

Methodology of estimating 2018 election results on new electoral boundaries

August 2022



Acknowledgement of Country

The VEC pays respect to Victoria's traditional owners and their elders past and present who have been custodians of this country for many thousands of years. Their living culture and their role in the life of Victoria is acknowledged by the VEC.

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Introduction

In the approach to a general election, one of the key factors that stakeholders and commentators consider is the margin by which parties and Independent members hold electorates.

Changes to electoral boundaries (known as a redivision in Victoria) can change the political complexion of electorates, and so analysts try to calculate electorate margins, based on the two-candidate-preferred (2CP) counts, on the new boundaries. These calculations face several obstacles:

- the secret ballot, preventing anyone from knowing how individuals have voted
- the fact that electors can cast an ordinary vote at any voting centre in a district
- ongoing huge increases in the rate of early voting, with early voters coming from all over a district
- the fact that the range of candidates and the strength of campaigns can vary widely in neighbouring districts.

The VEC can analyse voting data from the 2018 State election to allocate ordinary and declaration voters to the new electoral boundaries.

Results data analysis

We have analysed the 2018 State election results data against the new electoral boundaries. The table following is our estimate of how the two-candidate-preferred votes would have fallen, if the 2018 State election had used the electoral boundaries that will be in place for the 2022 State election.

2018 Victorian State election two-candidate-preferred vote on new boundaries

District	2018 electoral boundaries		Estimated vote on 2022 electoral boundaries	
	ALP (%)	Lib/Nat (%)	ALP (%)	Lib/Nat (%)
Albert Park	63.13	36.87	63.1	36.9
Ashwood (formerly Burwood)	53.31	46.69	52	48
Bass	52.39	47.61	49.3	50.7
Bayswater	50.39	49.61	49.4	50.6
Bellarine	61.45	38.55	61.4	38.6

District	2018 electoral boundaries		Estimated vote on 2022 electoral boundaries	
	ALP (%)	Lib/Nat (%)	ALP (%)	Lib/Nat (%)
Benambra (Independent v Liberal)	47.55 (Ind)	52.45	47.4(Ind)	52.6
Bendigo East	62.11	37.89	62.1	37.9
Bendigo West	68.55	31.45	68.6	31.4
Bentleigh	61.92	38.08	61.4	38.6
Berwick (new district)			48.7	51.3
Box Hill	52.1	47.9	53.1	46.9
Brighton	48.88	51.12	49.5	50.5
Broadmeadows	80.28	19.72	75.2	24.8
Brunswick (ALP v Greens)	48.01	51.99 (Greens)	48	52 (Greens)
Bulleen	44.23	55.77	44.5	55.5
Bundoora	67.42	33.58	66.2	33.8
Carrum	61.95	38.05	62	38
Caulfield	49.73	50.27	50.2	49.8
Clarinda	67.42	32.58	64.9	35.1
Cranbourne	60.98	39.02	59.3	40.7
Croydon	47.89	52.11	49	51
Dandenong	73.93	26.07	73.1	26.9
Eildon	47.56	52.44	49	51

District	2018 electoral boundaries		Estimated vote on 2022 electoral boundaries	
	ALP (%)	Lib/Nat (%)	ALP (%)	Lib/Nat (%)
Eltham	59.07	40.93	58.8	41.2
Essendon	65.86	34.14	65.8	34.2
Eureka (formerly Buninyong)	62.24	37.76	59.6	40.4
Euroa	34.56	63.44 (Nat)	34.2	65.8 (Nat)
Evelyn	47.35	52.65	48.2	51.8
Footscray	78.11	21.89	77.6	22.4
Frankston	59.74	40.26	60.2	39.8
Geelong	60.14	39.86	60.3	39.7
Gippsland East	32.41	67.59 (Nat)	32.4	67.6 (Nat)
Gippsland South	34.67	65.33 (Nat)	35.8	64.2 (Nat)
Glen Waverley (formerly Forest Hill)	48.89	51.11	49.1	50.9
Greenvale (new district)			72	28
Hastings	48.94	51.06	50.01	49.99
Hawthorn	50.42	49.58	50.6	49.4
Ivanhoe	62.37	37.63	62.3	37.7
Kalkallo (formerly Yuroke)	70.26	29.74	70.9	29.1
Kew	45.22	54.78	45.3	54.7

