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Department of Infrastructure, Transport,
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Technology scenarios for free-to-air television

Discussion paper

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Television technology changes

The Australian broadcasting and news landscape is changing. For 70 years, free-to-air television has been defined by its method of delivery: the use of radiofrequency (RF) signals to broadcast programming to television sets. However, broadcasting is no longer the dominant medium for distributing free-to-air television. Over the past decade there has been significant growth in online streaming services, including free, advertising-supported platforms like YouTube, Subscription Video on Demand (SVOD) services such as Netflix, as well as Broadcasting Video on Demand (BVOD) services provided by free-to-air television broadcasters.

- The number of Australians adults that used a BVOD service provided by a commercial or a national broadcaster in the past 7 days grew from 18% in 2017 to 44% in 2025.[1]
- Daily primetime audiences for free-to-air television services in the five mainland state capital cities have been declining for over a decade, and there has been an average year-on-year fall in daily primetime audiences for all free-to-air broadcasting in these markets of 3.6% between 2007 and 2024.[2]
- SVOD services have grown to become the most popular way to view screen content, with 68% of Australian adults using such services in the past 7 days in 2025, compared with 29% in 2017.[3]

Today, Australian households use a mix of technologies to access free-to-air television, and most consume these services via a terrestrial signal and online (as highlighted in Figure 1).[4]

Figure 1: Free-to-air television viewing personas

Hybrid free-to-air TV (53%)	Broadcast-only (20%)	Online-only (12%)	No free-to-air TV (16%)
More likely to: • Be aged 35-64 • Have fixed home internet • Own a newly purchased TV • Have children • Watch sports.	More likely to: • Be aged 45+ • Live outside a capital city • Not have access to fixed home internet • Be homeowners without children.	More likely to: • Be aged 25-54 • Live in metro areas • Watch content exclusively online • Not watch sports • Not have access to an external FTA aerial.	More likely to: • Be aged 18-44 • Live in metro areas • Be renters • Not have access to fixed home internet. • Not have access to an external FTA aerial.

Over the coming decade, the online medium is expected to play an increasing role in the delivery of free-to-air television. A key question is the relative roles of broadcast and online.

A future in which the online medium is central to the provision of free-to-air television will enable Australians to access a wider range of content, and provide broadcasters with the opportunity to grow audiences and (with respect to commercial operators) generate revenue.

But there will be challenges. The market for programming rights is increasingly competitive, and expanding the content offering on free-to-air services will create cost pressures. Significant investment will need to be made by industry over the coming years in terms of online apps and services and broadcast networks.

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[1] ACMA (2026) *Communications and media in Australia*, ACMA. Refer to the Annual consumer survey interactive report titled *How we watch and listen to content.* Within the interactive report, refer to *Viewing behaviours*.
[2] Departmental analysis of: OzTAM, 5 City Metro, Wks 1-52 2007-2024, Sun-Sat 1800-2400, Total People, Broadcast Audience, Consolidated 7.
[3] ACMA (2026) *Trends and developments in viewing and listening 2024-25*, ACMA, p 5.
[4] DITRDCSA (September 2026) *Television and Media Survey 2025 – final report*, DITRDCSA, p 106. Note that percentages are rounded and may not add to 100%.

There will also be a role for government in providing an appropriate regulatory environment as the technology makeup changes, and supporting ready access to online infrastructure for people across the country, aided by the National Broadband Network. It will be necessary to plan for this future to ensure that the services and content that matter to Australians continue to be provided; particularly free and easy access to news, sport and entertainment.

The current technology mix may be unsustainable in the long-term

The costs of operating broadcasting transmission networks are significant and generally fixed, meaning they don't decline if there is a reduction in audiences and, for commercial broadcasters, a fall in advertising revenue. This dynamic is accentuated in remote and regional areas of Australia.

- Close to 90% of all broadcasting sites for terrestrial free-to-air television are located in remote and regional Australia, and these sites provide services to less than half the combined population of the five mainland state capital cities.

Commercial television broadcasting services have temporarily or permanently ceased in some markets, notably in Mildura in 2024 with the full closure of Mildura Digital Television due to a lack of profitability.[5] Future service reductions and closures are more likely in the remote and smaller regional licence areas where audiences are smaller, and transmission equipment is ageing. Over time, there's a risk this may move through to the larger regional areas and capital city markets.

All national and commercial television broadcasters have identified growth in online service delivery as a key strategic goal.[6] This is consistent with international experience. For example, in 2024, Ofcom (UK) found that a range of broadcasters and other content providers were already making strategic decisions to prioritise streaming over broadcasting services.[7]

Technology change is normal in media markets, and periods of structural adjustment have historically followed the take-up of new media technology. However, the 'unmanaged decline' of free-to-air television would exacerbate the negative impacts of these changes, and erode much of the value of the free-to-air service offering.

Technology and spectrum issues are closely linked

Radiofrequency spectrum is fundamental to the broadcast of television services, and any consideration of optimal television technologies will need to consider spectrum issues. Ultra-High Frequency (UHF) spectrum was auctioned in 2013 and 2017 following the digitisation of free-to-air television services, creating economic value and generating Commonwealth revenue of approximately $3.45 billion.

