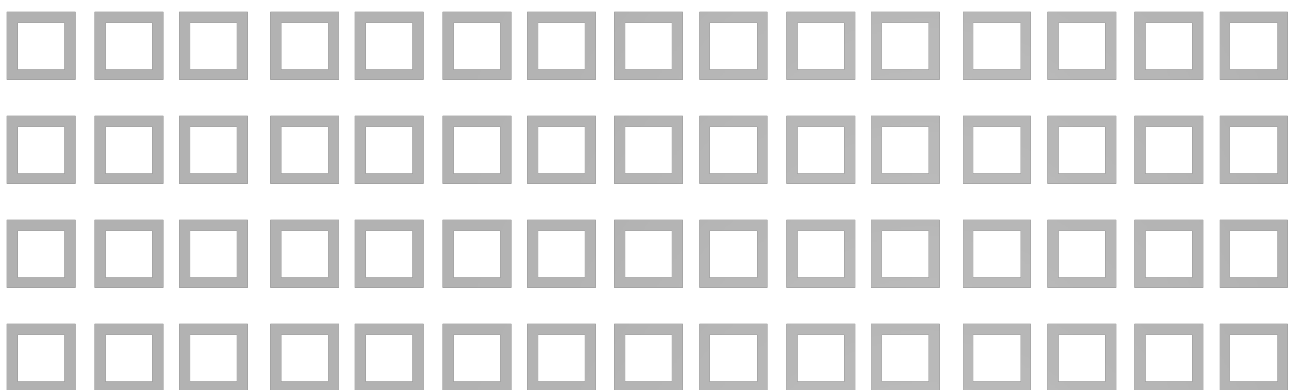


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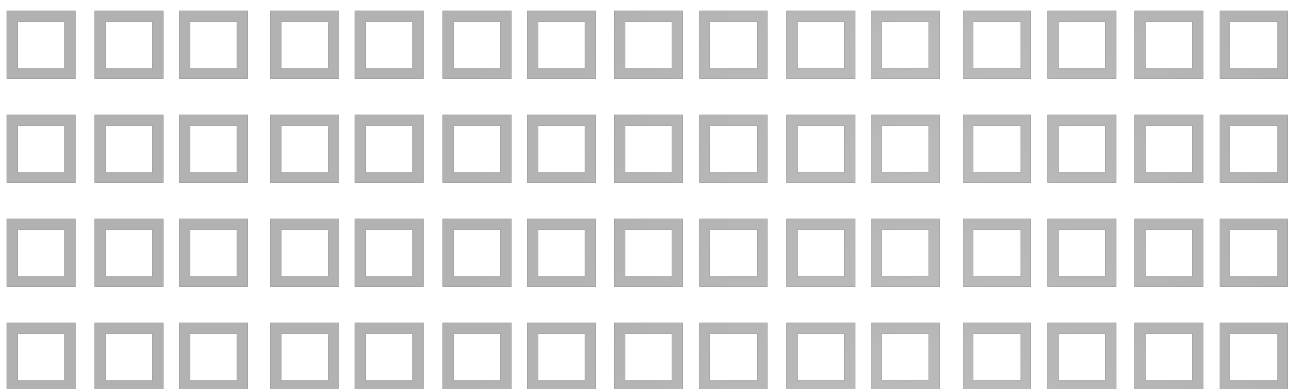
ACT ELECTORAL COMMISSION OFFICERS
OF THE ACT LEGISLATIVE ASSEMBLY



Ballot paper instructions under Hare-Clark—empirical analysis and options for reform

Briefing paper

March 2026



Contents

Executive summary.....	1
Purpose	2
Scope and limitations	2
Key finding	3
Background and inquiry context	3
Electoral Commission voting instructions	4
Analysis methodology	5
Results	6
Actual 2024 counts - preference activations.....	6
<i>Brindabella.....</i>	<i>6</i>
<i>Kurrajong.....</i>	<i>6</i>
<i>Yerrabi.....</i>	<i>6</i>
<i>Key observations</i>	<i>7</i>
<i>Conclusion from analysis of 2024 actual counts</i>	<i>7</i>
Contrived “extension of real Kurrajong 2024 preferences – 5 preferences to 10” dataset	8
Length of sequence	10
Exhausted votes and final-seat quota outcomes	12
Discussion: 'last-parcel' surplus distribution and impact on activating later preferences	12
Options.....	13
Conclusion.....	15

Executive summary

In 2024, approximately 98.2% of formal voters followed the ballot paper instructions by indicating at least as many preferences as there were vacancies in the electorate. Around 68.4% of formal voters indicated exactly as many preferences as there were vacancies, a rate consistent with 2020 (68.1%), slightly higher than 2016 (64%), but lower than 2012 (72%). Roughly 30% of formal voters indicated more than the minimum number of preferences, compared to 31% in 2020, 35% in 2016, and 26% in 2012.

This paper examines whether the current ACT ballot paper instructions - "Number five boxes from 1 to 5 in the order of your choice. You may then show as many further preferences as you wish by writing numbers from 6 onwards in other boxes" and "Remember, number at least five boxes from 1 to 5 in the order of your choice" appropriately guide voter behaviour under the Hare-Clark electoral system, and whether alternative instructions might materially reduce the impact of ballot exhaustion or change preference activation patterns. It emphasises that the objective of a preferential system is to reflect voters' intentions, with earlier preferences carrying more weight in that expression. Depth of count (i.e. activating preferences beyond five) is not inherently a virtue; later preferences are only used when earlier ones are either already effective (for candidates elected with a surplus) or no longer relevant (for excluded candidates).

