Technology assisted voting

Paper 2
Interim review report

August 2023

Contents

Revision record

Version	Released	Change
1	1 August 2023	N/A
1.1 (this version)	11 August 2023	Description of features of the Australian Capital Territory electronic voting system (paragraphs 106, 119, 120, 122, 132 and 200).

Part 1 – Foreword

I thank everyone who has contributed evidence, experiences and insights to this review to date.

The review provides an important opportunity to consider policy priorities for TAV around elector access, inclusion and enfranchisement – mapped against an increasingly complex risk environment for electoral systems involving technical performance and reliability, cyber security, and electoral misinformation and disinformation. The review examines the approaches to TAV in other countries, as well as in other Australian states and territories – and considers solutions including automated telephone voting using Interactive Voice Response (IVR), internet voting and kiosk voting machines.

The use of digital technology as a voting channel for electors represents only one element of the broader opportunities for technology to support the accuracy, efficiency and transparency of elections. The NSW Electoral Commission is separately proposing that the NSW Government support a program of digital modernisation to optimise settings for future system design and governance, which will include interoperability with any future TAV component.

The NSW State election on 25 March 2023 was the first since 2011 where internet voting and IVR were not available. The decision to not use internet voting and IVR in 2023 was a difficult one and the detailed reasons relating to the timing of software commissioning were set out in my statement on the matter, which is published on the NSW Electoral Commission's [website]. The decision was the only operationally viable one in the circumstances and was essential to maintaining trust in the integrity of the electoral process. The TAV option offered at the 2023 election was available to electors who are blind or low vision. These electors were eligible to cast a vote via the operator assisted telephone voting service.

Some members of the public, advocacy groups and peak bodies, including members of the NSW Electoral Commission's stakeholder reference groups, continue to support internet voting strongly over operator-assisted telephone voting, citing privacy and usability concerns. A [joint statement (DOC 118KB)] released by Blind Citizens Australia and the NSW Electoral Commission on 21 November 2022 acknowledges those issues and the role of this review in determining if it is feasible for internet voting to be made available again by the time of the NSW State general election in 2027.

During the six days the operator-assisted telephone service was available, 830 electors cast their votes in this way. This compares with 1,174 electors who applied to use iVote under the criteria of being blind or having low vision at the 2019 NSW State election and 2,382 at the 2021 NSW Local Government elections. The NSW Electoral Commission has commissioned surveys of, and feedback from, electors who are blind or have low vision who used operator-assisted telephone voting at the 2023 NSW State election to gain insights into their user experience. I look forward to considering the outcome of that research as I finalise this review.

This report sets out my *interim* findings and options under consideration for TAV at future elections. The release of this current paper provides an opportunity for stakeholders and interested parties to make submissions that I will take into account in preparing my *final* report to the NSW Government later in 2023.

Democratic inclusion and the integrity of the electoral system will continue to be the core principles guiding any recommendations for change.

John Schmidt
Electoral Commissioner for New South Wales
August 2023

Part 2 – Executive summary and interim review findings

1. As Electoral Commissioner, I am conducting this review to examine the feasibility of internet and other forms of technology assisted voting (TAV) for state and local government elections conducted in New South Wales. The review was prompted by performance issues with the NSW Electoral Commission's internet voting platform (iVote) at the 2021 Local Government elections.

2. This Interim review report sets out provisional recommendations for TAV in New South Wales. Stakeholders are invited to provide feedback before the publication of the final review report later in 2023.

3. Paper-based voting continues to provide the strongest foundation for secure and accurate elections in New South Wales due to the physical security attributes of ballot papers and the transparency of voting and counting paper-based votes **(para 58)**. I recommend that paper-based voting continues as the primary voting channel for the foreseeable future.

4. Global experience demonstrates that TAV has inherent risks that, if they were to materialise, could impact the integrity of an election process, including risks around technical non-performance, transparency, verifiability of votes and cyber security. The threat environment has worsened over the past decade, particularly for internet-based election systems **(para 60)**. These risks require management via complex controls**.** It is essential that any TAV systems are secure by design and are operated under robust risk-management practices.

5. In Australia, electors are required to vote in elections or referenda infrequently – on average less than once a year across the three levels of government. Attendance voting is an important democratic practice that imposes a minimal time obligation on the electorate.

6. Parliamentary and council elections operate in a unique context given the democratic imperatives of fairness, accessibility, compulsory voting, transparency and the secret ballot. This gives rise to additional risks and security requirements when compared to online elections for other bodies, such as boards and committees.

Internet and telephone voting

7. Internet voting appears to be the preferred way for electors who are blind or have low vision to vote independently; that is, without the direct assistance of another person to mark a ballot paper or to attend a voting centre **(para 72)**.

8. Internet voting may be feasible at small scale only from 2027 for NSW state and local government elections for this class of electors. This provisional view is contingent on a market RFI around technology vendor interest and capability, as well as a preliminary assessment of integration requirements with the NSW Electoral Commission's enterprise and system architecture. If a feasible technology solution seems possible after a RFI to the market, funding would be required for the NSW Electoral Commission in the 2024-25 State budget to procure, configure and test a preferred solution in time for the 2027 State general election.

9. Operator-assisted telephone voting remains a feasible and necessary voting channel for electors who are blind or have low vision **(para 136)**. It is my recommendation to continue to make this channel available for state and local government elections. Automated telephone Interactive Voice Response (IVR) solutions using keypad responses should be examined as an alternative or complementary channel. Emerging solutions (such as voice response software) should also be considered in the longer term.

10. Work should progress on the assumption that up to 4,000 electors who are blind or have low vision would use internet voting and up to 1,000 would use operator-assisted telephone voting in 2027, representing around 0.08 per cent and 0.02 per cent of New South Wales electors, respectively **(para 34)**.

11. Analysis of historical election data suggests that there is a low probability that the exclusion of up to 5,000 votes would materially affect a state election outcome **(para 192),** which is greater than the number of electors currently proposed to be eligible to use TAV in 2027. It remains possible, however, that in small or very close contests the unavailability of TAV for even a single eligible elector may be considered to give rise to a material irregularity.

12. Given the cost and adverse impact on public trust in democratic processes of re-running an election due to invalidity, it may be proportionate and appropriate for New South Wales legislation to protect, in specified circumstances, the validity of an election result despite technical performance issues with a TAV channel; for example where it is not available for all or some eligible electors to use or where votes that are already cast cannot be verified or counted. Consideration should be given to savings provisions operating differently between different types of elections to reflect and balance the requirements of different counting systems, size of electorates and consequences of holding an election again.

13. For all types of elections it appears appropriate and proportionate, given modelling based on previous results data and the proposed small-scale of TAV, for an election not to be invalid on the basis only that TAV was not available. For multi member proportional representation elections (such as the Legislative Council and local government councillor elections), however, it also may be appropriate to extend such protection to address risks of performance issues after votes have been cast. Such consideration is warranted because the scale of the risks and costs involved in re-running multi-vacancy elections, and the consequent detriment to the public interest.

14. For other contests (such as Legislative Assembly elections, local government mayoral elections and local government by-elections), a savings provision may also be appropriate even if votes cast by TAV cannot be verified or counted. This could apply if the Electoral Commissioner determines prior to the declaration of results that the number of votes cast by TAV in that election (but which could not be included in the count for any reason) was greater than the smallest exclusion point.

15. Overall, the scenarios for applying a savings provision to technical performance issues for TAV require a clear legislative framework before online voting is offered again **(para 184)**.

16. Even at small scale, registration via an eligibility declaration by electors who are blind or have low vision is required to support integrity and technical planning ahead of the election period **(para 166).** This may be simplified to a "once only" pre-registration using the registered early voter (technology assisted voting) process in section 37 of the Electoral Act. It is my preference to not require evidence of qualification for an elector who is blind or has low vision to be registered for TAV, although auditing may be appropriate if the number of users is not consistent with those expected eligible elector cohort **(para 175)**.

17. The internet voting solution contemplated for electors who are blind or have low vision in 2027 is, despite its small scale, a complex undertaking requiring significant budget commitment from the State for capital and recurrent costs. The estimated cost will be determined during the request for information and business case development, noting that the total cost (including both external and internal costs for development, staffing and system support) for deploying iVote for the 2019 NSW state election was $8.1 million. This figure represents $5.46 million in capital expense and $2.53 million in operating expenses. Recent increases in information hardware and services costs, coupled with additional cyber security requirements, may significantly increase the investment required **(para 78**).

18. Wider deployment of internet voting to other elector classes for the 2027 State general election would introduce an unacceptable level of risk to electoral integrity, including risks relating to short lead-times between nomination of candidates and production of ballot papers, technical performance **(para 93)**, cyber security **(para 95)** and, potentially, disinformation **(para 96)**.

19. Any internet voting solution for governmental elections requires a higher standard of governance than other types of internet voting (such as for corporate and community organisations), as well as more robust technical standards and operational reliability **(para 148)**. System architecture and governance must be informed by international standards and the operational protocols and auditing requirements that apply in the *Eleven Essential Principles for an Australian Internet Voting Service* published by the Electoral Council of Australia and New Zealand (ECANZ) **(para 152)**. It must be reviewed by an expert panel (cryptographers, mathematicians, system design, cyber security) to provide assurance of technical integrity both before implementation and following election events **(para 151)**.

Kiosk voting

20. Kiosk voting machines at voting centres could deliver accessibility benefits and support faster counting and declaration of results **(paras 122, 126)**. They could also provide flexibility for electors outside their state electorate to conveniently access an absentee vote, as well as voters in council elections where absentee voting is not presently permitted at all due to the complexity associated with the number of wards, contests, polls and referenda **(para 124)**. In 2016, the NSW Joint Standing Committee on Electoral Matters (JSCEM) recommended a limited trial of kiosks in electorates where there was confidence in an expected result and consulting with electoral authorities from other jurisdictions regarding possible pooling and sharing of resources **(para 118)**. This trial was not undertaken as the funding originally provided to the NSW Electoral Commission was subsequently withdrawn.

21. While the capital, operational and maintenance costs for a standalone New South Wales kiosk voting system currently do not offer a viable value proposition, the option should continue to be developed, with suitable funding. The feasibility of limited-scale trials at the 2028 Local Government elections should be explored, subject to a request for information to the market demonstrating suitable technology solutions and budgetary provision before July 2026.

22. Longer term, the public interest in exploring broader TAV solutions is also likely to continue in response to the ongoing decline of physical mail services and potential limited availability in Australia (and internationally) of suitable paper and printing supplies **(para 125)**. These anticipated changes will particularly affect voters in remote locations in New South Wales, as well as electors who are interstate or overseas during election periods.

National approach

23. The challenges in developing secure, cost-effective and sustainable TAV channels are faced by all Australian electoral commissions. Each jurisdiction also faces potential procurement and implementation risks from a limited global vendor market.

24. While New South Wales is a sovereign jurisdiction within the Australian federation and undertakes its elections according to the State Constitution and other laws, its actions intersect with the broader Australian democratic culture and electoral technology ecosystem **(para 202)**. The JSCEM has recommended that the NSW Electoral Commission consult other election management bodies regarding the sharing of resources, as a cost-mitigation method **(para 118)**.

25. The introduction of broader eligibility for TAV via personal devices presents a reputational risk for all Australian electoral management bodies. Any additional TAV initiatives for New South Wales (beyond those proposed here for kiosk trials and the internet option for electors who are blind or have low vision) would best be undertaken as part of a national electoral technology system, cooperatively designed, commissioned and operated on behalf of the states, territories, and the Commonwealth **(para 203)**.

26. A common national election technology system would promote electoral transparency, consistent with Australia's democratic conventions and values, and provide a consistent electoral experience for citizens, with national privacy, identity and cyber security assurance.

27. The development and operation of this technology would best be undertaken by a standing national elections delivery organisation. Its role would include the design, risk assessment and delivery of digital elections platforms, including for voting, for use by all jurisdictions for their elections and referenda **(para 206)**.

28. National Cabinet's stated priority to "deliver government services fit for the digital age" (tasked to Data and Digital Ministers) offers a context for consideration of this proposal, building on the initiative foreshadowed in 2018 for consideration by the Council of Australian Governments (COAG) for the development of a national internet voting service **(para 210).** The recent establishment of the Inter-jurisdictional Forum on Electoral Integrity, co-chaired by a Deputy Secretary of the Department of Prime Minister and Cabinet and the Australian Electoral Commissioner, provides a new avenue for interjurisdictional and interagency information sharing and collaboration on ideas and initiatives relating to all matters of electoral integrity and security, including for the development and adoption of election technologies **(para 211)**.

29. Work undertaken in response to National Cabinet's proposal to standardise systems for citizen and resident identities, which is part of the digital government services workstream, may be a place to consider synergies to support elector registration and voting in ways that strengthen the security and integrity of any future TAV systems **(para 214)**.

30. In the specific context of NSW elections, to facilitate the use of digital technology (including voting systems) constitutional and legislative reform should be considered including:

    a) lengthening the pre-election timeframes to settle candidate nominations and ballot draws for Legislative Assembly and Legislative Council elections to provide sufficient time to prepare TAV systems with candidate information and for user testing **(para 216)**;

    b) replacing the ballot sampling system for preference distributions in the NSW Legislative Council with a full count system that can use existing digital scanning and counting technology **(para 218)**; and

    c) rationalising the way parties, groups and candidates are nominated for and/or displayed on the Legislative Council ballot, so it is suited to digital display and other assistive technology **(para 222)**.

31. Before providing the final recommendations arising from this review to the NSW Government later in 2023, I invite submissions concerning these matters and any of the other issues identified in the review's Terms of Reference.

Part 3 – Purpose of this paper

The review into TAV by the Electoral Commissioner is assessing whether internet and other forms of TAV (in addition to telephone voting) can be provided by the NSW Electoral Commission at future elections and referenda for particular classes of eligible electors and, if so, in what form and at what scale.

This publication is the interim report of the review (Paper 2). It sets out provisional analysis and options for restricted voting via the internet, kiosks and telephone. Stakeholders have the opportunity to provide feedback on this interim report before the publication of the review's final report (Paper 3) later this year.

In November 2022, the Electoral Commissioner published an Issues and Questions paper (Paper 1) (PDF 820KB) to set out the policy context and to elicit initial feedback.

The review received 18 submissions in response to the *Issues and Questions* paper. The submissions are referred to throughout this interim review report and are published in full on the NSW Electoral Commission's website.

The majority of submissions set out perspectives for electors who are blind or have low vision and other groups facing barriers to voting access due to disability. Other submissions concern election system design, attendance voting arrangements for electors overseas and a range of legal policy matters.

As well as reviewing evidence from submissions, the Electoral Commission will continue to discuss TAV options with the Electoral Commissioner's Equal Access to Democracy Group (EAD Group), State and Commonwealth agencies and electoral organisations in Australia and internationally. It has also undertaken in-house research and analysis on matters set out in the review's Terms of Reference (PDF 572KB).

How to respond to this interim review report

Submissions are invited by 14 September 2023

Stakeholders may wish to use the submission coversheet, available for download from the Electoral Commission's website. Submissions should be written in an accessible format, following the NSW Electoral Commission's guidelines (PDF 69.1KB).

We prefer to receive submissions by email at TAV.Review@elections.nsw.gov.au

You also may send submissions by mail to:

Technology Assisted Voting review
NSW Electoral Commission
GPO Box 832
SYDNEY NSW 2001

The review team can be reached at TAV.Review@elections.nsw.gov.au or +61 (0)2 9290 5971.

Please contact the NSW Electoral Commission's Stakeholder engagement team at stakeholder.engagement@elections.nsw.gov.au to arrange alternative accessible channels including video and guided interview and transcription.

Find out more about the NSW Electoral Commission at elections.nsw.gov.au

Publication of submissions and privacy

The NSW Electoral Commission intends to publish all submissions to the TAV review on its website. Please do not include any personal information in any submission, including such information relating to third parties, if you do not consider that information to be suitable for publication.

In the case of individuals making submissions in a personal capacity, however, it is open to you to indicate if you prefer that your submission be published anonymously. If so, you should only include your personal information in the covering letter or email. Do not include any personal information in the submission itself that you do not wish to be published.

Names, contact details and addresses of people making submissions on behalf of organisations may be published on the website where they are contained in a submission (that is, they will not be redacted by us).

Please note that the NSW Electoral Commission may be required or authorised by law to disclose any information you provide as part of the review, whether it was provided in a covering letter or in a formal submission, regardless of website publication.

The NSW Electoral Commission also may redact or not publish any submission that, in our view, contains material that is discriminatory, offensive, defamatory, refers to matters currently before a court, contains sensitive health information or other personal information of third parties, or where it considers publication may otherwise be contrary to law.

Part 4 – Summary of submissions to the Issues and Questions paper

1. The review received 18 submissions in response to the Issues and Questions paper. All submissions can be viewed on the NSW Electoral Commission's [website](#). The majority of submissions set out perspectives for electors who are blind or have low vision and other groups facing barriers to voting access due to disability. Other submissions examine election system design, attendance voting arrangements for electors overseas and a range of legal policy matters. Following is a summary of the key themes arising in these submissions.

The effect of the discontinuation of iVote on the rights of electors

2. The discontinuation of iVote as the previous TAV channel in New South Wales was referred to in submissions from Vision Australia, Blind Citizens Australia (endorsed by The Australian Communications Consumer Action Network, Guide Dogs Australia and People with Disability Australia), Physical Disability Council of NSW, Guide Dogs Australia, Anti-Discrimination NSW, as well as individual submissions.[1]

3. Many stakeholders emphasised New South Wales accessibility obligations under certain statutes and international treaties,[2] and discussed how the discontinuation of iVote affected their ability to cast a secret and independent vote:

    *   "The decision to remove iVote, irrespective of the merits or inevitability of that decision, was therefore a decision whose effect has been to diminish the right of electors with disability to participate on the same basis as the rest of the community…The equity and inclusion vacuum left by the disappearance of iVote is not consistent with Australia's obligations under the UN Convention on the Rights of Persons with Disabilities".[3]

    *   "We believe the decision to decommission iVote without plans for a replacement infringed on the rights of people who are blind or vision impaired to participate fully in the electoral process, as it removed the only existing accessible voting mechanism to ensure an independent, secret, and verifiable vote for our community".[4]

    *   "[Anti-Discrimination] NSW is concerned that suspending the use of the iVote electronic voting system creates barriers for people with a disability to participate in the electoral process freely and fairly".[5]

4. These stakeholders also spoke favourably about iVote, setting out expectations for future TAV platforms with reference to it. Disability peak bodies expressed a clear expectation that any system provided be the equivalent, or better than, the offerings of iVote, and should be designed in consultation with stakeholders.[6] The NSW Ageing and Disability Commissioner asserted that "any change to voting arrangements must provide at least what was previously available through iVote".[7] Accessibility NSW was less prescriptive on the form the system should take but noted that any system should be informed by the Australian Standard on accessibility requirements for ICT products and services.[8]

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[1] Submission 1, Vision Australia, 1; Submission 10, Blind Citizens Australia, 6; Submission 2, Physical Disability Council of NSW, 1; Submission 12, Guide Dogs Australia, 10; Submission 16, Anti-Discrimination NSW, 1-2, Submission 14, Ms Amanda Tink, 1; Submission 15, Ms Susan Thompson, 1.
[2] Submission 7, Deaf Australia, 4; Submission 10, Blind Citizens Australia, p4-5; Submission 16, Anti-Discrimination NSW, 1-2, Submission 1, Vision Australia, 1; Submission 13, NSW Ageing and Disability Commissioner, 1; Submission 11, Deaf Connect, 1; Submission 5, Carers NSW, 4; Submission 4, Accessibility NSW, 1.
[3] Submission 1, Vision Australia, 1.
[4] Submission 10, Blind Citizens Australia, 6.
[5] Submission 16, Anti-Discrimination NSW, 2.
[6] Submission 2, Physical Disability Council, 1; Submission 13, NSW Ageing and Disability Commissioner, 1; Submission 17, Council for Intellectual Disability, 7-8.
[7] Submission 13, NSW Ageing and Disability Commissioner, 1.
[8] Submission 4, Accessibility NSW, 2. See Australian Standard on accessibility requirements for ICT products and services ([AS EN 301 549](#)). See also Vision Australia, 8.

5. In the blind and low vision sector, Vision Australia and Blind Citizens Australia referred to iVote as "the gold standard" in accessible voting for people who are blind or have low vision, while Guide Dogs Australia referred to it as "best practice".[9] Blind Citizens Australia also described iVote as demonstrating "the capability and promise of TAV" and suggested that the NSW Electoral Commission might rework and improve it for future use.[10] Like the submissions from disability peak bodies, blind and low vision stakeholders called for their inclusion in any design of the system.[11]

A multi-channel response, including kiosks

6. Blind and low vision peak bodies called for a multi-channel response,[12] including a greater use of Braille to address the diverse needs of their community.[13] The Vision Australia submission notes:

    "the blind and low vision community is very diverse, and… people have unique needs that cannot always be met with a 'one size fits all' approach. Having a range of options available in particular contexts will ensure that the maximum number of people will be able to benefit".[14]

7. The need for a multi-channel response was also reflected in submissions from the disability sector. The Council for Intellectual Disability consulted its advocacy group and staff members to inform its submission. On the topic of the types of TAV that should be available, one member responded:

    "People should be able to choose from different types of technology assisted voting to pick what works best for them, there should be many different options available. People should be able to use technology to vote from home".[15]

8. Stakeholders were divided on the utility of kiosks as part of a multi-channel response. Vision Australia said that in general, kiosks are not favoured by the blind and low vision community due to the existing accessibility hurdles.[16] In contrast, Blind Citizens Australia strongly support kiosk voting, stating:

    "the introduction of voting kiosks, especially if augmented with additional technology such as electronic braille displays, has the potential to significantly improve the accessibility of voting for many people who are blind or vision impaired and other people with disability".[17]

9. The Council of Intellectual Disability noted that many people with an intellectual disability do not have internet access at home and as such, cognitively accessible kiosks are "an important feature to provide equal access".[18] Individuals cited in the organisation's submission also described essential components of these kiosks, such as touch screens, adjustable voting screen heights and simple displays.[19]

10. Deaf peak bodies such as Deaf Australia and Deaf Connect called for greater integration of AUSLAN with the voting process, both as part of TAV as well as in voting centres.[20]

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[9] Submission 1, Vision Australia, 7; Submission 10, Blind Citizens Australia, 8; Submission 12, Guide Dogs Australia, 10; Submission 15, Ms Susan Thompson, 7.
[10] Submission 10, Blind Citizens Australia, 8.
[11] Submission 10, Blind Citizens Australia, 9; Submission 1, Vision Australia, 10.
[12] Submission 10, Blind Citizens Australia, 8; Submission 1, Vision Australia, 8.
[13] Submission 2, Physical Disability Council, 1; Submission 10, Blind Citizens Australia, 9; Submission 1, Vision Australia, 9.
[14] Submission 1, Vision Australia, 4.
[15] Submission 17, Council for Intellectual Disability, 4.
[16] Submission 1, Vision Australia, 8.
[17] Submission 10, Blind Citizens Australia, 8-9.
[18] Submission 17, Council for Intellectual Disability, 6.
[19] Submission 17, Council for Intellectual Disability, 5.
[20] Submission 7, Deaf Australia, 4; Submission 11, Deaf Connect, 2-3.

