of candidates who are statistically unlikely to have been elected are being elected?

Mr GREEN: When you do an election count, you should expect to be able to count all the votes at the end of the process and say which candidates have been elected. The reasons for the examples in the blog post and that we know about Greystanes is that the Electoral Commission can do what you can do, which is just run the count over and over again to get a probability estimate of what percentage of times each candidate was elected. It is ridiculous to have a counting system where you can come up with a probability distribution at the end of the process about who is elected; it just should not be done that way. The count should be deterministic and should come up at the end with a decision. Of course, in all counting systems there are errors. If you ask someone to count the same pile of ballot papers 1,000 times and categorise them into A or B, they will not get the same result every time. It is a fact that you can make errors and get an error distribution. Ignoring the random measurement problem, it should not be part of the process of a count. There should not be random sampling. If you do a count of the same votes, you should get the same result every time. You should not have a system that can produce a different result, depending on how it is counted.

The CHAIR: Under all three of the current Gregory models that are in use, that reproducibility is 100 per cent, is it not?

Mr GREEN: Absolutely, yes.

The CHAIR: You can be absolutely certain that every time you hit the button, candidate number 11 on the Queanbeyan-Palerang Regional Council ticket will always be at number 11.

Mr GREEN: That is right. The other thing is that if you are writing computer software, all computer systems have to have a mode that locks in the sample. If you want to check the calculations are correct, you have to have a mode that will do the same calculation time and again. At the end of that process, you turn on random sampling. I remember the first time they used computer counting for the Legislative Council system, I think in 2003. John Watson, who was commissioner at the time, was very concerned about the process of random sampling and would not hit the button ahead of time to determine who was going to win. He did not do it until the end, so there was only one random sample. At that point a bug in the code emerged. It is one of the difficulties, although there was nothing wrong with the code but it was entirely to do with the way the data was stored. It is a sign of the randomness in this system. We use computers to get accurate repeatable results and to get a legally correct random sample. We are losing the ability to make the count repeatable.

The CHAIR: I turn an issue you raised in relation to bundling. Does bundling not produce the same sort of anachronistic results because, depending on the timing of when a particular bundle was received, the surplus beyond the quota is an arbitrary selection based on time with no real relevance to the total quantum of a person's vote?

Mr GREEN: The issue of the order of candidates getting elected or excluded is always there. For instance, in the 2013 Western Australian Senate count two candidates finished at ninth and tenth. They were only a handful of votes apart, and on the recount with missing ballots the order was excluded. That tiny gap between ninth and tenth candidates, neither of whom had any chance of getting elected, completely changed the order of the count and determined the final two seats. I can think of one New South Wales example, Balmain in 2011. In this single‑member electorate you had the case that Labor and Liberal candidates were very close and so it was difficult to determine in which order they were going to finish. The order in which they finished would determine who won the seat, because whoever finished second would then have the third party's preferences to get them ahead of first.

In any preferential count, that process where simply the order of exclusion has an impact, is going to happen. The same will occur with the bundling process. The order of the bundling, the order in which they go up, can have that impact. But on the other side of that—and you can do this though nobody in Australia does it—if and when a candidate is excluded, all votes and all values are distributed at the same time. What happens is that, if somebody is elected at that point, they have a much larger surplus. Therefore, what that brings into play is more of their first preferences in the distribution of preferences, so more of the candidate that reaches the quota ends up having their preferences distributed as opposed to a candidate who is excluded. Why is one candidate's preferences getting advantage under that system as opposed to another? If you want to talk to someone about individual bundling versus bundling together you should talk to the Tasmanian Electoral Commission. They used to use this individual bundling method and they would exclude in the order, as I said.

The CHAIR: And they dropped it.

Mr GREEN: They dropped it and have gone to doing it on equal transfer value.

The CHAIR: Did they give any reason for that?

Mr GREEN: They did some research on it and they ran back through a number of elections and looked to see if it would have changed results. They did not find an example where it would have. If you dig around, you can find examples but the main reason was that they conduct their counts manually. Trying to keep track of every individual bundle as it is transferred from candidate to candidate can be quite complex as well as trying to get them removed in the same order. In Tasmania also, because they use recounts to fill casual vacancies, it then becomes a much more complex process to do the recount as well. That is one of the reasons they moved away from it—to simplify their procedures. There is not any philosophical reason why one is a better result than the other.

The Hon. BEN FRANKLIN: I wish to follow up on that issue. You say that there is not one more correct than another and I understand you are continuing to hedge. Do you prefer one to the other, personally?

Mr GREEN: I would like to have the smaller bundles. I cannot see why candidate B's preferences get transferred to candidate A and that is done in such a way that it creates a very large surplus, which brings more of candidate A's first preferences into the bundle to distribute as preferences. I cannot see why that makes the count better. But as I said I do not think there is any philosophical reason why one system is better than the other. Please do not ask me to explain the Meek method but there are people who tell you that the Meek method is fairer because it treats all different levels of the counts or treats both equally at more points of the count. I am not convinced I understand it well enough to understand that argument.

The CHAIR: No-one uses it.

Mr GREEN: I think they use it for some local government boards or local health boards.

The CHAIR: Was it not the Western Australian Electoral Commission that commissioned an academic to look into this?

Mr GREEN: Yes.

The CHAIR: She came resoundingly down in favour of it, did she not?

Mr GREEN: Yes, and nobody understood what the Meek method is. I have got the paper here.

The CHAIR: And no-one could understand it.

The Hon. BEN FRANKLIN: If you do not fully understand it, I think none of us has a hope.

Mr GREEN: I will say that one of the oddities of the New South Wales Local Government Act is that you are conducting elections in a wide variety of different formats from elections where all the candidates in local areas, which may have a council of 3,000 and 4,000 voters and candidates and standing groups are all in individual columns on the ballot paper, and then you have candidates in elections as big as Campbelltown with 100,000 voters and 15 candidates. It is almost impossible to conduct Campbelltown City Council manually once you got rid of random sampling because there would be so many fractional transfers floating around. It is very difficult to do. If you had to use fractional transfer values and you wanted to conduct a three-person ward manually, you could probably do it. There would at most be only two transfer values floating around or three transfer values floating around at the same time, so you could do it manually. It would probably be a bit difficult to do but you could do it. The same would apply to the smaller councils.

In New Zealand where they do local government, their ballot papers do not have groupings. The candidates are all standing and listed in alphabetical order. They use computerised scanning but their ballot papers are designed for scanning. They have bar codes next to candidates. The previous witness was talking about the accuracy of scanning versus data entry. I think one of the reasons for that is that when you data entry under optional preferential voting, you have to make sure when you are doing the data entry that you are putting the number right next to the right box. That is when we can get an error because you get out of sync in the boxes as you are typing in. That is why data entry can have more errors in that way whereas optical character recognition [OCR], because the forms are aligned, the number would always end up in the right box. It is just a question of whether it is recognised or not. New Zealand uses a standard form and a standard format and they just scan them. Once you have done that you can use something like the Meek method because it is all in the computer. We are still using data entry and OCR in various different forms here.

The Hon. COURTNEY HOUSSOS: This question may be a bit outside your expertise, but you talked about local councils being able to conduct local ballots. Are you aware of many that do that at the moment?

Mr GREEN: The computerisation of the counts was largely done because of this issue of random sampling. The Electoral Commission was very concerned that councils were just doing what they have always done, which is if they have 1,000 votes here and they have to sample 100, they just take the top of the pile. That is not a random sample, given where those ballot votes have come from. If you were doing the New South Wales Legislative Council and you just took the top of the pile, you might have got all the ones from Ku-ring-gai and you got none from Liverpool.

The CHAIR: Hear, hear! That sounds like an excellent sample.

Mr GREEN: If you take a random sample of cards off a deck and the deck has been sorted, you get a different sample than you would if they had been shuffled up in the first place. That is much of the reason why they went to data entry—to ensure that there was not a problem with random sampling. The problem of random sampling was made worse when ticket voting was introduced because of the number of different variations and combinations of numbers on the ballot paper were diminished. Most people voted above the line and there were fewer numbers up there. Random sampling suddenly became more important if you are trying to detect preference flows above the line.

Tasmania conducts all of its local government elections and its State elections under Hare-Clark and by manual counting. Admittedly, they have got more staff who are brought in on a day-labour basis, who have used this before and who know how to do it, but counting a three-person council and a two-person council, like in Ku‑ring‑gai or Dubbo, it is not that difficult if you just follow the procedures. It is a relatively straightforward count. The only difficulty is that nobody has done it and therefore you have to train them up. Given the infrastructure of data entry already has been done and the computerised system is there, it is probably just as well to do it that way; plus you get better reports.

The Hon. COURTNEY HOUSSOS: The question of reporting was something that came up this morning. One of the witnesses said that they would like to receive daily totals or daily updates of counts after election day. Would you be in favour of that?