Empirically, across Brindabella, Kurrajong and Yerrabi, more than 90% of the votes contributing to the election of successful candidates had activated preferences no higher than 5 at the point of election. Activation beyond 5 rises mainly in the final stages of the count and remains a minority. A contrived test for Kurrajong that extended all five-preference ballots to ten preferences produced little change to overall activation patterns.

On this evidence, changing the ballot paper instructions to recommend more than five preferences would be unlikely to materially alter outcomes. While structural features of the scrutiny, especially the surplus distribution method, shape how often deeper preferences can become operative, the magnitude of any improvement from alternative methods is uncertain in the ACT context without rigorous modelling. In particular, the weighted inclusive Gregory (WIG) method should be regarded as an option that might make a difference in a small number of cases, but likely not a substantial or systematically 'better' one.

This paper draws on:

- **Live count data** from a random sample of the 2024 electorate outcomes - in Brindabella, Kurrajong and Yerrabi - showing that, at the point each candidate was elected, more than 90% of votes contributing to the election of the five successful candidates had activated preferences no higher than 5 and that activation beyond preference 5 rises only in late counts and remains a significant minority.
- **Exhausted ballot analysis** demonstrating that most exhausted ballots currently fall away at preference 5, aligning with the current suggested minimum numbering instruction.
- **Contrived "extension of real Kurrajong 2024 preferences – 5 preferences to 10" dataset** using the actual 2024 Kurrajong ballot data, in which every elector who had expressed exactly five preferences (approximately 64% of voters in Kurrajong), was assigned an additional five preferences – preferences 6 to 10 at random - while preserving their original genuine first five choices. This exercise attempts to simulate the effect sought by a number of submitters to the Committee hearing, who argue that ballot paper instructions should recommend numbering more boxes than there are members to be elected; one suggestion being at least ten boxes. The results show that this intervention produced very little change to overall preference-activation patterns: in both the real and contrived datasets, the

overwhelming majority of votes contributing to the election of all five members still resolved within preferences 1–5. In this limited test and analysis, it would appear that expanding the number of preferences expressed does **not** materially alter how preferences are activated under current Hare-Clark rules.

- **ACT Electoral Commission’s 2024 Report** (Recommendation 24) which, notwithstanding stakeholder concerns, recommends retaining current instructions to support consistent voter behaviour, reduce unintended disenfranchisement and minimise ballot exhaustion.
- **Inquiry submissions** noting multiple parties and individuals who raised concerns (Jordan Roche; CAPaD; Jude Dodd; ACT Greens; Bruce Paine; Independents for Canberra; Matt Watts; Fiona Carrick; ACT Electoral Commission).

Purpose

This paper has been prepared to support the Standing Committee on the Integrity Commission and Statutory Office Holders in its inquiry into the operation of the 2024 ACT election and the *Electoral Act 1992*. The Committee received a number of submissions raising concerns about the ballot paper instructions prescribed in Schedule 1 of the Act, including claims that the wording may contribute to voter confusion, premature cessation of numbering, or increased levels of ballot exhaustion. Several submitters further suggested that encouraging electors to mark more preferences could materially alter preference flows or election outcomes.

At the Committee’s public hearing, the Electoral Commissioner and Deputy Electoral Commissioner advised that Elections ACT would undertake additional analysis of ballot paper preferences to inform the Committee’s deliberations. This paper provides factual analysis and context to support the Committee’s deliberations. The paper does not propose or invite changes to the Commission’s published position on ballot paper instructions, which remains to retain the current legislated wording.

This paper addresses a central question raised in submissions to the Committee and discussed at the public hearing:

Does the current “number five boxes” ballot paper instruction distort electoral outcomes, and would changing the instruction materially change results?

The analysis that follows examines this question through multiple empirical lenses - preference-activation patterns, length-of-sequence data, exhaustion levels, scrutiny mechanics, and historical quota attainment for final-elected candidates - to determine whether the current instruction is influencing voter behaviour in a way that materially affects election outcomes under the ACT’s Hare-Clark system.

Scope and limitations

The scope of this paper is limited to analysing actual voter behaviour as recorded on formal ballot papers and the operation of the scrutiny under existing Hare-Clark rules, including the last-parcel surplus method. The paper does not attempt to model how voters *might* behave under different instructions, nor does it seek to predict the effect of hypothetical changes to the savings provision or the counting methodology. Similarly, the contrived Kurrajong dataset extends real ballot papers for analytical purposes only; it is not intended as a behavioural forecast or as a re-run of the election under alternative conditions.

Any substantive redesign of the ballot paper instructions or surplus-distribution rules would require further targeted modelling of voter behaviour, formal error rates, exhaustion patterns and practical impacts on the scrutiny process.

Key finding

Under actual ACT Hare-Clark dynamics, instructing voters to number at least five preferences in five-member electorates aligns with how preferences are activated in practice. Almost all decisive transfers occur within the first five preferences, with activation beyond five contributing only marginally and where it does, predominantly in the final stages of the count.