District	2018 electoral boundaries		Estimated vote on 2022 electoral boundaries	
	ALP (%)	Lib/Nat (%)	ALP (%)	Lib/Nat (%)
Kororoit	75.65	24.35	75.3	24.7
Lara	69.14	30.86	69.1	30.9
Laverton (new district)			73.4	26.6
Lowan	26.52	73.48 (Nat)	28.9	71.1 (Nat)
Macedon	63.18	36.82	63.4	36.6
Malvern	43.9	56.1	44	56
Melbourne (ALP v Greens)	48.36	51.64 (Greens)	48.3	51.7 (Greens)
Melton	54.29	45.71	55	45
Mildura (Independent v National)	50.34 (Ind)	49.66 (Nat)	49.6 (Ind)	50.4 (Nat)
Mill Park	74.89	25.11	74.9	25.1
Monbulk	58.61	41.39	57.1	42.9
Mordialloc	62.9	37.1	63.4	36.6
Mornington	45.01	54.99	45	55
Morwell (ALP v National)	52.41	47.59 (Nat)	54	46 (Nat)
Mulgrave	62.71	37.29	65.8	34.2
Murray Plains	26.05	73.95 (Nat)	26	74 (Nat)
Narracan	42.74	57.26	40	60

District	2018 electoral boundaries		Estimated vote on 2022 electoral boundaries	
	ALP (%)	Lib/Nat (%)	ALP (%)	Lib/Nat (%)
Narre Warren North	59.76	40.24	60.4	39.6
Narre Warren South	56.9	43.1	60.4	39.6
Nepean	50.91	49.09	50.7	49.3
Niddrie	62.59	37.41	62.5	37.5
Northcote (ALP v Greens)	51.71	48.29 (Greens)	51.7	48.3 (Greens)
Oakleigh	65.78	34.22	66	34
Ovens Valley	37.38	62.62 (Nat)	37.9	62.1 (Nat)
Pakenham (formerly Gembrook)	49.08	50.92	52.2	47.8
Pascoe Vale	68.32	31.68	72.3	27.7
Point Cook (formerly Altona)	64.57	35.43	62.8	37.2
Polwarth	44.6	55.4	48	52
Prahran (Greens v Liberal)	57.45 (Greens)	42.55	58.2 (Greens)	41.8
Preston (ALP v Greens)	70.7	29.3 (Greens)	71.3	28.7 (Greens)
Richmond (ALP v Greens)	55.47	44.53 (Greens)	55.8	44.2 (Greens)
Ringwood	52.82	47.18	53.2	46.8
Ripon	49.98	50.02	52.8	47.2

District	2018 electoral boundaries		Estimated vote on 2022 electoral boundaries	
	ALP (%)	Lib/Nat (%)	ALP (%)	Lib/Nat (%)
Rowville	44.31	55.69	44.5	55.5
Sandringham	49.35	50.65	49.6	50.4
Shepparton (Independent v Liberal)	55.3 (Ind)	44.7	55.3 (Ind)	44.7
South Barwon	54.6	45.4	53	47
South-West Coast	47.69	52.31	46.8	53.2
St Albans	71.54	28.46	72.00	28.00
Sunbury	64.33	35.67	64.5	35.5
Sydenham	67.86	32.14	68.3	31.7
Tarneit	68.02	31.98	67.9	32.1
Thomastown	77.19	22.81	77.4	22.6
Warrandyte	46.12	53.88	46.2	53.8
Wendouree	60.26	39.74	61	39
Werribee (ALP v Independent)	58.79	41.21 (Ind)	59.1	40.9 (Ind)
Williamstown	72.07	27.93	69.9	30.1
Yan Yean	67.03	32.97	66.9	33.1