The Australian Government is seeking to explore the possibility of realising a spectrum dividend as part of the policy development process initiated with the release of this paper. Separately, the commercial television industry has committed to working with government towards a UHF spectrum clearance in the first half of next decade (i.e. the 2030s), if the Commercial Broadcasting Tax (CBT) is permanently abolished. Mobile network operators have also indicated an interest in this spectrum for future 6G services, and have urged the government to work to progress the transition and reallocation of this band.[8]

Commercial broadcasters are required to pay the CBT which is levied on their use of spectrum. The government suspended the CBT from 9 June 2025 to 8 June 2028 in recognition of ongoing financial pressures, and this is expected to save broadcasters an estimated $161.6 million over three years.[9]

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[5] WIN TV (n.d.) 'Mildura 10 Closure', WIN TV.
[6] Seven West Media (14 August 2024) *2024 Annual Report*, Seven West Media, p 4; Nine Entertainment Co. (2024) *2024 Annual Report* [PDF 10.6 MB], Nine Entertainment Co., p 6; Paramount Global (26 February 2025) *2024 Annual Report* [PDF 4.0 MB], Paramount Global, p I-2; ABC (29 October 2024) *2024 Annual Report* [PDF 21.2 MB], ABC, p 8; SBS (29 August 2024) *2024 Annual Report* [PDF 18.6 MB], SBS, p 20.
[7] Ofcom (9 May 2024), *Report: Future of TV distribution*, Ofcom, p 23.
[8] Australian Mobile Telecommunications Association (AMTA) (3 May 2026) Submission to the ACMA: Consultation on the draft Five Year Spectrum Outlook 2025-2031, p 6.
[9] Australian Government Federal Register of Legislation (2025), *Commercial Broadcasting (Tax) (Transmitter Licence Tax Rebate) Rules 2024 (F2025C00200 C01)*, Australian Government; Australian Government Federal Register of Legislation (2026), *Commercial Broadcasting (Tax) Amendment (Transmitter Licence Tax Rebate) Rules 2026 (F2026L00629)*, Australian Government.

The assessment of the optimal mix of technologies for free-to-air television will need to consider spectrum pricing arrangements in that future state.

Potential technology scenarios for free-to-air television

This paper sets out three possible technology combinations that could be used to provide free-to-air television in the long-term. These are summarised below, and depicted in more detail in **Appendix A**.

Technology scenario 1 – partial online

The partial online scenario would involve minimal change to the technologies used to provide commercial free-to-air television services. It would be based on the premise that television services should be provided in broadly the same manner as they are now, although with efficiencies pursued and with the online medium augmenting, rather than replacing, broadcasting.

The key change under this scenario would be a modest consolidation in the infrastructure used to provide commercial television broadcasting services. Specifically, commercial television services in each licence area would be provided via two (rather than the current three) multiplexes[10], using the Digital Video Broadcasting – Terrestrial (DVB-T) standard[11] and the Moving Picture Experts Group (MPEG)-4 video compression format.[12]

It is assumed that BVOD services would be provided as they currently are, and that a satellite-based 'safety net service' – currently the government-funded Viewer Access Satellite Television (VAST) service – would continue to operate, providing viewers in remote areas, or those in areas with inadequate terrestrial reception, with access to television services.

Of the scenarios depicted in this paper, partial online is the closest to current arrangements. It would effectively extend two processes that are already underway in the Australian television market:

- the transition of all terrestrially-broadcast services from the MPEG-2 to MPEG-4 video compression format; [13] and
- the consolidation of the channels of more than one commercial broadcaster on a given multiplex.[14]

However, if progressed in all licence areas, this scenario would require a reduction in the number of commercial television program streams (channels) provided in larger regional markets, and in metropolitan areas. The assumptions underpinning this scenario could be varied, including through additional multiplex consolidation involving other broadcasting services, or by pursuing market-specific consolidation (i.e. a different approach in different markets).

Technology scenario 2 – online-dominant

The online-dominant scenario would constitute a significant change to the technology used to deliver free-to-air television, based on the premise that the online medium should take the lead role in providing free-to-air television services.

The key change under this scenario would be a significant reduction in the infrastructure used to provide all free-to-air television broadcasting services. The primary online-dominant approach considered in this paper would see terrestrial broadcasting operate as a 'nightlight' service – supplementing the online medium and maintained for viewers unable or unwilling to adopt online-delivered television services.

BVOD services would (ideally) be enhanced and expanded (i.e. additional content or channels) as the online medium becomes the main distribution mechanism for free-to-air television.

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[10] Multiplexes are a group of audio or audio-visual services broadcast as part of one transmission that are made available separately at the receiver.
[11] Digital Video Broadcasting (DVB) is a set of standards for digital television. DVB-T is the current DVB standard for terrestrial television in Australia.
[12] Moving Pictures Experts Group (MPEG) is an international standard for encoding and compressing audio and video. MPEG-4 enables higher quality video in smaller sizes than MPEG-2 and is widely used for streaming and digital television.
[13] This transition is well advanced, with the majority of commercial television broadcasters in remote and regional markets, and some broadcasters in certain metropolitan markets, having completed a full transition to MPEG-4 (i.e. with no services provided using MPEG-2).
[14] To date, WIN Network has undertaken such a consolidation in Mount Gambier, Riverland and Griffith, combining the program streams from the Seven Network and Network 10 onto a single multiplex.

Choices would need to be made regarding the 'core' services on the nightlight offering, and the technology and infrastructure used to deliver it. To support consideration of a tangible option, this scenario assumes that the nightlight service would comprise: one program stream (or channel) per broadcaster; operated terrestrially as part of a single, shared multiplex in each area using the DVB-T standard and the MPEG-4 video compression format. As a starting point, it is also assumed that a satellite-based safety net service would be provided using one or more geostationary satellites (akin to the current VAST platform).

A variation to this online-dominant technology configuration would see the full migration of free-to-air television services to the online medium. This is canvassed in more detail in **Appendix A**. Other variations could include providing a satellite-only nightlight broadcast service (i.e. with no terrestrial broadcasting), or operating more multiplexes in some or all markets.

Technology scenario 3 – broadcast enhancement

The broadcast enhancement scenario would also mark a significant change in the technology used to deliver free-to-air television, albeit in the form of upgrades to the capability of broadcasting, rather than greater reliance on the online medium.