The combined analysis of live and contrived datasets confirms that preference activation in ACT Hare-Clark elections is overwhelmingly concentrated within preferences 1–5, and that this pattern remains effectively unchanged even when all voters who currently number exactly five preferences are given five additional preferences. In the Contrived “extension of real Kurrajong 2024 preferences – 5 preferences to 10” dataset, the resulting activation profile closely mirrored that of the real count. Early seats continued to be elected almost entirely on the basis of preferences 1–5, while the final seats showed only modest increases in deeper-preference activation.

This would appear to indicate that increasing the suggested minimum number of preferences (for example, from 5 to 10) would have minimal practical effect on preference flows under the current ACT Hare-Clark counting rules. The system’s structural features - most notably the last-parcel surplus rule, which limits redistribution to only the most recently received parcel of votes - play a far more significant role in suppressing the activation of deeper preferences than the number of preferences voters are encouraged to mark on the ballot paper.

Where exhaustion occurs, it continues to cluster heavily at preference 5, reflecting voter behaviour under the existing instructions and ballot design. While changing the suggested minimum might marginally reduce exhaustion, the analysis suggests that instructional changes alone are unlikely to materially alter preference activation without accompanying structural reform to the counting methodology.

Background and inquiry context

The Standing Committee on the Integrity Commission and Statutory Office Holders is examining the operation of the 2024 ACT election and the *Electoral Act 1992*, the Terms of Reference (ToR) for which include examination of the ‘voting instructions, as provided by the ACT Electoral Commissioner’. As a number of the submissions to the inquiry have raised issue with the instructions printed on the ballot paper, it can be assumed that the intent of the reference within the ToR to voting instructions, was to include the voting instructions printed on the ballot paper, which, rather than a discretionary decision of the Commissioner, are mandated through legislation.

Schedule 1 Form of ballot paper

(see s 114)

Legislative Assembly for the Australian Capital Territory

Ballot paper

Election of [] Member(s)

Electorate of []

Number [] boxes from 1 to [] in the order of your choice

Then you may show as many further preferences as you wish by writing numbers from [] onwards in other boxes.

A []	B []	C []	[]
[] []	[] []	[] []	[] []
[] []	[] []	[] []	[] []
[] []	[] []	[] []	[] []

Remember, number at least [] boxes from 1 to [] in the order of your choice.

1. Insert number of vacancies

2. Insert name of electorate

3. Insert the number that is 1 more than the number of vacancies

4. Insert name, or abbreviation of name, of registered

5. Insert 'UNGROUPEd' if there are ungrouped candidates

6. Insert name of candidate

7. Insert name, or abbreviation of name, of registered party, or 'INDEPENDENT',

party, as required

as required

Submissions raising concerns include Jordan Rocke; CAPaD; the Australia Institute; Jude Dodd; the ACT Greens; Bruce Paine; Independents for Canberra; Matt Watts; Fiona Carrick; and the ACT Electoral Commission. The Commission’s election report serves as its submission.

Common themes across the submissions include:

- **Confusion from ‘number five boxes’ wording:** Multiple submissions say the phrase leads voters to conflate vacancies with vote preferences, fostering early cessation of preference allocation and increasing ballot exhaustion, which in turn, it is argued, provides an advantage to parties running five candidates.
- **Calls to encourage more preferences:** Several submissions suggest raising the suggested minimum or adding prompts to continue numbering beyond five to activate later preferences and reduce exhaustion.
- **Calls for clearer/simpler wording and education:** A number of submissions seek improved plain-English instructions, both on the ballot paper as well as Elections ACT materials, that emphasise numbering beyond the party column and reduce confusion.

Electoral Commission voting instructions

Several submissions raised concerns about the advice provided by the Electoral Commission on how to complete the ballot paper, as published on its website and in other materials. In particular, the Canberra Alliance for Participatory Democracy (CAPaD) argued that the Commission’s guidance suggests voters only need to number five boxes.

The Commission strongly refutes this claim. It notes that the evidence cited by CAPaD dates from April 2024, prior to a significant website refresh that was completed well before the 2024 ACT election. To demonstrate that its advice is accurate and consistent with the legislative

requirements for ballot paper instructions and formality under the *Electoral Act 1992*, the Commission provides excerpts from its website and household brochure.

The Commission also rejects submissions asserting that voters are only electing a single candidate and therefore do not influence the election of additional candidates. This interpretation is incorrect and misrepresents the operation of the Hare-Clark electoral system. Hare-Clark is a form of proportional representation using the single transferable vote method. Depending on the preferences marked on a ballot and the distribution of votes during the count, it is entirely possible for an individual ballot to contribute to the election of multiple candidates as it gets redistributed as part of a successful candidate's surplus vote.

www.elections.act.gov.au/for-voters/filling-in-your-ballot-paper:

In Australia we use numbers to mark our preferences on the ballot paper.

Clearly write the numbers 1, 2, 3, 4, 5 and so on, in the boxes next to candidate names in the order of your choice.

For the candidate you like best, write the number '1' in the box next to their name. For the person you like second best write '2' and so on.

To make the most of your vote you should number at least 5 boxes as there are 5 candidates to elect in each electorate.

You can keep numbering the candidates of your choice and you can fill in every box if you like.

If you only write '1' next to one candidate your vote still counts.