Mr GREEN: Of the total votes?

The Hon. COURTNEY HOUSSOS: The progressive count total.

Mr GREEN: This comes down to a problem—and we have this at State level as well, as we are moving towards data entry as quickly as possible—and that is: Instead of handling and counting all these ballot papers once manually and then counting them again and then moving on to data entry, they have tried to sort of smooth that process by moving part of the second area, particularly with postals and absences, by doing a rough count and then moving straight to data entry. The best example of this is the Commonwealth Electoral Commission's method of counting the Senate, which is different from the Legislative Council. New South Wales has a similar counting method for the Legislative Council and local government.

At the Commonwealth level they basically do a batch total for every column on the Senate ballot paper in a polling place on the night. That becomes what you would call in data entry terms a batch total: We reckon there are X number of ballot papers for each candidate in each column on the ballot paper. That goes off to data entry, but those numbers are entered in as the polling place result and they remain as part of the exported numbers. As data entry is done, the initial count is replaced by the data entry for that batch for that polling place. Your original counts slowly shift to the post data entry version in the Commonwealth. That is quite an expensive process because you have to match everything up all the time and you have to have a data entry system which matches up across.

Often what is happening is that the commission has one system which records the results by polling place and one system for data entering and counting the votes. Those two are rather difficult to match up and sometimes can be matched up only after the process. That is the difficulty of doing the regular updates. You have got two different processes going on. I know in New South Wales there is the slight frustration that in the Legislative Council counts there is a whole bunch of votes that get called "Other" and that is basically all the below the line votes. They do not get included in the count until later. The Commonwealth's procedures include them by having them in this batch total. If you look at the Senate results post-election, you get something called "below the line, unallocated", which is just basically the difference between the original batch total and what slowly has been data entered. It is a complex process. One of the things I would say is that sometimes people want to try to scrutineer online and the information is not available. Scrutineers at the place might have a bit more information.

One thing I could raise is that in the ACT they do progressive distributions of preferences. On election day they get 20 per cent of their votes taken electronically and then they scan the rest of the ballot papers and starting on the Tuesday after the election at the end of every day they do a distribution of preferences so you can try to work out which 25 members have been elected. This causes great confusion as for the first three days someone is elected and on the fourth day they are not elected.

The CHAIR: That is exactly right.

Mr GREEN: I understand what that means. At the State election, you might have noticed on the ABC website I was declaring candidates elected because I could. I got this very indignant email from someone from the east mid-coast council complaining I had declared her elected and how dare I do that. She said that this was not official and she was getting congratulated and it was wrong. I wrote back to her and I said, "You are eighth of 11 candidates. The candidate who is twelfth has half your votes and will not catch you on preferences. I am happy to declare you elected. If you do not wish to be declared elected I have removed the indication that you are elected." She then wrote me a letter and said, "I'm sorry. I did not realise it was Antony Green doing the analysis."

I well understand the issue you are raising, but the issue that is coming up is that as far as the data entry is concerned once votes starts to be declared informal, or they have been entered as a below the line and that turns out to be informal and reverts to an above the line it is quite a complex reconciliation process for the commission to sort those things out and then reconcile them back to the original polling places. Sometimes that is not done until the data entry is completed. The commission can probably confirm exactly why it cannot provide more details but I suspect it has something to do with the process of initially recording votes and then reconciling that afterwards with the data entered votes.

The Hon. COURTNEY HOUSSOS: This is a challenge for us. An earlier witness told us that this is the first inquiry we have had into voting systems post computerisation of electoral systems, which is exciting for us to consider. But this Committee is trying to grapple with the question of scrutiny of votes and transparency of elections in an era of computerisation and increasing computerisation of elections. Progressive distribution of preferences was suggested to be one way that we could be increasing the scrutiny. The point you made was that scrutiny often needs to occur in the polling place rather than online. Would it be beneficial for you to receive this information or do you think it is simply too onerous to put onto the Electoral Commissioner?

Mr GREEN: Most people cannot work out whether a multi-member electorate contest is close or not. It takes a lot of experience to understand it. I remember the 2013 Western Australia Senate election and my little calculator on the ABC website was able to apply the ticket. We knew very quickly that that was a close contest. In the lower House in a single-member electorate, at the end of election night, you know whether you have a close contest or not and the next day you are sending your scrutineers to that count to start looking at the ballot papers. In the case of the Western Australia Senate that election took place basically unscrutineered because nobody realised it was a close election for a week. At that point most of the ballot papers had been bundled up and sealed and nobody was looking at them again. It was not until the recount that people started to do this.

In local government again, what people are after is trying to get a cue on whether this contest is close. In Tasmania where they have randomly ordered candidates on ballot papers and all sorts of differences they have very experienced scrutineers who are able to try to work out what is going on with preference flows, but even there it is very difficult. You would have to change the counting system to get rid of the random sampling for a start. You would have to understand that you are going to have to leave a certain amount of time before you hit that first example of the distribution of preferences. If you did it, for instance, just with iVotes you are certain to get a biased sample. The example I worked through—I have got a paper I hope to publish early next year for the Parliament—using the iVote system at the last State election, the number of voters who gave preferences on an iVote was about 25 per cent to 30 per cent higher than all other categories of votes. It was much easier for them to ask do you want to give another preference and they would do it.

If you just did a distribution of preferences on the iVotes because they are the only electronics you have got there is a high likelihood you are going to get quite a different result because people do different votes using iVotes. If you only did postal votes you would get a different result. You might have to leave it two or three days but by that stage you are trying to figure what you want to scrutineer towards trying to ensure the result is going a particular way and by that stage the ballot paper you want to scrutineer may have already gone through the process and you cannot look at them again. I am not sure that the issuing of a preference distribution is going to help scrutineers, and I am not sure it is going to help people understanding the process.

The Hon. BEN FRANKLIN: I refer to your comment in relation to the counting error. I guess the point is that mistakes will always be made.

Mr GREEN: Yes.

The Hon. BEN FRANKLIN: Individuals are going to make mistakes in counting. This system is going to produce some strange, interesting outcomes. Is there a difference between an unintended error and an intended error that is deliberately built into the system and is trying to rectify that intended error—that is, the random sampling—a worthwhile pursuit and quite different to the unintended error of people making mistakes when they are counting?

Mr GREEN: Absolutely. I was trying to get away from the fact that if you do a recount you may find differences. We just know that.

The Hon. BEN FRANKLIN: Understood.

Mr GREEN: As far as I am concerned the random sampling just should not be there. If you do the same count with the same votes you would get a different result and that is not the way you should conduct an election.

The Hon. BEN FRANKLIN: I appreciate the written submission and its unqualified language. Other than simplicity of a manual count, including the logistical issues of implementation, are there any arguments against getting rid of random sampling?

Mr GREEN: I cannot think of one. The simple one is that it is not repeatable in a close contest, and that is just enough reason for me to say you should not do that. I am not even sure why New South Wales uses it. I have not been back and checked when proportional representation was used in the 1920s, and I am not sure how long it has been used in local government but when New South Wales used a similar Proportional Representation‑Single Transferrable Vote or PR-STV system to elect the upper House from 33 to 78, and the constituency in those days was just the members of the two Houses so it was an indirect election, they used fractional transfers. It is not like fractional transfers were foreign in New South Wales. When PR-STV was introduced for the Senate in 1949 it is unclear why Bert Evatt borrowed the Irish system of random sampling rather than use the Tasmanian system of counting every vote. It was raised by all the Tasmanian senators in debate and there was never a proper answer on it.

One of the basic reasons is just simply the sheer size of the elections. If you are counting five million votes in New South Wales it is a little easier than 55,000 in Braddon. It does not scale very well. It was an attempt to try to simplify it. That was in the Senate system right up until it was abandoned and removed in 1983 but the difficulty was in 1978 proportional representation was introduced for the Legislative Council and it copied the procedures of the Senate at the time, which included random sampling, and added on optional preferential voting as part of the compromises. But they basically borrowed the procedures and then stuck them in the Constitution and we now need a referendum change. Somewhere along the line many of the procedures in the Legislative Council were copied into the Local Government Act and they did not need to be done that way. I think that includes bulk ticket voting, minimum number of preferences and random sampling. They are all things which I think were put under local government and I do not think should necessarily be there. But within the remit of this Committee it is random sampling which should be removed from the Local Government Act.

The CHAIR: Is it fair to say that the criticisms which can be directed towards random sampling at a local government level are also applicable to the use of random sampling for the Legislative Council?

Mr GREEN: Yes, the only difference is we have not had a result close enough for it to matter yet.

The CHAIR: But that is not say that it could not happen?

Mr GREEN: It is not say that it could not happen.