Registration and additional verification requirements

11. Some stakeholders addressed the question of whether any TAV system should require additional verification of an elector's eligibility.

12. The NSW Ageing and Disability Commissioner stated that people with disability should be maintained as a mandatory category of electors entitled to use TAV and there should be no additional "verification" of eligibility, regardless of the risk of incorrect claims.[21]

13. Vision Australia was also strongly opposed to verification measures, describing the process of verifying whether a person is blind or has low vision as "logistically impossible and philosophically unconscionable".[22] In contrast, some individual stakeholders supported additional verification, to ensure the system is only used by those for whom it was intended.[23]

14. Industry member and former provider of iVote, Scytl, outlined the practical challenges in verifying an elector's eligibility, particularly when based on location:

    "Geolocation data is notoriously difficult to collect with a sufficiently high level of confidence that the data reported truly reflects the location of the person. An individual mobile device with GPS can be quite accurate, but a user using a shared landline device may have this information removed prior to reaching the measurement location." [24]

15. Scytl also discussed the technical benefits of requiring electors to pre-register, noting that it allowed for system load prediction and better monitoring of voter connection activity.[25] Its submission also advised against over-complicating system design, something which the Physical Disability Council of NSW echoed, calling for the registration process to be as simple as possible for this proportion of the voting population.[26]

16. As to when registration for TAV should be available, Vision Australia noted that they would "very reluctantly" agree to any suggestion that it not be available on election day, stating:

    "It would not be an acceptable outcome if a person who is blind or has low vision were to be denied the opportunity to vote because they became aware of their options only after the registration period had closed and while the rest of the community was still able to vote."[27]

Other considerations: Savings provision, overseas electors and national coordination

17. The submissions of the Law Society of New South Wales, Australian Department of Foreign Affairs and Trade (DFAT) and Scytl discussed other issues relevant to TAV.

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[21] Submission 13, NSW Ageing and Disability Commissioner, 1.
[22] Submission 1, Vision Australia, 9. The Physical Disability Council of NSW gave support for this statement in its submission: Submission 2, Physical Disability Council of NSW, 1.
[23] Submission 15, Ms Susan Thompson, 2.
[24] Submission 8, Scytl, 4.
[25] Submission 8, Scytl, 4.
[26] Submission 2, Physical Disability Council of NSW, 1.
[27] Submission 1, Vision Australia, 9.

18. On the merits of a savings provision – that is, a provision in legislation that states that performance issues with TAV during an election will not be material to the validity of that election – the Law Society of New South Wales suggested specifying when the failure of a TAV system could invalidate the results of an election.[28] It gave the following example:

> "An election is taken not to have failed, and the results of an election are not invalid, merely because online voting permitted by this clause was not operable during a period when online voting was permitted under this clause, unless:
>
> a) as a result of the inoperability eligible voters were prevented from voting throughout the voting period; and
>
> b) a recount by the Electoral Commissioner has determined that an alternative result may have resulted if the eligible voters had been able to vote online throughout the voting period; and
>
> c) as a result, the result of the election was likely to be affected."

19. Other stakeholders, such as Vision Australia did not support a provision to prevent the invalidation of an election in the event of system failure. Rather, its submission noted:

> "If there is a system failure, including a failure of human-assisted telephone voting, then voters who are blind or have low vision and anticipated voting via the system prior to its failure must be provided with another, predetermined and optional, way of voting that is not unduly burdensome or inconvenient, even if it is suboptimal in terms of independence, secrecy or verifiability, and even if it is inferior to the failed system."[29]

20. The DFAT submission asserted that it is becoming increasingly challenging to provide in-person overseas voting, noting that the United Kingdom, United States and Canada have discontinued in-person voting in overseas missions.[30] The submission expressed support for TAV as a means of supporting overseas voters, on the basis that it would lessen reliance on the postal service.[31] Support for TAV on this basis was also given by industry provider Scytl.[32] The Australian Electoral Commission announced in May 2023 that in-person overseas voting will be available for the 2023 Voice to Parliament referendum at most of Australia's diplomatic missions, as well as fast-tracked arrangements for overseas postal voting.[33] DFAT also provided support for in-person postal vote "drop-off" services at selected overseas missions for the 2023 State election.

21. The submission from Scytl discussed ways to strengthen the integrity of any TAV system. It called for the establishment of a scientific expert group to discuss potential improvements along with the inclusion of technical detail in codes and procedures, rather than legislation, to allow easier adjustment.[34]

22. Finally, stakeholders such as Guide Dogs Australia and Vision Australia called for national coordination in the deployment of any TAV solution, to ensure consistency in elector experience:[35]

> "Our strong view is that after identifying the method(s) of technology assisted voting that most fully uphold the right to an independent, secret and verifiable vote, all electoral commissions in Australia should move towards its adoption. While this might take time and require coordinated legislative reform, it is in the long-run highly undesirable that voters who are blind or have low vision in one jurisdiction should have an inferior voting experience to those in another."[36]

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[28] Submission 18, Law Society of New South Wales, 2-3.
[29] Submission 1, Vision Australia, 11.
[30] Submission 9, Australian Department of Foreign Affairs and Trade, 1.
[31] Submission 9, Australian Department of Foreign Affairs and Trade, 1.
[32] Submission 8, Scytl, 3.
[33] Australian Electoral Commission, Overseas voting services to increase for the 2023 referendum, Canberra, 22 May 2023.
[34] Submission 8, Scytl, 6.
[35] Submission 12, Guide Dogs Australia, 10.
[36] Submission 1, Vision Australia, 12.

Part 5 – Analysis

23. The terms of reference for this review require research and analysis of various aspects of TAV to assist in the making of findings on future options. The research and analysis are set out in the following parts:

    Part 5.1 – Potential elector classes for technology assisted voting

    Part 5.2 – Technology assisted voting platforms

    Part 5.3 – System design

    Part 5.4 – Longer-term proposals

Part 5.1 – Potential elector classes for technology assisted voting

24. This review assesses the feasibility of using TAV in circumstances where maintaining the integrity of elections and democratic practice are paramount. While attendance and paper-based voting are used by the majority of electors in New South Wales, TAV provides an alternative when these voting channels are difficult to access. This review identifies the need for TAV by eligible electors, as opposed to opportunities for convenience. It also considers the risks with increased TAV usage. This section considers the cohort size and demands of each elector class that are eligible for TAV as provided for in the Electoral Act.

Voting channels used by electors

25. Attendance voting remains the most utilised voting channel, with around 90 per cent of electors voting in person, either on election day or during the early voting period (see Figure 1).[37] Over the past three state general elections, there has been a trend towards early voting, with an increase of 59 per cent (641,910 to 1,020,780) from the 2015 NSW State election to the 2019 NSW State election,[38] and 53 per cent (1,020,780 to 1,567,515) from 2019 to the 2023 NSW State election. The increase from 2015 to 2023 (641,910 to 1,567,515) is 144 per cent.

26. Although attendance voting is used by a significant majority of electors, approximately 10 per cent of voters use non-attendance voting channels (split mainly between postal vote and, formerly, iVote). Postal voting reduced in popularity following the introduction of iVote in 2011, as shown in Figure 1.[39] At the 2023 NSW State election, where iVote was not used, rates of postal voting were again higher, with 540,208 postal vote applications received and an increase of 118 per cent from the 2019 election. Postal voting in other Australian State elections has increased during the same period (coinciding with the COVID-19 pandemic), with rises in Queensland (2020) of 145 per cent,[40] Western Australia (2021) of 85 per cent[41] and South Australia (2022) of 67 per cent.[42]

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[37] NSW Electoral Commission, *Report on the conduct of the 2019 NSW State election*, Sydney, 2019, 19.
[38] NSW Electoral Commission, *Report on the conduct of the 2019 NSW State election*, Sydney, 2019, 19.
[39] NSW Electoral Commission, *Report on the conduct of the 2019 NSW State election*, Sydney, 2019, 19.
[40] Electoral Commission of Queensland, 2020 State General Election: Report on the Election, Brisbane, 2021, 14
[41] Western Australian Electoral Commission, *2021 State General Election, Election Report*, Perth, 2021, 2
[42] Electoral Commission of South Australia, *Election Report, 2022 State Election*, Adelaide, 2023, 52

Figure 1: Voting channels used by electors at most recent state general elections (2011, 2015, 2019, 2023*)

Voting by channel - NSW state elections
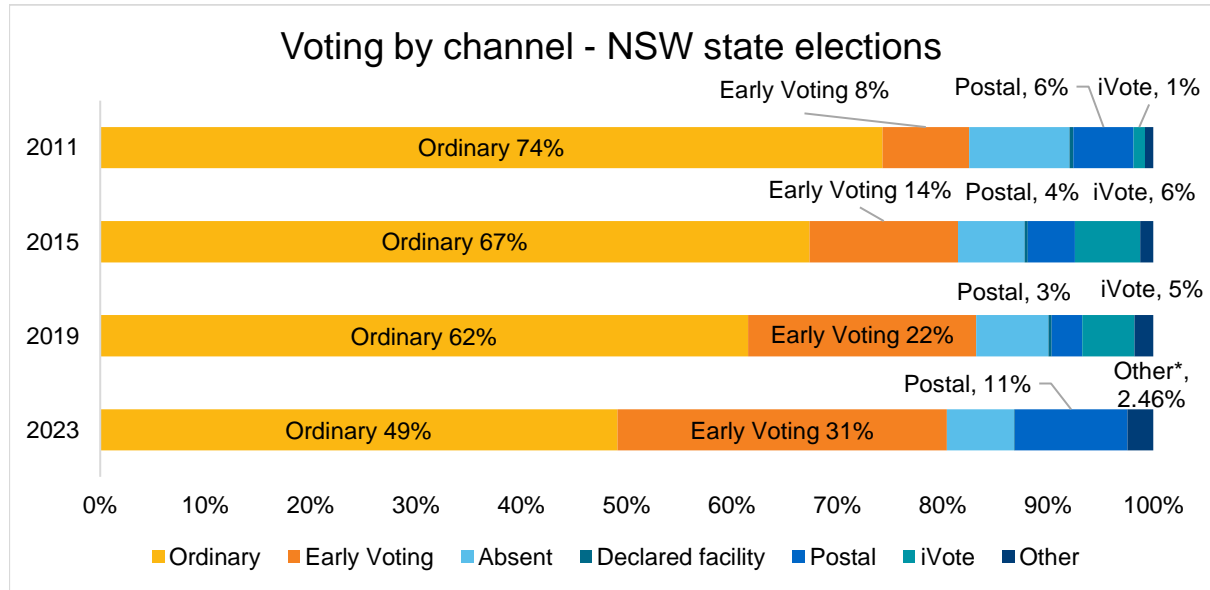
Source table for figure 1: Voting channels used by electors at most recent state general elections (2011, 2015, 2019 and 2023)

Votes by channel	2023	2019	2015	2011
Postal	11%	3%	4%	6%
iVote	0.00%	5%	6%	1%
Early Voting	31%	22%	14%	8%
Absent	6%	7%	6%	10%
Declared facility	0%	0.3%	0.3%	0.3%
Ordinary	49%	62%	67%	74%
Other*	2.46%	2%	1%	1%

* For 2023, telephone voting (830 votes – 0.02 per cent) have been included in the "Other" category. Other also includes Enrolment, provisional and silent voters.

Table 1: iVote usage by elector class at the 2019 NSW State election[43]

Eligibility criteria	Number of iVotes cast	Percentage of total	iVoted by internet	iVoted by telephone
Blind/low vision	1,174	0.50 %	1,106	68
Reading disability	2,077	0.89 %	2,038	39
Disability	12,773	5.45 %	12,485	288
20km from a voting centre	7,381	3.15 %	7,311	70
Outside NSW (interstate)	160,025	68.27 %	158,657	1,368
Outside NSW (overseas)	47,977	20.47 %	47,678	299
Silent elector	2,994	1.28 %	2,946	48
Total	**234,401**	**100 %**	**232,211**	**2,180**

Eligible elector classes

27. The risk to the integrity of an election from the technical failure of a TAV system becomes greater as the size of the TAV user cohort increases. The feasibility of internet voting – and other forms of TAV – therefore depends in part on its scale. Knowing the size of eligible elector classes also supports electoral authorities to plan capacity in IT systems to support TAV.

28. Currently, section 152 of the Electoral Act sets out eligible elector classes for TAV as follows:

    a) the elector has a disability (within the meaning of the *Anti-Discrimination Act 1977*) and because of that disability he or she has difficulty voting at a voting centre or is unable to vote without assistance,

    b) the elector is illiterate and because of that he or she is unable to vote without assistance,

    c) the elector's residence is not within 20 kilometres, by the nearest practicable route, of a voting centre,

    d) the elector is a silent elector,

    e) the elector will not throughout the hours of voting on election day be within New South Wales,

    f) the elector is a registered early voter (technology assisted voting),

    g) in relation to a by-election—the elector will not throughout the hours of voting on election day be within the electoral district concerned,

    h) the elector meets such other eligibility requirements as may be prescribed by the regulations.[44]

29. The following section estimates the size of each of potential cohort and predicted usage of any future TAV offering by each class, based on previous iVote usage and data from the Australian Bureau of Statistics (ABS), advocacy organisations and NSW Electoral Commission geospatial data.

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[43] NSW Electoral Commission, *Report on the conduct of the 2019 NSW State election*, 61.
[44] *Electoral Act 2017*, s 152.

General qualification about estimated users:

30. The estimated number of users of a future TAV solution is lower than the number of electors who may be eligible because some eligible electors will choose other channels. The estimates are based on past usage of iVote as a proportion of the estimated eligible class and so may not hold true in the event of major environmental change. Such change might include lower cost and more user-friendly personal technology options, as well as demographic shifts that mean a future eligible user group contains a larger number of older voters who are experienced users of digital services compared with voters in 2011 when iVote was first introduced. If future demand for TAV at an election did prove much higher than the following estimates recommended as the basis for a solution design, TAV may need to be withdrawn as a voting channel, entirely or after a certain time during the voting period, because of the integrity risks for that election arising from that increased volume.

31. It is challenging to predict future usage given the various factors that can influence demand. In the 11 years when iVote was provided at New South Wales elections (2011 to 2021), there was growth in usage across all eligible elector classes (refer to Table 2, Table 3, Table 4 and Table 5). There are several factors that could have contributed to this including: familiarity with the platform in the electorate, increased availability of electronic devices, population growth,[45] an aging population[46] resulting in increased disability (including blindness and low vision) and more digitally-literate electors. The COVID-19 pandemic's impact on the acceleration of digital adoption[47] and the projected net shift in migration towards regional areas from capital cities,[48] may also affect elector class sizes and TAV demand. In addition, the shortening of the early voting period enacted in 2022 for the 2023 State election (from 13 days to seven days) may have increased the attractiveness of internet voting as an alternative voting channel for any eligible electors. Adding to this complexity is the requirement for electors to self-nominate their eligibility when using iVote.

Table 2: iVote use by eligible elector class 2011 NSW State election

Eligibility criteria	Number of iVotes (internet and IVR) cast
Blind/low vision/low literacy	668
Disability	1,296
20km from a voting centre	1,643
Outside NSW on (interstate and overseas)	43,257
Total	**46,864**

Table 3: iVote use by eligible elector class 2015 NSW State election

Eligibility criteria	Number of iVotes (internet and IVR) cast
Blind/low vision/low literacy	4,818
Disability	12,714
20km from a voting centre	8,407
Outside NSW (interstate and overseas)	257,730
Total	**283,669**

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[45] NSW Department of Planning and Environment, Population Projections, Sydney, 2022.
[46] Australian Institute of Health and Welfare, Older Australians, Canberra, 30 November 2021.
[47] McKinsey & Company, COVID-19 digital transformation and strategy, New York, 5 October 2022.
[48] Australian Government – Centre for Population, Migration between Cities and Regions: A quick guide to COVID-19 impacts, Canberra, September 2021.

Table 4: iVote use by eligible elector class 2019 NSW State election

Eligibility criteria	Number of iVotes (internet and IVR) cast
Blind/low vision	1,174
Reading disability	2,077
Disability	12,773
20km from a voting centre	7,381
Outside NSW (interstate)	160,025
Outside NSW (overseas)	47,977
Silent elector	2,994
Total	**234,401**

Table 5: iVote use by eligible classes at the 2021 NSW Local Government elections

Eligibility criteria	Number of internet and telephone (operator assisted) votes cast **Telephone (interactive voice response) not available**
Blind/low vision	2,382
Other Disability	35,252
Literacy	4,783
20km from a voting centre	10,622
No Postal Pack	11,048
Outside Council Ward (including interstate and overseas)	601,553
Silent elector	5,954
Total	**671,594**

Electors who are blind or have low vision

32. At the 2019 NSW State general election, 1,174 iVote electors identified as being blind or having low vision. This figure increased to 2,382 at the 2021 Local Government elections. At the recent 2023 State general election, 830 electors identified as being blind or having low vision to vote via the operator-assisted telephone voting service – the only cohort eligible to do so.

33. Vision Australia estimates that there are approximately 120,000 people in New South Wales who are blind or have low vision.[49] Nationwide, Blind Citizens Australia says there currently are more than 500,000 people who are blind or vision impaired, with estimates that this will rise to 564,000 by 2030.[50] Citing research conducted by Vision Initiative, Blind Citizens Australia note that around 80 per cent of vision loss in Australia is caused by conditions that become more common as people age.[51]

34. It is estimated that up to 4,000 eligible electors in this class would use an internet voting offering and up to 1,000 would use operator-assisted telephone voting if it were available to this class of electors in 2027. This estimate of 4,000 internet users in 2027 is well above the number of iVote users in this eligible elector class at the 2021 Local Government elections. The estimate takes account of the growth trajectory since 2011. There is also an expectation that, if blind and low vision is the only available eligible elector class in 2027, some electors previously from the general disability class would be able to instead self-nominate for this class.

Electors with disability

35. Eligibility for this class under the Electoral Act is an elector with disability within the meaning of the *Anti-Discrimination Act 1977* and because of that disability has difficulty voting at a voting centre or is unable to vote without assistance.[52]

36. At the 2011 NSW State general election, 668 iVote electors identified as being blind or having low vision and 1,296 identified as with disability – a total of 1,964 electors. At the 2019 State general election, 16,024 electors registered for iVote under this eligibility class (identified as 1,174 blind or low vision, 2,077 reading disability and 12,773 disability). There was a significant increase in the number of electors identifying in this class at the 2021 Local Government elections, at 35,252 electors.

37. At 30 June 2022, the Australian population was 25,978,935 with the New South Wales population at 8,153,600 (31.4 per cent of the national population).[53] Applying that ratio to national statistics for people with disability would indicate there are about 1.38 million people in New South Wales with disability, including around 440,000 with a profound disability. This is consistent with the ABS 2021 estimate of 464,712 people with disability in New South Wales who require assistance with "core activity".[54] ABS defines core activity as self-care, communication, and mobility due to disability, long-term health conditions or the effects of old age.

38. Subject to the general qualification above, it is estimated that approximately 25,000 eligible electors in this class would use an internet voting offering in the medium term (2027 to 2031) if available. This estimate takes into account the growth trajectory established between 2011 and 2019, as well as the expectation a majority of electors in the class for the 2021 election (during pandemic conditions) would choose to use the iVote channel again.

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[49] Submission 1, Vision Australia, 9.
[50] Submission 10, Blind Citizens Australia, 3.
[51] Vision2020. *Eye health in Australia*. http://www.visioninitiative.org.au/common-eye-conditions/eye-health-in-australia
[52] *Electoral Act 2017*, s152(a).
[53] Australian Bureau of Statistics. National, state and territory population Canberra, September 2022.
[54] Australian Bureau of Statistics. Disability and carers: Census Canberra, 2021.

More than 20km from a voting centre in New South Wales

39. At the 2019 NSW State general election, 7,381 electors voted by iVote under this eligibility class. This increased to 10,622 at the 2021 Local Government elections. In 2023, geospatial analysis puts the total number of electors that are 20km or more from a voting centre at 46,925. The majority of these electors cast their vote via postal vote.

40. Based on the growth trajectory from previous iVote usage, and subject to the general qualification above, it is estimated that approximately 15,000 eligible electors in this class would use an internet voting offering in the medium term (2027 to 2031) if available.

41. Recent arrangements to improve participation rates include the Electoral Commission sending all postal vote packs within Australia via priority class mail under an extended statutory deadline of 13 days after the close of voting (compared to four days previously).[55] However, any future decline of mail services may make it more challenging for these electors to receive and cast a valid postal ballot even within the extended prescribed time frames. A recent review into New Zealand's electoral system found that the gradual decline in postal voting requires more consideration around scalable and sustainable voting methods for people who cannot vote in person.[56]

Outside New South Wales (interstate)

42. Being interstate on an election day is a valid excuse for failing to vote (a "sufficient reason"). The provision of voting facilities outside New South Wales is therefore a measure to support voter participation.

43. Statistics from the 2016 ABS Census suggests that about 75,000 New South Wales electors were temporarily staying overnight in another state or territory on census night.[57] This may only be a partial indication of the actual number of electors away on an election day. At the 2019 State general election, 160,025 electors voted by iVote under this eligibility class. Figures from the 2021 Local Government elections are less applicable as eligibility was extended to any elector outside their council ward or area, with their specific location (that is, interstate or overseas) not recorded.

44. Noting the limited data on interstate iVote usage, and subject to the general qualification above, it is estimated that approximately 90,000 eligible electors in this class would use an internet voting offering in the medium term if available. In light of the ABS data (75,000 New South Wales residents outside New South Wales on census night), some of the 160,025 electors who used iVote under this criterion may have incorrectly claimed to be eligible. Any actual usage in 2027, if available for this cohort, therefore could be higher than 90,000 on that basis.