Household brochures:

When you vote in the election make sure your vote counts. If voting on a paper ballot write the numbers 1, 2, 3, 4, 5 and so on in the squares in the order of your choice – no ticks or crosses. Be careful not to use the same number twice. You should fill in at least five squares as there are five candidates to be elected in each electorate. But, to make sure that you get the most value from your vote, you can continue to fill in the squares, until all your preferences are recorded. You can fill in every box if you like. If you only write '1' next to one candidate your vote still counts.

Analysis methodology

Actual 2024 counts (Brindabella, Kurrajong, Yerrabi datasets):

Three randomly chosen 2024 electorate scrutinies were selected. We analysed the vote preferences contributing to each elected candidate at the point in the count when the candidate became successfully elected, noting and recording the highest activated preference on those ballots. This demonstrates the share of contributing ballots with final preferences ≤ 5 versus > 5 .

Length of sequence analysis:

We reviewed the data published in the Electoral Commission's 2024 Election Report, displaying the 'length of sequence' across all electorate ballot papers. This data shows the percentages for ballot papers that cease numbering at each preference number.

Results

Actual 2024 counts - preference activations

Across the three electorates examined, the analysis focused on the proportion of ballot papers contributing to each elected candidate at the point they achieved quota, and the highest preference number activated on those ballots. This provides insight into how far down the preference sequence ballot papers typically travel before becoming decisive in electing a candidate.

Brindabella

In Brindabella the first elected candidate was elected relatively early in the overall count – count 7 of 34 counts in total.

The first candidate, elected at count 7, is elected via ballot papers where 100% of the ballot papers that sit with the Candidate at the time they are elected had reached the elected candidate through preferences no higher than 5. That is, every ballot paper sitting with the candidate had reached the candidate using either preference 1, 2, 3, 4 or 5. No ballot papers currently held by the candidate at the point where they are elected had activated preferences of 6 or more.

When the second candidate is elected, at count 23, 98.3% of ballot papers were preferences 5 or less.

When the third candidate is elected at count 26, 98.8% were 5 or less.

For the fourth elected candidate (count 29) the figure is 98.1%

For the final elected candidate (count 34) it is 84%.

Kurrajong

In Kurrajong, the first elected candidate was elected on the first count – count 1 of 61 counts in total. The second candidate is not elected until the 51st count.

The first elected candidate, at count 1, has 100% of the ballot papers with activated preferences of preference 5 or less.

Elected candidate 2 (count 51) is 99.6% at preference 5 or less.

Candidate 3 (count 57) is 98.6% at preference 5 or less.

Candidate 4 (count 59) is 93.7% at preference 5 or less.

Candidate 5 (count 61) is 86.6% at preference 5 or less.

Yerrabi

In Yerrabi, the first elected candidate was elected relatively late in the overall count – count 25 of 35 counts in total. The next four candidates are elected across just 9 counts.

The first elected candidate, at count 25, has 99.3% of the ballot papers with activated preferences of preference 5 or less.

Candidate 2 (count 27) is 96.6% at preference 5 or less.

Candidate 3 (count 27) is 98.6% at preference 5 or less.

Candidate 4 (count 31) is 97.0% at preference 5 or less.

Candidate 5 (count 35) is 90.0% at preference 5 or less.

Key observations

Early seats resolve almost entirely on low-number preferences:

For the first candidate elected in each electorate, 99-100% of contributing ballots had activated preferences within 1–5. This indicates that initial quota attainment is driven almost entirely by primary votes and early preferences.

Seats 2–4 remain heavily concentrated within the first five preferences:

Even as the count progresses and candidates are elected later, the proportion of ballots activating preferences beyond five remains minimal - typically 1–7% for seats two through four. For example, in Brindabella, candidates two through four had 98.3%, 98.8%, and 98.1% of contributing ballots resolved within ballot papers that had activated preferences of five or less. It is important to understand that many of these ballot papers will have indicated further preferences, but the later preferences were not 'activated' as part of the distribution of a newly elected candidate. Even in Yerrabi, where all five candidates are elected in the final 10 counts, the figures are no greater than 3.4% of ballot papers with a preference of 6 or higher.

Final seat shows the greatest reliance on deeper preferences, but still limited:

The fifth seat in each electorate exhibits a noticeable increase in ballots activating preferences beyond five, yet the majority still resolve within the first five preferences:

- **Brindabella:** 84% ≤ 5 , meaning 16% required activation beyond five.
- **Kurrajong:** 86.6% ≤ 5 , or 13.4% required activation beyond five.
- **Yerrabi:** 90% ≤ 5 , or just one in 10 that required activation beyond the fifth preference.

This pattern reflects the narrowing candidate pool late in the count, where deeper preferences become relevant.

Structural features of Hare–Clark help explain these activation patterns

The consistently high proportion of activated preferences within 1–5 may be partly attributable to the ACT's last-parcel surplus distribution rule, which redistributes only the most recent parcel of votes when a candidate exceeds quota. Earlier received parcels remain with the elected candidate and do not re-enter the scrutiny. This may have the impact of limiting the circumstances in which later preferences may be activated, although this reflects normal Hare–Clark operation rather than any influence from ballot paper instructions.

In addition to these activation patterns, the relationship between exhaustion and final-seat outcomes warrants consideration. A separate section later in this paper examines quota attainment for the final elected candidate across recent ACT elections, to assess whether exhaustion has, in practice, prevented candidates from reaching quota or otherwise influenced the competitiveness of the final seat.