The CHAIR: Does the size of the quota required for election have a material effect on the possibility of statistical unlikely candidates getting up? For example, if you are in a three-member ward you have a 25 per cent quota and in a nine-member unitary country electorate you have a 10 per cent quota, but in the upper House you are looking at a 4.54 per cent quota. Does the size of the quota matter in the possibility of unlikely candidates being elected?

Mr GREEN: It is not so much the percentage, it is actually the raw number of the quota. If you have two candidates on a quota of around 500 you have got a chance that those numbers are close together. In the Legislative Council the quota is, I think, 180,000. The chances of getting two candidates where the ballot is 180,000 votes out of five million is much smaller than getting two people with about 500 votes out of 10,000. It is just a factor of probability. I think that is all that is. But if you did have two candidates very close, the commission—I cannot remember if I mentioned it in that blog post or not—did the same process of repeating several Legislative Council elections. It made a difference of about 100 votes either way, the random sample, but it did not change any results. We have not had a result that close yet. I think it should be changed. Of course, the difficulty is having to hold a referendum to do it.

The Hon. BEN FRANKLIN: There has been some discussion from earlier witnesses about the importance of transparency in the publication of results in terms of the broader community and psephologists like yourself being able to have access to the information they need to provide confidence in the electoral system. What further information would you like to be put online, if any, by either the NSW Electoral Commission or other electoral companies that would assist in either public confidence or in your work?

Mr GREEN: The commission had all the information I needed. I was quite happy with what the commission did. It is a bit awkward to drive but it is very difficult to develop a very big website at a reasonable cost. I think their site has all the information there. You just have to get used to it and know what you are looking for. The average member of the public would walk in there and not have the faintest idea what the vast number of these reports are. But for those of us who are close to the process, we would know that. That is just a fact of life that some people do not know how the electoral system works and therefore they look for answers on the website and cannot always find them. Why I ran, like I did, a local government website was just to present the information in a slightly easier format, which people are more used to looking at. I can do things like accumulate by party. That is something I can do, which is not really the job of the commission to do, in some senses.

On the private election company, I used that data from Maitland but it was impossible for me to, for instance, work out what was the number of ticket votes as opposed to the number of candidates for the first candidate on the list, because of the way they publish their report. It did not have all the information there I am used to getting hold of. On accessibility of the code, I think we should move towards a system where the counting process is available as source code. I do not think any of the commissions use anything wildly proprietorial in the software. In terms of confidence in the system, I think we should move towards something like that which is auditable. The request of source code becomes more difficult with things like iVote and with electronic voting, because commissions for simple costs reasons may want to use proprietary software to do screen painters, to do data capture, the things that interface between your system and the internet.

It is very difficult for an electoral commission to have software which will run on all devices available. I do not know why but some people wanted to use their iPhone to vote below the line in the upper House at the last New South Wales election. The Electoral Commission had to have software which would handle that sort of screen device. That is one of the difficulties of electronic voting. I know this from the ACT, they have electronic voting and their software is publicly available. You can go in and audit it, everyone is very happy. But if you use that software it is a little old and clunky compared with what everyone is used to using on the internet nowadays. The pace of change in this software is quite fast and you are asking a commission to have enough available resources to keep their software up to date. Sometimes it is easier to use a company with proprietary software to look after that front face of the website of the voting system. That is where the argument between software and proprietary systems becomes much more complex.

In terms of the counting software, that is done by the commissions. They are not going out and buying somebody else's software to do the count; they write their own software to match the Electoral Act. The South Australians were talking to me about trying to use the New South Wales system for their upper House. I said, "You can't because the Act is written differently." No two PR-STV systems in Australia are exactly alike, they all have subtle differences. Every time I go to Victoria they do their full value vote transfers in two bundles, one for first preferences and one for excluded preferences received at full value. Nobody else does that. Every State does it slightly differently, which is why all the States have their own counting software. I think that should be more publicly available.

Off the top of my head, from what I do I cannot think of anything particularly that I need extra from local government. I tried to access polling place results for the 2012 local government elections to try and estimate results for Cumberland and Parramatta councils. It was there. I did not do it in the end because it was going to take too much time to do and I had other things which were more interesting in my life. I was happy that there was everything there that I could see. I am not sure, I think the NSW Electoral Commission tends to publish the data from the ballot papers eventually as well, as does the Australian Electoral Commission, so that data is available.

The Hon. BEN FRANKLIN: Which means in terms of preferences with two different candidates it can be worked out who would have won.

Mr GREEN: There was a case in the Victorian Civil and Administrative Tribunal, because the Melbourne City Council elections data is all released people therefore had the electronic availability of it. This raises a rather novel problem, that if someone wants to resign somebody can take the data and work out who will be elected in their place. There was a case in the Field Government in Tasmania between 1989 and 1992 where a defeated Labor candidate was appointed Ombudsman. There was a corruption argument about whether he had been told if he took the Ombudsman job he could not nominate for the casual vacancy if there had to be a recount, and was this corruption, and was this a valid deal to engage in. That is one of the problems if you go down the path of recounts and making data available. People can work out who is going to get elected.

The CHAIR: But that happens in the ACT all the time.

Mr GREEN: It does.

The CHAIR: They have not fallen over.

Mr GREEN: No, they have not fallen over. It does raise an issue if you have two Labor candidates on a ticket and they both want to nominate. One stands and the party wins a ticket, wins the seat, and if the other one stands the seat drifts off to somebody else. You might get someone trying to work that out. The data is available.

The CHAIR: It also has the unintended advantage of filling out the ticket with reasonable people who might be respectable for your party on a campaign, rather than filling out the dead spots on the ticket with no‑hopers.

Mr GREEN: As I pointed out, the changes to the Senate's voting system have made the parties much more aware that they must pay attention to the candidates they put on their ballot paper and the order they appear, as the Labor Party discovered when Lisa Singh was elected from number six in Tasmania in the last election. You cannot just demote somebody on the ticket for factional reasons if the voter is prepared to put them back into office. I make one further comment: This is quite a complex area and I would suggest that you may have to do iterations of this sort of report, produce what you think the system should be. I think there needs to be some sort of expert review of what is proposed, because there are lots of people who have detailed knowledge of the system. For instance, I do as well but it was difficult to put forward a submission which is very general. The process should narrow down and hopefully that is the direction the Committee will take.

The CHAIR: We will have to check that the technical capacity of what we are asking for is able to be delivered. It is a big P political problem, and that is I do not think there is much disagreement that random sampling should be done away with, but inevitably there will be concerns that if the major parties agree that something should be done there is something nefarious and dodgy about it. From your point of view, do either the Weighted Inclusive Gregory method or the Inclusive Gregory method materially benefit major parties—list parties, if you like, who will get large numbers of preferences—to the detriment of smaller parties or Independents?

Mr GREEN: The current Gregory method tends to give greatest effect to the first preference intent of a voter. If you vote for a candidate who is later elected, your vote stays entirely with that candidate. It does not get included in the surplus of that candidate, it stays where it was put first. The oddity in New South Wales is, because ticket voting has been included, if you vote above the line on the ticket the Inclusive Gregory method it gives huge weight to the top of the ticket. The votes that come down the ticket have weight because anyone who is elected second, third or fourth on that ticket gets no extra weight. Their votes do not get included in the surplus, only the top of the ticket.

Within the party ticket and in controlling preferences there is not a lot of impact between simple Gregory and the other two forms. The difference between Inclusive Gregory and Weighted Inclusive Gregory, it really matters only in a situation where someone is elected in the middle of the count. The current Inclusive Gregory method will give greatest advantage to someone who has elected multiple candidates already. The Inclusive Gregory method works to the benefit of a party that has two or three quotas and to the disadvantage of somebody who reaches their first quota in the middle of the count. If there is an argument about who the Inclusive Gregory method—the current Senate method—is advantaging, it is advantaging the party with the most votes. The Weighted Inclusive Gregory method will get rid of that bias and will give a result which is more logically sensible to people about why someone was elected.

The CHAIR: So a Weighted Inclusive Gregory could not have an argument mounted against it by minor parties and Independents that it was somehow favouring the major parties?

Mr GREEN: No, it would not advantage a major party in regard to preferences; Inclusive Gregory does. My only caution about Weighted Inclusive Gregory goes to these country councils where you are electing nine members. There may be only one, two or three elected on the first quota and everything else is to do with preferences. Suddenly, if a candidate elected on the first count elects somebody else on there, it changes the way that preferences work. But I suspect they probably work in a better way because all the candidates' preferences get included. So I do think Weighted Inclusive Gregory is the best method to move towards. As I said, I think a proposal should be put forward. I am sure people will look at the technicalities of it and how it should work.

Mr ANDREW FRASER: I asked someone else the same question. On those smaller country councils where there is less of a political influence would it not be better to have nine first past the post candidates? In other words, if you have nine votes, those with the most ticks or crosses get elected?