45. New South Wales electors temporarily interstate may also apply for a postal vote or attend a voting centre in any Australian state or territory capital city, a service provided under a reciprocal arrangement between electoral commissions. At the 2023 NSW State election, 7,338 votes were cast under the reciprocal arrangement at electoral commission offices in Australia and New Zealand. Current arrangements, which include sending all postal vote packs via priority class, and the extension of the deadline before which postal vote packs must be returned currently provide a high standard of support for this cohort. However, any future decline of mail services may make it more challenging for these electors to receive and cast a valid postal ballot within the existing prescribed time frames.

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[55] *Electoral Act 2017*, s 149(1)(b).
[56] Independent Electoral Review, *Interim Report: Our draft recommendations for a Fairer, Clearer and More Accessible Electoral System*, Wellington: New Zealand, 2023, 155-6
[57] Australian Bureau of Statistics, 2016 Census of Population and Housing, Place of Usual Residence on Census night, New South Wales, G03 (2021 Census data does not reflect usual interstate movement data due to COVID-19 travel restrictions in place at the Census date).

Outside of New South Wales (outside Australia)

46. There are two key groups in this cohort: electors who are resident overseas and electors who are overseas on holidays or for another short-term reason.

47. At the 2019 NSW State election, 47,977 electors used iVote on the basis of being overseas. ABS data indicates that during the period around that election (February and March 2019) approximately 100,000 New South Wales resident electors would have been travelling overseas on election day.

48. Separately, an Australian citizen residing overseas – as opposed to being on holiday or away from their residence in Australia for a short period – is eligible to vote in Commonwealth, state and local government elections if they are enrolled as an Eligible Overseas Elector (EOE).[58] Currently, there are 37,890 EOEs from all states and territories. There currently are 14,031 EOEs registered in New South Wales electorates who are eligible to vote at NSW state and local government elections. More than three quarters of the New South Wales EOEs are registered as General Postal Voters (an eligible person who has pre-registered to automatically receive their ballot papers in the mail after an election has been announced).

49. Subject to the general qualification above, it is estimated that approximately 60,000 eligible electors in this class would use an internet voting if available. This would be an option for the estimated 100,000 New South Wales resident electors travelling overseas at election time plus around 14,000 EOEs. It represents an increase on the 2019 overseas iVote figure of 47,977, although take-up would be influenced by the availability of in-person and postal voting channels at Australian diplomatic missions or other facilities.

50. As iVote was not available at the 2023 NSW State election, to be able to vote New South Wales resident electors who were temporarily overseas – and not registered as EOE – had to make an application (either online or by post) for a postal vote. The NSW Electoral Commission introduced additional measures to increase the options for both groups of overseas electors to vote by post including:

    • supporting a legislated extension of the deadline before which postal vote packs must be returned

    • couriering of postal vote packs to maximise the time electors had to complete and return postal votes

    • providing an option to deliver completed postal vote envelopes to selected Australian missions in overseas locations where higher numbers of New South Wales residents are known to be located.

51. For the 2023 NSW State election, 20,418 postal vote packs were dispatched by courier to electors who applied from overseas. By the close of the legislated date for postal returns, 5,706 (28 per cent) had been returned by mail or to drop-off points in nine locations: Hong Kong, London, New York, Ottawa, Paris, Rome, Singapore, The Hague and Berlin. Of the 5,706 returned postal votes, 4,398 were delivered to the NSW Electoral Commission by mail services and 1,308 were drop-off returns. This return rate was higher than for previous elections – for example in SGE 2015 out of 5,856 postal packs sent to overseas electors only 1,062 were returned and only 129 of those were able to be included in the count. At the SGE 2019, out of 13,036 postal vote packs sent to overseas electors only 3,772 were returned and only 252 of those were able to be included in the count. The higher return rate for 2023 is attributable to the previously mentioned courier services (used for the first time) and the longer legislative period permitted for the receipt of returned postal votes by the Electoral Commission (four days after election day compared with 12 days in 2023).

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[58] An EOE must register for this status before leaving Australia (or within two years of leaving Australia) and intends to resume residing in Australia within six years of leaving. Extensions of one year are available provided the EOE certifies they intend to resume residing in Australia. See *Commonwealth Electoral Act 1918*, s 94.

52. In summary, although internet voting may provide an additional convenient option for this cohort, there are a number of factors that needed to be weighed against this convenience:

-   the size of this elector class increases the risks to election validity from potential performance failure

-   including this class would introduce specific integrity risks around determining eligibility, given it would not be practicable to require any proof that electors were overseas on election day (such as geolocation or passport records)

-   unlike many other elections, electors can plan ahead to vote at New South Wales general elections as these are always scheduled for the third Saturday of March every four years

-   additional measures introduced for 2023 NSW State election postal voting (noted above) provided an increased level of participation for a proportion of New South Wales electors who were overseas during the voting period.

53. The Australian Electoral Commission also announced in May 2023 that in-person voting for overseas electors again will be provided at most of Australia's diplomatic missions for the 2023 Voice to Parliament referendum.[59] The NSW Electoral Commission will consult with DFAT ahead of the 2027 State election to determine whether this in-person voting option can also be made available for Australians overseas who are eligible to vote in that election.

Silent elector

54. There are 39,119 silent electors registered in New South Wales. At the 2019 NSW State general election, 2,994 electors voted by iVote under this eligibility class. This increased to 5,954 electors at the 2021 Local Government elections. Under the Electoral Act, silent electors are eligible to apply to vote by postal vote, which currently provides the most popular voting channel for electors in this class.

55. Based on the trajectory established in previous iVote usage, and subject to the general qualification above, it is estimated that approximately 9,000 eligible electors in this class would use an internet voting offering in the medium term (2027 to 2031) if available.

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[59] Australian Electoral Commission, *Overseas voting services to increase for the 2023 referendum* Canberra, 22 May 2023.

Part 5.2 – Technology assisted voting platforms

56. This review considers technology options used in past elections including remote internet voting, operator assisted telephone voting, interactive voice and keypad response voting and voting kiosks. The advancement of technology may introduce other solutions, such as spoken instruction voting (for example by telephone or computer headset) using voice recognition and response software.

57. Technology, whether in the form of devices or networks, can assist electors who find traditional voting channels (paper ballot attendance voting or postal voting) inadequate for their needs or who face independent access constraints. The potential beneficiaries include electors who are blind or have low vision, have mobility or access related issues due to disability, face language barriers or have limited English language proficiency, or who are in remote parts of the state or are outside the state.

58. Any examination of TAV must be undertaken against the background of the long-established voting practices designed around written, paper ballots. The paper ballot voting system continues to provide the strongest foundation for conducting secure and accurate elections.

    The use of paper ballots – and human counting of those ballots – creates one of the most secure electoral systems imaginable.[60]

59. As the US-based Brennan Center for Justice has noted, when preferences are recorded on paper, voters can easily verify that their ballot accurately reflects their choices before submitting it.[61] Rigorous chain of custody processes also limit the ability for an elector's vote to be manipulated after it has been submitted into the count. At the counting stage, the presence of scrutineers who can observe the physical ballots being counted adds additional transparency to the process.[62]

60. In contrast, TAV uses complex digital systems to verify votes. Furthermore, the cyber threat environment has worsened in the past decade. Since the introduction of iVote, there has also been an increase in the misinformation and disinformation around elections with the rise of social media, greater technical complexity of digital systems and a heightened risk of malicious interference, all contributing to a vastly different operating environment. A risk common to all TAV systems is technical failure (for example, due to outages or other performance issues or malicious actor attack) and its potential impact on the integrity of an election outcome. Such a failure may have widespread impacts, particularly if it introduces uncertainty around all votes cast using a particular TAV channel. These risks require management via complex controls. It is essential that any TAV systems are secure by design and are operated under robust risk-management practices.

61. In the past decade it has become common in Australia and other advanced economies for corporate elections – for example for public companies, trade unions and governing boards of educational institutions – to use online voting systems hosted by specialist service providers. A survey of Australian company annual general meetings in 2022 indicated that 86 per cent of voting at shareholder meetings was conducted online, with 14 per cent being conducted using paper.[63] The design and utility of these voting systems may be suitable and convenient for environments such as companies and other organisations where the secret ballot is not required.[64] Voting in elections for parliaments and local councils in Australia must meet higher standards because it is through these elections that citizens choose who has the power to make the laws by which they are governed. Voting in these elections in New South Wales is also compulsory.

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[60] Paul Miller, 'If it ain't broke, don't fix it: Australia should stay away from electronic voting' *The Conversation*, 23 August 2018.
[61] Derek Tisler and Turquoise Baker, 'Paper Ballots Helped Secure the 2020 Election — What Will 2022 Look Like?' *Brennan Centre for Justice*, New York, 10 May 2022.
[62] Rodney Smith et al, 'Implications of Changes to Voting Channels in Australia: A Research Report Commissioned by the Electoral Regulation Research Network', Sydney, December 2018, 31.
[63] Computershare Limited, 2023 AGM Intelligence Report, Sydney, 2023.
[64] The Institution of Engineering and Technology, Internet voting in the UK, London, 2020, 5.

62. The design of any future TAV platform must be consistent, therefore, with high standards that reflect the key policy requirements of the voting process in the Electoral Act. In summary, these requirements are:

   - **Fairness** – which includes facilitating the exercise of a voter's right to participate freely in the electoral process.

   - **Integrity** – maintaining an electoral system characterised by accessibility, integrity and fairness.

   - **Compulsory** – a legal requirement for all eligible electors to enrol and vote.

   - **Transparency** – an election process that is open to scrutiny and processes designed to support transparency.

   - **Secret and independent** – a central tenet in the Australian electoral system that requires a voter to be allowed to cast a vote, free from duress or coercion, with their identity and the contents of their vote remaining anonymous.

63. Regardless of the scale of any future TAV undertaking in New South Wales, a significant budget commitment would be required for upfront infrastructure as well as ongoing hardware and software maintenance and upgrades.

64. Each TAV platform has unique risks and benefits, and these vary between systems. For example, although remote internet voting can increase accessibility, the potential risk of vote coercion is higher (similar to postal voting), as the voting environment is unsupervised.[65] A benefit of kiosk attendance voting, like traditional paper attendance voting, is that electors are in a regulated "safe space" and participate in a common democratic experience with other citizens, overseen by impartial election officials.[66]

65. Overall, while TAV may have benefits such as accessibility, convenience and computational speed, it is important to make risk-based decisions about its adoption based on a careful evaluation of the requirements relating to each election environment.

Remote internet voting

66. Remote internet voting involves an elector casting their vote through a web browser or an application on their personal device (for example, mobile phone or personal computer). This was the principal channel for the iVote system used at New South Wales elections between 2011 and 2021. Remote internet voting supports a secret and independent vote, particularly for electors who are blind or have low vision or electors with disability. However, it attracts significant critical attention in relation to transparency and the heightened risks associated with transmitting information over the internet. As discussed above, technical failure (both real and perceived) can have significant impacts on election integrity.[67]

67. Apart from the former iVote system in New South Wales, there are no large-scale remote online voting systems operating in jurisdictions with Westminster parliamentary systems. Although there appears to be significant global interest in remote internet voting, large-scale adoption is far less common.

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[65] David Kerslake 'Out with the old, in the with new: the case for internet voting in Australia' *The Parliamentarian,* 3, London, 2015, 190
[66] S Birch et al, 'Putting Electronic Voting Under the Microscope' 85(2) *The Political Quarterly Wiley, Hoboken: United States, 2014,* 187-190.
[67] Joint Standing Committee on Electoral Matters, Parliament of Australia, *Inquiry into the conduct of the 2013 federal election: An assessment of electronic voting options* (Second Interim Report), November 2014, 53.

68. At a national election level, Estonia has the most mature remote internet voting system, where more than half of all electors cast their votes online.[68] Estonia's national parliamentary elections, held in March 2023, elected 101 MPs across 12 multi-member electorates using a "party list" proportional representation system.[69] A policy driver for internet voting in Estonia is to increase participation rates among its approximately 1 million registered electors by providing a convenient voting channel.[70] The national turn-out in March 2023 was 63.7 per cent.[71] Australia, by contrast, does not face the same participation challenge given compulsory voting in national, state and territory elections.

69. The government of Switzerland has resumed a trial of remote internet voting by the nation's cantons (regional governments) which conduct election operations, using a solution designed and operated by Swiss Post.[72] Switzerland has approximately 5.5 million registered electors.[73] About 3,616 Swiss "abroad" electors from the cantons of Basel City, St Gallen, and Thurgau (representing half of the registered abroad voters) voted in a federal referendum on 18 June 2023.[74] This follows the suspension of internet voting in 2019 due to concerns regarding system integrity.[75] The Canadian province of Nova Scotia is preparing to provide an internet voting service for Canadian Defence Force personnel stationed outside the jurisdiction to participate in provincial elections.[76] The Philippines intends to introduce internet voting for overseas absentee voting for the 2025 national elections and, depending on uptake, may consider replacing the existing mail-in and in-person casting of ballots for overseas voters.[77] Elsewhere remote internet voting is used at small scale by local government authorities for councillor elections and plebiscites.[78]

70. The steps involved in casting a vote via iVote were broadly consistent with those used by remote internet voting systems generally.

[68] ERR News, Estonia sets new e-voting record at Riigikogu 2023 elections, Tallinn, 5 March 2023.
[69] Dylan Difford, How do elections work in Estonia? *Electoral Reform Society*, 25 February 2023.
[70] Pirit Ehin, 'Internet voting in Estonia 2005-2019: Evidence from eleven elections', *Government Information Quarterly,* 39(4), Amsterdam, 2022, 4. This study concluded that Internet voting does not increase electoral participation in countries where access to voting is already very good and where early voting is widely available; The number of registered electors in Estonia in February 2023 was 966,129 – see International Federation for Electoral Systems, 'Election Guide; Republic of Estonia', Arlington: United States, 2023
[71] Helen Wright, New turnout record set during Estonia's Riigikogu elections, *ERR News*, Tallinn, 6 March 2023.
[72] Swiss Post, Votes now possible with Swiss Post's e-voting system (Media Release), 3 March 2023.
[73] Institute for Democracy and Electoral Assistance, 'Switzerland', Strömsborg: Sweden, 2023: Switzerland had 5,457,940 registered electors in 2019
[74] Swiss Broadcasting Corporation, Voters and cantons enthusiastic about 'successful' e-voting trial, 19 June 2023.
[75] Federal Chancellery, E-Voting, (Webpage)
[76] Elections Nova Scotia, 'Elections Nova Scotia Selects an Internet Voting Vender' (Media Release), Halifax, 14 February 2023
[77] Ferdinand Patinio, Online voting eyed for overseas voters in 2025 polls: Comelec, Philippine News Agency, Manila, 24 May 2023
[78] Association of Municipalities Ontario, 2022 Municipal Election – Context, 26 September 2022; Waqas Chughtai, Online voting is growing in Canada, raising calls for clear standards, *CBC* 21 October 2022.

Table 6: Steps involved in casting a vote using a remote internet voting system

Step	Description
Apply	The eligible elector registers for the service online or via the telephone. Electors are marked off the authorised roll and are provided with a unique registration number. The elector is usually asked to choose a PIN or password and required to declare their eligibility for the service. For security purposes some services may ask for identification documents to authenticate a person's identity.
Cast vote	The elector uses their unique registration number and PIN/password to login to the system and cast their vote. Electors are usually provided the opportunity to confirm their preferences before submitting their vote (cast as intended verification), as well as a receipt confirming their vote was cast.
Store	Vote preferences are encrypted on the voter's device before they are transmitted via the internet and stored in a data storage server.
Verify	Some systems have a mandatory or optional system to verify a vote. This is where an elector verifies their vote was recorded as cast (that is, the system correctly recorded their preferences) using a receipt or a QR code provided when the vote was submitted.
Include in count	Voter information is separated from the vote preferences. Some systems also provide a mixnet process, where de-identified votes are mixed so that they cannot be re-identified to a person. The de-identified and mixed encrypted votes, are then decrypted and the vote data is uploaded to the counting system. Counting systems may also receive vote data from paper ballots, via data-entry or ballot scanning.

Accessibility

71. A voter is able to cast a vote from anywhere in the world with an internet connection.[79] The vote is lodged immediately and does not rely on physical transmission to a counting centre. The use of a personal device (such as phone, tablet or personal computer) to conduct transactions is familiar to many users. When voting choices are made by the voter, a remote internet voting system can "play back" or confirm those choices to the voter without another person's involvement. With correct system configuration, it can also "verify" to the elector that their vote is lodged in the form they selected.

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[79] Chantal Enguehard, 'Transparency in Electronic Voting: the Great Challenge', *IPSA International Political Science Association RC 10 on Electronic Democracy,* Conference on "E-democracy – State of the art and future agenda", Stellenbosch: South Africa, 2008, 5.

72. In submissions to this review, advocacy groups stated that, for electors who are blind or have low vision or electors with disability, remote internet voting is the voting option that best enables them to cast an independent and secret vote.[80] Most remote internet voting systems can be configured with text-to-speech capability, or increased font size, lessening the need for an elector who is blind or low vision to rely on another person for assistance. Remote internet voting can also assist electors with low English language proficiency as voting information can be translated in multiple languages.

73. In submissions, both blind and low vision, as well as physical disability advocacy groups strongly support reintroducing internet voting to New South Wales to support an independent and secret vote.[81] As previously mentioned, Vision Australia's submission described the platform as being met "with universal acceptance and support", referring to it as "the 'gold standard' in accessible voting for people who are blind or have low vision".[82] For Blind Citizens Australia, remote internet voting in the form of iVote was "best practice".[83] The NSW Ageing and Disability Commission asserts that remote internet voting is the best channel for an elector who is blind or have low vision to cast a secret and independent vote.[84]

74. For electors whose disability or vision impairment makes attending a voting centre difficult, voting remotely can also remove physical accessibility hurdles when casting a vote in person.[85] Some electors may also find voting on their own personal device in a familiar environment such as their own home preferable. The Council for Intellectual Disability's submission suggested that remote internet voting at home "could provide an opportunity to vote with appropriate support, in a relaxed environment away from the hustle of election day".[86]

75. Remote internet voting may also support electors who are challenged by their distance from voting centres.[87] Until 2021, iVote was an option for electors in remote parts of New South Wales or who were temporarily interstate or overseas. Remote internet voting can also benefit electors who find themselves unable to attend a voting centre in person due to illness, or unexpected events such as natural disasters.[88] Many of these electors currently have the option to cast a postal vote, although the future levels for postal services to remote areas are being reviewed.[89]

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[80] Submission 1, Vision Australia, 12; Submission 1, Vision Australia, 8. Directorate-General for Justice and Consumers, *Study on the Benefits and Drawbacks of Remote Voting*, European Union, (Final Report), 2018 96; David Kerslake 'Out with the old, in the with new: the case for internet voting in Australia' *The Parliamentarian*, 3, London, 2015, 191.

[81] Submission 1, Vision Australia, 7; Submission 10, Blind Citizens Australia, 8; Submission 12, Guide Dogs Australia, 10; Submission 15, Ms Susan Thompson, 7; Submission 2, Physical Disability Council, 1; Submission 13, NSW Ageing and Disability Commissioner, 1; Submission 17, Council for Intellectual Disability, p7-8.

[82] Submission 1, Vision Australia, 7

[83] Submission 10, Blind Citizens Australia, 8.

[84] Submission 13, NSW Ageing and Disability Commissioner, 1.

[85] Directorate-General for Justice and Consumers, *Study on the Benefits and Drawbacks of Remote Voting*, European Union, (Final Report), 2018, 96.

[86] Submission 17, Council for Intellectual Disability, 6.

[87] Directorate-General for Justice and Consumers, *Study on the Benefits and Drawbacks of Remote Voting*, European Union, (Final Report), 2018, 96.

[88] Joint Standing Committee on Electoral Matters, Parliament of Australia, *Inquiry on the future conduct of elections operating during times of emergency situations* (Final Report), June 2021, 2-3, 28.

[89] Department of Infrastructure, Transport, Regional Development, Communications and the Arts, Postal Service Modernisation, Discussion Paper, Canberra, March 2023

76. Similarly, eligible electors living or travelling overseas during the election period face declining international post services.[90] The Australian Department of Foreign Affairs and Trade has indicated that in-person voting in consulates and embassies is not likely to be offered at the state level at future elections due to resourcing and logistical constraints.[91] However, the Australian Electoral Commission's recent decision to provide in-person overseas voting at most Australian diplomatic missions for the Voice to Parliament 2023 referendum,[92] may signal future flexibility for election events. While declining postal services can make the delivery and return of a postal vote by the legislated cut-off dates difficult, [93] the recent extension to the timeframe (increased to 13 days from four days) after election day for postal ballots at the 2023 State general election has improved the return rate of postal ballots.

77. The Commonwealth Government's current review of postal service standards will provide further insight into the future viability of postal services as a means of supporting a voting channel for voters outside New South Wales or located remotely.[94]

Budget commitment

78. At any size, a remote internet voting system is a complex undertaking requiring significant budget commitment. The total cost (including both external and internal costs for development, staffing and system support) for deploying iVote for the 2019 NSW state election was $8.1 million. This was comprised of $5.46 million in capital expense and $2.53 million in operating expenses.[95] Establishing a new internet voting system would require an initial upfront capital investment for the implementation of the system, along with ongoing upgrade and maintenance costs, which are relatively fixed regardless of elector cohort size.[96] Nonetheless, the cost of the system would rise if elector cohorts size expanded to meet additional technical and security requirements arising from increased risk.

79. Information technology costs have risen sharply in the past two years due, in part, to supply chain and labour disruptions from the COVID-19 pandemic. Producer Price Index (PPI) data, which tracks prices paid to the producers of goods and services, reveals a steep year-on-year price rise for host computers and servers – a 21 per cent increase over pricing levels in June 2021.[97]

80. Internet voting can become more cost-effective with large-scale implementation[98] when compared with other voting channels, such as attendance and postal voting where costs increase proportionate to use. However, it would take several election cycles for remote internet voting to achieve cost savings as there is significant new procurement, training, public awareness campaigning and security involved with the establishment of such a system.[99] Over time "higher volumes of elections and referenda wouldn't have as high an incremental cost over and above the sunk cost of maintaining the online infrastructure".[100]

81. Although there are potential benefits from cost efficiencies when remote internet voting is offered at scale, these benefits must be weighed against the increased risks associated with larger-scale operations.

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[90] Elections ACT, A limited electronic voting option for electors who are overseas: ACT Electoral Commission report to the Legislative Assembly, 11 September 2019, 3.