This would involve a planned upgrade of broadcasting networks to a newer, more efficient standard: DVB-T2.[15] This would be a significant and complex undertaking and require investment in new transmission infrastructure. It would also require all Australian households to have DVB-T2-capable reception equipment (televisions or other connected television devices) if they wished to receive broadcast services.

To support the consideration of a tangible option, this scenario assumes that the enhanced broadcasting medium would comprise: the provision of terrestrial free-to-air television services using the DVB-T2 standard, and the MPEG-4 and (potentially) the HEVC compression formats; the continuation of the satellite-based safety net service using geostationary satellites (akin to the current VAST safety net service, or an equivalent); and the provision of BVOD services in parallel to broadcast services. These assumptions could be varied or replaced by others. For example, utilising a different digital television standard, such as DVB-I[16], or operating a different number of multiplexes in different markets.

Next steps

The scenarios described in this paper are intended to stimulate consideration of what is a fundamental issue for the future of media in Australia. Views are sought on whether one or more of these scenarios, or any alternatives, would represent a sensible and sustainable way of delivering free-to-air television services over the medium- to longer-term.

Respondents are asked to consider these scenarios with respect to a range of issues, including consumer and infrastructure impacts, and a series of questions has been provided to guide this consideration.

It is anticipated that additional consultation will be undertaken on specific pathways and timings once these technology end-points are further refined.

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[15] DVB-T2 is an advanced digital terrestrial broadcasting standard that would allow greater capacity in a given amount of spectrum, compared to the DVB-T standard currently in use for free-to-air television in Australia.

[16] DVB-I is a television distribution standard that would use the internet to deliver broadcasting and streaming content to end users, as well as content distributed via terrestrial broadcasting or satellite.

Make your views known

Making a submission

The department is inviting written comments and submissions on the matters outlined in this paper. Comments and submissions should be received by **5:00 pm Australian Eastern Daylight Time on 24 November 2026**.

Comments and submissions can be lodged by:

Website: https://www.infrastructure.gov.au/have-your-say/

Post: Broadcast and Technology Policy Section
Consumer Safeguards, Media and Connectivity Division
Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts
GPO Box 594
CANBERRA ACT 2601

Comments and submissions should include the respondent's name, organisation (if applicable) and contact details. Questions about the consultation process can be directed to media.reform@communications.gov.au.

Publication of submissions and confidentiality

All submissions will be made publicly available by the department unless a respondent specifically requests that a submission, or a part of a submission, including names of persons and/or organisations, contact details and information that may be commercially sensitive, be kept confidential.

The department reserves the right not to publish any submission, or part thereof, which in its view contains potentially offensive or defamatory material, or for confidentiality reasons. Comments will not be published.

The department is subject to the *Freedom of Information Act 1982* and comments and submissions may be required to be disclosed by the department in response to requests made under that Act.

Consultation questions

Technology scenarios

1. Would one or more of the technology scenarios depicted in this paper represent a sensible and sustainable way of delivering free-to-air television services over the medium- to longer-term?
    a. Is there a preferred scenario from those described, or an alternative that isn't represented?
    b. Could a particular scenario be altered to provide a suitable technology mix for free-to-air television, including through the variations noted for each of the main scenarios?
    c. Should this scenario (or elements of it) be combined with one of the other scenarios?
    d. How do the relative strengths and weaknesses of this scenario compare with those of the other scenarios outlined in this paper?

Technical pre-conditions

2. Are there any specific pre-conditions or minimum thresholds that would need to be met before an optimal technology scenario could be considered to be viable? For example, achieving:
    a. a particular level of take-up of high-speed internet in Australian households;
    b. a certain level of usage of BVOD services by Australian viewers; or

c. a given household adoption rate for television devices capable of receiving more advanced television standards and compression formats?

3. What actions or initiatives might enable these pre-conditions or thresholds to be met?

Broader pre-conditions

4. What other changes would be needed to ensure Australians can access free-to-air television services providing news, entertainment and sport? For example, regulatory changes?

Consumers

5. Which of the technology scenarios described in this paper, or an alternative, would:
   a. maximise the ability to access free-to-air television services for all Australians that wish to do so; and
   b. enhance the quality and diversity of free-to-air television services available to these consumers?

Infrastructure

6. What impact would the technology scenarios depicted in this paper, or any alternatives, have on broadcasting and broadband infrastructure networks?
   a. What are the expected impacts on the operation and performance of the network(s), including impacts on other users?
   b. What investment might be required to implement these scenarios to enable the network(s) to reliably provide free-to-air broadcasting services and content over the medium-to longer-term?
   c. What additional costs might be incurred, or cost savings realised, by the owners and / or providers of network infrastructure once the scenarios, or any alternatives, were implemented?
   d. To what extent would the scenarios depicted in this paper, or any alternatives, affect the revenue-generating capacity of the owners and / or providers of network infrastructure?

Spectrum

7. If it was possible to free up UHF spectrum under one or more of the scenarios depicted in this paper, is there a minimum quantum of spectrum needed to support a viable dividend for allocation to other uses?
   a. Does the minimum viable amount of freed-up spectrum differ from what might be optimal?
   b. When would this spectrum need to be made available for alternative uses?
   c. What technical or other characteristics would be necessary to ensure any freed-up spectrum is able to be deployed for other uses?
   d. To what extent does this consideration of a viable spectrum dividend depend on international approaches to spectrum allocation and use?

Devices and equipment

8. What impact would the scenarios depicted in this paper, or any alternatives, have on the manufacture, supply or use of communications devices and equipment, including: television sets and other connected devices; home routers, modems and Wi-Fi systems; broadcasting transmission and related equipment; and handheld microphones and other wireless devices?

Timeframes

9. At what point would a choice regarding a particular technology scenario or scenarios need to be made in order to support the sustainable provision of free-to-air television service and content over the medium-to longer-term? Within two years? Three years? Another time period?