Mr GREEN: You would get the Senate system. You would get the Senate system pre-1949. Up until 1949 in every State one party used to win all the seats. They used to talk about a windscreen-wiper effect—a small swing from one side to the other would wipe out Parliament. We used to use block voting for the Legislative Assembly here until 1891 and then when parties first emerged it was suddenly completely distorted. What the Labor Party did at the 1891 election, it would stand as many candidates as it thought could be elected and it blocked those members in. If people vote on party lines, even if they are not listed as a party on the ballot paper, there is a likelihood that without proportional representation they would win all the vacancies. Whereas the proportional representation, through the single transferable vote counting system, tries to get the most popular collection rather than deliver all the seats to one party. I can understand that but the minute a council started to get factions on it you get the situation where one faction could win all the seats, if you used the first past the post multi-member system.

The CHAIR: Thank you for your inspiration and congratulations on your Order of Australia which was entirely deserved. We may have additional questions for you on notice which your testimony or subsequent testimony might raise with us. Would you be happy to provide a written reply to any further questions within 21 days?

Mr GREEN: I would be happy to do so. Unfortunately my blog has recently been restructured and a number of posts have disappeared which will come back. I would like to point to two of them—which is difficult at the moment because they are not available. The first is the counting error in Northern Metropolitan and also some comments on the issue in Eastern Metropolitan in Western Australia where the order of the candidates that were excluded had an impact. I would like to point to those but I do not have them available at the moment.

The CHAIR: Would you be able to give that to the Committee secretariat?

Mr GREEN: I will certainly do that.

**(The witness withdrew)**

**(Luncheon adjournment)**

**DONNA RYGATE**, Chief Executive, Local Government NSW, sworn and examined

**SHAUN McBRIDE**, Senior Strategy Manager, Local Government NSW, sworn and examined

The CHAIR: Before we start with questions, would you like to make an opening statement?

Ms RYGATE: There is not a great deal more to be said than what we said in our submission, and it was mercifully short.

The CHAIR: It was very direct. There was no ambiguity about that submission.

Ms RYGATE: Local Government NSW is the organisation representing the local government sector in the State. We endeavour, through means of advocacy, member services, all sorts of different ways, to strengthen and protect an effective democratic system of local government in the State. The question of how votes are counted in local government elections is obviously relevant to us. We believe that in order to maximise the integrity of election outcomes, the current system needs to change and some system should be instituted that allows all votes to be counted properly. In respect of the technicalities, I noticed you had on your agenda some people who are far better qualified than me—I will not speak for Mr McBride—in the ins and outs of electoral matters to provide you with advice.

The CHAIR: Thank you. Before you became involved in local government, did you realise that preferences were done by random selection?

Ms RYGATE: I did not.

Mr McBRIDE: I did not, no.

The CHAIR: Would you say that would be fairly common throughout the voting community in New South Wales?

Mr McBRIDE: I would think most people were probably not aware.

The CHAIR: Would it also be fair to say that most councillors would not be aware it is a random selection of preferences?

Ms RYGATE: I think we could not speculate on that. Once one is standing for election, they seem to become a great deal more interested in the ins and outs of those methodologies. It is possible. I could not say with any certainty.

The CHAIR: Would it be reasonable to believe, as an ordinary Australian voting citizen, when your preferences are being allocated by you on that ballot paper they would have some material effect rather than possibly being dismissed through an arbitrary selection process?

Ms RYGATE: I am sure that is why people go to the trouble of doing it.

The CHAIR: This next question comes down to issues which were raised earlier by witnesses today. If we were to move away from the current system towards whatever model, but a model which counted every preference and allocated every preference, there is a strong possibility that smaller councils could not do hand counts anymore, that they would be required to either take on the Electoral Commission or private companies to do it. Do you believe your members would have any concern about that technical effect taking place?

Ms RYGATE: I think that the principal concern with that would be in relation to the additional costs that it imposes on local government. The system where councils pay for their elections is an interesting one. We would, of course, advocate that there need to be changes to the system and there needs to be some system of funding those changes so that the democratic process is properly maintained and community expectations are delivered.

The CHAIR: If the Committee were to recommend a change I fear that councils will immediately say, "It is all too complex. It is too difficult. You are forcing us to change something which we have done for ages and ages and you are not giving us any compensation for this change."

Ms RYGATE: Surely, Dr Phelps, in your recommendations you would endeavour to address that issue and nip that in the bud.

The CHAIR: By providing State Government money for the conduct of local government elections?

Ms RYGATE: I cannot see why that would be a bad thing. Local government, as we all know, is a creature of the State. The process is dictated by the State. It is appropriate for the Electoral Commission to be funded if it were to undertake the role. If we were maintaining a system whereby other parties could do this work it would be appropriate that some means of funding be provided so that we have real democracy rather than a misguided understanding of democracy.

The Hon. COURTNEY HOUSSOS: Do you know how many of these smaller local government areas currently conduct their own elections?

Ms RYGATE: I cannot tell you the number but it is pretty small. In the election just held in September there were one or two; not a lot, just a tiny number. Similarly, with the elections we had last September again it was a pretty small number. We did work with councils around how that process worked for the councils that did their own elections and the ones that used the Electoral Commission. We have been working with the Electoral Commission to make sure they have the councils' feedback, which is mostly about the speed of results being known. It is a pretty tiny number that still do it themselves.

The Hon. COURTNEY HOUSSOS: Did they provide you with feedback as to why?

Ms RYGATE: It was principally about cost.

The Hon. BEN FRANKLIN: Could you take on notice how many and which councils have taken responsibility for their own elections from 2012 onwards?

Ms RYGATE: Yes, if that data is available on the Electoral Commission website where I will look. You could potentially ask them—I think they are coming up after us—and they might know the answer. On the website it has everybody that is going to election and the data for those that the EC is doing.

The Hon. BEN FRANKLIN: Of those who did not have the Electoral Commission, did they all hold their elections with the Australian Election Company or did they do it themselves?

Ms RYGATE: Some did it themselves and some used the company.

The Hon. BEN FRANKLIN: All of that information is on the Electoral Commission website?

Ms RYGATE: Yes. If they cannot help you ask your Committee officers to come back to us and we will be more than happy to help.

Mr ANDREW FRASER: Do you have a recommendation to councils as to which way they should jump as an association?

Ms RYGATE: No, it is entirely a matter for the council.

The Hon. COURTNEY HOUSSOS: Are you aware of any other providers? There was the Electoral Commission, the Australian Election Company, and some councils that did it themselves. Were there other providers?

Ms RYGATE: None spring to mind.

Mr McBRIDE: Not that I am aware of.

The Hon. BEN FRANKLIN: Have any of your constituent members raised with you the issue of the random selection? I am not asking for specific conversations or people but I am trying to understand whether this is an important issue and whether have they raised it with the peak body.

Ms RYGATE: It has received a bit of prominence in the media in recent months. There has been a bit of discussion about that. Also, from the activities of this inquiry, people are interested. I was at a forum with a couple of councils this morning in Wollongong and told them that I was coming to see you this afternoon and there is interest there.

The Hon. BEN FRANKLIN: Is it your view that if a recommendation were to come out of this inquiry random sampling should be ended, taken out of the legislation? Would that be something that your members would likely support?

Ms RYGATE: I would think so, yes.

The Hon. BEN FRANKLIN: Strongly?

Ms RYGATE: Yes, I believe so.

The CHAIR: To be frank, the problem we face is that I think there is a strong degree of unanimity that it is a bad system at the current time. But whenever the major parties get together and suggest a change to voting arrangements there are always conspiratorial notions that the big parties are ganging up to get some sort of advantage. The question would be—and I will be unsubtle enough to ask it—if we were to propose it in legislation would Local Government NSW be prepared to say, "We think this is a good change and a change for the better"? The normal reaction from certain sections would be that the major parties want to take over local government and this is one of the ways they are doing it.

The Hon. BEN FRANKLIN: I was heading there in a more gentle way.

Ms RYGATE: We do submissions to all sorts of parliamentary inquiries but we do not put all of them before our president for a signature before we send them in. We did that because we wanted to be confident the position that we, at officer level, were putting forward had that political support. You have the signature of the president on there and that probably answers your question.

The Hon. BEN FRANKLIN: There is a line in your submission about the source code for the algorithm not being available for public scrutiny. To clarify, you would support the source code being available for public scrutiny?

Ms RYGATE: Yes. As a general principle the stuff about how elections are run and how decisions are made should be available to the community and the voting public.

The Hon. BEN FRANKLIN: Why is that important?

Ms RYGATE: It is the disinfectant of sunlight. The other thing we would say is we support the same sort of approach being taken to local government elections as to elections in other spheres of government. It is beyond your remit but the fact that the random sampling happens in the upper House is the subject for a new inquiry.

The CHAIR: The reason you are lumbered with it is that the drafters of the Local Government Act said, "We will cut and paste this."