Conclusion from analysis of 2024 actual counts

The live data demonstrates that the current minimum instruction aligns with real-world voting behaviour and the practical operation of the ACT's Hare–Clark system. Most ballot papers that

contribute to the election of candidates do so on the strength of a voter's early preferences, which is consistent with the purpose of preferential voting. Later preferences influence outcomes mainly in the final seat, and even then only for a minority of papers.

The analysis also shows that, even where electors record preferences beyond five, these additional preferences are rarely activated during the count. This is a natural consequence of how surplus votes and exclusions are processed under Hare–Clark, rather than an artefact of the ballot paper instructions.

While structural features of the count may shape the extent to which deeper preferences become active, the degree to which alternative methods of surplus distribution might materially change outcomes remains uncertain without specific modelling. Any substantial increase in the activation of later preferences may therefore be more likely to arise from modifications to surplus-distribution rules than from changes to the wording of ballot paper instructions.

Contrived “extension of real Kurrajong 2024 preferences – 5 preferences to 10” dataset

Following the analysis of the live 2024 election results - which showed that almost all preference activation occurs within the first five preferences - attention then turned to concerns raised in several submissions to the Committee. A number of submitters suggested that electors should be encouraged to number significantly more than the current five boxes, with some advocating a recommendation for at least ten preferences.

To assess whether such a change would meaningfully increase the activation of later preferences under the Hare–Clark system, a test was established using the actual 2024 Kurrajong ballot data, and extending the preference sequences of the approximately 63% of voters who recorded exactly five preferences so that they instead recorded ten preferences. In effect, replicating the likely result if ballot paper instructions were amended to suggest completion to at least 10 boxes. This provided a practical way to evaluate whether expanding the number of preferences expressed would materially influence preference flows in an ACT Hare–Clark count.

Key finding:

Preference-activation patterns were remarkably similar to the real 2024 Kurrajong election.

In contrived Kurrajong, the first elected candidate, at count 1, has 100% of the ballot papers with activated preferences of preference 5 or less. This exactly mirrored the live Kurrajong count.

Elected candidate 2 (count 47 – previously 51) is 99.0% at preference 5 or less (99.6% in real Kurrajong count).

Candidate 3 (count 59 - previously 57) is 97.1% at preference 5 or less (98.6% in real Kurrajong count).

Candidate 4 (count 63 – previously 59) is 81.4% (93.7% in real Kurrajong count).

Candidate 5 (count 68 – previously 61) is 89.4% (86.6% in real Kurrajong count).

Across all five elected candidates, the share of contributing ballots whose preferences resolved within the first five preferences changed only marginally from the real election results.

In the actual Kurrajong count, the proportion of ballots resolving at preferences ≤ 5 ranged from 100% for the first elected candidate to 86.6% for the final elected candidate. In the contrived “5-to-10” dataset, the corresponding range was 100% down to 81.4%. In other words early seats

were almost completely unaffected. The proportion of ballots activating preferences beyond five remained virtually unchanged for the first three candidates. Later seats showed very modest increases in deeper-preference activation. Even with every 5-preference voter given preferences 6–10, the final elected candidates still received the vast majority of their decisive votes via preferences 1–5. In this limited testing and analysis, it would appear that Hare–Clark counts overwhelmingly resolve on the first few preferences, with deeper preferences contributing only at the margins.

Length of sequence

The following tables show the number of ballot papers for each electorate at the 2024 election that:

- 1. Numbered exactly to each preference and the percentage that did so.
- 2. Numbered at least to that preference and the percentage that did so.

Length of sequence — Brindabella

Preferences																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Total	345	136	242	196	42,761	2,298	1,558	2,891	702	1,113	815	348	315	214	115	182	75	47	100	19	51	68	89	3,566
%	0.59	0.23	0.42	0.34	73.41	3.95	2.67	4.96	1.21	1.91	1.40	0.60	0.54	0.37	0.20	0.31	0.13	0.08	0.17	0.03	0.09	0.12	0.15	6.12
Progressive total	58,246	57,901	57,765	57,523	57,327	14,566	12,268	10,710	7,819	7,117	6,004	5,189	4,841	4,526	4,312	4,197	4,015	3,940	3,893	3,793	3,774	3,723	3,655	3,566
Progressive %	100.00	99.41	99.17	98.76	98.42	25.01	21.06	18.39	13.42	12.22	10.31	8.91	8.31	7.77	7.40	7.21	6.89	6.76	6.68	6.51	6.48	6.39	6.28	6.12

Length of sequence — Ginninderra

Preferences																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Total	273	159	213	743	36,192	2,745	3,263	1,442	2,945	1,564	733	889	337	482	295	227	147	85	129	74	63	45	35	35	21	15	10	27	42	17	47	61	2,697
%	0.49	0.28	0.38	1.33	64.57	4.90	5.82	2.57	5.25	2.79	1.31	1.59	0.60	0.86	0.53	0.40	0.26	0.15	0.23	0.13	0.11	0.08	0.06	0.06	0.04	0.03	0.02	0.05	0.07	0.03	0.08	0.11	4.81
Progressive total	56,052	55,779	55,620	55,407	54,664	18,472	15,727	12,464	11,022	8,077	6,513	5,780	4,891	4,554	4,072	3,777	3,550	3,403	3,318	3,189	3,115	3,052	3,007	2,972	2,937	2,916	2,901	2,891	2,864	2,822	2,805	2,758	2,697
Progressive %	100.00	99.51	99.23	98.85	97.52	32.96	28.06	22.24	19.66	14.41	11.62	10.31	8.73	8.12	7.26	6.74	6.33	6.07	5.92	5.69	5.56	5.44	5.36	5.30	5.24	5.20	5.18	5.16	5.11	5.03	5.00	4.92	4.81