10. Would this choice need to be made at a whole-of-industry level, or could it be open to individual broadcasters to determine when and if they sought to implement a particular technology configuration? What are the pros and cons of these alternatives?

Appendix A: Television technology scenarios

A range of factors will influence the future of free-to-air television, and one of the key determinants will be the technologies used to deliver services to audiences. This is changing rapidly. Australians have embraced the online consumption of audio-visual content in parallel with a longer-term decline in broadcast viewing. What is unknown is how far these trends will play out.

Three possible technology configurations are described in this appendix. They represent three ways in which a combination of technologies *could be used* to deliver free-to-air television services in the long-term, based on current trends. Although not exhaustive, these scenarios are intended to prompt consideration of a critical strategic issue for the free-to-air television industry and for government, given the key role these services play in supporting important policy objectives.

1.1 Technology scenario 1 – partial online

1.1.1 Outline

The partial online scenario would see broadcasting retained as a key mechanism for delivering free-to-air television services, alongside the online medium.

- The key change under this scenario would be a modest consolidation in the infrastructure used to provide commercial television broadcasting services. Specifically, commercial television services in each licence area would be provided via two (rather than the current three) multiplexes, using the DVB-T standard and the MPEG-4 video compression format.
- BVOD services would be provided as they currently are, and a satellite-based safety net service (VAST, or an equivalent) would continue to operate, providing viewers in remote areas, or those in areas with inadequate terrestrial reception, with access to free-to-air television services.

Table 1: Possible elements of a partial online scenario

Elements	Details
Broadcasting technology	DVB-T standard and the MPEG-4 video compression format. DVB-S2[17] standard and the MPEG-4 video compression format.
Multiplex configuration	Partial planned multiplex sharing – consolidate commercial television services to two multiplexes in all markets.
Services	Broadcast – maintain commercial channels in remote and small regional markets; reduce the channel offering in larger regional and metro markets. Online – maintain the BVOD offering for linear and on-demand content.
Online technology	OTT[18] for BVOD services.

Note: potential variations to these key elements of the partial online scenario are considered in section 1.1.4.

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[17] DVB-S2 is the "second generation" modulation and channel coding system for the satellite delivery of the DVB standard (DVB-S). See: DVB (1 November 2014), 'DVB-S2 (Second Generation Satellite)', *DVB*.
[18] 'Over-the-Top', or OTT, means broadcasts are distributed via the open internet, directly to viewers, rather than through a dedicated distribution or transmission network

Of the scenarios depicted in this paper, partial online is the closest to current arrangements. It would effectively extend two processes that are already underway in the Australian television market.

- The transition of all terrestrially-broadcast services from the MPEG-2 to MPEG-4 video compression format. This is reasonably well-advanced, with the majority of commercial television broadcasters in remote and regional markets, and some broadcasters in certain metropolitan markets, having completed a full transition to MPEG-4 (i.e. with no services provided using MPEG-2).
- The consolidation of the channels provided by more than one commercial television broadcasting licensee on a given multiplex. This is more nascent. To date, only the WIN Network has completed such a consolidation in Mount Gambier, Riverland and Griffith.

However, if progressed in all licence areas, this scenario is likely to require a reduction in the number of commercial television program streams (channels) provided via the consolidated broadcast infrastructure, compared to current arrangements. This is because the current range of commercial channels are unlikely to fit on two multiplexes in the larger regional and metropolitan areas.

This scenario could be implemented as either a transitional arrangement ahead of the adoption of another scenario, or as the settled approach for Australia's television technology.

1.1.2 Technology configuration

Broadcasting

Terrestrial broadcasting

Under this scenario, commercial television broadcasting services would be provided on two DVB-T multiplexes rather than three in all markets, using the MPEG-4 compression format. This type of consolidation has already occurred in Mount Gambier, Riverland and Griffith, and is being considered in other markets.

Partial consolidation of multiplexes in this way is likely to be possible in the markets of Broken Hill, Remote Central and Eastern Australia, Remote and Regional Western Australia, and Spencer Gulf without any changes to the current service offering.

However, in all remaining markets, partial multiplex consolidation would require at least some change in the number of commercial television broadcasting channels provided (assuming no changes to the television transmission standard or any material reduction in service quality).

- This could range from a small reduction in the number of datacasting (shopping) channels provided, through to more substantiative cuts to the suite of channels offered, or to the multiplex bitrate made available to particular channels.[19]
- More significant changes to the channel line-up would be required in the larger regional and metropolitan markets, as more channels are provided in these areas.

In addition to the potential for multiplex consolidation, the transition of all services from the MPEG-2 to MPEG-4 compression format may – from a technical perspective – provide scope for an 'HD uplift' for certain channels (providing them in HD rather than SD quality), or to provide an additional channel of content (either in SD or HD). This will ultimately depend on whether there is sufficient capacity on a given multiplex in a given market, and a range of technical considerations and operational choices.

Satellite broadcasting

Under this scenario, it is assumed that a safety-net broadcasting service would be provided under a direct-to-home model using geostationary satellites. The is the basis of the current government-funded VAST platform

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[19] Multiplex capacity used by a particular channel is typically not fixed or static, but managed dynamically as part of the overall capacity of the multiplex. This is known as statistical multiplexing. For example, at a given point in time, making additional bit-rate available for coverage of a sporting fixture (to enable high audio-visual quality), and less bitrate to a concurrent news bulletin broadcast on another channel (which may require less bitrate). This results in an overall enhancement in the efficiency of the multiplex. Any 'reduction' in bitrate made available to a datacasting channel would take place as part of the overall management of the capacity of the multiplex.

that provides access to commercial television services for viewers in remote areas, or those who are otherwise unable to access terrestrial television broadcasting signals. The current funding agreements for VAST expire in 2031. Under this technology scenario, it is assumed that the service would continue to be provided. This would use DVB-S2 modulation, carrying MPEG-4 video encoded programs, with signals transmitted in the 11.7 to 12.7 GHz range of the Ku satellite band. It is also assumed that the commercial television services carried on the satellite service would continue to match those provided in the corresponding remote terrestrial markets.