Estimated District margins by party ranked from closest to safest

	ALP	Liberal	National	Greens	Independents
1.	Hastings 50.01%	Sandringham 50.4%	Mildura (v Cupper) 50.4%	Melbourne (v ALP) 51.7%	Shepparton (v Lib) 55.3%
2.	Caulfield 50.2%	Brighton 50.5%	Ovens Valley 62.1%	Brunswick (v ALP) 52%	
3.	Hawthorn 50.6%	Bayswater 50.6%	Gippsland South 64.2%	Prahran (v Lib) 58.2%	
4.	Nepean 50.7%	Bass 50.7%	Euroa 65.8%		
5.	Northcote (v Greens) 51.7%	Glen Waverley 50.9%	Gippsland East 67.6%		
6.	Ashwood 52%	Croydon 51%	Lowan 71.1%		
7.	Pakenham 52.2%	Eildon 51%	Murray Plains 74%		
8.	Ripon 52.8%	Berwick 51.3%			
9.	South Barwon 53%	Evelyn 51.8%			
10.	Box Hill 53.1%	Polwarth 52%			
11.	Ringwood 53.2%	Benambra (v Hawkins) 52.6%			
12.	Morwell 54%	South-West Coast 53.2%			
13.	Melton 55%	Warrandyte 53.8%			
14.	Richmond (v Greens) 55.8%	Kew (54.7%)			

	ALP	Liberal	National	Greens	Independents
15.	Monbulk 57.1%	Mornington 55%			
16.	Eltham 58.8%	Rowville 55.5%			
17.	Werribee (v Garra) 59.1%	Bulleen 55.5%			
18.	Cranbourne 59.3%	Malvern 56%			
19.	Eureka 59.6%	Narracan 60%			
20.	Frankston 60.2%				
21.	Geelong 60.3				
22.	Narre Warren South 60.4%				
23.	Narre Warren North 60.4%				
24.	Wendouree 61%				
25.	Bellarine 61.4%				
26.	Bentleigh 61.4%				
27.	Carrum 62%				
28.	Bendigo East 62.1%				
29.	Ivanhoe 62.3%				
30.	Niddrie 62.5%				

	ALP	Liberal	National	Greens	Independents
31. Point Cook 62.8%					
32. Albert Park 63.1%					
33. Macedon 63.4%					
34. Mordialloc 63.4%					
35. Sunbury 64.5%					
36. Clarinda 64.9%					
37. Mulgrave 65.8%					
38. Essendon 65.8%					
39. Oakleigh 66%					
40. Bundoora 66.2%					
41. Yan Yean 66.9%					
42. Tarneit 67.9%					
43. Sydenham 68.3%					
44. Bendigo West 68.6%					
45. Lara 69.1%					
46. Williamstown 69.9%					

	ALP	Liberal	National	Greens	Independents
47.	Kalkallo 70.9%				
48.	Preston (v Greens) 71.3%				
49.	St Albans 72%				
50.	Greenvale 72%				
51.	Pascoe Vale 72.3%				
52.	Dandenong 73.1%				
53.	Laverton 73.4%				
54.	Mill Park 74.9%				
55.	Broadmeadows 75.2%				
56.	Kororoit 75.3%				
57.	Thomastown 77.4%				
58.	Footscray 77.6%				

Districts notionally changing hands in redivision based on 2018 results

1. Bass (ALP to Liberal)
2. Bayswater (ALP to Liberal)
3. Caulfield (Liberal to ALP)
4. Hastings (Liberal to ALP)
5. Mildura (Independent to National)
6. Pakenham (Liberal to ALP) (treating Pakenham as formerly Gembrook)

7. Ripon (Liberal to ALP)

Abolished districts

1. Ferntree Gully (Liberal 51.66%)
2. Keysborough (ALP 64.85%)
3. Mount Waverley (ALP 51.53%)

New districts

1. Berwick (Liberal 51.3%)
2. Greenvale (ALP 72%)
3. Laverton (ALP 73.4%)

Methodology

To begin, we produced spreadsheets for each 2018 district.¹ Attachment 1 shows the 2018 votes for Box Hill District and their allocation to the 2022 districts as an example.