[91] Submission 9, Australian Department of Foreign Affairs and Trade, 1.

[92] Australian Electoral Commission, Overseas voting services to increase for the 2023 referendum,, Canberra, 22 May 2023

[93] See Narelle Miragliotta, Remote Voting Under COVID-19, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, (Working Paper 72), September 2020, 8-9.

[94] Department of Infrastructure, Transport, Regional Development, Communications and the Arts, Postal Services Modernisation

[95] NSW Electoral Commission, Report on the conduct of the 2019 NSW State election, Sydney, 2019, 38, 39

[96] See Narelle Miragliotta, Remote Voting Under COVID-19, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, (Working Paper 72), September 2020, 15.

[97] John Moore, Technology costs rise as inflation hits hardware, services, TechTarget, Newton: United States, 21 July 2022

[98] Robert Krimmer et al 'New methodology for calculating cost-efficiency of different ways of voting: is internet voting cheaper?' 41(1) Public Money & Management 17, 2021, 22; Robert Krimmer et al, 'How Much Does an e-Vote Cost? Cost Comparison per Vote in Multichannel Elections in Estonia', International Joint Conference on Electronic Voting, 2018, 1.

[99] Meredith Applegate et al, Considerations on Internet Voting: An Overview for Electoral Decision-Makers, International Foundation for Electoral Systems, Arlington: United States, April 2020, 1

[100] The Institution of Engineering and Technology, Internet voting in the UK, London, 2020, 8

Transparency

82. Trust in election systems is crucial for ensuring electors and parties accept the outcome as legitimate. Systems with advanced information technology present risks of a "larger potential attack surface" from within a society and also are less understandable to lay electors.[101] A landmark German legal case in 2009 established the requirement that voting systems be understood by the wider community. The Federal Constitutional Court ruled that the use of electronic voting machines at the 2005 elections did not meet the constitutional principle of transparency of elections, which requires that the particular voting machines be safeguarded against potential manipulation or error through procedures understandable to the average citizen without any special knowledge of the subject.[102] That ruling has arguably had a chilling effect on the use of TAV in Germany, with no new large-scale initiatives since that time. Postal ballot rates have been rising, with the 2021 Bundestag elections reaching 47.3 per cent,[103] with an overall participation rate of 76.6 per cent.[104]

83. As both voting and counting for remote internet voting are conducted via electronic devices and servers over data networks (including the internet), there is less information for citizens, auditors and scrutineers to readily observe. [105] For example, like postal voting, there is no scope for election officials to observe if an elector has been subject to coercion. [106] Moreover, electronic systems – when compared to paper systems, could be affected quickly and at scale through error or interference: "A remote programmer changing a line of code could in-principle change millions of electronic ballots in milliseconds, whereas changing millions of paper ballots requires physical access and one-by-one handling."[107] The mitigating steps to manage these risks for TAV are not required for paper based voting.

84. An election management body must demonstrate integrity of TAV systems in unique ways. During iVote's operation in New South Wales, for example, party/candidate scrutineers and independent auditors were invited to review processes and observe steps in the electronic voting process, including the collation of votes and their inclusion in the count. Independent monitors were also appointed to conduct verifiability checks such as validating mathematical proofs from the mixing of the votes in the ballot box (mixnet) and from the decryption of votes, as well as cross-checking the credential, voting and assurance systems. The independent monitors performed these checks in the presence of the auditor. However, it must be acknowledged that these processes did not afford scrutineers the same "hands on" experience as dealing with paper ballots.

Verifiability

85. While paper-based voting channels allow ballot papers to be physically tracked throughout the scrutiny and count, remote internet voting involves no physical element. Best practice internet voting systems therefore aim to address the lack of physical, verifiable paper ballots through an additional standard of end-to-end verifiability.[108]

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[101] Samuel Agesi *et al* "What Will Make Me Trust or Not Trust Will Depend Upon How Secure the Technology Is": Factors Influencing Trust Perceptions of the Use of Election Technologies, proceedings of Seventh International Joint Conference on Electronic Voting, E-Vote-ID 2022, 4-7 October 2022, 1
[102] Bundesverfassungsgericht, Use of voting computers in 2005 Bundestag election unconstitutional, Press release 19/2009, 3 March 2009
[103] Jasmine Fitzpatrick and Paula Jöst, The High Mass of Democracy – Why Germany Remains Aloof to the Idea of Electronic Voting, *Frontiers in Political Science*, Volume 4, Lausanne, 13 July 2022
[104] Statistisches Bundesamt, 2021 Bundestag Election: greater turnout of young voters, Press release 26/2022, 26 January 2022
[105] Directorate-General for Justice and Consumers, *Study on the Benefits and Drawbacks of Remote Voting*, European Union, (Final Report), 2018, 101-2.
[106] Chantal Enguehard, 'Transparency in Electronic Voting: the Great Challenge', *IPSA International Political Science Association RC 10 on Electronic Democracy,* Conference on "E-democracy – State of the art and future agenda" Stellenbosch, South Africa, 2008, 8.
[107] Sunoo Park et al, 'Going from bad to worse: from Internet voting to blockchain voting' Journal of Cybersecurity, 7, (1), Oxford Academic, Kettering: UK, 2021, 3
[108] Josh Benaloh *et al*, '*End to end verifiability'*, 2 February 2014, 2,7.

86. Verifiability enables individual electors to directly check elements of the voting process, such as the recording of their preferences, without relying on election software, hardware, election officials, procedures, or observers.[109] End-to-end verification involves three stages:[110]

Table 7: Stages of end-to-end verification

Verification type	Stages	Scenarios
Individual verifiability	**Stage 1: Cast as intended:** the vote preferences correctly reflect the elector's choice	An elector has the option of reviewing and confirming vote preferences before submitting it.
	Stage 2: Recorded as cast: the system has correctly saved the elector's vote preferences in the virtual ballot box	Using iVote, an elector had the option to verify their vote using a QR code on their confirmation receipt through a Verification app, within an hour of voting. An elector's encrypted vote is published on a web bulletin board.
Universal verifiability	**Stage 3: Counted as recorded** (also known as tallied as cast): the elector's saved vote preferences are counted correctly	Mixnet process (used in iVote) provides cryptographic proof that the votes were not changed in the shuffling process. Ideally auditors or selected cryptographic experts (rather than the public) will evaluate these proofs to ensure that the result has been established correctly.[111]

87. End-to-end verifiability has not yet been achieved for internet voting.[112] Switzerland has developed a definition of "complete verifiability", which describes a system that makes it "possible to detect any manipulation that leads to a falsification of the result while preserving voting secrecy (complete verifiability)".[113]

Technical and security risks increase as the cohort size increases

88. The risk of system issues with remote internet voting increases with the number of electors who use the system, for example:

- **Technical failure: T**his occurred during the 2021 NSW Local Government elections, discussed in detail at Appendix 1, where larger-than-anticipated usage caused a delay in the sending out of credentials to enable access to the iVote system. The practical effect of this was that a significant number of electors were prevented from accessing the iVote system to cast their vote.

- **Larger target for malicious outsider attacks**: The incentive for malicious third parties to intervene in elections also increases as the cohort size increases, given the greater effect an attack would have on the election outcome. With remote internet voting, this is further exacerbated by the fact that many elements of the voting process, including an elector's personal voting device, use the internet to transmit data and data storage servers are outside the control of the election management body. This increases the vulnerability of the system to cyber attacks, such as denial of service attacks and disinformation (including false links on social media).[114]

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[109]Josh Benaloh *et al*, '*End to end verifiability'*, 2 February 2014, 1.
[110] Josh Benaloh *et al*, '*End to end verifiability'*, 2 February 2014, 2-3.
[111] Sandra Guasch Castello, *Individual Verifiability in Electronic Voting*, Universitat Polit`ecnica de Catalunya, Barcelona, 2016, 18-20.
[112] National Academies of Science, Engineering and Medicine, *Securing the vote: Protecting American Democracy*, Washington, 2018, 9, 106
[113] *Federal Chancellery Ordinance on Electronic Voting* (Switzerland), art 5.1.
[114] Sunoo Park et al, 'Going from bad to worse: from Internet voting to blockchain voting' Journal of Cybersecurity, 7, (1), Oxford Academic, Kettering: UK, 2021, 5.

89. All voting channels are potentially vulnerable to malicious interference.[115] For example, for postal vote ballots, an adversary could theoretically gain physical access to a mailed ballot, change the contents, and reinsert it into the mail,[116] as there is a break in the chain of ballot custody by election officials.[117] The resources and logistics required to intercept a number of postal ballots mean that any such interference is unlikely to materially affect an election outcome undetected. In contrast, a remote internet voting system could hypothetically allow an attack on a much larger number of votes with less effort, given an electronic attack can be conducted from anywhere in world.[118] Furthermore, when information is transferred to and stored in central servers, accessing and manipulating a larger number of votes may be possible.[119]

90. A risk mitigation strategy to address these threats is capping the number of electors who can vote using a specific voting channel. This approach is taken in Switzerland, with the proportion of electors able to vote using internet voting capped at 10 per cent nationally and 30 per cent in any canton (regional) electorate.[120]

91. While there was limited discussion of this issue in submissions received, Vision Australia noted that they did not support a limitation on the number of electors using a particular system:

> "We do not support the use of legislated caps or proportions of electors who can use a particular system because they are likely to become out-of-date quickly as systems evolve, but we do believe that it is essential for voting systems to be adequately resourced by government so that they can continue to be developed and maintained."[121]

92. In the United States, security experts recently have identified weaknesses in remote internet voting platforms (such as OmniBallot email voting[122] and Virginia's mobile app)[123] and cautioned against the widespread introduction of internet voting.[124] In 2020, 70 members of the American Association for the Advancement of Science wrote a letter to the country's Governors and Secretaries of State warning that internet voting is not a secure system for use in elections now or the foreseeable future.[125] The letter referred to persistent vulnerabilities such as "malware and denial of service attacks, voter authentication, ballot protection and anonymisation" and how disputed ballots are handled.[126] It also noted that blockchain systems do not address security concerns of internet voting and can actually add further vulnerability points of attack.[127] In 2020, the United States Department of Homeland Security also criticised internet voting (including both email or web portal voting) due to security concerns and risks to the integrity of elections.[128] A recent paper on internet voting in the UK by industry and government experts concluded that "technology is not now – or in the near future – ready to address the range of cybersecurity threats that could undermine an internet voting system."[129]

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[115] Sunoo Park et al, 'Going from bad to worse: from Internet voting to blockchain voting' *Journal of Cybersecurity*, 7, (1), Oxford Academic, Kettering: UK, 2021, 5.

[116] Sunoo Park et al, 'Going from bad to worse: from Internet voting to blockchain voting' *Journal of Cybersecurity*, 7, (1), Oxford Academic, Kettering: UK, 2021, 6.

[117] Narelle Miragliotta, *Remote Voting Under COVID-19*, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, (Working Paper 72), September 2020, 9.

[118] Sunoo Park et al, 'Going from bad to worse: from Internet voting to blockchain voting' *Journal of Cybersecurity*, 7, (1), Oxford Academic, Kettering: UK, 2021, 1; Directorate-General for Justice and Consumers, *Study on the Benefits and Drawbacks of Remote Voting*, European Union, (Final Report), 2018, 102.

[119] The Carter Centre, Summary of Proceedings: Automated Voting and Election Observation, Atlanta: United States, 17-18 March 2005, 3.

[120] Swiss Federal Chancellery, 'E-voting: New legislation comes into force' (Media Release), 25 May 2022.

[121] Submission 1, Vision Australia, 12.

[122] Nicole Casal Moore, New remote voting risks and solutions identified, *Phys Org*, 10 June 2020.

[123] Michael Specter *et al*, 'The Ballot is Busted Before The Blockchain: A Security Analysis of Voatz, the First Internet Voting Application Used in U.S Federal Elections', *Proceedings of the 29th USENIX Conference on Security Symposium* 1535, 2020.

[124] Michael Specter et al, 'The Ballot is Busted Before The Blockchain: A Security Analysis of Voatz, the First Internet Voting Application Used in U.S Federal Elections', *Proceedings of the 29th USENIX Conference on Security Symposium* 1548, 2020.

[125] American Association for the Advancement of Science, *Letter to Governors and Secretaries of State on the insecurity of online voting*, 9 April 2020.

[126] American Association for the Advancement of Science, *Letter to Governors and Secretaries of State on the insecurity of online voting*, 9 April 2020.

[127] American Association for the Advancement of Science, *Letter to Governors and Secretaries of State on the insecurity of online voting*, 9 April 2020.

[128] Kim Zetter, US government plans to urge states to resist 'high-risk' internet voting, *The Guardian*, 9 May 2020.

[129] The Institution of Engineering and Technology, Internet voting in the UK, London, 2020, 5

Technical failure and interference

93.   Although all voting channels can experience system performance issues, technical failure of internet voting draws a high level of public interest. For example, performance issues with iVote at the 2019 NSW State election are estimated to have impacted between 35,000 and 45,000 people,[130] and generated significant media attention.[131] Similarly, at the 2021 NSW Local Government elections, a delay in the system sending out elector credentials meant many electors did not receive the necessary information in time to vote online before 6pm on election day.[132]

94.   Such failures can have both real impacts (disenfranchising electors and invalidating election results) and reputational impacts (raising questions about the effectiveness of an electoral management body and election integrity). At the 2021 NSW Local Government elections, the number of eligible electors who were unable to use iVote to cast a vote online before voting closed resulted in three local government elections being voided by the NSW Supreme Court. Beyond the validity of an election, it can also delay election results. This occurred in Ontario's 2018 municipal elections, where technical issues with online voting platforms meant that more than 50 municipalities needed to extend their voting hours.[133]

95.   Similar concerns apply to malicious interference in a voting system, such as through cyber attack. Although the iVote system did not experience such interference, malicious actors (including "state" actors) are using the digitisation of election systems, election administration and election campaigns to interfere in foreign elections and referendums including denial of service (DoS) attacks and phishing attacks.[134]

Misinformation and disinformation

96.   Electoral management bodies worldwide face greater levels of misinformation and disinformation around elections with the rise of social media, greater technical complexity of digital systems and an increasing threat of malicious interference.[135] Disinformation that coincides with technical failure of election infrastructure – including from cyber attack – can amplify disruptions of electoral processes and public distrust of election results.[136]

97.   The United States government's Cybersecurity and Infrastructure Security agency (CISA) asserts that foreign state and non-state actors are leveraging information activities as part of broad campaigns to sow discord, manipulate public discourse and discredit the electoral system to undermine pillars of democracy.

98.   In CISA's view, this interference aims to:

   ● dissuade electors from participating by suggesting their votes do not matter or through content that misleads them about the election process;

   ● impact candidate selection through, among other activities, pushing fabricated and favourable content about preferred candidates, and fabricated or disparaging content about disfavoured candidates; and

   ● damage the public perception of a fair and free election by pushing false or misleading content regarding election processes and results.[137]

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[130] NSW Electoral Commission, Report on the conduct of the 2019 NSW State Election, Sydney, 2019, 78.
[131] Ry Crozier, NSW iVote registration goes down on election eve, *IT News*, 22 March 2019; Josephine Tovey, NSW election: technical problems down online voting and disrupt pre-poll booths, *The Guardian*, 13 March 2019.
[132] NSW Electoral Commission, Report on the conduct of the 2021 Local Government Elections – Part One, Sydney, 2019, 8, 13; NSW Electoral Commission apologises after iVote system inaccessible on election day, *IT News*, 5 December 2021.
[133] Waqas Chughtai, Online voting is growing in Canada, raising calls for clear standards, CBC*,* 21 October 2022.
[134] Sarah O'Connor *et al*, 'Cyber-enabled foreign interference in elections and referendums' Report 41/2020, Australian Strategic Policy Institute, Canberra, October 2022, 3
[135] Paul Miller, 'If it ain't broke, don't fix it: Australia should stay away from electronic voting' *The Conversation*, 23 August 2018.
[136] Cybersecurity and Infrastructure Security Agency, Election Infrastructure Cyber Risk Assessment, Department of Homeland Security, Washington, 28 July 2020.
[137] Cybersecurity and Infrastructure Security Agency, Election Infrastructure Cyber Risk Assessment, Department of Homeland Security, Washington, 28 July 2020.

99. Globally, TAV usage has been a contested factor in elections – and subject to misinformation and disinformation – in recent years. Elections in Brazil (2022), Estonia (2023) and the United States (2016) have been the subject of criticism by candidates and commentators – leading in some cases to an erosion of trust in the electorate. As an example, Brazil's universal voting machine system has been in place for 27 years. Ahead of the 2022 presidential election, the US embassy in Brasilia stated that Brazil's electronic voting machines were "a model for the world",[138] while some academic commentators dispute the system's reliability and the integrity of its governance.[139] The unsuccessful presidential candidate in the 2022 election faced trial after the election for criticism of the electronic voting system where, as President, he told foreign diplomats that the machines were prone to being hacked and open to large-scale fraud.[140] In June 2023, Brazil's [Electoral Court] ruled that the former President, Jair Bolsonaro, had violated Brazil's election laws by making the claims and ruled him ineligible to run for the office of President until 2030.[141] Between 2007 and 2018, the percentage of Brazilians who saw elections as honest halved following a sustained campaign of disinformation and conspiracy theories about the electronic voting machine system.[142]

100. In the recent 2023 Estonian elections, the unsuccessful opposition party questioned the reliability of the technology and results on the election night.[143] Although complaints filed by the opposition parties were ultimately dismissed by Estonia's Supreme Court, it delayed the declaration of the election. The Court acknowledged the need for clearer legislation to address the mistrust caused by difficulties understanding the technical side of the e-voting system.[144] Given that internet voting is technically complex with less visual transparency of vote counting than paper-based processes, successfully countering such an assertion can be difficult. Perception and trust of the voting public in the *bona fides* of an election management body are crucial. If enough people believe that the results have been subject to manipulation that an election management body was either unaware of or is hiding, even if this belief is misplaced, that lack of trust can undermine the legitimacy of the outcome.

101. Against this international background, the Australian Government has established a multi-agency body – the Election Integrity Assurance Taskforce (EIAT) – to protect the integrity of Australia's electoral processes and maintain trust in Australia's democratic processes. The EIAT has identified a range of risks around elections:

> "Disinformation and misinformation are perpetrated by a range of different actors and groups for various purposes. Online media platforms have identified numerous instances of groups using disinformation and misinformation as a vehicle to interfere with domestic and foreign politics. Foreign governments have tried to use disinformation to influence elections by targeting particular groups of voters. Public relations firms and social media marketing companies have also been hired to use inauthentic behaviour to promote a political agenda without disclosing a connection to candidates or parties."[145]

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[138] Philip Friedrich, Brazil's Democracy Confronts the Looming Threat of Election Denial, Freedom House, Washington, 22 September 2022.
[139] Augusto Zimmermann, 'How They Count Votes in Brazil', *Quadrant*, Sydney, 10 January 2023.
[140] Jack Nicas, 'Bolsonaro to Face Trial Over Electoral Fraud Claims', *The New York Times*, New York, 6 June 2023..
[141] Jack Nicas, 'Brazil Bars Bolsonaro From Office for Election-Fraud Claims', *The New York Times*, New York, 30 June 2023
[142] 'Brazil's voters worry about the integrity of their elections: The electronic voting system is very fast and quite safe', *The Economist*, London, 5 October 2018.
[143] Eesti Rahvusringhääling (Estonian National Broadcasting Company), E-voting not serious, Tallinn, 6 March 2023.
[144] Eesti Rahvusringhääling (Estonian National Broadcasting Company), Supreme Court dismisses all election complaints, Tallinn, 31 March 2023.
[145] Electoral Integrity Assurance Taskforce, Disinformation and Misinformation, Factsheet, Australian Government, accessed 11 July 2023

102. Online disinformation introduces a risk around internet voting, as an elector voting online is potentially more exposed to misinformation and coercion at the time they are casting their vote.[146] In contrast, electors in voting centres are given a space that is free from canvassing (with the handing out of how-to-vote material restricted to more than six metres from the entrances) and provided with booths within which they can complete their ballot papers in secret.[147] Election officials are also present to provide impartial information about the requirements of voting and can observe the voting centre environment to ensure it is independent and secret, limiting the risk of undue influence on those casting their vote.

Marginalisation of electors who are not digitally connected or have low digital literacy

103. Despite its accessibility benefits, some electors may find remote internet voting confusing or intimidating to use. Older electors who develop vision-related problems with age may currently not be as familiar with certain technology. In recognition of this, Vision Australia recommends a multi-channel approach, to "accommodate the diversity of the blind and low vision community, including those people who are not comfortable interacting with an online platform and who will find it more convenient to use a human-assisted service".[148]

104. Remote internet voting, unlike attendance and postal voting, may also not be accessible for electors who do not have access to the technology necessary to use the system, known as "digital divide".[149] The most recent Australian Digital Inclusion Index found that twenty-eight per cent of Australians are digitally excluded, particularly in cohorts that are already at risk of disenfranchisement such as those with disability, not employed, low income, older voters and/or living in regional New South Wales.[150] The Council for Intellectual Disability's submission supported this finding, noting that many people with intellectual disability do not have access to internet at home or smart devices.[151]

Kiosks

105. Kiosks (also known as electronic voting booths or voting machines) allow an elector to cast their vote via a computer terminal located within a voting centre. The setup usually includes a digital interface device such as a touchscreen connected to a computer server via a local network and is not connected to the internet or other over-the-air network. Voting information typically is stored on dual hard drives (master and back-up) which can be securely stored and transported to secure locations to download data and compile results. Although they can be configured to assist voters who are blind and have low vision and reduce ballot paper informality, they do not increase accessibility for voters that have difficulty attending a voting centre due to mobility issues. Some kiosks can be equipped with printers that allow sighted voters to confirm their selections on an independent paper record before recording their votes into computer memory, creating a verifiable paper audit trail. This paper record can be preserved and made available in the event of an audit or recount.[152]

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[146] Chris Culnane, Submission to the Victorian Electoral Matters Committee Inquiry into Electronic Voting, 2016, 2.

[147] NSW Electoral Commission, Regulation of electoral material and election conduct (webpage). .

[148] Submission 1, Vision Australia, 5.

[149] Directorate-General for Justice and Consumers, *Study on the Benefits and Drawbacks of Remote Voting*, European Union, (Final Report), 2018, 101.

[150] Australian Digital Inclusion Index, Understanding digital inclusion (webpage)

[151] Submission 17, Council for Intellectual Disability, 6.