Online

Under this scenario, it is assumed that free-to-air broadcasters would continue to provide services online in much the same manner as they currently do. Today, this is primarily via standalone BVOD apps that are developed by broadcasters.

- BVOD services provide a range of linear and on-demand programming that, due to fewer technical limitations on the number of titles broadcasters can make available, offer a greater volume of content compared to traditional broadcasts. BVODs also allow broadcasters to offer programming at differing levels of video quality – from SD through to full HD and (potentially) 4K.
- These apps generally operate on a standalone basis (one per broadcaster) and provide programming and content for that specific broadcaster. Multiple versions of these apps are commonly developed for particular devices or operating systems.
- The main BVOD apps are ABC iview, SBS On Demand, 10 Play, 9Now, 7plus and CTV+.[20]

As with most online streaming services, BVOD apps operate on an 'Over-the-Top' or OTT basis, meaning they are distributed via the open internet, directly to viewers, rather than through a dedicated distribution or transmission network. They are also one-to-one or 'unicast' services,[21] rather than 'multicast'[22] (one to-many), supported by Content Delivery Networks (CDNs) that help to manage traffic flows.

Given the expected importance of on-demand content to the future of free-to-air television, all of the main technology scenarios depicted in this paper assume OTT service provision, under a unicast model. However, these assumptions could be varied, and potential alternatives are considered in more detail in the relevant 'scenario variation' sections of the paper.

1.1.3 Indicative impacts

The partial online scenario would involve a minimal change to the technologies used to provide commercial free-to-air television services. It would be based on the premise that the DVB-T multiplexes should continue to provide free-to-air television services in the longer-term in broadly the same manner as they are now, and that the online medium would augment rather than replace broadcasting.

Broadcasters

The impact on commercial broadcasters is likely to be modest, although this will vary by broadcaster and assumes that the 'dual medium' model – operating broadcast and online services concurrently – will be financially sustainable over the long-term.

These broadcasters would have the opportunity to realise cost savings at the margins as a result of multiplex consolidation: reduced capital and ongoing costs (subject to the operation of third-party service contracts); and reduced spectrum charges (assuming any such charges are in place in the long-term).

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[20] CTV+ is a jointly operated app for community television services C31 and C44.
[21] A unicast system is a 'one-to-one' model for delivering content to a given receiver. In a unicast system, a single source transmits separate copies of data to each individual, rather than sending this data to a group of recipients. The data (i.e. a program or live-stream) may be the same, but it is sent to each individual separately.
[22] A multicast system is a 'one-to-many' model for delivering the same content feed to many premises. In a multicast system, a single source transmits data to a designated group of recipients, rather than sending separate copies to each individual, saving bandwidth and reducing network load.

There may also be opportunity for an 'HD uplift' for certain channels (offering them in HD rather than SD), or to provide an additional channel of content (either in SD or HD). The costs of providing the VAST (or an equivalent) would be relatively unchanged under this scenario, given the minimal changes in the terrestrial service offering.

The net impact on commercial broadcasters is likely to depend on the overall audience response to the dual medium model. The reduction of the broadcast channel offering could potentially reduce audiences (and revenue), although programming costs may also fall marginally (depending on the impact of rights and affiliation deals). Ultimately, the opportunity for an uplift in audiences under this scenario is likely to come from the online medium. While broadcasters wouldn't be technically constrained in the quantum and quality of programming they could make available on their BVOD services, their capacity to invest in content and service enhancements might be financially constrained as a result of the continued operation of broadcast networks.[23]

There would be no direct impact on national or community broadcasters under this scenario, assuming that technology changes are limited to the commercial sector.

Consumers

Consumers wouldn't need to purchase new television equipment, and most wouldn't need to retune sets, to receive broadcast services provided on any shared multiplexes. The cohorts of viewers that tend to rely most on free-to-air television services – those that are older, with lower incomes, living in remote and regional areas – would not be disadvantaged relative to those with the capacity and willingness to access services online. Viewers that access VAST are unlikely to be affected under a partial online scenario, as it assumes that there would be no material change to the operation of the satellite platform. This scenario assumes that broadcasters continue to operate and invest in their BVOD apps, and to the extent that this is sustainable, consumers would continue to have access to linear and on-demand content via these online services. However, this will require viewers to have a suitable internet connection, and there will be ongoing costs associated with this connectivity.

Third-party service providers

The impact on third-party service providers of broadcasting services – contribution, playout, distribution and transmission[24] – would depend on the duration and operation of relevant service contracts. However, over the longer term, shared multiplexing can be expected to marginally reduce demand for these services. The demand for capacity for the satellite-based safety net service may also reduce marginally, although this would depend on contractual arrangements and technical factors.

One nascent factor that will impact broadcasters, consumers and broadcast infrastructure providers under this scenario is the number of dwellings that are able to connect to a broadcast signal. More than three quarters of Australians used 'traditional connections' to watch free-to-air content in 2024[25], and 73% of Australian homes were able to connect to an aerial or antenna and receive television broadcast signals in 2025.[26] However, based on current trends, this is expected to decline gradually over time. This may impact the long-term viability of broadcasting as a content delivery mechanism.

Network operators and other spectrum users

The impact of this technology scenario on broadband networks is likely to be relatively modest, assuming that the progressive, gradual transition of viewers to the BVOD service offering to date continues over the medium- to long-term. However, data traffic and congestion may be more marked if the audience transition to online were to accelerate.