Ms RYGATE: We have this from the Neville Wran era, and rate pegging, which we strongly oppose.

The Hon. BEN FRANKLIN: That might be outside the terms of reference.

Mr JAI ROWELL: I am impressed with your CV. Congratulations on taking up the role. I used to be on the executive many years ago.

Ms RYGATE: Yes, I know.

Mr JAI ROWELL: When I was on the executive the method of voting for Local Government NSW, or the previous names it has had, was the same model. Has that changed? We had random sampling in the election of executive members.

Mr McBRIDE: It is not random.

Mr JAI ROWELL: In my day there were people elected that had no votes.

Ms RYGATE: There is an incredibly complex formula. We are a registered organisation under the Fair Work (Registered Organisations) Act 2009 and we have a detailed set of rules. We are registered under the State industrial relations Act. There is a complicated formula in there for the allocation of votes. Our elections are conducted by the Australian Electoral Commission because of the Federal registration. I am not aware that random sampling is used. No-one has said anything to me in the three years I have been there. We have elections in December.

Mr JAI ROWELL: Good luck.

Ms RYGATE: Thank you.

The CHAIR: Thank you for appearing before the Committee. There might be additional questions that arise when we look at the transcript or following testimony from the NSW Electoral Commission. Would you be happy to supply written replies to questions on notice within 21 days?

Ms RYGATE: Yes.

**(The witnesses withdrew)**

**JOHN SCHMIDT**, Electoral Commissioner, NSW Electoral Commission, affirmed and examined

**JOHN CANT**, Executive Director Information Systems, NSW Electoral Commission, sworn and examined

**SIMON KWOK**, Executive Director Elections, NSW Electoral Commission, affirmed and examined

**GREG COPSON**, Election Operation Manager, NSW Electoral Commission, affirmed and examined

The CHAIR: I welcome representatives from the NSW Electoral Commission. Do any of you have questions about the hearing process?

Mr SCHMIDT: No, Chair.

The CHAIR: Would you like to make an opening statement?

Mr SCHMIDT: I would like to make a couple of quick observations. I had the benefit of being able to observe a great deal of this on the internet before I came here and I thoroughly enjoyed it.

The CHAIR: You are every bit as weird as we are, in that case.

Mr SCHMIDT: I have a low pleasure threshold, obviously.

The CHAIR: Nothing is more exciting than the counting of votes.

Mr SCHMIDT: Exactly. To the point that has arisen a couple of times about the general knowledge of this element of the count, some of you may know that I was the last Secretary of the New South Wales Cabinet Office and headed up the legal branch for a while. If I knew it at the time, I had completely forgotten by the time that I took on this role. With the experience of the media coverage in the lead-up to the recent local government elections, it is apparent that there is a great deal of ignorance about preference counting, although "ignorance" is not the right word. Some of my colleagues can talk about this in detail in due course, if you wish to hear it, but in their discussions with candidates and others in the course of the election, people were surprised to find that this was an element that came into play.

An extra twist to the New South Wales system is that in our local government elections, a candidate has two grounds or two bases for seeking a recount. One is they can come to me and ask for a recount and I would seek evidence of some error in the process or some other grounds. The other is they can pay for no grounds whatsoever. People talked about the different sizes of electorates or councils—it could be a small ward in a country town or it could be an undivided council in a major metropolitan area—and that costs can vary from a few thousand dollars up to tens of thousands of dollars, which raises yet another complication and concern I have. I said in my submission that there is a lottery element that comes into this.

There is a lottery element because you can run the count again, and probability says if you run it a million times, you will get different results. Then of course you have the issue that if you are willing to pay and it is close enough, maybe it is worth putting your money on the table and seeing how you go. I am not in any way casting aspersions on anybody who has paid for a recount in the history of that provision—it is there and they are perfectly entitled to do it—but it raises a degree of uncertainty. It concerns me that it might throw into doubt in the public mind the basis on which an election result is arrived at.

Moving on, I owe Vanessa Teague an apology. She raised before the Committee that after the 2016 local government elections she pointed out two bugs in the algorithm. We had in fact prepared a response to that, and I do not know why but it was never transmitted. I will be sending the response to her after this meeting. Yes, there were two bugs, which were immediately fixed. I am also sure that neither of those bugs would have affected the outcome of any of those elections in September 2016. The final point I would make is that I saw some testimony this morning that might have been interpreted as raising a question as to what degree we audit or certify our systems. I can assure you that prior to every major election event, we both audit the software and have it certified by independent third parties. If I remember correctly, those certifications are published online. That is a regular and expected process we go through.

The Hon. COURTNEY HOUSSOS: I start by thanking you not only for appearing before us today but also for paying attention this morning. It is quite encouraging that someone is taking advantage of the broadcast; we are delighted.

Mr CANT: I watched some of it, too.

The Hon. COURTNEY HOUSSOS: We have two watchers, excellent. I also thank you for your lengthy and useful submission. I definitely agree with you that a large proportion of the public is probably not aware of the random element of local government elections. In your submission, you talk about the media coverage of the random element and say that led to an increased number of people asking for recounts. You said that you declined a large number of those requests. Please explain the process.

Mr SCHMIDT: I will pass this to one of my colleagues, who dealt with the candidates.

Mr COPSON: In total there were 11 requests for recounts. To explain the process, once we have run the count, we are required to put the results of the distribution of preferences up on our website. Under local government legislation, candidates then have 24 hours to request a recount. We notify all the candidates by virtue of the fact that we capture their emails and phone numbers on their nomination forms and we tell them the results are on the website. Candidates then would write to the returning officer and to ourselves requesting a recount. The majority of these recount requests were simply on the basis of the closeness of the result. It is commission policy for the commissioner not to direct a recount simply because the result is close, because of the random selection. Someone could easily be granted a recount, we run the count again and a different person gets elected, not because there is anything wrong with the count but the random selection could result in a different person being elected.

The CHAIR: To stop you there, could a person who lost subsequently ask for a recount?

Mr COPSON: No, under legislation—

The CHAIR: So the first recount is the final recount?

Mr COPSON: Yes, that is right. The commissioner can direct as many recounts as he sees fit in order to be satisfied that the result is correct. But there can only be one candidate who requests and is granted a recount.

The Hon. BEN FRANKLIN: Does that include paying for one?

Mr COPSON: That is right.

The CHAIR: You are missing out on a financing opportunity.

Mr SCHMIDT: If you could recommend something along those lines.

Mr COPSON: Last year, off the top of my head, there were probably about 15 recount requests, none of which were granted. This time around, there were 11 and two were granted. One was declined, in Parramatta ward, but then the candidates subsequently paid for that recount. The other one was in Cumberland Greystanes ward, where there was a close result but the commissioner directed a recount because of an administrative error on the floor of the counting centre, where the ballot papers for that particular ward were put out to data entry prior to our counting schedule on the website. Scrutineers in that area turned up after we had already started data entry on them, and they were declined the opportunity to look at those ballot papers from the start. Based on that, that was the reason for the commissioner granting a recount in that particular ward.

Mr SCHMIDT: If I can say a little bit by way of illustration?

The Hon. COURTNEY HOUSSOS: Yes, of course.

Mr SCHMIDT: Greg Copson speaks to these people individually and explores the reason why they are asking for a recount. In at least one of the written requests, the candidate said, based on the articles about the randomisation, "That is the basis on which I would like to have my recount", which is fine.

The CHAIR: It is very honest.

Mr SCHMIDT: Yes. That thinking underpinned a number of the conversations that I understand Mr Copson had with some of those applicants.

Mr COPSON: Yes.

The Hon. COURTNEY HOUSSOS: You said that you publish on your website a full distribution of preferences. Are you aware of whether the Australian Election Company publishes that level of data?

Mr COPSON: I am not aware of their processes, no.

The Hon. COURTNEY HOUSSOS: I should probably direct that question to them. I think there was only one this year that did not opt to use your service.

Mr SCHMIDT: That is correct. Maitland was the only one and they used the Australian Election Company.

The Hon. COURTNEY HOUSSOS: This morning we heard a request for published daily distribution of preferences to be uploaded to the website. How onerous would that be on the Electoral Commission?

Mr SCHMIDT: If I could make some observations and pass to Mr Cant, who is head of IT?

The Hon. COURTNEY HOUSSOS: And feel free to say whether you think this would be useful or not.

Mr SCHMIDT: Okay. I will talk about the practicality first at a very high level. This to some degree overlaps with a recommendation from the Joint Standing Committee on Electoral Matters from the 2015 election, which talked about us publishing more end-of-count-day data each day. In the Government response to that it was pointed out that, to even do that, would require significant change to our current systems anyway. We are not in a position to do it yet and it would be a substantial IT project, which would be something that would have to be funded, too. I think the Government response was that we would be asked to prepare a business case to explore that. In a sense, some of this consideration already is in train in respect to the previous recommendation, but on specifics?