Within Box Hill District, we can see that of the 911 votes cast at Balwyn voting centre, 65 were by voters who are still in Box Hill District; 822 voters have been transferred to Kew District, 23 voters to Hawthorn District, and one voter to Ringwood District. These figures provide a starting point for estimating margins on the new boundaries.

Estimates are based on the assumption that the votes at a voting centre are homogeneous – that they have the same formality rate and two-candidate-preferred vote regardless of which 2022 district they are allocated to. The information available does not allow any other approach.

The two-candidate-preferred vote comprises formal votes only, so the informal votes need to be removed. The total votes for a voting centre are multiplied by the formal vote rate for that voting centre to arrive at the estimated formal votes for a voting centre's allocation to each district. Using Box Hill District as an example again, the 822 Balwyn voting centre votes that have been transferred to Kew District are multiplied by Balwyn's formal voting rate of 95.6% to arrive at 786 formal votes.

The formal votes for each voting centre are then multiplied by the ALP's (Australian Labor Party) two-candidate-preferred vote for that voting centre. In Balwyn's case, the ALP vote was 39.33%. This yields an ALP vote for Balwyn of 309 votes, and so a Liberal vote of 477.

The question then arises of how to deal with declaration votes, which come from all over the district. We know the number of each type of declaration votes allocated to each 2022 district, and the ALP vote for each type of declaration vote. However, it would be a mistake to simply multiply the number of declaration votes transferred to another district by the ALP vote for each type of declaration vote.

¹ There are minor discrepancies between the figures in the spreadsheets and the election statistics on the VEC website as a result of the differences between marked-off votes and votes admitted to the count.

An area transferred out of an old district is likely to differ from that district as a whole, and the declaration votes should reflect this. The answer is to weight the declaration votes according to the difference between the ordinary votes for the area being transferred and the ordinary votes for the whole district.

In the portion of the Box Hill District that was transferred to Kew District, the ALP ordinary vote rate was 48.2%. In Box Hill District as a whole, the ALP gained 54.5% of the ordinary votes. The declaration votes for the area transferred to Kew District were weighted by dividing the transferred area vote of .482 by the district-wide vote of .545, to produce a weight of .8844. This was then applied to the declaration votes in the transferred area and reduces the ALP declaration votes in this area in line with the ordinary votes.

Outliers

The above approach works well for most districts. However, there were several districts where the two-candidate-preferred count was not between the ALP and the Liberal/National coalition. In Brunswick, Melbourne, Northcote, Preston and Richmond districts, the contest was between the ALP and the Greens. In Prahran District it was between the Greens and the Liberals. In Geelong, Morwell and Pascoe Vale districts it was between the ALP and an Independent. In Mildura and Shepparton districts it was between an Independent and the Liberals or Nationals. In these districts we conducted a special two-party-preferred (2PP) count (ALP and Liberal/National coalition) on a district-wide basis.

The way to estimate local 2PP results in these districts is to calculate the flow of preferences to the ALP and the Liberal/National candidate from the other candidates. For example, in Melbourne District there were 19,069 first-preference votes for other candidates, 15,963 of which flowed to the ALP candidate and 3,116 to the Liberal candidate. Thus 83.66% of other candidates' preferences went to the ALP. This fraction was applied to votes for other candidates for each voting centre and type of declaration vote. So, for instance, at Carlton voting centre there were 634 votes for other candidates, 530 of which were allocated to the ALP and 104 to the Liberals. These amounts were then added to the first-preference votes for the ALP and Liberals in Carlton, to produce a 2PP vote in Carlton of 1,019 for the ALP (489+530) and 266 for the Liberals (162+104).²

A similar exercise created notional ALP or Liberal versus Greens counts for districts where areas were transferred to the above districts. For example, in Thomastown District, where part of Reservoir was transferred from Thomastown District to Preston District, 56.82% of other candidates' preferences flowed to the ALP and 43.18% to the Greens. These fractions were applied to Thomastown District's voting centres and declaration votes, with the estimated result of 2,041 ALP votes and 535 Greens votes being added to Preston District's total. In the same way, Independent versus major party counts were created for districts that have lost areas to neighbouring districts: Benambra (Hawkins versus Liberal) and Werribee (ALP versus Garra).