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[23] The opportunity for growth in the online environment is not something that is currently available to commercial television broadcasters that don't hold digital content rights and don't operate BVOD services.
[24] These third-party service providers own and operate relevant broadcasting infrastructure, monitor and manage the infrastructure owned by broadcasters, or provide standalone services under contract with broadcasters.
[25] R Lobato, J Wallace, A Dharmawardhana, A Scarlata, D Featherstone (September 2026) *TV Technology and Market Assessment*, DITRDCSA, p 99.
[26] DITRDCSA (September 2026) *Television and Media Survey 2025 – final report*, DITRDCSA, p 100.

Similarly, this scenario may see a modest increase in demand for online services that help to reduce load times and improve service reliability, such as CDNs, and services that support the design of user interfaces and other elements of BVOD apps and services.

The partial online scenario would provide for the more efficient use of spectrum to a degree, enabling the same services to be provided with fewer RF channels in certain markets. However, the capacity to realise a meaningful spectrum dividend for allocation to other users is expected to be limited for this reason. Mobile network operators have indicated an interest in 600 MHz spectrum for future 6G services, and this scenario is highly unlikely to enable the reallocation of a meaningful quantum of spectrum for this potential use.

1.1.4 Scenario variations

The partial online scenario describes a set of relatively modest changes to the technology used to broadcast free-to-air television services. There are a number of ways in which this scenario could be varied, and views are sought in relation to these variations, along with the main scenario.

Additional multiplex consolidation

A '3 to 2' consolidation of commercial television multiplexes isn't the only way in which broadcasting infrastructure consolidation could be pursued.

A more aggressive form of consolidation would involve providing the program streams or channels of three commercial television licences using one multiplex, rather than two. However, assuming the continued use of DVB-T and MPEG-4, this would require significant reductions in the suite of channels provided.

Broadcasting infrastructure consolidation could also extend to the services provided by other sectors of the free-to-air television industry.

- The services of the ABC and SBS could be provided on one rather than two multiplexes. However, this would require a reduction in the suite of channels offered (assuming no other technology changes other than the use of the MPEG-4 compression format).
- It may also be technically possible for the existing community television broadcasting services – C44[27] and C31 – to be consolidated on to a commercial or national multiplex in each of Adelaide and Melbourne (respectively). This is likely to necessitate some change to the bitrates allocated to the other channels.

Non-uniform multiplex consolidation

It may be possible to pursue broadcasting infrastructure consolidation differently in different markets. For example:

- The '3 to 2' consolidation of commercial television multiplexes could be pursued in larger regional markets.
- A more aggressive '3 to 1' consolidation (described in the preceding section) could be adopted in remote and smaller regional markets.
- The status quo (3 separate multiplexes) could be retained in metro markets (meaning no multiplex consolidation in these larger markets).

A non-uniform approach to multiplex consolidation would affect the distribution of costs for broadcasters, and the extent to which a spectrum dividend may be able to be realised.

IPTV and multicasting

The partial online scenario assumes that free-to-air television content is provided OTT (via the open internet), and via a unicast model (one-to-one). These assumptions could be varied.

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[27] C44 is Adelaide's community television station. However, the station technically operates under an open narrowcast licence.

- Multicasting might, in theory, provide for a more efficient use of available broadband capacity than unicast. However, multicasting would generally only allow for linear content delivery (not on demand), along with some push VOD functionality (if relevant devices had sufficient hard drive capability). Multicasting may also have network implications that could require changes in the configuration of infrastructure at various levels.

- A dedicated Internet Protocol television (IPTV)[28] service could be developed to provide free-to-air television content to households over broadband in a way that does not utilise the open internet (i.e. a dedicated distribution network rather than an OTT service). However, further work would be needed to assess the technical and financial feasibility of any such IPTV model.

Growth in consolidated apps and aggregator services

At present, BVOD apps are the primary mechanism to deliver free-to-air content online. However, this may change over time. Free-to-air television content can also be provided via consolidated apps that provide the linear and on-demand content of more than one broadcaster.

- The Freeview app brings Australia's free-to-air broadcasters onto a single platform, utilising HbbTV's hybrid mix of digital terrestrial broadcast TV enhanced with internet-enabled features.

- BritBox provides on-demand content from the BBC, ITV, Channel 4 and Channel 5 in a number of countries (including Australia), although this operates on subscription rather than free-to-air basis.

Free-to-air broadcasting programming and content could also be made available via aggregator services or integrated content platforms, rather than solely via consumer-facing apps. This could involve the provision of specific titles (i.e. episodes or series), IP feeds of linear channels, or virtual playlist channels (among other potential arrangements), in addition to broadcaster apps. Some of these features are already included in connected TV devices, including the Fetch TV, Foxtel iQ and Hubbl devices. These trends may not evolve into full adaptive user interfaces that contain no apps, but rather personalise content and programming using artificial intelligence.[29] The use of consolidated apps and non-app-based aggregator services may grow over time, and BVOD apps may lose their primacy in terms of online content distribution.

1.2 Technology scenario 2 – online-dominant

1.2.1 Outline

Under the online-dominant scenario, the online medium would be the main mechanism for delivering free-to-air television services, with broadcasting operating as a supplementary medium. Effectively, broadcasting would be a 'nightlight' service for viewers unable or unwilling to adopt online-delivered television services.

- The key proposed change under this scenario would be a significant reduction in the infrastructure used to provide free-to-air television broadcasting services and, in turn, a commensurate reduction in the number of channels provided. Specifically, television services in each licence area would be provided on one multiplex, using the DVB-T standard and the MPEG-4 video compression format. Alternative multiplex configuration options also are canvassed in section 1.2.4.

- BVOD services would be the primary distribution mechanism for free-to-air television, and a satellite-based safety net service would be provided for viewers in remote areas, or those in areas with inadequate terrestrial reception (although with a smaller content offering to match terrestrially-broadcast services).