Length of sequence — Kurrajong

Preferences																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Total	160	106	88	89	30,557	2,444	1,987	1,188	717	3,357	753	933	358	251	1,054	213	382	155	136	293	75	184	74	93	78	34	41	22	72	18	4	35	45	2,926
%	0.33	0.22	0.18	0.18	62.46	5.00	4.06	2.43	1.47	6.86	1.54	1.91	0.73	0.51	2.15	0.44	0.78	0.32	0.28	0.60	0.15	0.38	0.15	0.19	0.16	0.07	0.08	0.04	0.15	0.04	0.01	0.07	0.09	5.98
Progressive total	48,922	48,762	48,656	48,568	48,479	17,922	15,478	13,491	12,303	11,586	8,229	7,476	6,543	6,185	5,934	4,880	4,667	4,285	4,130	3,994	3,701	3,626	3,442	3,368	3,275	3,197	3,163	3,122	3,100	3,028	3,010	3,006	2,971	2,926
Progressive %	100.00	99.67	99.46	99.28	99.09	36.63	31.64	27.58	25.15	23.68	16.82	15.28	13.37	12.64	12.13	9.98	9.54	8.76	8.44	8.16	7.57	7.41	7.04	6.88	6.69	6.53	6.47	6.38	6.34	6.19	6.15	6.14	6.07	5.98

Length of sequence — Murrumbidgee

Preferences																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Total	335	130	180	230	37,368	3,132	1,858	1,810	1,898	1,462	603	596	479	412	264	179	214	197	103	138	24	75	55	34	90	90	3,893
%	0.60	0.23	0.32	0.41	66.91	5.61	3.33	3.24	3.40	2.62	1.08	1.07	0.86	0.74	0.47	0.32	0.38	0.35	0.18	0.25	0.04	0.13	0.10	0.06	0.16	0.16	6.97
Progressive total	55,849	55,514	55,384	55,204	54,974	17,606	14,474	12,616	10,806	8,908	7,446	6,843	6,247	5,768	5,356	5,092	4,913	4,699	4,502	4,399	4,261	4,237	4,162	4,107	4,073	3,983	3,893
Progressive %	100.00	99.40	99.17	98.85	98.43	31.52	25.92	22.59	19.35	15.95	13.33	12.25	11.19	10.33	9.59	9.12	8.80	8.41	8.06	7.88	7.63	7.59	7.45	7.35	7.29	7.13	6.97

Length of sequence — Yerrabi

Preferences																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Total	514	224	263	316	41,152	2,400	1,693	1,896	1,169	1,059	332	525	321	225	176	104	142	84	67	62	53	23	20	23	9	53	15	19	34	50	1,931
%	0.94	0.41	0.48	0.58	74.88	4.37	3.08	3.45	2.13	1.93	0.60	0.96	0.58	0.41	0.32	0.19	0.26	0.15	0.12	0.11	0.10	0.04	0.04	0.04	0.02	0.10	0.03	0.03	0.06	0.09	3.51
Progressive total	54,954	54,440	54,216	53,953	53,637	12,485	10,085	8,392	6,496	5,327	4,268	3,936	3,411	3,090	2,865	2,689	2,585	2,443	2,359	2,292	2,230	2,177	2,154	2,134	2,111	2,102	2,049	2,034	2,015	1,981	1,931
Progressive %	100.00	99.06	98.66	98.18	97.60	22.72	18.35	15.27	11.82	9.69	7.77	7.16	6.21	5.62	5.21	4.89	4.70	4.45	4.29	4.17	4.06	3.96	3.92	3.88	3.84	3.83	3.73	3.70	3.67	3.60	3.51

Exhausted votes and final-seat quota outcomes

A further dimension relevant to concerns about ballot paper instructions is the extent to which exhausted votes may affect the quota attainment of the final successful candidate. While it is clear that many electors follow only the initial sentence of the ballot paper instructions - "Number five boxes from 1 to 5 in the order of your choice" - by indicating exactly five preferences (68% in both 2024 and 2020, and 64% in 2016), the material question is whether this behaviour produces a pattern in which final elected candidates consistently fall short of a full quota, reflecting a reduced pool of transferable votes late in the scrutiny.

A review of the final elected candidates across the 2024, 2020 and 2016 ACT elections does not support this interpretation. In the majority of electorates across these three elections, the fifth elected candidate did reach quota (in 11 out of 15 electorates). Where candidates were elected under quota, the size of the shortfall varied but was generally modest (At the 2020 election the final candidate elected in Kurrajong was 420.933743 votes short of the quota, equating to 5% of the quota. In Brindabella at the 2016 election the final candidate was only 144 votes short of the quota - 1.8%), and only two electorates recorded more substantial under quota outcomes (for example, Brindabella in 2024, where the final candidate was 1289.851627 votes short of quota, equating to 13% of the quota). These instances appear isolated rather than indicative of a systemic pattern across election years.