[152] UNSW Institute for Cyber Security, IFCYBER Seminar, 'People's Trust in Technical Controls with Dr Vanessa Teague' (YouTube, 28 March 2022) 00:36:00-00:38:00; Verified Voting, 'Types of Voting Equipment', *Voting Equipment,* Washington.

Table 8: Steps involved in casting a vote using a kiosk

Step	Description
Apply	The eligible elector attends a voting centre and has their name marked off the electoral roll. This can be done manually (like current attendance voting practices) or electronically via the kiosk.
Cast vote	The elector then casts their vote using the online digital interface which displays the ballot paper on screen. These systems may also provide audio assistance (via headphones) and tactile input options for accessibility.
Verify	Some systems allow an elector to verify their vote was cast as intended (that is, the system correctly recorded their preferences) by providing an acknowledgement receipt, which can be used to check their vote once cast. The system may also allow the elector to use this same receipt to verify their vote was recorded as cast (correctly registered in the ballot box) after the election results are announced.
Store	Kiosk systems store vote preferences in a server located in the polling place. Information is not transmitted via public networks (including the internet). Some kiosks (such as those used in California) print physical paper ballot papers to be included in the ballot box, which provides another means for electors to verify their vote and supports auditing by election officials.
Include in count	Vote preferences stored in individual voting centres are uploaded (physically or electronically) into the counting system to be included in the count.

106. Kiosks have been implemented globally with mixed levels of success. The Australian Capital Territory (the ACT) is a long-term user of electronic voting terminals, known as the electronic voting and counting system (eVACS). In 2001, eVACS was the first voting system to be used for a parliamentary election in Australia.[153] Kiosk facilities are provided in ACT early voting centres, some of which also open on election day as ordinary polling places. In the 2020 elections, 192,892 people (more than 70 per cent of all electors) used touchscreen electronic voting kiosks, reporting a 98 per cent satisfaction rate.[154] The kiosk terminal for electors who are blind or have low vision is equipped with headphones that deliver recorded audio instructions to guide an elector through the ballot paper and a telephone style keypad, allowing an elector with vision impairment to vote independently.[155]

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[153] Elections ACT, Electronic voting and counting (EVACS), 6 October 2020.
[154] Elections ACT, Report on the Legislative Assembly Election 2020, April 2021, 2.
[155] Elections ACT, Report on the Legislative Assembly Election 2020, April 2021, 35.

107. Brazil introduced kiosks (referred to as electronic voting machines (EVMs) in 1996 to address accessibility issues due to illiteracy) and concerns around ballot box stuffing.[156] Since 2000, kiosks have been used in place of paper ballots across the entire country, with more than 577,000 kiosks at 460,000 polling stations, and a further 2,228 overseas. There is no early voting or postal voting.[157] Brazil has adopted biometric identification to identify and mark off electors.[158] In the recent 2022 Brazilian presidential elections – the result of run-off round between the final two candidates was announced within hours of the close of voting, with the winning candidate taking 50.9 per cent of the 118,552,353 valid votes.[159] Claims by the unsuccessful candidate of flaws with the electronic voting system were not sustained, however international election monitors noted that disinformation was having a harmful impact on public trust in Brazil:

> "The electronic ballot box in Brazil once again proved its reliability and speed in processing results, overcoming the challenge of handling the largest electoral register in Latin America, with more than 156 million voters. Its operation, which had been smooth in past decades, was unnecessarily mired in controversies that took time and energy away from the institutional framework and provoked friction between branches of government. Despite their unfounded nature, the accusations weakened the population's confidence in its institutions and electoral procedures, eroding important pillars of democratic coexistence."[160]

108. Kiosks are a common form of TAV in the United States, but the system is not without its critics. For example, claims of election fraud have increased mistrust in elections and electronic voting systems,[161] leading to a general decline in their use. At the 2016 US elections, about 22 per cent of registered voters lived in jurisdictions where direct recording electronic machines (kiosks) were the primary voting channel. By 2022, this had declined to around seven per cent of registered voters.[162] Similarly, in 2012, Ireland disposed of 7,500 voting machines valued at 54 million euros, as they could not be guaranteed to be safe from tampering.[163]

Transparency and security

109. Kiosks offer a more secure form of TAV compared with internet voting. Electors cast their vote in a supervised environment, which lessens the potential for coercion and increases transparency.[164] Votes cast using kiosks are recorded and stored on locally owned infrastructure and are not transmitted via public networks such as the internet. This reduces the vulnerability of the system to malicious external attacks.

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[156] AFP, Five things on Brazil's voting machines, *France 24*, 1 September 2022.

[157] Nigel Walker, Brazil: 2022 Presidential Election, House of Commons Library, London, 16 December 2022, 5.

[158] Wilson Center, A Conversation with Justice Gilmar Mendes: Building a Modern and Transparent Electoral System in Brazil, 7 November 2016, 7.

[159] Bloomberg, Brazil Election Live Results, New York, 31 October 2022

[160] Institute for Democracy and Electoral Assistance, International IDEA statement on the second round of the Brazilian presidential election 2022, Press Release, 31 October 2022.

[161] Nicholas Berlinski et al, 'The Effects of Unsubstantiated Claims of Voter Fraud on Confidence in Elections', 16(1) *Journal of Experimental Political Science*, Cambridge University Press, Cambridge, 2021, 34

[162] Verified Voting, 'The Verifier – Election Day Equipment – November 2022' (Website)

[163] Paul Melia and Luke Byrne, €54m voting machines scrapped for €9 each, *Independent.ie,* 29 June 2012.

[164] Chris Culnane, Submission to the Victorian Electoral Matters Committee Inquiry into Electronic Voting, 2016, 2; Narelle Miragliotta, *Remote Voting Under COVID-19*, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, (Working Paper 72), September 2020, 4.

110. As kiosk voting takes place in a voting centre, it benefits from some of the transparency elements of attendance voting. The process is overseen by non-partisan election officials and monitored by scrutineers, votes are stored on-site, and inside the venue is free of campaigning. However, voting by kiosk is still less transparent than paper-based voting because the vote information is entered, transmitted, stored and counted electronically.[165] Like remote internet voting, there generally is not a verifiable paper-based back-up system, requiring election management bodies to implement system and process features to support public trust – including public security tests, cryptographic hardware, source code publication, audits, and ceremonies for digital signing and sealing of systems.[166]

111. One way to increase transparency is to configure the system to print a verifiable ballot paper. This also allows risk-limiting audits to be conducted by allow ballot papers to be manually examined against electronic records. This approach is taken in California, where all kiosks used after 1 January 2006, must have an accessible voter-verified paper audit trail.[167] In contrast, the kiosks used in Brazil do not currently provide a printout of individual voters' preferences, leading some to criticise their lack of transparency.[168] In 2019, a bill was introduced into the National Congress of Brazil to require a paper printout of voters' preferences. This would have created a physical record to be checked at the time of voting, while also serving as a means of auditing – both measures intended to increase transparency in the current system.[169] The bill did not proceed. There is also the possibility, particularly for electoral contests involving many candidates and potential preferences, that an elector verifying a print-out of their preferences may not accurately recall how they were entered into the system and dispute that their vote was recorded correctly.

112. Kiosks can also be designed to be end-to-end verifiable, allowing an elector to confirm their vote was cast as intended, recorded as cast and counted as recorded. An example of such end-to-end verifiability is Victoria's V-vote system.

> **Victoria's electronic voting booths** [170]
>
> In 2006, the Victorian Electoral Commission piloted electronic voting booths for voters who are blind, partially sighted and motor impaired (six locations across Victorian) and in 2010 extended this to those electors who speak a language other than English and voters out of state or overseas (in 101 locations across Victoria, eight interstate and two locations in UK). In 2014, the Victorian State Election introduced v-Vote, which was also deployed at 24 early voting centres including six accessibility centres around Victoria and one centre in London, UK. The system involved a common computer tablet (Google Nexus 10) as the interface for capturing the vote. For voters who are blind a tactile latex "telephone keypad" was overlaid on the touchscreen, and headphones provided audio instructions. For sighted voters, it included a screen with the candidate list.

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[165] Chantal Enguehard, 'Transparency in Electronic Voting: the Great Challenge', *IPSA International Political Science Association RC 10 on Electronic Democracy,* Conference on "E-democracy – State of the art and future agenda", Stellenbosch, South Africa, 2008, 11.

[166] Tribunal Superior Electoral, Brazilian Electronic Voting Machine: 20 Years in Favor of Democracy, Brasilia, 2016

[167] California Elections Code, s 19250. This provision requires all voters voting on an electronic voting machine to review and verify their ballot choices on this printed paper record, prior to finalizing and casting their ballot. Once the ballot is cast, this paper record of the ballot is retained inside the voting machine as part of the election audit trail to verify the accuracy of the votes recorded. However, this benefit is reduced if the elector does not verify that the ballot paper reflects their intentions.

[168] Tiago Jokura, Brazil's electronic voting machine comes of age, *Pequisa, 306,* August 2021

[169] Tiago Jokura, Brazil's electronic voting machine comes of age *Pequisa, 306*, August 2021.

[170] Sourced from: Craig Burton et al, 'Verifiable Electronic Voting in Practice: the use of vVote in the Victorian State Election' *IEEE Security & Privacy*, 14(4), 2016, 64-73; Parliament of Victoria – Electoral Matters Committee, Inquiry into electronic voting, 2 May 2017; Victorian Electoral Commission, Enabling electors every day – Annual Report 2017-18, Victoria, 2018.

Once the voter was marked off the electoral roll, they received a Candidate List receipt which, when scanned at the kiosk, generated a randomised candidate list. After the elector had cast their vote, a Preferences Receipt was printed, which listed the voters' preferences without the candidate names. As electors cast their votes, information was transmitted to the Victorian Electoral Commission for subsequent decryption and printing on secure systems.

The system provided end-to-end verifiability. When the Candidate List and Preferences Receipt were scanned together, the voter could check whether their vote was cast as intended. The voter could then use the Preferences Receipt to verify their vote had been recorded as cast through a public Web Bulletin Board. The general public could also verify that votes had been counted as recorded as the cryptographic proofs (mixing and decrypting of the encrypted votes) could be publicly verifiable.

Although this system was end-to-end verifiable and there was in-principle support to provide it at future elections, the Victorian Government favoured a national approach and did not progress with electronic voting in 2018.

Efficiencies at large scale

113. Kiosk voting systems involve significant capital costs (upfront and ongoing) so offer greatest value if implemented at a large scale (to reduce costs of paper voting) and if used frequently. Committed costs include initial investment and ongoing maintenance and upgrades of kiosk hardware and software. There are also significant costs associated with technical and physical logistics of the system including delivery, installation, configuration and testing.

114. As an example, ageing voting equipment in the United States, principally kiosk voting machines, requires replacement by 2027 at a cost of US$580 million (A$870 million).

    "Like any computerised system, voting machines age into obsolescence. For electronic voting machines purchased since 2000, experts agree that the expected lifespan for the core components is between 10 and 20 years. For most systems, however, it is probably closer to 10 than 20."[171]

115. A common setup for kiosk voting is a touchscreen terminal connected to a server via a local wired network. Individual kiosks may have additional assistive features such as touch pads or headphones as required. The ACT has used kiosks designed in this way since 2001. In the ACT elections in 2020, 300 units were deployed in 15 early polling centres to serve approximately 202,000 attendance voters (with 192,892 using them).[172]

116. The United States National Conference of State Legislatures (NCSL) advises that the latest computerised machines cost between US$2,500 and US$3,000 each, and election management bodies should budget for one machine per 250-300 electors.[173] There are additional costs for software development, maintenance, storage and voting centre training.

117. Given the significant upfront and ongoing costs and the infrequency of elections, it may not be feasible for New South Wales to implement a large-scale solution as a standalone jurisdiction. Further economies of scale could be achieved through a national solution – for example through more cost-effective leasing agreements or infrastructure procurement. It would also allow for national consistency of technology standards, processes and elector experience.

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[171] Turquoise Baker and Lawrence Norden, Voting Machines at Risk in 2022, The Brennan Center, Washington, 1 March 2022
[172] Elections ACT, Report on the Legislative Assembly Election 2020, April 2021, 54.
[173] Sarah Breitenbach, Aging Voting Machines Cost Local, State Governments, Pew Trust, Philadelphia, 2 March 2016.

Limited trials

118. While the capital, operational and maintenance costs for introducing a standalone New South Wales system currently do not seem viable, limited scale trials could be considered. As part of its inquiry into the *Administration of the 2015 NSW State general election,* the NSW Joint Standing Committee on Electoral Matters previously recommended that the NSW Electoral Commission trial electronic voting via kiosks in voting centres.[174] In recommending this, the committee acknowledged that the integrity and security of any kiosk system must be ensured before their widespread deployment and that the best way to ensure this would be a limited trial in electorates where there is confidence in an expected result. The Committee also suggested consulting with electoral authorities from other jurisdictions regarding possible pooling and sharing of resources. This trial was not undertaken as the funding originally provided to the NSW Electoral Commission was subsequently withdrawn.

Designs for electors who are blind or have low vision, as well as electors with disability

119. Appropriately configured kiosks can assist voters who are blind and have low vision, including people with certain disabilities and low English language proficiency. In the ACT, kiosks in voting centres are configured to suit electors with vision impairment by providing audio instructions (through headphones) and a key pad to assist navigate the system and user interface.[175] In its submission, Blind Citizens Australia noted that kiosks (with assistive technologies electronic braille displays, audio and visual outputs, printers and scanners) have the potential to significantly improve the accessibility of voting for many people who are blind or have low vision, while providing a greater level of privacy and data security than was available under iVote.[176]

Informal votes

120. When compared with paper-based voting options, and like internet voting systems, kiosks can decrease accidental ballot paper informality if configured with prompts. The system used by the ACT provides a warning if the elector is about to cast an informal vote but still allows them to do so in the form of a blank vote if this action is confirmed by the electors. The 2020 ACT elections had a lower rate of informal electronic votes compared with paper voter ballots (0.85 per cent versus 3.21 per cent), resulting in a lower rate of informality overall as most of the population cast their votes via kiosks.[177] In past New South Wales elections, iVote ballots also had higher formality rates compared with paper ballots.

121. To achieve equivalence with paper-based voting, electors should have the option to cast an informal vote. In Brazil, where voting also is compulsory, an elector may lodge an informal vote via kiosks. At the 2022 Presidential run-off election, there were 1,769,678 blank and 3,930,765 spoiled ballots, resulting in an informality rate of 4.58 per cent.[178] An elector can lodge a spoiled ballot by typing in a non-existent candidate code. The voting machine also has an option to vote blank. Invalid and blank ballots are not tabulated.[179]

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[174] Joint Standing Committee on Electoral Matters, Parliament of New South Wales, *Administration of the 2015 NSW State Election* (Final Report), November 2016, 20.

[175] Elections ACT, Report on the Legislative Assembly Election 2020, April 2021, 35.

[176] Submission 10, Blind Citizens Australia, 8.

[177] Elections ACT, Report on the Legislative Assembly Election 2020, April 2021, 1, 74.

[178] Nigel Walker, Brazil: 2022 Presidential Election, House of Commons Library, London, 16 December 2022, 12.

[179] Amanda Audi, Why spoiled ballots are important in Brazil*, The Brazilian Report*, Itaguassu, 2 October 2022

Speed of results declaration

122. Results also can be finalised more quickly when votes are cast electronically through kiosks.[180] At the ACT 2020 election, preferences from all the electronic votes from the three-week early voting period were distributed and available on the ACT Electoral Commission website at 6.20pm, 20 minutes after the close of the polls. A second interim distribution of preferences, which included all electronic early votes and all electronic polling day votes, was published on the website at around 10pm.[181]

Out-of-area voting

123. Kiosks in voting centres could provide a viable centralised voting method for out-of-area electors. Out-of-district electors in New South Wales state elections currently are required to complete a paper-based absent declaration vote, which undergoes an additional scrutiny stage by an election official after voting closes and before it is admitted to the count. Providing a kiosk option for these electors could simplify the scrutiny and count process, allowing results to be finalised more quickly than paper-based processes.

124. Kiosks could also provide more effective absent voting options at local government elections where out-of-council area absent voting currently is not currently permitted due to the complexity with the number of ward contests, polls and referenda. This may also serve to reduce the incidence of electors failing to vote in these elections, noting that being outside the local council or ward (including interstate and overseas) was both the key reason for failing to vote and the primary reason for registering for iVote (89 per cent) at the 2021 Local Government elections.

Supply chain and logistics

125. Longer term, the public interest in exploring kiosks may continue in response to the ongoing decline of paper production services and products. The COVID-19 pandemic saw many traditionally paper-based processes and products converted to electronic format, reducing demand for paper. As such, the global paper industry is shifting its focus to other products to fill the gap left by the shrinking graphic paper market.[182] Beyond pandemic-related supply issues, the 2023 NSW State election also experienced operational challenges as a result of environmental protection measures that impacted the Australian forestry industry.[183] The Electoral Commission's order for paper suitable for printing ballot papers was only able to be met through importing supplies, after local pulp became unavailable.

Physical accessibility

126. Established non-attendance voting channels (such as postal voting and telephone voting) can support electors who find it difficult to access voting centres.[184] Kiosks at voting centres, however, do not address accessibility for all electors. Vision Australia's submission notes that while kiosks may have benefits for stakeholders who are blind or have low vision, their benefit may be limited by the additional accessibility hurdles that come with attending a voting centre, including navigating inaccessible venues.[185] Peak bodies for the blind and low vision community, as well as disability organisations suggest that kiosks should be provided as part of a suite of accessible voting options, to support electors who prefer to vote at voting centres, but require other adjustments or assistance (for example, to support voters with low English language proficiency).[186]

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[180] Elections ACT, Report on the Legislative Assembly Election 2020, April 2021, 35; Wilson Center, A Conversation with Justice Gilmar Mendes: Building a Modern and Transparent Electoral System in Brazil, 7 November 2016, 6.
[181] Elections ACT, Report on the Legislative Assembly Election 2020, April 2021, 56.
[182] Peter Berg and Oskar Lingqvist, 'Pulp, paper, and packaging in the next decade: Transformational changes', McKinsey & Company, 7 August 2019.
[183] *Environment East Gippsland Inc v VicForests (No 4)* [2022] VSC 668 (4 November 2022).
[184] Narelle Miragliotta, *Remote Voting Under COVID-19*, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, Working Paper 72, September 2020, 12.
[185] Submission 1, Vision Australia, 8.
[186] Submission 17, Council for Intellectual Disability, 4. Submission 10, Blind Citizens Australia, 8; Submission 1, Vision Australia, 8.

Telephone voting

127. Telephone voting systems can function in two different ways:

    1) electors casting their votes through speaking with two or more election officials (operator-assisted telephone voting); and

    2) electors casting their votes through an automated telephone-based system with a numeric keypad input (interactive voice response (IVR) or automated telephone voting).

128. Emerging technology may increase options available such as through voice automation and speech recognition technology, where the elector casts their vote with spoken instructions without the need for an operator or a telephone pad.

129. Operator-assisted telephone voting is widely used across Australian jurisdictions, particularly for electors who cannot vote in person without assistance. It is also arguably more accessible than internet or kiosk voting for electors who are less familiar with technology. Some electors, however, do not consider this to be a secret and independent alternative to attendance or internet voting. This concern arises mainly because all voters must identify themselves verbally to an election official to register to use the channel and then verbally convey their voting preferences to a second election official (who should not be able to identify them).

130. Furthermore, this option is costly as it requires significant human resources to take individual elector calls. Given its lack of scalability, telephone voting is likely to remain part of a multi-channel approach to TAV.

131. Telephone voting generally involves the following steps:[187]

Table 9: Steps involved in casting a vote using a telephone voting system

Step	Description
Apply	The eligible elector registers for the service online or via the telephone. Elector details are matched against the electoral roll and the elector is provided with a unique registration number. The elector is usually asked to choose a PIN.
	Eligibility for TAV is based on self-declaration, where an elector nominates the reason from a defined list.
Cast vote	The elector casts their vote over the telephone.
	For operator assisted, the elector speaks to a different election official to the one that registers them. The election official reads through the voting instructions and ballot paper information and marks the ballot paper based on instructions from voter. There may be a second election official who listens to the conversation to ensure the ballot paper is marked as instructed. Scrutineers may also be present to observe the process but cannot listen into the conversation.
	For automated telephone voting, using interactive voice response (IVR), the elector calls a number for an automated telephone system. Once the system confirms the registration number and PIN, it reads out the ballot paper. The elector can use the keypad to navigate/scroll through the ballot paper and to make their selection. The system reads out the voter's entry for them to confirm. An automated telephone voting system requires upfront pre-recording and programming of ballot information but no personnel to provide or receive voting information.

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[187] Narelle Miragliotta, *Remote Voting Under COVID-19*, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, Working Paper 72, September 2020, 12.

Step	Description
Store	For operator assisted voting, ballots marked by the election officials are usually sealed and stored in a secure ballot box.
	For automated telephone voting, information is usually collected by the telephone and stored in local networks and is not usually transmitted through the internet, similar to other channels in the iVote system.
Include in count	For operator assisted voting, paper ballots are sent to counting centres to be included in the count.
	For automated telephone voting, results are uploaded into the counting system. The IVR system used in 2019 NSW State election was integrated into the iVote system, so that votes were automatically added to the count, alongside other votes taken through iVote's alternative channels.

132. Telephone voting is used in most Australian jurisdictions, although not widely in other countries. The ACT first introduced automated telephone voting using an IVR system that was introduced for people who are blind, vision impaired and physically disabled electors in 2020.[188] Eligible electors register with Elections ACT via the telephone and applications closed two hours prior to attendance voting closure, with the voting system being entirely electronic.[189] The system is not connected to the internet and vote data is collected by the telephone and stored in a controlled and isolated environment.

133. The Australian Electoral Commission has provided operator assisted telephone voting to those electors who are blind or have low vision since 2013.[190] For the 2022 elections, this was extended to include electors who were isolating due to testing positive for COVID-19, which increased numbers significantly.[191] To mitigate the risks to the validity of the election from any performance issues arising from increased demand, the *Commonwealth Electoral (COVID Enfranchisement) Regulations 2022* were amended to provide the following savings provision:

> Any failure to provide a telephone voting method in accordance with this Part does not invalidate the result of a general election, Senate election or byelection.[192]

134. It is noted that the drafting of this provision focuses on a potential failure by the AEC to provide eligible electors with this voting channel, not on saving an election result in which votes have been lost or interfered with.