A variation to this technology configuration would see the full migration of free-to-air television services to the online medium. This possible variation is canvassed in more detail in section 1.2.4.

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[28] IPTV involves the distribution of content through a closed, proprietary and optimised broadband network, typically provided by (or in conjunction with) an RSP. IPTV video streams are encoded into a series of internet protocol packets and then carried out through the public internet which means it can be received by anyone who owns a compatible set-top box and (typically) a subscription for the service.

[29] CESA (2024), *Senate Committee Inquiry into Communications Legislation Amendment (Prominence and Anti-siphoning) Bill 2023*, Parliament of Australia, p 5.

Table 2: Possible elements of an online-dominant scenario

Elements	Details
Broadcasting technology	DVB-T standard and the MPEG-4 video compression format. DVB-S2 standard and the MPEG-4 video compression format (noting that alternative satellite technologies are considered in section 1.2.4)
Multiplex configuration	Extensive planned multiplex sharing – consolidate all free-to-air television services to one multiplex in all markets.
Services	Broadcast – one channel (program stream) per broadcaster in all markets. Online – enhance the BVOD offering for linear and on-demand content.
Online technology	OTT for BVOD services.

Under the main online-dominant scenario depicted in this paper, choices would need to be made regarding the 'core' channels that would form part of the reduced broadcast offering. To enable consideration of a tangible option, this paper assumes that the nightlight service would comprise:

- one program stream (or channel) per broadcaster;
- operated terrestrially as part of a single, shared multiplex in each area using DVB-T and MPEG-4; and
- a matched satellite-based safety net service in remote licence areas and where terrestrial reception was not available.

As with technology scenario 1, the option could be implemented as a transitional arrangement ahead of the adoption of another scenario, or as the settled approach for Australia's television technology.

1.2.2 Technology configuration

Broadcasting

Terrestrial broadcasting

Under this scenario, all free-to-air television services – commercial, national and community – would be provided terrestrially on a single, combined multiplex in each area, using the DVB-T standard and the MPEG-4 compression format. This would be a substantive reduction in television infrastructure compared with the current arrangements, where between four and six multiplexes are in operation (depending on the market).

This would permit five or six television channels (program streams) to be provided on a single multiplex, assuming average bitrate requirements for SD and HD services of 1.5 and 4.3 Mbps respectively: two national broadcasting channels; three commercial channels; and one community channel in markets where such channels are provided (currently Melbourne and Adelaide).

This would involve a significant reduction in channels, given that free-to-air broadcasters currently provide around four separate channels on each of their respective, standalone multiplexes,[30] although this varies from three to seven depending on the market (including datacasting and racing channels and excluding simulcasts).

Indicative channel capacity

Figure 2 describes two possible configurations of a single, shared multiplex: one with five television channels; and one with six. This would include ABC and SBS radio services, along with an additional multiplex overhead.

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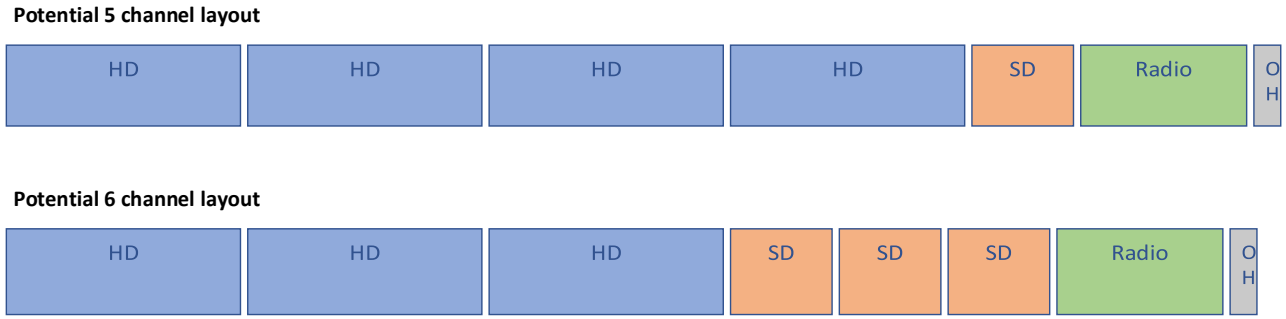
[30] Except for WIN Network, which has consolidated the program streams from the Seven Network and Network 10 onto a single multiplex in Mount Gambier / South East TV1, Riverland TV1 and Griffith and MIA TV1 licence areas.

Figure 2: Indicative channel configurations on a single multiplex under the online-dominant scenario



Notes: This depiction of possible multiplex configurations assumes that HD channels utilize 4.3 Mbps and SD 1.5 Mbps, inclusive of video, audio and subtitles. These possible multiplex configurations also assume that ABC and SBS radio draws on a total available bit rate of 3.0 Mbps, and that a further 1.1 Mbps is made available as a multiplex overhead (for service information and null packets). This graphic therefore presents a static representation of the distribution of multiplex capacity. In reality, this would be dynamically managed through the use of statistical multiplexing. With the caveat, this would suggest a total (static) bit rate usage of around 22.8 Mbps for the possible 5 channel allocation (assuming 4 HD and 1 SD channels), and around 21.5 Mbps for the possible 6 channel allocation (assuming 3 HD and 3 SD channels). Source: departmental analysis.

This would require the use of holistic statistical multiplexing,[31] and one or more channels may need to be provided in SD quality at any given point in time in order to accommodate television services, along with the radio services of the ABC and SBS.

Satellite broadcasting

It is assumed that a satellite-based broadcasting service would continue to operate as a safety net for audiences that are not able to access commercial television broadcasting signals under this scenario. As a baseline, and in order to present a tangible option, it is assumed that this would operate as a 'direct-to-home' arrangement using one or more geostationary satellites.