Mr CANT: I probably should defer a little bit to the elections guys as well. From a systems perspective, it would be a change in the way our systems are configured. We would actually need the systems to be updated. But there are also some procedural issues around how the information is gathered that would probably affect that even more.

Mr KWOK: In the context of local government elections, in 2017 we ran 122 council elections over the course of eight or nine days. All the results were declared on the Sunday, with the exception of the two recounts of course. If we are going to have provisions to allow for this daily distribution of preferences, it would undoubtedly cause a delay in completing these results, which was one of our key aims in the election. As our friends from Local Government NSW would attest, the councils would like the results as soon as possible because they have the council meetings that are due to run as soon as possible. In the context of running 122 elections, to provide a daily update of each one of those contests would be quite a burden administratively.

The Hon. BEN FRANKLIN: Would those delays add to staffing and logistical costs?

Mr KWOK: Yes.

The Hon. PETER PRIMROSE: One thing that has obviously changed with data entry is different approaches to scrutineering. As someone said this morning, it is not a matter of lacking trust; it is that the whole system operates on the basis of transparency. Like many people, I sought to scrutineer at the most recent council elections and found it impossible. You cannot scrutineer the batching and then you are trying to have enough people to look over the shoulders of 60 data entry people, not knowing who is entering which particular one, and it is difficult to see over their shoulders anyway. One proposal that was put up this morning was having some form of random audit comparing data entry material with a selection of ballot papers that have been entered and comparing those at random points throughout the process. Could you please comment on that?

Mr COPSON: Yes, I can comment on that. As far as our data entry is concerned, we allocate a council or a ward to a particular data entry team. Scrutineers come through the count centre, they go to a particular data entry team and they know that that team is doing that particular council or ward. Granted there are 20 data entry operators in a team so it is difficult for a scrutineer to audit 20 data entry people who are all data entering at the same time. The number of scrutineers I spoke to, not only at this election but previous elections at 2012 and prior to that, when they started to ask questions about the data entry system, I did offer them the opportunity of selecting a particular batch of ballot papers, printing out data entry reports, and we would have two people sit down and read the ballot papers back against the data entry markings reports. We did that in 2012. One particular scrutineer questioned the integrity of the data entry operator, so we printed out those reports and read them back. That is offered to scrutineers. Certainly it is being offered by me and others.

The CHAIR: That is a pre-existing thing. That already exists at the current time?

Mr COPSON: Yes.

The Hon. PETER PRIMROSE: Can I say, as a scrutineer, it was not offered to me but I do not challenge you. My question is: Instead of being a mechanism that is offered to a scrutineer, would it be something that would be worthwhile doing on a random basis as a matter of course?

Mr COPSON: As a business practice?

The Hon. PETER PRIMROSE: Yes.

Mr COPSON: Yes, absolutely.

Mr KWOK: We would be amenable to formalise that as part of the counting process.

The CHAIR: Mr Primrose makes an excellent point and that goes to the whole issue of the quality assurance of data entry. Does the commission use optical character recognition [OCR], or is it all manual data entry?

Mr COPSON: It is all manual data entry, but just to explain the process: It is a two-step process in that we have a batching process and a data entry process. In the batching area the people isolate any ballot paper that is a single "1" above the line for a group because we do not need to have someone data enter that; we can just bulk enter those figures. Depending on the council, that could be 40, 50 or 60 per cent of the ballot papers which are isolated in that batching area. They are isolated, they are counted twice, and then they are bulk entered into the system. Every other ballot paper goes to data entry. If it is preferences above the line or below the line or above and below the line, any other paper that is informal, they all go to data entry.

The data entry process is that the entire polling place is allocated to the one data entry person. They do the entire polling place. It then comes out and the system will not allow the same person to do the round two data entry on it. The entire polling place goes back into data entry and a second person does blind data entry on that particular polling place. If round one does not match round two, it then goes to reconciliation. There are two rounds of data entry and a reconciliation process before that polling place leaves the data entry team.

The CHAIR: But the key point about that system which you have enunciated is that there is no link between one and two. In other words, it is two different sets of eyes.

Mr COPSON: Yes, exactly right.

Mr ANDREW FRASER: That data entry is not done on a daily basis. How often is it done?

Mr COPSON: No. We start batching on the Sunday after election day because we need batching to be ahead of data entry because batching feeds data entry. Then the data entry is commenced on the Monday after election day and is all completed by the Friday after election day. At its peak, we had 140 people data entering. As batching slows down, we put in more data entry teams. We data entered from the Monday to the Friday after election day.

Mr ANDREW FRASER: The suggestion is that there should be some daily progress announced. Surely your system already allows for that, if the data entry is done on a daily basis.

Mr KWOK: Can you repeat the question, I am sorry?

Mr ANDREW FRASER: It was suggested before that there should be some daily notification on the website or what have you about how the count is progressing. If that data entry is going in on a daily basis, surely it would be only a matter of hitting a button at the end of the day to basically collate that data and put it up for public viewing.

Mr KWOK: In previous submissions I think it was discussed that if we run a distribution of preferences—what you are talking about is to run a distribution of preferences count on a daily basis—it is fair to say that it does depend on, at that point in time, the ballot papers that we are actually counting at that time. It may provide a different outlook. If we are processing, for example, postal votes at that point in time, it provides different guidance, which may or may not inform the participants of what the outcome may be. I am not sure that is necessary given the administrative burden in providing the service would it necessarily assist participants in the process.

The Hon. COURTNEY HOUSSOS: If we were to remove random sampling from the counting, so assume we go to some kind inclusive weighted program or whatever it might be, some kind of fractional transfer, would you be more confident in releasing a daily progress total data distribution?

Mr KWOK: Again in the context of local government elections we have operations that ran 122 council contests in 2017 over the course of eight days. Essentially, you can just divide up over eight days all of the different operations. The time in which you run the count is really only over a course of a couple of days or so, when we run the data entry. It probably would not give you a lot of forward projection as to what the outcome is going to be.

Mr SCHMIDT: It is probably likely to skew the results as well, because, for example, if you have got certain polling places that are favouring one party over another party and we put them through the data entry system first and then we show those reports you are going to have all those party candidates thinking they are going to get elected when, in fact, until you have the last ballot paper in there you do not know what the result is going to be.

Mr JAI ROWELL: Mr Fraser commented about publishing a distribution of preferences. If you did not do that, you could easily do the data entry for the primary votes for each of those candidates. Admittedly, I know that would not reflect any potential trends because it would be whatever polling booths you did, but how hard would that be?

Mr KWOK: I will refer to John. That would obviously require modifications of the software.

Mr CANT: It is a software modification in terms of how the information is currently captured. It is there. It is a matter of creating a system that could provide, I guess, a public view to that that is understandable and makes sense.

The Hon. BEN FRANKLIN: My question is the fundamental one: What logistical issues will arise if we go down the random selection process?

The CHAIR: Of removing the random selection process, moving towards a full count.

The Hon. BEN FRANKLIN: Exactly. If we abolish it, what will that mean to you and the commission in terms of the logistical implications?

The CHAIR: I think the euphemism is "resourcing".

Mr CANT: The simple answer from a systems perspective, which is where the majority of the impact is, is that we would have to rewrite our proportional representation computer count [PRCC] code that currently does the proportional representation count, so there would be a software change required.

The Hon. BEN FRANKLIN: Some software people would have to do their thing on the software?

Mr CANT: Yes.

The Hon. BEN FRANKLIN: How long would that take? Are we talking about two years of intensive research and work or it will take one programmer or someone a week to sit down and do whatever he or she needs to do?

Mr CANT: Somewhere between those two extremes. I would expect it to be a reasonably small six‑month project that would be carried out.

Mr SCHMIDT: The only caveat I would raise there—and I do not understand the other systems that were being talked about this morning as alternatives, and as a commission we would not nominate a particular system which we would think would be better than another. However, if a system is put forward we will work with anybody then to work out the logistics of implementing it. There is the issue or the system you have got for taking out randomisation or moving to a new system, and if you move to a new system then, of course, you have further development which would be required. Going back to what Mr Cant said, we are talking about months rather than years.

Mr CANT: The original PRCC development was quite a reasonable piece of development but it was primarily done initially for the upper House and it was adopted to work for local councils. One of the issues from our perspective is that we would have different count algorithms being used for State versus local government and we would essentially have to go to the point of maintaining two separate applications essentially as opposed to currently we have a single application that will run both.

The Hon. BEN FRANKLIN: Understood. I presume you would need to do different training modules and communications and all the rest of the usual things.

Mr SCHMIDT: And testing.

The Hon. BEN FRANKLIN: Is there any reason why—assuming this Committee reports back relatively soon, and if this were to come into being, and were legislated next year—this could not be implemented for the 2020 local government elections?