135. A similar savings provision was included for operator-assisted telephone voting at the NSW 2023 State general election:

> An election is taken not to have failed, and the results of an election are not invalid, merely because telephone voting permitted by this clause was not available during a period when telephone voting was permitted under this clause.[193]

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[188] Elections ACT, Report on the Legislative Assembly Election 2020, Canberra, April 2021, 14.
[189] Elections ACT, Report on the Legislative Assembly Election 2020, Canberra, April 2021, 14, 18.
[190] Damon Muller, 'Telephone voting for coronavirus affecter voters at the 2022 federal election' Research Paper, Parliamentary Library, Parliament of Australia, Canberra, 13 May 2022.
[191] Tom Rogers, Eligibility for telephone voting formally expanded, Australian Electoral Commission (Media release), Canberra, 20 May 2022.
[192] Commonwealth Electoral (COVID Enfranchisement) Regulations 2022, cl 7(4).
[193] *Electoral Act 2017*, Sch 7 Pt 4 s 14(6)

Accessibility

136. Operator assisted telephone voting remains feasible and necessary to support electors who are blind or have low vision. IVR could also be considered as an alternative or complementary channel to support accessibility to voting, noting the emergence of voice automation and speech recognition technology. The degree of risk and accessibility varies depending on the specific option made available.

Table 10: Summary of the different telephone voting systems

Option	Voting method	Integrity risk profile	Method of oversight
IVR	Allows an elector to cast a vote without any human interaction required at any stage in the process. Lower accessibility for electors who are not comfortable navigating via keypad.	Equivalent to broader iVote system	Voters can also call back to confirm their vote preferences were recorded as cast.
Operator-assisted (based on the iVote model)	Allows an elector to cast a vote with some human interaction, through speaking preferences to an election official who cannot identify them and who inputs them into iVote system.	Equivalent to broader iVote system, with the support from election official/ operator. The use of one network – as opposed to individual networks for each elector – also reduces the opportunities for malicious interference.	There are two calls – a registration call and a voting call. During the voting call a second election listens to the call and ensures the vote is recorded correctly.
Operator assisted (based on the 2023 NSW State election model	Allows an elector to cast vote with some human interaction, through speaking preferences to an election official who cannot identify them and who marks a physical ballot paper.	Lowest risk of three options, as information is transmitted directly between the elector and an election official via a telephone line and votes are physically marked on a paper ballot, so there is minimal or no risk that a vote could be intercepted or modified.	There are two calls – a registration call and a voting call. A second election official listens in on the voting call and confirms that the ballot paper is marked according to an elector's spoken preferences.

137. For operator assisted telephone voting, as information is transmitted directly between the elector and the election management body via a telephone line and votes are marked on a paper ballot by the operator, there is minimal or no risk that a vote that can be intercepted or modified, unlike electronic voting.[194]

138. Furthermore, scrutineers are allowed to observe (but not listen to) voting calls to check that the election official is following processes, including the second operator. Having a second operator listening and checking preferences are being captured correctly also reduces the chance of error.

[194] Narelle Miragliotta, *Remote Voting Under COVID-19*, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, Working Paper 72, September 2020, 13.

139. While the majority of submission authors indicated a preference for remote internet voting, Vision Australia's submission made clear that human-assisted telephone voting should be retained as part of a multi-channel approach.[195] The submission notes that operator-assisted telephone voting plays an important role for electors who prefer to speak with a human, rather than use a computer, to cast their vote. This may be of particular importance for electors who have developed vision-impairment later in life and may not be familiar with assistive technology:

> "It is important to emphasise, however, that we do not support the replacement of a human-assisted telephone service with technology assisted voting, including online voting. There will always be a need for practical voting options that accommodate the diversity of the blind and low vision community, including those people who are not comfortable interacting with an online platform and who will find it more convenient to use a human-assisted service, notwithstanding that they will sacrifice some secrecy and verifiability in so doing. Technology assisted voting must always be regarded as an essential but not the only voting option available to people who are blind or have low vision."[196]

140. In a Vision Australia survey of voters who are blind or have low vision, 86 per cent of respondents who used the operator-assisted telephone voting service at the 2022 Federal election reported a positive experience when casting their vote.[197]

Concerns around secrecy and privacy

141. The chief criticism directed at operator-assisted telephone voting by advocates for electors who are blind or have low vision is that it does not allow the casting of a secret and independent vote, as it requires an elector to speak their preferences to an election official. This was the case with the system used at the 2023 NSW State election and recent elections in other Australian jurisdictions. From the perspective of electoral management bodies, this system retains an elector's anonymity during voting, as the processes of elector registration and vote taking are split between two election officials, with independent oversight by a third official to ensure an elector's identity remains unknown to those who know the vote preferences.

142. The Vision Australia submission described their concerns with this system, citing the survey after the 2022 Federal Election. The submission noted that although 75 per cent of respondents thought this system would retain the secrecy of their vote, a threshold of 25 per cent of voters who did not was too high to accept.[198] They also described situations where it may be more difficult to keep an elector's vote secret:

> "One of the constraints on the uptake of human-assisted telephone voting is that it is not secret, in the sense that in order to use it a voter has to disclose their voting preferences to another person. While there are separate registration and voter recording processes that minimise the risk of identifying individual voters, it is nonetheless easy to appreciate situations in which there is a higher risk. For example, if a person who is blind or has low vision is acquainted with call centre staff, or if they live close to the location of the call centre, or if they live in a rural or regional area where there are only a few voters who are blind or have low vision, then they may well have concerns about the secrecy of using the service."[199]

143. Blind Citizens Australia (whose submission was endorsed by The Australian Communications Consumer Action Network, Guide Dogs Australia and People with Disability Australia) identified similar concerns around elector identity. In response to this, system developers could consider voice masking technology as it can provide anonymity. The Blind Citizens Australia submission also referred to the inability for electors to verify their vote has been recorded as they intended, unlike in TAV systems like iVote.[200]

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[195] Submission 1, Vision Australia, 4.
[196] Submission 1, Vision Australia, 5.
[197] Vision Australia, *Submission to the Joint Standing Committee on Electoral Matters Inquiry into the 2022 Federal Election*, 4.
[198] Submission 1, Vision Australia, 4.
[199] Submission 1, Vision Australia 4.
[200] Submission 10, Blind Citizens Australia, 8.

Telephone voting requires dedicated human resources

144. Operator-assisted telephone service involves at least three election officials for each vote – one to issue a unique identifier in an initial call, one to record the vote in a second call and the third person to listen into the voting call to verify that the election official has accurately recorded the elector's preferences.[201] The average call time for the 2023 NSW State general election was approximately five minutes. At the 2019 State general election, 30 operators were assigned to take 2,652 votes. In the 2021 Local Government elections, up to 100 operators were employed to take 9,164 votes.

145. Automated telephone voting can also involve significant costs, although these are generally incurred during the establishment of the system through procurement, programming and testing. The complexity of this programming is considerable, as it requires all ballot papers to be entered into the system and names recorded for each candidate with the correct pronunciation. Each ballot paper then needs to be logic and accuracy tested, all within a very short timeframe – in the nine calendar days between the ballot paper draw and start of early voting. This is a logistical challenge for New South Wales state general elections. For example, at the 2019 election there were 568 candidates across the 93 Legislative Assembly districts and 346 candidates, with 20 groups on the Legislative Council ballot paper.[202] At the 2021 Local Government elections, IVR was not offered to electors due to the high number of candidate numbers over multiple council areas and wards.

146. However, once an automated telephone system is programmed and tested, access to it can be provided to a large cohort, with minimal additional costs. The cost effectiveness of automated telephone voting is therefore greatest when large numbers of electors use this service. However, IVR has historically had a very low uptake by electors, used by 2,180 electors (of which 68 were electors who are blind or have low vision) as part of the iVote offering at the 2019 State general election.

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[201] Narelle Miragliotta, *Remote Voting Under COVID-19*, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, Working Paper 72, September 2020, 12.
[202] To date, the logistical challenge of establishing an automated telephone voting system for local government elections has been too great, given the thousands of candidates across the State's local government areas and wards.

Part 5.3 – System design

147. This section of the report sets out essential system design components for any future TAV offering. This will inform market testing, procurement and operational oversight.

Standards and regulatory approaches

148. Any internet voting solution requires the highest standards of governance, technical and operational reliability. Established industry standards and a strong regulatory framework are integral to the success of TAV. Codifying system requirements in a publicly accessible format provides a foundation for accountability, while also improving transparency for election management bodies and service providers.

149. The risks from a lack of uniform standards were demonstrated at Ontario's 2018 municipal elections where 49 out of 177 internet voting systems experienced significant technical failure. In these elections, each individual municipality was responsible for designing and implementing internet voting, without specified principles, performance benchmarks or security protocols.[203] To limit the effect of inconsistencies across jurisdictions, certain municipalities in Canada are now working with the Digital Governance Council to develop national standards for online electoral voting.[204] The Estonian Supreme Court, in response to complaints of the e-voting system, noted that to address complaints and ensure public confidence in elections, "the essential rules on electronic voting should be more specifically contained in the law or at least in a government decree."[205]

150. In contrast, Switzerland recently has adopted a more prescriptive approach to governance for sub-national internet voting systems. Technical requirements (such as complete verifiability), auditing requirements and caps on usage are stipulated by the Federal Chancellery in the Ordinance on Electronic Voting (OEV).[206] The OEV specifies the universal requirements that must be followed by every canton when implementing internet voting, however the responsibility of procuring and delivering the system is left to their discretion. It was developed through extensive consultation conducted over several years, before being agreed to by the Federal Council in May 2022, and includes the following:

- high level principles that a system must meet

- complete verifiability including technical requirements for cryptographic protocols

- minimum requirements to be met in the voting process such as casting a vote, preparation of the ballot and tallying votes in the electronic ballot box

- auditing requirements including what needs to be audited and examination criteria

- disclosure requirements including what needs to be published publicly, how it can be disclosed, and who should be involved

- IT systems security processes, procedures for identifying and reporting security events and quality of source code and documentation

- a list of threats to internet voting and the impact on fundamental principles

151. It is also important to highlight that the OEV is technology-agnostic, focusing on what needs to be achieved rather than how to achieve it or the specific technology to be used. The Federal Chancellery also established an expert panel consisting of cryptographers, cyber security and mathematicians to endorse technical integrity of a system before implementation.

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[203] Helen Hayes *et al*, 'The Effect of Exogenous Shocks on the Administration of Online Voting Evidence from Ontario, Canada', *International Joint Conference on Electronic Voting*, 2022, 72.
[204] CIO Strategy Council, CIO Strategy Council Developing National Standards For Online Electoral Voting Technologies, Media release, 22 January 2021.
[205] *Eesti Rahvusringhääling*, Supreme Court dismisses all election complaints, Tallinn, 31 March 2023.
[206] *Federal Chancellery Ordinance on Electronic Voting* (Switzerland).

152. Future regulatory frameworks and system design in New South Wales should be informed by the principles for internet voting developed by ECANZ. The ECANZ *Eleven essential principles for an Australian internet voting service* reflect the objectives of **enfranchisement, integrity** and **privacy** when designing and operating internet voting. In drafting these principles, ECANZ examined the United States Election Assistance Commission's "Voluntary Voting System Guidelines (VVSG 2.0)" and the Council of Europe's Standards for E-Voting (CM/Rec (2017)5).

153. To date, the details of how TAV in New South Wales is delivered for each election event are published by the Electoral Commissioner in "approved procedures" under s 155 of the *Electoral Act 2017.* To establish higher levels of trust in TAV, technical requirements around security, auditing processes, threat mapping, the voting process and scrutineering should be documented in detail well ahead of any election at which TAV will be available.

Scrutineering, auditing and disclosure

154. Experience from international jurisdictions has demonstrated the importance of auditing and transparency measures (such as scrutineering and disclosure) in mitigating technical and security risks and increasing trust in elections.[207]

155. There are two main ways an audit of a TAV system can be completed.

Examination of source code

156. The first involves an examination of the software prior to its use in an election, including the source code and related system documentation, to ensure it is performing correctly and free from vulnerabilities.[208] Many cryptographers argue that making source codes publicly available prior to an election is best practice,[209] with some jurisdictions with established internet voting systems, including Estonia and Switzerland, publishing source code.[210] For New South Wales, only parts of the iVote source code were published to enable interested parties to review the code.[211] Switzerland also legislates that the source code, system documentation and relevant technical specifications be published in a way that is easy to read and analyse.[212] It also requires the public be provided with an avenue to identify issues and suggest improvements.[213] In consultation with Swiss Post (the e-voting vendor), its executives emphasised the positive impact that increasing transparency had on their relationship with experts and critics.

Verification of election results

157. Election results can also be audited after the election, to confirm the correctness of the result, independent of the voting software, by using universal verifiability (as part of end-to-end verifiability). Universal verifiability uses the data created and produced by the system to check that each vote was included in the election results, via cryptographic mathematical proofs.[214] Switzerland's approach to universal verifiability allows auditors (rather than the public, as occurs with the examination of source code) to verify results.[215] The process is as follows:

- The auditors receive proof that the result has been established correctly; the proof confirms that the result includes all and only the votes cast in conformity with the system and independent verification processes.

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[207] Rajeev Goré and Vanessa Teague, Joint Standing Committee on Electoral Matters into the 2013 Federal Election, Submission 114, Parliament of the Commonwealth of Australia, 7 March 2014, 6-7.
[208] National Democratic Institute, Testing, Source Code Review and Certification, Washington, 17 December 2013
[209] Ardita Driza Maurer, 'E-voting source code publication: a good practice becomes a legal requirement', *Jusletter IT*, 26, Weblaw AG, Bern, September 2018, 6
[210] Estonian source code.
[211] NSW Electoral Commission, iVote code released for review, 21 March 2023.
[212] *Federal Chancellery Ordinance on Electronic Voting* (Switzerland).
[213] *Federal Chancellery Ordinance on Electronic Voting* (Switzerland).
[214] Sandra Guasch Castello, *Individual Verifiability in Electronic Voting*, Requirements of electronic voting, Universitat Polit`ecnica de Catalunya, Barcelona, 2016, 36.
[215] *Federal Chancellery Ordinance on Electronic Voting* (Switzerland), Art 2, 5.

- The auditors evaluate the proof in an observable procedure; to do so, they must use technical aids that are independent of and isolated from the rest of the system.[216]

158. It could be beneficial for NSW to follow the Swiss approach, where system audits are undertaken by an expert advisory panel of electoral and technical experts. In addition to post-election audits, this panel could play a role in reviewing or approving any TAV system prior to its implementation, as well as suggesting improvements for the system and processes.

159. There is also scope for the role of scrutineers to be redesigned to be more meaningful in the context of a TAV platform. Unlike traditional voting channels that provide many opportunities for scrutineers to visually observe the election process, much of the TAV process (especially internet voting) occurs within a computer system, making voting and counting extremely difficult to observe, other than watching election officials interacting with a computer to provide parts of a key to unlock the system, to give it commands and then observing what data may be displayed on a screen.[217]

160. There is limited international guidance on how to enhance the scrutineer's role in electronic voting beyond being a passive observer. The Carter Center has produced a Handbook for Observing Electronic Voting; however, this is mainly applicable to international observers of kiosk voting.[218] Municipalities in Canada that conduct completely electronic elections (remote online and telephone voting) have removed scrutineers altogether. However, similar to iVote scrutineering in NSW, those that retained scrutineers involved them in voting demonstrations, showing them the vote count process before the election, allowing them to test the technology to illustrate a vote cannot be cast twice, and including them as part of the tabulation process.[219]

161. Existing legislation and procedures in NSW provide that ballots cast by TAV must be able to be printed for the purpose of scrutiny.[220] Given the small-scale internet solution proposed for 2027, this step could be undertaken as an integrity enhancement measure, with printed TAV votes counted alongside other paper ballots cast at voting centres or by postal voting. Updated procedures may be required to protect voter privacy in electorates with small numbers of TAV electors if the printed form of the ballot is distinguishable by a scrutineer.

Digital identity verification for internet voting

162. Australian governments have only recently decided to explore a national digital identity system to improve federated services and cross-border credentials. Requiring electors to provide digital identity to use TAV platforms is a means of strengthening the integrity of the system. It provides greater assurance around the identity of an elector and limits the risk of system infiltration by bots or malicious third parties.

163. There is a clear relationship between operational TAV platforms and established national identity systems, such as in Brazil and Estonia.**[221]** A review of internet voting in Estonia in 2022 noted that their developed national digital infrastructure was "a major enabling condition and a key to understanding Estonian exceptionalism in the realm of Internet voting".**[222]**

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[216] *Federal Chancellery Ordinance on Electronic Voting* (Switzerland), Art 5.

[217] Aleksander Essex and Nicole Goodman, 'Protecting Electoral Integrity in the Digital Age: Developing E-Voting Regulations in Canada' *Election Law Journal* 19(2), 2020, 172,174.

[218] The Carter Center, The Carter Center Handbook on Observing Electronic Voting, January 2012.

[219] Aleksander Essex and Nicole Goodman, 'Protecting Electoral Integrity in the Digital Age: Developing E-Voting Regulations in Canada' *Election Law Journal* 19(2), 2020, 172,174.

[220] Electoral Act 2017, s155(2)(g); NSW Electoral Commission, Technology Assisted Voting Approved procedures for NSW State elections, 12(1)(c), Sydney, 7 February 2019

[221] Joint Standing Committee on Electoral Matters, Parliament of Australia, *Inquiry into the conduct of the 2013 federal election: An assessment of electronic voting options* (Second Interim Report), November 2014, 44.

[222] Piret Ehin et al, 'Internet voting in Estonia 2005-2019: Evidence from eleven elections', *Government Information Quarterly* 39(4), 2022, 1, 4.

164. Integrating existing digital identity documents (such as a future ServiceNSW identity, or Commonwealth platform such as MyGovID) could also simplify the registration process for electors.[223] As the submission from Scytl notes, the integration of digital identity with any electronic voting system "increases the available channels of authentication".[224] However, integration of existing identity schemes in Australia remains challenging, noting a 2019 review of Australia's current system found a "large number of weaknesses and deficiencies", concluding it was not fit for a future of online transactions.[225]

165. The key argument against requiring identity documents for voting is the disenfranchising effect their use can have on certain elector cohorts.[226] The ability for electors in all Australian jurisdictions to vote without providing identity documents (with the exception of certain declaration votes) is a cornerstone of the universal franchise, underpinned by the fundamental right to a secret and independent vote. Attempts to introduce voter identification laws more broadly have been met with criticism, given the disproportionate impact these laws have on particular electors, such as electors of Aboriginal or Torres Strait Islander background, and people experiencing homelessness, who may be less likely to have formal identification documents.[227] The NSW Joint Standing Committee on Electoral Matters has also found that there should be no legislative change to require voters to produce proof of identity to vote in New South Wales.[228] The submission from the Council of Intellectual Disability emphasised this point, noting that that many people with intellectual disability often do not have identification and would be an "unnecessary step that is likely to exclude some people with intellectual disability".[229]

Pre-registration, registration and voting periods

166. Requiring electors to register for TAV is an effective way to support integrity and technical planning ahead of the election period. Registration assists in managing capacity and risk of system issues, as noted by Scytl in its submission to this review.[230]

167. Extending the existing pre-registration General Postal Vote (GPV) arrangement – where an eligible elector has a standing status that rolls over from election to election – to TAV eligible electors would strengthen and simplify the registration requirement. Section 37 of the Electoral Act provides for the pre-registration of a registered early voter (technology assisted voting). To implement this option, there would need to be funding for the design and integration of a robust registration process into the Electoral Commission systems, including any new internet voting platform.

168. Even at small scale, registration via an eligibility declaration by eligible electors is required to support integrity and technical planning ahead of the election period. A future internet or telephone voting system should provide for the same registration opening date as postal vote applications, that is from the January before the March election. Once registered, an elector should be able to cast their vote online or by telephone during the one-week early voting period – that is from the Saturday to Friday before election day.

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[223] Submission 3, Mr Ian Brightwell, 6.
[224] Submission 8, Scytl, 5.
[225] Roger Wilkins and David Lacey, The Review of National Arrangements for the Protection and Management of Identity Information, March 2019, 6.
[226] Rodney Smith, Multiple Voting and Voter Identification: A research report prepared for the New South Wales Electoral Commission, February 2014, 20.
[227] Paull Karp, Proposed voter ID laws 'real threat' to rights of Indigenous Australians and people without homes, *The Guardian*, 27 October 2021.
[228] Joint Standing Committee on Electoral Matters, Parliament of New South Wales, *Administration of the 2019 NSW State Election* (Final Report), October 2020, 34.
[229] Submission 17, Council for Intellectual Disability, 6.
[230] Submission 8, Scytl, 4.

169. Requiring TAV voting before election day allows resources to focus on attendance voting channels on election day. The absence of this buffer in the 2021 Local Government elections (as electors could register for iVote until 1 pm on election day) meant that many electors did not receive their login credentials before the close of voting, due to system error exacerbated by a large number of election day registrations.

170. Any risk that eligible electors miss the chance to vote by waiting until election day to register should be mitigated by clear communication and co-designing registration processes with relevant stakeholders.

171. If NSW were to require strict pre-registration as the sole path to TAV (that is an eligible elector must register before the election period) it may impact eligible electors who experience an emergency or where postal packs have not arrived by election day. At the 2015 NSW State election for example, 6.42 per cent of electors who applied for a postal pack voted instead through iVote, suggesting that internet voting may have provided a proportion of those electors a useful "backup" option if their postal pack did not arrive in time.

172. Studies of US online systems have also shown that introducing registration can affect voter turnout,[231] and may disproportionately burden disadvantaged electors.[232] While concerns about voter turnout are less pressing in the context of compulsory voting in NSW, any proposed risk mitigation strategy should not impose unnecessary burdens on electors. As noted in section 2, Vision Australia raised concerns about this issue, noting:

> "We would only very reluctantly agree to any suggestion that registration not be available on election day. Some respondents to our survey of voter experiences in the 2022 Federal election said that they only found out about the availability of the Blind and Low Vision Telephone Voting Service on election day itself, while others noted the difficulty of taking time out from their job to register during business hours. It would not be an acceptable outcome if a person who is blind or has low vision were to be denied the opportunity to vote because they became aware of their options only after the registration period had closed and while the rest of the community was still able to vote".[233]

173. Vision Australia also noted that registration was not required for any other voting channel, asserting that any system implemented should be done bearing in mind the maximum degree of amenity and convenience for voters who are blind or have low vision. It also stated that "the blind and low vision community has an understandable expectation that any reduction of the pre-registration period would be offset by clear and tangible benefits in other areas of the voting process".[234]

174. On the issue of registration for TAV in general, the Physical Disability Council of NSW recommended that the registration process be simplified, particularly for electors with a physical disability.[235]

Verification of eligibility of elector class

175. Verification of eligibility as a precondition to using TAV allows electoral management bodies to limit system usage to specific cohorts. This can better align resources and staffing with estimated elector usage and reduce the likelihood of system error due to excessive demand. Stakeholders do not support verification of eligibility. While it is preferred to not require evidence of eligibility, it may be necessary to have an audit mechanism in case numbers of users exceed expectations.