One difficulty is how to deal with Independent candidates whose districts will now include new areas. These candidates did not stand in such areas in 2018. However, it is possible to make reasonable guesses, relying on the fact that the Independents tended to do well in their own

² It was not necessary to create local 2PP votes for Northcote and Shepparton districts, because the boundaries of these districts were unchanged. In Richmond District there was no Liberal candidate; the Independent candidate Kevin Quoc Tran was a Liberal Party member and can be treated as a surrogate Liberal.

districts and had a profile in the areas transferred to their districts. Our estimates include the following loadings to the Independents' votes:

- Mildura District gained Charlton and Donald (the southern end of Buloke Shire) from Ripon District. Ali Cupper gained 36.28% of the 2CP vote in the part of Buloke Shire already in Mildura District. This fraction has been applied to the area transferred from Ripon, to come up with an estimated vote for Cupper for the new Mildura District of 19,440 (49.6%).

Attachment 1: 2018 State election results for Box Hill District, allocated to 2022 districts

Voting centre	Allocation	2022 district	2018 total by voting centre	New total by voting centre
Balwyn	Preserved	Box Hill	911	65
Balwyn	Moved	Kew	911	822
Balwyn	Moved	Hawthorn	911	23
Balwyn	Moved	Ringwood	911	1
Blackburn	Moved	Kew	1111	3
Blackburn	Moved	Ringwood	1111	335
Blackburn	Preserved	Box Hill	1111	772
Blackburn	Moved	Hawthorn	1111	1
Blackburn Lake	Moved	Kew	1532	1
Blackburn Lake	Moved	Ringwood	1532	1454
Blackburn Lake	Preserved	Box Hill	1532	77
Blackburn North	Moved	Ringwood	1442	648
Blackburn North	Moved	Hawthorn	1442	3
Blackburn North	Moved	Kew	1442	6
Blackburn North	Preserved	Box Hill	1442	785
Box Hill	Moved	Hawthorn	774	3
Box Hill	Preserved	Box Hill	774	762
Box Hill	Moved	Kew	774	4

Box Hill	Moved	Ringwood	774	5
Box Hill Central	Moved	Hawthorn	857	6
Box Hill Central	Preserved	Box Hill	857	838
Box Hill Central	Moved	Ringwood	857	4
Box Hill Central	Moved	Kew	857	9
Box Hill North	Moved	Ringwood	655	2
Box Hill North	Preserved	Box Hill	655	651
Box Hill North	Moved	Kew	655	1
Box Hill North	Moved	Hawthorn	655	1
Chatham	Moved	Kew	1539	1007
Chatham	Moved	Hawthorn	1539	448
Chatham	Preserved	Box Hill	1539	83
Chatham	Moved	Ringwood	1539	1
Greythorn	Moved	Kew	665	504
Greythorn	Moved	Ringwood	665	2
Greythorn	Moved	Hawthorn	665	4
Greythorn	Preserved	Box Hill	665	155
Kerrimuir	Moved	Kew	1597	3
Kerrimuir	Moved	Hawthorn	1597	1
Kerrimuir	Preserved	Box Hill	1597	1592
Kerrimuir	Moved	Ringwood	1597	1

Koonung Heights	Preserved	Box Hill	1472	1432
Koonung Heights	Moved	Hawthorn	1472	6
Koonung Heights	Moved	Ringwood	1472	5
Koonung Heights	Moved	Kew	1472	29
Laburnum	Moved	Kew	1368	4
Laburnum	Moved	Ringwood	1368	34
Laburnum	Moved	Hawthorn	1368	1
Laburnum	Preserved	Box Hill	1368	1329
Middlefield	Moved	Ringwood	1735	55
Middlefield	Preserved	Box Hill	1735	1678
Middlefield	Moved	Kew	1735	2
Mont Albert	Moved	Hawthorn	1520	5
Mont Albert	Preserved	Box Hill	1520	1251
Mont Albert	Moved	Kew	1520	264
Surrey Hills	Moved	Kew	730	8
Surrey Hills	Moved	Hawthorn	730	27
Surrey Hills	Preserved	Box Hill	730	692
Surrey Hills	Moved	Ringwood	730	3
Surrey Hills North	Preserved	Box Hill	1272	387