Mr SCHMIDT: Based on what I know so far, no.

The CHAIR: Mr Ellis from the Australian Election Company raised a number of matters in relation to the oddities or disparities between the proportional representation counts of the New South Wales upper House and local government. The first one related to how many decimal places you are supposed to go to for transfers. The other was a slight difference in surplus transfers. Are you aware of these discrepancies? Do you have any recommendations to make on them?

Mr KWOK: Nothing other than that, as discussed in our submission, in major elections, including local government elections and the State elections, our software is certified by an independent auditor and certifier. They would go through the software logic.

The CHAIR: It is not a question in relation to my concerns about your administrative matters, but has this posed itself as a problem to you? How many decimals points do we go down to?

Mr CANT: The decimal point one I can address directly because I have been involved in some fairly lengthy discussions about it.

The CHAIR: How many do we use?

Mr CANT: It depends on whether it is the upper House or the local council. The local council we essentially artificially use four decimal places because that is what is in the legislation whereas for the upper House it uses 12, I think it is. Developers have issues with the artificial reduction of the number of decimal places.

The Hon. BEN FRANKLIN: Is that a reasonable matter for the Committee to consider and recommend an increase in the number of the decimal places?

Mr CANT: I would definitely not be against that.

The Hon. BEN FRANKLIN: That is as strong an endorsement from the commission as we are likely to get. There has been some discussion about opening up the source code. Would you like to make any comments about that?

Mr CANT: In general I agree. I think that public scrutiny of the source code is not a bad thing. I guess the issue is trying to ensure that it is done in a way that protects our—

The CHAIR: Your intellectual property [IP] rights?

Mr CANT: Our IP and the IP of any other organisations. For instance, our PRCC software was developed by a company on our behalf, and as part of the agreement for the development it has the right to market that software on its own behalf. I guess from our perspective it would be a process of how we actually manage the commercial rights associated with software. From my perspective, releasing it for public scrutiny and academic review does not necessarily mean that we have to release it for commercial use. One option would be to come up with a—

The CHAIR: A confidentiality arrangement?

Mr CANT: A confidentiality agreement or a licensing agreement. One of the challenges we have had historically—I know Vanessa Teague spoke earlier. We have offered to release our software to her under a non‑disclosure agreement [NDA] but it is quite a restrictive non-disclosure agreement that we have historically tried to use. At least from my perspective I can understand her reluctance to spend effort doing a review of code if, from an academic perspective, she has no rights to publish any information that she discovers through that process. What I would propose is that we have a lot less constricting NDA in place so that an academic can actually make use of the information that they gather through a review to publish a paper or whatever.

The Hon. COURTNEY HOUSSOS: To have such a restrictive NDA, is that legislatively in place or is that an Electoral Commission policy?

Mr CANT: It was the Electoral Commission's view on how they would choose to release the software. One of the things I have checked at the Department of Finance, Services and Innovation is to confirm that there is not a government position on the release of software.

The CHAIR: Was your source code developed in house, or was it developed externally under commission from you?

Mr CANT: The proportional representation computer count [PRCC] software was developed by an external company but under a contract to us. We own the IP but there is a clause in the contract that gives them the rights to use that IP outside New South Wales.

The CHAIR: If anyone would be crazy enough to move to a system of random selection for distribution of preferences.

Mr CANT: The value of that is debatable. It is a commercial agreement that we have to take into consideration.

The CHAIR: Would you have a cost estimation of whether the source code would require a complete rewrite or would it require amending it? The Australian Electoral Company indicated it would simply be an amendment of their software rather than a complete rewrite.

Mr CANT: The PRCC system does more than just the count process, it manages the dual data entry process and all of the reconciliation processes and reporting, et cetera. In my view it would be a rewrite of the core count element that would be required to operate the system, so it would not be a complete new system, it would be an amendment to the existing system.

The CHAIR: One other thing that has arisen from today's hearing is the issue of the, if you like, impartial scrutiny of the internal processes of the count. Do you think we should be recommending that there be a minimum standard of internal or independent audit of the count processes? You appear to have your own system in place. Would you like to see the Committee recommend a minimum mandatory standard of scrutiny?

Mr SCHMIDT: I think any recommendations should be a level playing field. Any recommendations coming out of this about auditing or scrutiny or whatever, everybody who is in this space should abide by it. The issue of scrutiny again has come up before this Committee late last year in the context of iVote. We are talking about technology and the challenge with technology is how do you have active engagement. I fully support any opportunity we can get for political participants to engage with the technology and be comfortable with its integrity.

We have this review which is just kicking off now to look at iVote and one of the terms of reference there is what we can do about improving scrutiny. I think the same basic arguments apply here. Back to your starting point, it should be the same. What should it look like? Not a hundred per cent sure. But I am more than happy to work further on this to see what we can do. If you come up with suggestions, or other people who you seek further information from, or questions on notice after this to inform a discussion, I would welcome it because I think we need to have that engagement.

The CHAIR: On that point before you go any further, I would like to put on record my thanks to the NSWEC for scheduling the iVote demonstration here, which not only demonstrated its practical application but also went into great detail on the integrity methods which are put in place to ensure that the iVote system in this State is of the highest calibre. If you could pass on to the members of your organisation who developed that presentation and the gentleman who presented it my thanks as the Chairman of this Committee. It was an excellent presentation and clearly demonstrated the great deal of thought which the NSWEC has put into the integrity measures, in particular, of the iVote system in this State.

Mr SCHMIDT: Thank you, Chair, and I will pass that on to Mark Radcliffe. That is an open invitation at any time, if people want to talk about any of our systems we are more than happy to provide whatever information we can.

The Hon. COURTNEY HOUSSOS: Much of the testimony this morning was around how we can make the system more transparent, more openly accessible. Are there any legislative inhibitors to that at the moment from your perspective?

Mr SCHMIDT: Not that I can think of. The legislation is quite broad when it comes to scrutiny. iVote has specific provisions about enabling scrutineers to participate in or examine parts of the processes there. The legislation is fairly open. We could have a look at it again but on its face I do not see anything there which would inhibit people engaging in scrutiny at any part of the process of counting the votes and entering the data.

Mr CANT: The only observation I would make is that one of the things that we have chosen to do is publish the full preference files, all the preference markings that are the output of the data entry process, which enables anybody to run their own preference count against the preferences that have been marked. There is not a legislative framework under which that is released. It is something that we do because we think it is a good thing to do. There have been some discussions internally about whether there are implications of us doing something that is not in legislation. It is not inhibiting us releasing the information but it potentially could be a question mark as to whether we should release it because of the destruction of electoral materials and those kinds of issues that are legislated.

Mr SCHMIDT: A simple recommendation there would be that the commissioner be given the power to determine what related data he decides to make available in relation to the conduct of an election of the casting of a vote, something along those lines.

The Hon. COURTNEY HOUSSOS: And that there should be unanimity across whether it is the Electoral Commission or a private company conducting the elections.

The CHAIR: Or councils.

The Hon. COURTNEY HOUSSOS: Absolutely. This information is useful in the scrutiny of elections.

Mr CANT: A lot of the scrutiny that Vanessa Teague and Antony Green have been able to carry out is because those preference files are available, which, at least in my view, has led to a better outcome and more openness of the way our systems operate.

The Hon. COURTNEY HOUSSOS: That is absolutely right.

The Hon. PETER PRIMROSE: I would ask if you would take this question on notice. As you are aware, we heard evidence this morning in relation to the countback system for vacancies that was legislated last year to avoid expensive by-elections. We still have not seen any of the regulations that will allow that to be implemented. We live in hope. We heard evidence this morning that abolishing the random selection would make the countback provisions easier. Could you take that on notice? You may come back and simply say we have not seen any of the regulations so we cannot answer that, but there may also be some particular provisions that we can make recommendations on that would make it easier for any countback provision.

Mr SCHMIDT: I might be able to address it now.

The Hon. PETER PRIMROSE: Please.

Mr SCHMIDT: There are two ways you can do a countback. I think this may have been alluded to this morning. It depends how far you go back. Obviously, with computer technology you can fix in concrete, as it were, the randomised distribution. If that is the basis on which the count is conducted and you run that again, you can do a countback but it is based on the randomisation. Or, you could go back a step further and say when you do a countback you must run randomisation again so the lottery element comes into play.

The CHAIR: Neither of which are optimal for integrity of the system.

Mr CANT: One of the issues, particularly with the locking of the random selections in place, is around visibility and if there is a set of information sitting in a computer system that is not publicly available, visible, that will determine what the output of that countback process is. At least from my perspective there are some concerns around having a system. If we did go to a countback process where random selection is in place and we wanted to fix it, I would push quite strongly for us to publish the random distribution files so that that set in concrete piece was available so that there is no question that the data has been either altered or fixed or tampered with from when the election was carried out to when the countback was conducted.