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[231] Stephen Ansolabehere and David M. Konisky, 'The Introduction of Voter Registration and Its Effect on Turnout', *Political Analysis* 14(1), 2006, 83; Kelly Beadle, Peter de Guzman and Alberto Medina, The Impact of Voting Laws on Youth Turnout and Registration, *Center for Information & Research on Civic Learning and Engagement*, 17 March 2022.
[232] Bhatt *et al*, 'Registration costs and voter turnout', *Journal of Economic Behavior and Organization*, 176, Elsevier, Amsterdam, 2020, 91.
[233] Submission 1, Vision Australia, 9.
[234] Submission 1, Vision Australia, 9.
[235] Submission 2, Physical Disability Council, 1.

176. There are privacy and other policy considerations that mitigate against asking an elector to provide medical evidence to prove their eligibility on the basis of low vision or disability. Consultation with key stakeholders made it clear that many electors who may require adjustments do not wish to have to prove their eligibility and may not want to identify as having a disability. Submissions from blind and low vision organisations, as well as disability peak bodies were unanimously against verifying eligibility for these reasons:

> **Vision Australia** – "We regard any attempt to verify whether a person is blind or has low vision as logistically impossible and philosophically unconscionable".[236]

> **NSW Ageing and Disability Commissioner** – "We would not support measures for the NSW Electoral Commissioner to 'verify eligibility of persons claiming to fall within a technology assisted voting elector class with external agencies or organisations'. While we appreciate that some people may incorrectly claim eligibility in order to use TAV, we do not consider that this risk would justify intrusive measures that impact on a person with disability's privacy, or require them to have to take additional steps to provide evidence of their eligibility."[237]

> **Council for Intellectual Disability** – "There shouldn't be criteria for using technology to vote, anyone should be able to use technology if it helps them vote".[238]

177. Separate to privacy considerations concerning the collection of health data by an electoral commission, verification of elector eligibility raises some practical issues. For overseas and interstate voters, using an elector's IP address or geolocation data to confirm their location may be technically difficult in practice, as shared landline devices and virtual private networks can lead to inaccuracies. Geolocation would also not be useful for electors who vote or register early, as an elector only needs to be outside of NSW on election day to be eligible for TAV. Historically, the out-of-state cohort has been, by far, the largest of all iVote eligible electors and there should be safeguards to allow the Electoral Commissioner to monitor whether it is appropriate to offer TAV voting for this group.

178. Currently, verification of eligibility for alternative voting channels (such as early voting, postal vote or iVote) is based on a self-declaration (noting electors who are 20km from a voting centre are verified by their enrolled address) from the criteria contained within the Electoral Act.[239] However, an analysis of anticipated versus actual usage of these channels suggests that some electors may be choosing to use these channels, regardless of their eligibility.[240] For example, at the 2019 NSW State election, 160,025 electors registered for iVote on the basis they were interstate on election day.[241] However, statistics from the 2016 ABS Census suggests that only about 75,000 NSW electors would be interstate on any given day.[242] The NSW Joint Standing Committee on Electoral Matters has described this phenomenon as "convenience voting", noting that "many people are disregarding eligibility requirements to vote early in NSW and are voting at early voting centres for reasons of convenience".[243] This was seen at the 2021 Local Government elections, where 56 per cent of electors who did not receive their iVote login credentials found other channels to vote and a majority of these electors voted by in-person ordinary voting at a polling place in their area or ward (53.41 per cent).[244]

[236] Submission 1, Vision Australia, 9.
[237] Submission 13, NSW Ageing and Disability Commissioner, 2.
[238] Submission 17, Council for Intellectual Disability, 4.
[239] *Electoral Act 2017*, ss 6, 152.
[240] Narelle Miragliotta, *Remote Voting Under COVID-19*, Electoral Regulation Research Network/Democratic Audit Of Australia Joint Working Paper Series, (Working Paper 72), September 2020, 7.
[241] NSW Electoral Commission, *Report on the conduct of the 2019 NSW State election*, 61.
[242] Australian Bureau of Statistics, 2016 Census of Population and Housing, Place of Usual Residence on Census night, New South Wales, G03(2021 Census data does not reflect usual interstate movement data due to COVID-19 travel restrictions in place at the Census date).
[243] Joint Standing Committee on Electoral Matters, Parliament of New South Wales, *Administration of the 2019 NSW State Election* (Final Report), October 2020, 3.
[244] NSW Electoral Commission, Submission 14, *Inquiry into the conduct of elections in New South Wales*, NSW Legislative Council Select Committee on the Conduct of Elections in New South Wales, 55, Sydney, 2022.

Savings provisions

179. It open to the NSW Parliament to enact electoral legislation to protect the public interest by eliminating or mitigating the greater levels of risk that arises from TAV, compared to paper-based voting. Providing a savings provision, for example, can ensure that technical failures or interruptions associated with any re-introduction of online voting are not always grounds for invalidating the result of an election.

180. Both Commonwealth and NSW legislation have included specific savings provisions, following a broader roll-out of operator-assisted telephone voting during the 2022 Federal election for COVID-19 impacted electors. For the 2023 NSW State general election, for example, cl 14(6) of Part 4, Schedule 7 to the *Electoral Act 2017* (NSW) provided:

> (6) An election is taken not to have failed, and the results of an election are not invalid, merely because telephone voting permitted by this clause was not available during a period when telephone voting was permitted under this clause.

181. It is not clear, however, whether such provisions would protect an election if a court considers the number of registered voters prevented from accessing TAV was statistically significant.

182. In its submission to this inquiry, the Law Society of New South Wales suggested also setting out the exceptions for when the failure of a TAV system *has* invalidated the results of an election:

1) An election is taken not to have failed, and the results of an election are not invalid, merely because online voting permitted by this clause was not operable during a period when online voting was permitted under this clause, unless:

   a) as a result of the inoperability eligible voters were prevented from voting throughout the voting period; and

   b) a recount by the Electoral Commissioner has determined that an alternative result may have resulted if the eligible voters had been able to vote online throughout the voting period; and

   c) as a result, the result of the election was likely to be affected.

183. Under none of these existing or proposed formulations, however, would an election be saved if eligible electors used online voting but their votes were not included in the count correctly or at all (that is, the data was lost or corrupted), due to either poor system performance or malicious interference. These provisions deal only with circumstances in which a TAV system is not made available for voting, which is only a small segment of the risk profile for internet voting. Before internet or kiosk voting could be deployed at future elections in NSW, therefore, it should be clarified in what broader circumstances (if any) an election remains valid. Such scenarios may arise in the following circumstances:

   a) TAV is not made available by the Electoral Commissioner to all or some registered eligible electors, including where the Commissioner determines that the security environment at the time of the election period poses a risk to the integrity of the election that makes the voting channel inappropriate to offer at all or for a period of time;

   b) TAV systems experience a performance issue (whatever the cause) that results in some or all registered eligible electors not being able to cast a vote in that channel; and

   c) TAV systems experience a performance issue (whatever the cause) that results in some or all votes already cast not being able to be verified and/or counted.

184. It is appropriate to consider savings provisions to respond to these broader scenarios given the consequences for the NSW community of re-running elections, from small local contests through to a state-wide Legislative Council election. It must be acknowledged, however, that it is more difficult to make the case for legislation to save an election in the event of a security breach or technical failure that has compromised the integrity of votes actually cast using TAV. It is also more difficult to make the case for saving an election when a large proportion of the total electors have been impacted. In such cases, there is a strong argument that it would be appropriate to continue to apply the usual materiality tests to determine validity, despite the risk of a material irregularity risks for TAV being higher than for paper-based voting.

185. All these scenarios require further policy consideration before online voting is offered again. To deem an election to be valid when online votes have been lost or corrupted is more significant legislative and policy intervention than validating an election in which a particular voting channel was unavailable. Consideration would need to be given whether the TAV levels of risk justify differential treatment of electronic and paper ballots.

186. In any TAV scenario, it seems preferable that a savings provision should only apply where there are a small number of electors impacted. If future eligibility to use TAV was expansive (as it was previously for iVote with multiple eligible elector classes), any savings provision itself could undermine election integrity and trust in the democratic process. Validating legislation would need to be carefully drafted to set low thresholds at which statutory provisions can maintain the validity of an election and define whether these thresholds should differ according to the type of election event.

187. It may be appropriate to consider different approaches for savings provisions capable of covering the potential scenarios in both the NSW Legislative Assembly and proportional counting systems such Legislative Council and local government council ward elections. Due to the complexity of voting and counting in proportional systems, it can be computationally difficult to ascertain whether the loss or frustration of even small numbers of votes is likely to impact an outcome. Legislative Assembly elections, on the other hand, are single member contests with full-value transferable preferences. The impact of eligible electors not being able to cast a vote (or not having a vote counted) due to technical failure of a TAV platform can be accurately modelled after an election to apply a materiality test to the outcome. Any requirement to rerun the election is limited to a particular electorate.

188. For the Legislative Council, however, which is elected by all 5.5 million voters in NSW, a constitutional requirement provides for random sampling during the distribution of preferences. This means a recount could already produce a different outcome despite the capture of every preference in the Electoral Commission's computer count system. A review of preferences to assess whether not cast/missing online votes could have changed the outcome of a Legislative Council election may not provide consistent conclusions.

189. A similar ambiguity arose until recently in multi-member Local Government contests, which has been overcome by the introduction of the Weighted Inclusive Gregory Method (WIGM) for the first time at the elections held in 2021. The main impact of online voting interruptions or interference in Local Government contests now, as was observed in the Kempsey Shire Council case,[245] arises when there are a small number of votes between candidates at any exclusion point during a count. Without a savings provision, if the number of "lost" online votes is equal to or greater than the difference between an ongoing and excluded candidate, it is likely that a contest would need to be re-run despite the disadvantages and inconveniences of doing so for the community.

190. The consequence of the Court of Disputed Returns ordering that a Legislative Council election was invalid because of a technical failure in TAV would be the need to conduct a new state-wide election, with attendant risks to continuity of the law-making functions of the NSW Parliament, as well as a significant erosion of public trust and the cost and time for re-running the election.

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[245] *NSW Electoral Commissioner v Kempsey Shire Council (No 2)* *[2022] NSWSC 409*

191. To accommodate the characteristics of different election types, a future savings provision regime in NSW could apply the following principles:

   - For all types of elections it is appropriate and proportionate, given the small-scale of TAV, for an election not to be invalid on the basis only that TAV was not available.

   - For multi member proportional representation elections (such as the Legislative Council and local government councillor elections), it also may be appropriate to extend such protection to where there have been performance issues after votes have been cast. Such consideration is warranted because the scale of the risks and costs involved in re-running multi-vacancy elections, and the consequent detriment to the public interest.

   - For other contests (such as Legislative Assembly electorates, local government mayoral elections and councillor by-elections), a savings provision may be appropriate even if votes cast by TAV cannot be verified or counted but only if the Electoral Commissioner determines prior to the declaration of results that the number of votes cast by TAV in that election (but which could not be included in the count) was greater than the smallest exclusion point.

192. The appropriateness of approaches to savings provisions is informed by analysis of past election data to determine what changes to votes are sufficient to alter election outcomes. NSW Electoral Commission analysis of 2015 and 2109 State general election results in the Legislative Council and the Legislative Assembly indicates that random removal of 5 per cent of formal ballots from all candidates (across 10,000 simulations) had the following outcomes:

   - 2015 Legislative Council: No change

   - 2015 Legislative Assembly: Alternative outcome in one (of 93) electorates in 0.01 per cent of simulations

   - 2019 Legislative Council: No change

   - 2019 Legislative Assembly: No change

193. In alternative scenarios where the impact was assessed by removing only ballots where the first preference was for the elected candidate, alternative election outcomes can be observed when as little as 1 per cent of votes are removed. This was observed in the three Legislative Assembly electorates in 2015, and two in 2019.

194. In the case of the 2022 Senate elections for all Australian States, analysts developed heuristics to test the data and published the smallest vote change to alter who won at least one seat (usually the last seat allocated through the Senate preference distribution process). From smallest to largest factor, the changes to affect the electoral outcome were Victoria 0.24 per cent, Western Australia 0.77 per cent, South Australia 0.82 per cent, New South Wales 1.19 per cent, Queensland 1.82 per cent and Tasmania 3.24 per cent.[246]

195. These analyses indicate that a lost opportunity to vote (or have a vote cast counted) by 0.1 per cent of the electorate historically would not have materially affected an election outcome.[247]

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[246] Vanessa Teague *et al*, Submission to the JSCEM Inquiry into the 2022 Federal Election, Submission 282, Parliament of the Commonwealth of Australia, Canberra, 28 September 2022.
[247] It is important to note that the results of past elections are not indicative of future elections, and there may be situations where a single vote can impact the outcome of an election.

Procurement strategy

196. Drawing on recent global experience and stakeholder feedback discussed above, any TAV system implemented in NSW should be designed to include the following:

- An ability to be reconfigured for different election types including state general elections (Legislative Assembly and Legislative Council), local government elections (councillor and mayoral elections), by-elections and referenda

- Designed in line with ECANZ Eleven Essential Principles for an Australian Internet Voting Service, including for enfranchisement, security, integrity, privacy and vote secrecy

- Technical and security features:
  - encryption of vote information (on the elector's device) and decryption using a private key
  - separating data connecting the elector to the vote
  - mixing of votes after the close of election whilst maintaining verifiability
  - provision for the electoral management body to monitor the entire election event
  - future scalability

- System verifiability requirements (potentially codified in legislation) including:
  - individual verifiability to allow a user to verify their vote was cast as intended and recorded as cast
  - universal verifiability to allow external auditors to verify that the votes are counted as recorded
  - rigorous testing and compliance of software, potentially by an external accreditation organisation

- Publication of source code and system documentation

- Adherence to cyber security standards from Australian Cyber Security Centre, informed by international standards

- Robust contractual agreements with commercial third-party vendors to protect the supply chain, including visibility and input into the use of sub-contractors to deliver services, vetting of all staff who may need to access the system, and compliance with data protection standards such as the Essential Eight and requirements under the Digital Transformation Agency's Hosting Certification Framework

- Project deadlines with internal end-to-end testing complete and operational systems integrated six months before statewide election events, to provide a go/no go decision point.

Steps for implementation of targeted internet voting for the 2027 NSW State election

197. To deliver an internet voting solution for the State general election in March 2027, an indicative schedule, based on previous experience with implementation and in consultation with members of the Electoral Commission's reference group representing electors who are blind or have low vision, requires:

- Business Case development including Request for Information (RFI) to potential suppliers – October 2023 to February 2024

- Funding Approval – July 2024

- Solution design and tender preparation – July 2024 to December 2024

- Confirmation of intent to proceed with SGE2027 implementation – December 2024 (Required prior to starting procurement process)

- Procurement – January 2025 to March 2025

- System Development and Implementation – April 2025 to March 2026

- System Testing – April 2026 to June 2026
- Integration and process Testing – July 2026 to September 2026
- System Readiness go/no-go (6 months to election) September 2026

Part 5.4 – Longer-term proposals

National coordination

198. Through ECANZ, this review has canvassed the views and experiences of the other Australian jurisdictions in relation to TAV. These jurisdictions face common challenges in developing secure, cost-effective and sustainable TAV channels. Each jurisdiction faces potential procurement and implementation risks from a limited global vendor market. The best prospects for TAV arise under a unified national approach to digital election infrastructure, including integration with any emerging national digital identity system.

199. There are important insights into the challenges ahead for any TAV initiatives in Australia, informed by the recent experiences in NSW, the Australian Capital Territory and Western Australia.

200. The ACT is unique in offering a widely available kiosk voting system which, approaching its third decade of operation, channels three quarters of the territory's comparatively (to NSW) small number of votes at a general election. In 2020, the ACT offered a limited internet voting service to electors overseas.

201. Western Australia offered internet voting, in 2017, supported by the NSW iVote platform. The internet voting channel was available to electors with disabilities and was used by 2,200 electors. Looking to future TAV deployment, Western Australia recently has undertaken an extensive market sounding exercise via a Request for Information process. For the 2025 State general election it is developing a procurement strategy for a Direct Recording and Electronic (DRE) replacement solution for its Vote Assist kiosk product (previously deployed at two voting centres in Perth) and an automated telephone IVR system. Longer term, the Commission says it is committed to a full online internet voting in the future.[248]

202. While NSW is a sovereign jurisdiction and undertakes its elections according to the State Constitution and electoral laws, its actions intersect with the broader Australian democratic culture and electoral technology ecosystem.

203. Any additional TAV initiatives for NSW (beyond those proposed for kiosk trials and the internet option for electors who are blind or have low vision) would ideally be undertaken as part of a national electoral technology system, cooperatively designed, commissioned and operated on behalf of all the States, Territories and the Commonwealth.

204. Such an initiative has been identified in other inquiries. The 2017 report of a Victorian Parliamentary Committee concluded that:

> It makes little commercial or economic sense to implement a state-by-state based approach to remote voting. Developing a national, electronic voting capability is, for the committee, and indeed the NSW JSCEM and the Commonwealth JSCEM, a major priority for the future of Australia's electoral administration.[249]

205. A common national election technology system would project electoral transparency consistent with Australia's democratic conventions and values, and promote a consistent elections experience for citizens, with national privacy, identity and cyber security assurance.

206. The development and operation of this technology could be undertaken by a standing national elections delivery agency. Its role would include the design, risk assessment and delivery of digital elections platforms, including for voting, for use by all jurisdictions for respective elections and referenda.

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[248] Western Australian Electoral Commission, Update on Technology Assisted Voting Request for Information (RFI), Communications Update 5, Perth, 2 March 2023.
[249] Electoral Matters Committee, Inquiry into electronic voting, Parliament of Victoria, Melbourne, May 2017, 134

207. The type of body to undertake the role could follow several models. One is a company limited by guarantee, similar to PEXA Pty Ltd. PEXA was established following a 2011 intergovernmental agreement on national conveyancing to build and operate a single national electronic system for the settling of real property transactions in all Australian States and Territories. This agreement also established the Australian Registrars' National Electronic Conveyancing Council (ARNECC), composed of the Land Titles Registrars (or their nominee) from each Australian State and Territory, tasked with the ongoing management of the regulatory framework for National E-Conveyancing to minimise inconsistencies between jurisdictions.[250] New South Wales, Victoria, Queensland and Western Australian governments were shareholders in PEXA from its establishment. The body has subsequently been commercialised and is now PEXA Group Limited. An alternative model is a company limited by shares held by the Commonwealth, six state and two territory governments. This is the structure of PSMA Australia, trading as Geoscape Australia, which is self-funded through the sale of spatial data.[251]

208. A national approach to future election technology systems has been proposed previously. The July 2017 ECANZ meeting of Australian Electoral Commissioners signed a letter to all Australian First Ministers advocating a national cooperative approach to the development and security of internet voting. The matter was considered by the 9 February 2018 meeting of the Council of Australian Governments which, in its post-meeting communique, said:

> "COAG also considered proposals from the Electoral Council of Australia and New Zealand to modernise state and federal electoral systems. COAG noted the importance of cooperation to mitigate cyber security risks, and looks forward to the Australian Cyber Security Centre's proposed cyber-security health checks of our electoral processes."[252]

209. National Cabinet, which succeeded COAG as a forum for first Ministers in 2020, has recently identified the delivery of "government services fit for the digital age" (tasked to Data and Digital Ministers) as a priority policy issue, which offers a route and forum for consideration of a national electoral delivery body.[253]

210. This National Cabinet priority workstream includes national digital identity reform. It is proposed that enrolment information is included in the national digital identity system.[254] This is an opportunity to identify synergies between a national identity platform and elector registration and voting to strengthen the security and integrity of any future TAV systems.

211. The recent establishment of the Inter-jurisdictional Forum on Electoral Integrity, co-chaired by a Deputy Secretary of the Department of Prime Minister and Cabinet and the Australian Electoral Commissioner, also provides a new avenue for interjurisdictional and interagency information sharing and collaboration on ideas and initiatives relating to all matters of electoral integrity and security, including the development and adoption of election technologies.

212. The criticality of digital identity verification for successful TAV delivery is demonstrated by Estonia, which has the most advanced and utilised remote internet voting system. An important feature, not reflected in Australia, is Estonia's longstanding digital identity system for all citizens which is integrated with the electronic voting system as part of a wider, national digital infrastructure system.[255] As the submission from Scytl notes, the integration of digital identity with any electronic voting system "increases the available channels of authentication".[256]

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[250] Council of Australian Governments, Intergovernmental Agreement for an Electronic Conveyancing National Law, 2011.
[251] PSMA Australia Limited, Statement of Expectations, 4 December 2017.
[252] Roger Wilkins, Report on the Security of the iVote System, Sydney, May 2018.
[253] Department of Prime Minister and Cabinet, National Cabinet Priorities, Canberra, November 2022.
[254] Tom Burton, New digital identity system to get go-ahead, *The Australian Financial Review*, 23 February 2023.
[255] Piret Ehin *et al*, 'Internet voting in Estonia 2005-2019: Evidence from eleven elections', *Government Information Quarterly* 39(4), 2022, 1, 4.
[256] Submission 8, Scytl, 5.

213. In contrast to Estonia, the fragmentation of electoral functions and policies among counties, states and the Federal government in the United States continues to be a barrier for a unified approach to security and innovation.[257] Responsibility for operations, including cybersecurity, falls to the council or municipality where expertise and resources are often limited. In addition, the cybersecurity risk increases because of diverse and ageing hardware and software.[258]

214. Given that most electoral enrolments in Australia are already centralised with the Australian Electoral Commission, a common elector authentication "front door" for TAV for all jurisdictions could be developed as a feature of a national technical solution.