Surrey Hills North	Moved	Hawthorn	1272	612
Surrey Hills North	Moved	Ringwood	1272	4
Surrey Hills North	Moved	Kew	1272	269
Tyne	Moved	Ringwood	902	3
Tyne	Moved	Hawthorn	902	4
Tyne	Preserved	Box Hill	902	889
Tyne	Moved	Kew	902	6
Absent	Moved	Hawthorn	2743	217
Absent	Preserved	Box Hill	2743	1625
Absent	Moved	Ringwood	2743	308
Absent	Moved	Kew	2743	593
Early Vote	Preserved	Box Hill	11012	7854
Early Vote	Moved	Ringwood	11012	1198
Early Vote	Moved	Hawthorn	11012	442
Early Vote	Moved	Kew	11012	1518
Postal Vote	Moved	Hawthorn	5778	254
Postal Vote	Preserved	Box Hill	5778	3856
Postal Vote	Moved	Ringwood	5778	790
Postal Vote	Moved	Kew	5778	878
Provisional	Moved	Kew	35	5

Provisional	Preserved	Box Hill	35	25
Provisional	Moved	Ringwood	35	3
Provisional	Moved	Hawthorn	35	2

Glossary

Declaration votes

Votes that are not cast by enrolled voters within their own district on election day. The voter makes a declaration of eligibility to vote. Declaration votes are counted on a district-wide basis; they are not sorted to particular locations. There are 4 main types of declaration votes:

- Absent votes: Cast by voters outside their own districts on election day.
- Early votes: Cast by voters at early voting centres in the 2 weeks before election day.
- Postal votes: Cast by voters who have applied for a postal vote. The VEC posts voting material to applicants, who complete their vote and post it back to the VEC.
- Provisional votes: Cast by voters who cannot be found on the roll at a voting centre and who apply for a provisional vote, providing required information on a form. These votes are checked by the VEC before being admitted to the count.

District

A Lower House (Legislative Assembly) electorate. There are 88 districts in Victoria, with an average enrolment of about 50,000 per district.

Formal votes

Votes that are cast in accordance with the directions on the ballot paper.

Informal votes

Votes that are not cast in accordance with the directions on the ballot paper, and cannot be counted for any candidate.

Ordinary votes

Votes that are cast by enrolled voters at a voting centre within their own district on election day. Ordinary votes are counted by voting centre.

Redivision

A change to electoral boundaries under Victorian law (changes to Federal electoral boundaries are known as a redistribution). Redivisions take place every 8 years, and are conducted by the independent Electoral Boundaries Commission. A redivision restores all

electorates to approximate equality (within 10% of the State average) while taking account of communities of interest and population trends.

Two-candidate-preferred count

The main purpose of a two-candidate-preferred (2CP) count is to provide an early indication of the election result. Before election day, the VEC predicts the two lead candidates for each district. On election night and in the following days, election officials re-sort the votes for the other candidates to the two lead candidates according to the preferences on those votes. The 2CP count is separate from the official distribution of preferences, that determines the result in districts where no candidate has more than half of the first-preference votes. One advantage of the 2CP count is that it is conducted on a voting centre basis, providing valuable information for researchers and enabling estimates of the effect of redivisions.

Two-party-preferred count

In districts where the two candidates in the 2CP count are not ALP and Liberal/National, the VEC conducts a special two-party-preferred (2PP) count, allocating preferences from other candidates to the ALP and Liberal/National candidates. The purpose of the 2PP count is to establish the balance between the two main sides of politics across the whole State. The special 2PP counts are conducted on a district-wide basis, but it is possible to estimate the 2PP votes by voting centre and type of declaration vote.