This historical pattern suggests that while exhausted votes do occur, most commonly at preference five, they have not generally been of a scale that prevents the final successful candidate from reaching quota. In particular, the data does not support the proposition that the ballot paper instructions are causing widespread premature cessation of numbering in a way that is materially suppressing the impact of voter preferences on the final seat.

Taken together with the preference activation analysis, these results indicate that exhaustion plays a limited role in determining final seat outcomes under current ACT conditions. They also reinforce that changes to ballot paper instructions would be unlikely to produce significant shifts in final seat competitiveness.

Discussion: 'last-parcel' surplus distribution and impact on activating later preferences

Summary of the Gregory Fractional Transfer method

The Gregory Fractional Transfer method is a surplus-distribution technique used in some Single Transferable Vote (STV) systems. When a candidate exceeds the quota, only the specific batch of ballot papers that last contributed to their election is examined. A transfer value is calculated by dividing the surplus by the total value of that "last-parcel," and each ballot in that parcel is transferred to the next available preference at that fractional value. All previously received ballots remain with the elected candidate and do not take part in the surplus distribution.

Summary of the Weighted Inclusive Gregory (WIG) method

The Weighted Inclusive Gregory method is a variant of fractional transfer in which *all* ballot papers held by an elected candidate are included in the surplus calculation. Each ballot paper is redistributed at a uniform fractional value derived from the total surplus divided by the candidate's entire vote total. This approach provides that every ballot contributes proportionally to surplus flows, enabling the full set of preferences expressed on those ballots.

The ACT's Hare-Clark system

Under ACT Hare-Clark, a candidate's surplus votes are redistributed not from the entire pool of their ballot papers but only from the 'last-parcel' - the batch of votes most recently received in the count, which pushed the candidate over quota. The remainder of the votes remain committed to the elected candidate. This method aligns with the *Gregory Fractional Transfer* method in which to transfer surplus votes.

How the 'last-parcel' method works

- A candidate attains or exceeds quota after receiving a parcel of distributed votes.
- Only that parcel - the "last-parcel" - is used to calculate and pass on a fractional transfer (via an established transfer value) to continuing candidates.
- All previously counted votes remain "frozen" with the elected candidate.

Implication for preference activation

It could be argued that this approach materially influences preference activation. By leaving ballots received by the elected candidate at earlier counts standing against that candidate, the method potentially limits the depth of the count, contributing to the observed high percentage of ballots that do not activate deep preferences. Earlier parcels, which may contain longer preference sequences, remain with the elected candidate and therefore do not contribute to further transfers. This helps explain why in the 2024 counts, later preferences were only minimally activated for seats 1–4, and only modestly more for the final seat. However, this is a normal and intended consequence of the method rather than an indicator that the system is failing to use preferences that voters wish to be decisive. Early preferences naturally remain the most influential because they reflect voters' strongest choices; later preferences only become relevant when earlier ones can no longer take effect.

Alternative: distributing full vote pool

In some jurisdictions, the surplus is redistributed using the Weighted Inclusive Gregory method. Because this method incorporates all ballot papers held by an elected candidate, it can bring more preferences, including deeper ones, back into play in later stages of the count. This may also reduce the rate at which ballots become exhausted, as more papers continue through the count at fractional value. The method can therefore produce outcomes that make fuller use of the range of preferences expressed by voters.

However, adopting such a method introduces additional complexity. While eVACS can support more intricate fractional transfers, the likely practical effect in the ACT context is uncertain. Factors such as Robson rotation and the limited role of ticket or directed preference voting mean that deeper preferences may still be scattered widely or may not be meaningfully aligned in ways that would alter outcomes. Without detailed modelling on ACT election data, including the behaviour of long preference sequences, it is difficult to determine whether WIG would materially change results or whether it would do so in a way that better reflects voter intention. Last-parcel surplus distribution has its own rationale in giving greatest weight to the preferences most directly contributing to a candidate's election.

Options

The following options outline potential approaches available to the Assembly in responding to the concerns raised about ballot paper instructions during the inquiry. Each option reflects a different policy approach ranging from retaining the current legislated wording, to recommending the completion of more boxes, to examining structural changes to the Hare-Clark counting process.

They are presented to assist the Committee in considering both the practicality and the likely effectiveness of any reforms.

Option A - Maintain current instructions

Keep the currently legislated wording on the ballot paper. Current ACT ballot paper instructions read *"Number five boxes from 1 to 5 in the order of your choice. You may then show as many further preferences as you wish by writing numbers from 6 onwards in other boxes"*.

In 2024, approximately 98.2% of formal voters followed these ballot paper instructions, indicating at least as many preferences as there were vacancies in the electorate. Around 30% of formal voters then chose to continue their numbering past the fifth preference (25% in Brindabella, 33% in Ginninderra, 37% in Kurrajong, 32% in Murrumbidgee and 23% in Yerrabi).

While around 68% of voters number only as many squares as there are members to elect, the impact of this has been shown in the analysis to be minimal as each of the five members are being elected with a very high concentration of ballot papers received by the elected candidates not needing to be activated past the fifth preference i.e. before the ballot paper has had a chance to exhaust during the count. This would seem to indicate that the current ballot paper instructions are logical, based in a rationale aligned with the electoral system provisions of electing five members and are not materially skewing election results.