Legislative change

215. This review has also highlighted that elements of the legislation governing state and local government elections are unsuited to electronic voting systems. Legislated timeframes for ballot paper production are directed towards manual, paper-based processes and may provide insufficient time for preparing an electronic voting system between the closure of nominations and start of the early voting period. The counting process for the Legislative Council, which requires random sampling to distribute preferences, is an anomaly when compared to other jurisdictions, which have harnessed technological advancements to allow a full distribution of preferences. Practical challenges also exist in translating the large and complex Legislative Council ballot paper to a digital format, in a manner that is simple to use and does not unfairly preference certain candidates. To enable the robust deployment of technology in the democratic processes of the state, NSW should consider these legislative reforms.

Lengthening the pre-election timeframes between the close of candidate nominations and subsequent ballot paper draws for Legislative Assembly and Legislative Council elections, and the commencement of the early voting period

216. Lengthening this timeframe will provide more time to sufficiently prepare any future TAV systems with candidate information and to complete user testing. One of the cited reasons for the failure of a 2007 internet voting pilot in the United Kingdom was that short pre-election timeframes did not allow for sufficient design, development and testing and the development of complete project documentation.[259]

217. The NSW Joint Standing Committee on Electoral Matters has previously observed that these short timeframes posed challenges for political parties in preparing campaign material for the start of the early voting period.[260] In 2019, the committee recommended that the NSW Government consider legislative amendments to delay the start of the early voting period to allow parties and candidates more time between the ballot draw and the start of early voting to register campaign materials.[261] The early voting period was subsequently shortened from two weeks to one week for the 2023 NSW State election, via ordinary legislation.[262] The committee has also noted the challenges in amending the timing of processes linked to the expiration of the Legislative Assembly under section 24A of the *Constitution Act,* including the issue of the writs, which specify the date for the close of nominations.[263]

[257] Erik S Herron, Estonia's e-governance revolution is hailed as a voting success – so why are some US states pulling in the opposite direction?, The Conversation, Melbourne, 17 March 2023.
[258] Securing the Vote: *Protecting American Democracy*, National Academies Press, Washington, 2018, 92.
[259] The Electoral Commission (UK), Submission to Speaker's Commission on Digital Democracy – Inquiry into Electronic Voting, Parliament of the United Kingdom, London, 10 October 2014.
[260] Joint Standing Committee on Electoral Matters, Parliament of New South Wales, *Administration of the 2019 NSW State Election* (Final Report), October 2020, 7-10; Joint Standing Committee on Electoral Matters, Parliament of New South Wales, *Administration of the 2015 NSW State Election* (Final Report), November 2016, 23.
[261] Joint Standing Committee on Electoral Matters, Parliament of New South Wales, *Administration of the 2019 NSW State Election* (Final Report, October 2020), 3.
[262] Electoral Legislation Amendment Bill 2022.
[263] Joint Standing Committee on Electoral Matters, Parliament of New South Wales, *Administration of the 2019 NSW State Election* (Final Report, October 2020), 3.

Replacing the ballot sampling system for preference distributions in the NSW Legislative Council with a full count system and take full advantage of existing digital scanning and counting technology

218. Clause 10(f) of the Sixth Schedule to the Constitution Act requires that preference distributions in the count of NSW Legislative Council ballot papers be conducted using ballot paper sampling.[264] This requirement was introduced in 1978, as part of the reconstitution of the Legislative Council to provide for direct election by the people via system of proportional representation.[265]

219. Since that time, advances in technology have allowed complex preference distributions in proportional representation contests to occur without a need for random sampling. Computational data entry and full electronic distribution of preferences is now considered best practice. The AEC has distributed preferences in the Federal Senate count process without random sampling since 1984, following changes to the Commonwealth Electoral Act made in 1983.[266] Similarly, the Weighted Inclusive Gregory Method was introduced as the method of counting for NSW Local Government councillor elections in 2021. This method does not use random sampling and is conducted using the NSW Electoral Commission's electronic count system, which was modified accordingly for those elections.[267]

220. Changing the requirement for random sampling within Schedule 6 of the Constitution would allow the Legislative Council count method to take advantage of a system that allows a full distribution of preferences, without sampling. A full distribution of preferences would assist in any future assessment of the materiality to the outcome of an election in the event of eligible electors not being to cast a vote due to technical performance of a TAV system or other disruption.

221. While reform to preference distribution in the Legislative Council does not otherwise touch on TAV design benefits or requirements, future technical refinements to counting methods would evolve in the same digital ecosystem as TAV. Any future TAV initiatives approved in the short term in NSW will require interoperability with the systems under development as part of the NSW Electoral Commission's digital modernisation program.

Rationalising the way parties, groups and candidates are displayed on the Legislative Council ballot paper for a digital display or for telephone voting

222. The size and complexity of the Legislative Council and Local Government councillor ballot papers pose logistical challenges for both paper-based and TAV channels. The ballot paper for the 1999 State general election featured 264 candidates in 81 groups, necessitating a ballot paper 100 centimetres wide by 70 centimetres long, later known as the "tablecloth".[268] While no Legislative Council ballot paper has reached this size since, there are challenges in translating a paper format to a digital one in the case of the Legislative Council. For one, it is difficult to make the ballot paper electronically accessible in a manner that does not favour particular groups of candidates. Presenting the first candidate who appears on the paper ballot and requiring the internet elector to scroll down, has the potential to lead to that candidate benefitting significantly from a "donkey vote", where electors favour the candidate presented first on the screen.[269] It is also very time consuming for telephone operators (and electors) to read out all candidates "below the line" for telephone-assisted voters, adding to the logistics of that method of TAV.

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[264] Constitution Act, Sixth Schedule.
[265] *Constitution and Parliamentary Electorates and Elections (Amendment) Act 1978*.
[266] Commonwealth Electoral Legislation Amendment Bill 1983 (Explanatory memorandum).
[267] NSW Electoral Commission, Functional specification for vote count: Using the Weighted Inclusive Gregory Method, March 2021, 9.
[268] Antony Green, 'New South Wales Legislative Council Elections 1999' Research Paper, Parliamentary Library, Parliament of NSW, May 2000, 1; Steven Reynolds, 'The tablecloth and the long bell: media perceptions of the NSW Legislative Council 1999–2009' 26(1) *Australasian Parliamentary Review*, 26(1), 2011, 143-144.
[269] Antony Green, 'Donkey Vote Advantages for the 2021 Western Australian Election', *Antony Green's Election Blog*, 13 February 2021.

223. One approach for screen-based digital is to implement a randomised display, where the ballot paper opens at a different point for each elector. This is similar in theory to the system of ballot rotation used in the Tasmania, known as the Robson rotation, where candidates named are placed first in a random sequence on paper ballot papers.[270] This was the approach taken with iVote for the 2019 NSW State election, following commentary during the 2015 JSCEM inquiry into the election that the previous iVote system defaulted to displaying the candidate at the beginning of the ballot paper.[271]

224. A different approach is taken in the ACT, where the kiosk system used in voting centres displays the ballot paper in full ballot paper view, noting that there is only a single, lower house in that jurisdiction. If the relevant Legislative Assembly electorate or local council area or ward has only a small number of candidates, the ballot paper displays in a readable fashion, in a similar size to its paper form. However, if an electorate has a larger number of candidates, there is potential for the ballot paper to be displayed in quite a small font. In this case an elector who has low vision can zoom the screen, using a slide bar at the bottom of the screen, which may obscure some candidates from view.

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[270] Tasmanian Parliamentary Library, House of Assembly Elections, Parliamentary Library, Parliament of Tasmania, March 2015.
[271] Joint Standing Committee on Electoral Matters, Parliament of New South Wales, *Administration of the 2015 NSW State Election* (Final Report), November 2016, 15.

Appendices

Appendix 1: History of iVote in New South Wales

225. iVote was introduced by the NSW Electoral Commission for the 2011 State general election, following an investigation into the feasibility of TAV by the Electoral Commissioner in 2010 (the 2010 NSW Electoral Commission report).[272] The report concluded that remote internet voting (voting by an internet or telephone service) was technically feasible and could be implemented for a limited stakeholder group.[273]

226. Following the release of this report, the *Parliamentary Electorates and Elections Act 1912* (NSW) was amended to provide for TAV.[274] Providing a means for electors who were blind or had low vision to cast an independent secret ballot was the key focus of the amending bill and basis for the introduction of iVote. The bill's second-reading speech stated that:

> "Many people in New South Wales who are blind, or vision impaired currently do not have the opportunity to cast a secret vote at a State election. They have no choice but to enlist the help of another person to fill out their ballot paper and place it in the ballot box… [This] bill will allow these vision-impaired electors to vote in secret, using a computer or telephone at a private location such as their home. As a result, these voters will gain new levels of independence and empowerment as participants in our democratic processes."[275]

227. Other classes of electors were also made eligible to use iVote at this first election, including:

- people with a disability;
- those who lived 20 kilometres or more from a polling place; and
- those who were going to be outside of New South Wales on election day.

Key challenges faced by iVote

228. At the 2019 State general election, the iVote platform experienced intermittent performance issues, most significantly in the week leading up to election day (including the day before election day and election day itself). These technical issues may have impacted between 35,000 and 45,000 people in some way, including delays and having to use other channels.[276] None of these service incidents affected the security of the iVote system.

229. On 4 December 2021, local government elections were held across NSW, having been delayed due to the COVID-19 pandemic.[277] Due to the ongoing pandemic, iVote was used in these local government elections for the first time. It was available to the same elector cohort as state general elections, as well as electors outside their council area or ward on polling day.[278]

230. Although projected demand (based on previous figures) was 218,000 electors, almost triple the number of electors successfully used iVote. This usage was greater than at any previous NSW election (234,401 compared with 652,983).[279] While system testing had showed that the voting system could cope with much higher numbers than the estimated users an unidentified error delayed sending out credentials to many successful applicants late in the voting period. Many eligible electors therefore did not receive their credentials before voting closed to be able to cast their vote through iVote.

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[272] NSW Electoral Commission, *Report on the feasibility of providing 'iVote' remote electronic voting system*, 23 July 2010.
[273] NSW Electoral Commission, *Report on the feasibility of providing 'iVote' remote electronic voting system*, 23 July 2010, ii.
[274] The PE&E Act was amended by the Parliamentary Electorates and Elections Further Amendment Bill 2010.
[275] New South Wales, *Parliamentary Debates,* Legislative Assembly, 24 November 2010 (John Aquilina MP, Parliamentary Secretary).
[276] NSW Electoral Commission, 2019 State election report, 78.
[277] Office of Local Government (NSW), 'Local government elections postponed' (Media Release, 25 July 2021).
[278] Local Government (General) Amendment Regulation 2021, cl 333C.
[279] NSW Electoral Commission, Submission 14, *Inquiry into the conduct of elections in New South Wales*, NSW Legislative Council Select Committee on the Conduct of Elections in New South Wales, 53, 82

231. Of the electors who did not receive their credentials by the end of election day, fortunately 56 per cent found other channels to vote.[280] The majority of the iVote electors who voted using alternative voting channels did so by in-person ordinary voting at a polling place in their area or ward (53.41per cent).[281]

Investigation of iVote issues by the NSW Electoral Commission

232. On 23 December 2021, the NSW Electoral Commission released its assessment of the potential impacts to the 2021 local government elections as a result of the iVote system access issues.[282] Based on this analysis, the Electoral Commissioner determined that there was no material impact on these elections, with the important exception of elections held in the following three local government areas:

   - Kempsey – Councillor elections,

   - Singleton – Councillor Elections, and

   - City of Shellharbour – Ward A – Councillor elections.[283]

233. For these elections, the Electoral Commissioner stated that there was a possibility that, if each individual who had registered to use iVote on election day had been able to vote, a different outcome might have occurred.

New South Wales Electoral Commissioner v Kempsey Shire Council (No 2)

234. On 11 January 2022, the Electoral Commissioner commenced proceedings in the NSW Supreme Court, seeking orders in relation to the councillor elections held on 4 December 2021 for Kempsey Shire Council, Shellharbour City Council (Ward A) and Singleton Council.

235. On 17 March 2022, the Supreme Court of NSW delivered judgment in relation to the application in *NSW Electoral Commissioner v Kempsey Shire Council (No 2) [2022] NSWSC 409*. The Court decided that the problem that occurred for some internet voters in these areas was an irregularity, with the result that the affected elections were declared void.

236. In its decision, the Court noted that the failure to provide eligible electors with the opportunity to vote by the iVote channel because of technical issues, was capable of being a material irregularity according to the requirements of regulation 333E of the Local Government (General) Regulation.[284] The Court also decided that the correct approach to assessing the materiality was to consider the difference between the margin at each of the exclusion points in the count against the number of electors who were approved to use iVote and did not vote by any other means.[285] The approach taken by the Electoral Commissioner prior to the proceedings differed from this approach. The Electoral Commissioner employed a Monte Carlo simulation, which calculated the probability of a different outcome by considering a thousand simulations of the missing iVotes based on random selections of actual vote preferences in impacted contests.[286]

237. For each of the three elections in dispute, the Court found that because the number of potential "missing iVotes" was greater than the margin between candidates at one (at least) of the exclusion points, that was sufficient to find there were reasonable grounds to believe that a majority of the voters may have been prevented from electing the candidate they preferred.[287]

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[280] NSW Electoral Commission, Submission 14, *Inquiry into the conduct of elections in New South Wales*, NSW Legislative Council Select Committee on the Conduct of Elections in New South Wales, 55.

[281] NSW Electoral Commission, Submission 14, *Inquiry into the conduct of elections in New South Wales*, NSW Legislative Council Select Committee on the Conduct of Elections in New South Wales, 55.

[282] NSW Electoral Commission, *iVote system performance issue: Assessment of the potential impacts to the 2021 local government elections*, 23 December 2021.

[283] NSW Electoral Commissioner, 'iVote and the 2021 NSW local government elections' (Media release, 23 December 2021).

[284] *NSW Electoral Commissioner v Kempsey Shire Council (No 2) [2022] NSWSC 409*, [84]-[86].

[285] *NSW Electoral Commissioner v Kempsey Shire Council (No 2) [2022] NSWSC 409* [83].

[286] *NSW Electoral Commissioner v Kempsey Shire Council (No 2) [2022] NSWSC 409* [83].

[287] *NSW Electoral Commissioner v Kempsey Shire Council (No 2) [2022] NSWSC 409*, [84]-[86].

238. On 5 April 2022, each of the elections referred to in the proceedings was declared void by the Court, with the date for the recontested elections subsequently set for 30 July 2022.

Discontinuation of iVote for 2023 State general election

239. In March 2023, the NSW Electoral Commissioner determined that, except for telephone voting for electors who are blind or have low vision, TAV would not be used at the SGE 2023 or any state or local government by-election in the intervening period. As the determination stated:

> "In 2022/2023, the current version of the iVote software used by the Electoral Commission will be phased out and the short runway for configuring and testing a new version before March 2023 means the Electoral Commissioner cannot be confident an updated system adapted for elections in NSW will be ready in time".[288]

240. In October 2022, the NSW Parliament passed legislation which confirmed these more limited arrangements for 2023.

241. During the six days the operator-assisted service was available, 830 electors who identified as blind or as having low vision cast their votes via the operator-assisted telephone service. This compares with 1,174 who used iVote at the 2019 State General election and 2,382 at the 2021 NSW Local Government elections.

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[288] NSW Electoral Commissioner, 'iVote will not be used for 2023 NSW State election' (Determination, 16 March 2022).

Appendix 2: Eleven essential principles for an Australian internet voting service

The following eleven essential principles for an internet voting service were endorsed by the Electoral Council of Australia and New Zealand (ECANZ) on 4 July 2017.

These principles are reflective of existing best electoral practices as they apply to current voting channels.

In developing these principles, the ECANZ examined the United States Election Assistance Commission's 'Voluntary Voting System Guidelines (VVSG 2.0)', and the Council of Europe's intergovernmental standards for e-voting (CM/Rec (2017)5) – drawing on these standards and principles to develop eleven essential principles to guide the design and implementation of an internet voting service in Australia for use by all member Electoral Commissions.

Enfranchisement

Accessibility

- as far as is practical, all eligible people should be able to access the internet voting service

The internet voting service shall be designed, as far as practicable, to enable eligible voters to vote independently regardless of disabilities, technology, or geography. The internet voting service will be an additional and optional service for specific eligible voters to use. It would be offered in conjunction with other pre-existing methods of voting.

Usability

- the process of internet voting should be sufficiently easy for eligible people to cast a vote

The user interface of the internet voting service should be easy to understand, intuitive, and able to be used by all eligible voters on multiple technology platforms. Information provided may be presented differently depending on the differing technologies and channels which the service can be accessed on. For example, the electoral content presented on an electronic ballot paper will be the same as on the physical paper ballot paper (ensuring impartiality and equitably); however, changes may be made in accordance with relevant legislative provisions while ensuring usability on each technology platform.

One person, one vote

- the ability to ensure that each eligible elector receives only their voting entitlement

The internet voting service should enable each eligible voter to be uniquely identified, ensuring that they are distinguishable from other voters. The service should cater for any legislative requirements around the presentation of identification documents. An eligible voter will only be able to use this channel if they can be uniquely identified this way. The service will check eligibility and only grant access to those that have been authenticated as an eligible voter. The service will have a process to ensure that only one vote per eligible voter is admitted to the count.

Integrity

Security

- prevention of loss, corruption or tampering of votes

The internet voting service and responsible Electoral Management Body shall protect authentication data so that unauthorised parties cannot misuse, intercept, modify, or otherwise gain knowledge of this data. The authenticity, availability and integrity of the electoral roll and lists of candidates shall be maintained. Only persons authorised by the electoral management body shall have access to the central infrastructure, the servers, and the electoral event data.

The audit system should be able to detect voter fraud and provide proof that all counted votes are authentic. The audit system shall be open and comprehensive, and actively report on potential issues and threats. Where incidents that could threaten the integrity of the service occur, those responsible for operating the equipment shall immediately inform the electoral management body. Procedures shall be established to ensure regular installation of updated versions and corrections of all relevant software as the service will need to be continually evolved to meet and protect against potential and actual issues and threats.

The service will encrypt votes if they are to be stored or communicated outside controlled environments. The electoral management body shall handle all cryptographic material securely. Votes shall be kept sealed[289] until after the close of polling.

Robustness

- the system and processes are not subject to significant interruption or failure

Robustness applies to people, process, and technology. The internet voting service must be available, reliable, and secure to ensure that it can function on its own, irrespective of shortcomings in the hardware or software. The technical solution for the service will be peer-reviewed to help ensure availability, reliability, usability, and security. The service shall identify votes that are affected by an irregularity so that necessary measures are taken, and stakeholders are informed. The electoral management body administering the service will ultimately be responsible for compliance with the above even in the case of failure.

Transparency

- the service and processes be designed to enable scrutiny, to provide stakeholder confidence

The internet voting service and accompanying processes will be established with a focus on transparency. The service will ensure that the way in which eligible voters are guided through the internet voting process shall not lead them to vote without due diligence or without confirmation. The service should be designed to allow the voter to express his or her true will. A voter will be allowed sufficient time to consider their choices and will be under no obligation to commit their vote without time for reflection on their choices. Upon casting their vote, the service will verify to the voter that his or her intention is accurately represented and that the vote has been submitted. Any alteration to the voter's vote should be detected by the service.

Voters and third parties should be able to observe the count of the votes and check that only eligible voters' votes are included in the results. The service will provide evidence that only eligible voters' votes have been included and this evidence will be auditable.

Clear and unambiguous information about the internet voting service should be available to the public explaining how to use the service and how the service operates.

The service should be open for verification, assurance, and scrutiny purposes. Observers, to the extent permitted by law, shall be enabled to observe, comment on, and scrutinise the internet voting component of an election, including the compilation of the results.

Independence

- accountability for the system and processes shall rest with the Electoral Management Body

The electoral management body will be accountable for the internet voting service of an electoral event. The electoral management body must be able to put into place assurances that maintain their electoral integrity and independence.

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[289] Sealed is an analogy to the seal on a physical ballot box. This is the term used in the European standards.

Impartiality

- the voter's intention should not be affected by the voting service

An eligible voter's intent should not be affected by the internet voting service. The service will ensure that the way in which voters are guided through the process and the information displayed will not influence their vote.

The service should be structured to ensure that voter's do not miss anything during the voting process. It should provide a means for informal voting by allowing a blank vote to be cast, however advising the voter they would be casting an informal vote and providing them with the option to change their vote if they wish. This provides an equitable approach across channels enabling voters to cast an informal vote via both the service and the paper-based option. Other than a blank ballot paper, all formality rules will be enforced by the service.

Accuracy

- the service should accurately capture, store, and export the voters intention

The internet voting service shall provide sound evidence that only votes from eligible voters are included in the result while de-identifying a completed ballot paper from its voter. The service shall support the voter in marking the ballot paper and accurately store, capture, verify, and export the vote cast. Before an event, the electoral management body administering the service shall satisfy itself that the service is genuine and operates correctly.

The service shall allow and support evaluation regarding the compliance of the service and its related components. This should occur upon introduction, periodically and after significant change to the service has been made.

Privacy

Privacy of personal information

- the system and processes shall maintain the privacy of personal information

The internet voting service shall process and store, if necessary, only the personal data needed for the conduct of the electoral event. The electoral management body administering the service will determine what information is deemed necessary to keep and dispose in accordance with relevant legislative obligations. Any information retained will be secure and any information not required to be retained will be securely disposed of.

Secrecy of vote cast

- the service shall maintain the secrecy of the votes cast

The internet voting service shall be organised in such a way as to ensure that the secrecy of the vote is respected at all stages of the voting process – from pre-polling through to counting of the votes. Votes shall remain sealed until the counting process commences. During completion of the ballot paper, the service will protect the secrecy of the voter's choice. The service should not provide a proof of vote preferences that would facilitate coercion or vote buying.

The service will be able to de-identify a voter from their completed ballot paper to preserve the secrecy of the ballot. The order in which votes are cast shall be mixed to deny reconstruction of the order of votes submitted.

Appendix 3: List of submissions

Submission number	Author
1	Vision Australia
2	Physical Disability Council of NSW
3	Mr Ian Brightwell
4	Accessibility NSW
5	Carers NSW
6	Australian Election Company
7	Deaf Australia
8	Scytl
9	Australian Department of Foreign Affairs and Trade
10	Blind Citizens Australia (endorsed by The Australian Communications Consumer Action Network, Guide Dogs Australia and People with Disability Australia)
11	Deaf Connect
12	Guide Dogs Australia
13	NSW Ageing and Disability Commission
14	Ms Amanda Tink
15	Ms Susan Thompson
16	Anti-Discrimination NSW
17	Council for Intellectual Disability
18	The Law Society of New South Wales