The Hon. PETER PRIMROSE: That answered my question, thank you.

Mr ADAM CROUCH: Commissioner you mentioned before 122 elections and 140 data entry staff. Obviously it is quite a resource intensive exercise. Has the Electoral Commission looked at or is it looking at the idea of using optical character recognition? We heard Mr Green's evidence about the New Zealand model where the ballot paper is clearly definable by OCR. Is the Electoral Commission looking at that option?

Mr SCHMIDT: Yes, we are looking at the technology. I will refer the question to Mr Kwok.

Mr KWOK: As you may know, the Australian Electoral Commission has pioneered the scanning of the Senate ballot paper using OCR technology, using an outside service provider. Obviously that is a piece of technology that we are looking into. Particularly it also addresses to facilitate scrutineers in the process and to ensure that the participants are given the opportunity to carry out a process where we are utilising this type of technology. Obviously, we are looking at both the Legislative Council elections as well as potentially for local government elections. There are challenges at both levels. At the Legislative Council election level, as you know, the current legislation provides that you have more than 33 groups we have to wrap around the ballot paper, double decker, if you like. No scanner that we know of on this planet at the moment can scan at that sort of dimension.

Mr JAI ROWELL: So Campbelltown Council is out.

Mr KWOK: Not quite. There are challenges where, if we employ the technology, what do we do in a scenario where it does occur. Also we would not know the make-up of the groups until the close of nominations, which gives a compressed time frame to have any contingency in place. That is the challenge at the Legislative Council election level. At the local government election level, as you know, we have 122 contests and they all have different dimensions, different sizes, different groups and we have to be able to cater for each one of those. I think those issues are a more technological set-up. They probably can be overcome. One issue though is that we need a provide access to scrutineers and other participants in the counting process. How are we able to employ the technology in all areas? For example, are we going to be able to provide a high-speed scanner in the western edge of the State, say in Broken Hill? How can we provide that access? Those are the sorts of things we do have to explore to make sure that the process is not just looking at the technology level but also providing access and service to all the participants.

Mr ADAM CROUCH: So logistically it is challenging but it is one the commission is now looking at?

Mr SCHMIDT: Yes.

Mr ADAM CROUCH: This goes to Mr Primrose's point too with scrutineers. For instance, one of the suggestions was that OCR documents would then be randomly selected every hour or half an hour, whatever it might be, and then compared against the paper ballots. The scrutineers would then have the opportunity to look at the report from the OCR versus the actual paper ballots that are there which they have been scanned from. So there is an option to do a regular scan of those things to compare them for scrutineers. Obviously a scrutineer is not going to be able to keep up with an OCR machine to check it out.

Mr KWOK: Essentially it uses a process as per what Mr Copson mentioned previously. Scrutineers can request us on a call-back service. It just so happened that this is more an electronic online sort of service so that ballot papers can be examined from a scanned repository against what their expectations are.

Mr ADAM CROUCH: Does the commission have an approximate time for when you might have a trial of the OCR scanners in contrast to hand data entry?

Mr KWOK: We are currently looking at a funding issue and we are looking at the possibility of that technology for the upcoming State general election. But again we are just looking at that at this point in time.

The CHAIR: Commissioner, I refer to something you mentioned earlier. Do you or any of your officers know when was the last time anyone paid money to have a recount done at a local government election?

Mr SCHMIDT: This time. One of the two recounts, a request was made, I refused it and then the candidate took the option of paying for the recount.

The CHAIR: How much was that?

Mr SCHMIDT: I think it was approximately $11,000 for that.

Mr COPSON: Yes, it is Parramatta Council. It was $53 per 100 ballot papers. I think it was roughly $11,000.

Mr SCHMIDT: The legislation provides that if they are successful they get their money back. If not, they do not. It is a gamble.

The CHAIR: That leads me to my next question. If we were to recommend and the State Government were to move towards a system of what I will call the full counting of preferences, you will have absolute reproducibility, irrespective of the number of times you hit the button. Is there any point in retaining an ability to seek a recount for the payment of a fee?

Mr SCHMIDT: It is certainly not available in State elections. I do not know the history of it but there may have been reasons put up which convinced people at the time that it was a good thing to do. There are avenues available if people want to challenge my decision not to grant a recount. My initial reaction is it should be exactly the same at the State and local government level. You should not be able to purchase a recount. On equity grounds I can see arguments against it, in that a well-heeled person might endeavour to seek a recount on that basis alone. That is available now. As for arguments for maintaining it, none readily spring to mind.

The CHAIR: For a person who does seek a recount where you have refused, do they go to the Supreme Court or to the NSW Civil and Administrative Tribunal [NCAT]?

Mr COPSON: NCAT.

The CHAIR: So they can go to NCAT?

Mr COPSON: Yes, after the results are in.

The CHAIR: There is no financial prohibition of having to go to the Supreme Court?

Mr SCHMIDT: I think this is before the count. If they wanted to challenge my decision to refuse to grant a recount, there is nothing to stop them going to the Supreme Court to seek an injunction.

The CHAIR: No, but you would not go to the Supreme Court and pay that money if you can go to NCAT and pay a substantially less amount of money.

Mr SCHMIDT: I am not sure whether you can go to NCAT prior to the declaration of the election because then it becomes the Court of Disputed Returns. But it only becomes the Court of Disputed Returns for local government elections when the election result is declared.

The CHAIR: But it is seeking a review of your administrative decision not to hold a recount?

Mr SCHMIDT: Whether that is an administrative decision caught by the NCAT legislation, I do not know.

The CHAIR: Something for the lawyers to work out.

Mr ANDREW FRASER: What criteria do you use when someone asks for a recount?

Mr SCHMIDT: On the occasion on which it was granted this time, there was a clear problem with the way the counting was conducted for the benefit of scrutineers. The scheduling was published incorrectly on our website so people could not get the scrutineers in to see a major part of the count. If there was a significant allegation of misconduct or errors in counting that challenges the basis of the election I would be minded to give a recount in those cases. But simply the fact that it was a close result and randomisation is available for a possible change of that outcome is not enough.

Mr ANDREW FRASER: If you made that decision not to grant one and someone was prepared to pay for a recount would they then get a recount?

Mr SCHMIDT: If you pay for it, under the local government legislation you do not have to give a reason. You do not even have to come to me and ask for a recount. You can just turn up and say, "I want a recount. Tell me how much it is. I will pay it over." If I am successful, I will get my money back. If I am not successful, I lose it.

Mr ADAM CROUCH: It gives randomisation a chance so that they could be successful.

The CHAIR: But is it fair to say, Commissioner, that it is not unreasonable for you to be reluctant to grant recounts under a structural impediment where a random selection could materially change the outcome of an election in the way that a replicable recount would not impose upon your thinking?

Mr SCHMIDT: Yes, and if there is no other deficiency, just that alone would cause me concerns. One of the exchanges of correspondence we had in the request for a recount, the person who was not the person who requested the recount, it was another candidate in one area, said, "What if that candidate who has requested the recount is successful?"—on a throw of the dice, basically—and, "Why can I not have another go?" That is where the whole process begins to lose integrity in the electoral sense.

The CHAIR: That is a very good point.

The Hon. BEN FRANKLIN: The Electoral Commission runs the overwhelming lion's share of local government elections. As a side note, I note your comment about the fact that you do not want to determine which system is fair or appropriate, but you will implement whichever ones you do, and you do that very well. In particular, I acknowledge Mr Copson, with whom I worked in a previous life as a former State director. He does an extremely good job.

The Hon. COURTNEY HOUSSOS: Hear, hear!

Mr SCHMIDT: I will withdraw his dismissal note immediately.

The CHAIR: There is your pay review sorted out.

Mr COPSON: Thank you.

The Hon. BEN FRANKLIN: Other than the Electoral Commission ones—and obviously there is a small number of others that are run—does any company other than the Australian Election Company or councils run them and can you give us a list of those others, if it is appropriate, that were run by someone else other than the Electoral Commission since 2011?

Mr SCHMIDT: We can certainly give you the list of councils that did not use us. I am not sure we can say who ran those elections, can we?

Mr COPSON: Do not take it as gospel, but apart from the Australian Election Company the only councils that I am aware of who have run their own elections individually were Gunnedah and Sutherland Shire Council in 2012. I think they got experienced election officials as their returning officers to run those elections.

The Hon. BEN FRANKLIN: Would you mind taking that question on notice?

Mr COPSON: Sure.

Mr SCHMIDT: Sure.

The CHAIR: Thank you very much, Commissioner, and your officials for coming in today. It has been useful and helpful. Thank you for your participation. There may be some additional questions which we would like to place with you on notice. Would it be possible to get answers to those within 21 days?

Mr SCHMIDT: No problems.

(The witnesses withdrew)

The Committee adjourned 15:11.