Option B – Amend the Electoral Act so that the ballot paper instructions recommend numbering more boxes than there are vacancies

Under this option, the Electoral Act would be amended so that the ballot paper instructions recommend numbering more boxes than the number of members to be elected - for example, advising electors to "number at least ten boxes" in a five-member electorate. This reflects suggestions made in several submissions to the inquiry which argue that encouraging voters to express more preferences may reduce ballot exhaustion and improve the prospects of independents and minor-party candidates.

However, the analysis undertaken shows that recommending more than five preferences would have minimal practical effect on preference activation. Both the live 2024 counts and the contrived Kurrajong dataset demonstrate that decisive preference flows overwhelmingly occur within preferences 1 to 5, even when additional preferences are available. Encouraging deeper numbering would therefore be unlikely to meaningfully influence outcomes except in a small number of late-count scenarios.

Any recommended minimum greater than five would also be inherently arbitrary, because the number five is the only figure that carries electoral-system logic - it aligns directly with the number of vacancies in each electorate. Elections ACT already receives complaints from voters questioning why ballot papers say "number five boxes" when a single preference is formally allowable. This is relatively straightforward to explain because the five-preference recommendation is grounded in the structure of the system. If that alignment is removed and replaced with an arbitrary alternative (such as ten), Elections ACT's ability to explain the rationale for the instruction would be weakened and may increase voter confusion and mistrust rather than reduce it.

Given the lack of demonstrated benefit, the arbitrariness of selecting a higher minimum, and the potential for complicating voter communication, this option is not recommended by the Commission.

Option C – Further evaluate reforming the surplus transfer rules through adoption of the Weighted Inclusive Gregory (WIG) fractional transfer method

Under this option, the Assembly would consider reforming the Hare–Clark surplus transfer rules by replacing the current last-parcel method with the Weighted Inclusive Gregory (WIG) fractional transfer method. Unlike the ACT’s existing approach, which redistributes only the final parcel of votes that pushes a candidate over quota, the WIG method redistributes all ballot papers held by an elected candidate, each at a weighted fractional value. The intention of such reform would be to allow a greater proportion of expressed preferences, particularly later preferences, to be taken into account during surplus distribution.

The analysis in this paper indicates that limited activation of deeper preferences may be influenced by the current surplus-transfer rules, which leave earlier parcels of votes “frozen” with elected candidates. Modifying the method could therefore have a more direct impact on preference utilisation than altering ballot-paper instructions alone.

However, the Commission suggests caution. The effect of WIG in the ACT context - where Robson rotation reduces ticket effects and voters’ later preferences may not meaningfully align between candidates - remains empirically uncertain. While WIG may affect outcomes in a small number of cases, it cannot be assumed that such changes would be significant or more reflective of voter intention than the current method, which gives strong weight to the preferences most directly associated with electing a candidate.

Adopting WIG would also represent a significant procedural shift, increasing administrative complexity and requiring enhancements to the electronic counting system. Jurisdictions that have adopted inclusive transfer methods rely on extensive modelling and robust electronic infrastructures to ensure transparency and accuracy. Any consideration of WIG in the ACT would require a structured program of detailed modelling using ACT data, operational feasibility testing, and stakeholder engagement before a legislative recommendation could be made.

Conclusion

The analysis of the 2024 live counts across Brindabella, Kurrajong and Yerrabi demonstrates that preference activation under ACT Hare–Clark is overwhelmingly concentrated within the first five preferences. In every electorate, the ballots contributing to the election of each candidate resolved almost entirely on preferences 1 to 5. Even when ballot papers contained longer sequences, later preferences were rarely activated in practice. The contrived Kurrajong dataset reinforces this finding: extending all five-preference ballots with additional randomly assigned preferences (6 to 10) produced activation patterns that closely mirrored the real count. Early seats were elected almost exclusively on the basis of preferences 1 to 5, and later seats exhibited only modest increases in deeper-preference activation. This demonstrates that simply increasing the number of preferences expressed through ballot paper instructions is unlikely to materially alter preference flows.

The limited role of later preferences appears to be a normal feature of how Hare–Clark operates rather than a consequence of the ballot paper instructions. Voters’ strongest preferences - those ranked early - naturally play the most decisive role, and later preferences only become active when earlier preferences cease to be relevant. Structural elements of the scrutiny, particularly the last-parcel surplus rule, also influence the extent to which deeper preferences can be examined. Because only the most recent parcel of votes is redistributed when a candidate exceeds quota, earlier parcels remain with the elected candidate rather than re-entering the count. This reduces opportunities for deeper preferences to become active, although the overall effect of this constraint, and the extent to which alternatives would make a meaningful difference, cannot be fully assessed without detailed modelling.

For these reasons, changing the minimum recommended number of preferences from five to a higher number is unlikely to materially influence preference-flow dynamics or address the concerns

raised about exhaustion or candidate competitiveness. The current instruction aligns with both voter behaviour and the structure of five-member electorates. Any number higher than five would lack the clear electoral logic that underpins the present recommendation. In addition, historical quota outcomes indicate that exhausted votes have not typically prevented final elected candidates from reaching quota, further suggesting that the ballot paper instructions are not materially diminishing the effect of voter preferences on the final seat. If the Assembly wishes to explore increased activation of later preferences, this would likely require closer examination of surplus-distribution rules rather than adjustments to ballot-paper instructions alone. However, any such consideration would need to be informed by rigorous modelling to determine whether alternative approaches would produce materially different, and demonstrably beneficial, outcomes in the ACT context.