This is the technology configuration for the current VAST platform, which provides access to commercial free-to-air television services for viewers in remote areas, and for those in areas with inadequate terrestrial reception. However, under an online-dominant technology scenario, there may be merit in considering alternative satellite technologies to support the provision of the safety net service. This is considered further under the scenario variations section.

Irrespective of the satellite technology used, for this scenario, it is assumed that the commercial television services carried on the safety-net service would continue to match those provided in the corresponding remote terrestrial markets.

Shared multiplexing

Under the online-dominant scenario, broadcasters would share capacity on one multiplex. This would necessitate changes to contribution, playout and distribution arrangements.

- Contribution and playout: shared multiplex arrangements are likely to require all uncompressed broadcast signals to be brought together at a central location. It is likely that the shared multiplex would need to be played out of the same facility and would also need to use a common hardware and software set up for encoding and multiplexing.
- Distribution: commercial television services are typically off-air fed (i.e. receiving and rebroadcasting a terrestrial signal from a distant terrestrial transmitter), while the television services of the national broadcasters are typically satellite-fed (with the exclusion of metropolitan markets). Off-air inputs may need to be upgraded to microwave links or fibre, and this requirement would be elevated for any

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[31] Statistical multiplexing refers to a process of dynamically allocating the available bitrate dependant on the bitrate requirements of each program stream or service. Statistical multiplexing in a 'holistic' manner is where dynamic bit rate allocation is undertaken for all services on the multiplex, in contrast with a 'sequestered' multiplex (where a multiplex is divided into smaller fixed capacity segments). Holistic statistical multiplexing is likely to be required to manage capacity on a single multiplex, and in turn this would require a multiplex manager to make dynamic real time decisions about how capacity should be allocated across a channel offering. This would raise commercial and legal issues that would need to be carefully assessed and settled.

additional use of Single Frequency Networks[32] (SFNs), which typically require the use of direct-link feeds such as microwave to meet stricter timing requirements.

- Transmission: commercial and national broadcasters don't always have the same coverage patterns, particularly at higher power sites. As such, there may be a need to install new antennas at certain sites to accommodate these differences, which may affect overall coverage outcomes. Shared multiplexing may also necessitate re-housing of equipment at transmission sites to one building and tower and (where necessary) upgrade equipment and renegotiate site access arrangements.

Online

Under the online-dominant scenario, it is assumed that free-to-air television services would be predominantly distributed online in the medium- to longer-term. Today, this is primarily via standalone BVOD apps that are developed by broadcasters. In order to present a simple, tangible option, this scenario assumes that BVODs would continue to be a key online distribution format. However, as outlined in section 1.2.4, online delivery could also utilise consolidated apps (on which the linear and on-demand content of more than one broadcaster is provided), or integrated content platforms operate alongside, or instead of, BVOD apps.

As with each of the scenarios depicted in this paper, it is assumed that the provision of free-to-air television online would be on an OTT basis, rather than through a dedicated distribution or transmission network, and one-to-one or 'unicast', rather than multicast' (one to-many), supported by CDNs that help to manage traffic flows. Again, these assumptions could be varied.

1.2.3 Indicative impacts

The online-dominant scenario would constitute a significant change to the technology used to deliver free-to-air television, based on the premise that the online medium should take the lead role in providing free-to-air television, supplemented by a nightlight broadcasting service for those Australians unable or unwilling to access services online.

Broadcasters

The impact on broadcasters is likely to be significant, although this will depend on whether they are able to provide services online (noting that certain regional commercial broadcasters don't currently operate such services due to rights and affiliation deals), and whether operating broadcast and online services concurrently is financially sustainable over the long-term.

Collectively, free-to-air television broadcasters would have the opportunity to realise significant cost savings from operating one rather than as many as a five or six separate multiplexes, although this will depend on the nature and quantum of any decommissioning costs and operation of third-party service contracts.

Commercial television broadcasters may also have the opportunity to reduce any spectrum charges (assuming any such charges are in place in the long-term). However, there would be little or no opportunity for uplift to the number or audio-visual quality of broadcast services. Any such service and content enhancements would need to occur on the online medium.

The costs of providing a satellite-based safety net service are likely be reduced if the service were to match the reduced terrestrial broadcast offering, although this would ultimately depend on the technology and network configuration used to provide the content.

The net impact on broadcasters is likely to depend on whether the consumers are willing and able to make the transition to online viewing. The nightlight broadcasting service is likely to attract a smaller audience (with any peaks focused on time-dependent programming like sports), and BVOD services would need to take a far

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[32] SFNs are a type of transmission network where different transmitters in the network broadcast identical content, synchronised in time and on the same frequency. SFNs are used extensively in many areas of Australia as part of the provision of free-to-air television services. SFNs are discussed in more detail in technology scenario 3: broadcasting technology enhancement.

more prominent role in generating audiences and revenue. The quantum of audience viewing and engagement online would be important in this regard.

As highlighted in Figure 1, over half of Australian households are currently hybrid households when it comes to free-to-air television: consuming both broadcast and online services. However, BVOD viewing comprises a relatively small proportion of overall viewing: 19.1% of total minutes spent watching free-to-air television in the first half of 2026.[33] The relative proportion of online and broadcast viewing would need to shift in favour of the former if broadcasters are to operate sustainably over the longer term under this online-dominant scenario.

Consumers

Consumers would not need to upgrade their reception equipment, or retune devices, to receive broadcast services, although the range of programming on the nightlight service would be substantially reduced compared with the situation today. However, if broadcasters are able to re-invest savings from the reduction in broadcasting services in their online service offering, this may boost the range and quality of programming available to consumers.

Accessing these online services would require viewers to have a suitable internet connection, and there would be ongoing costs associated with this online connectivity. If broadcasters intend to provide UHD (4K) content via the internet, a proportion of Australian households may need to upgrade their existing internet plans over time to access those services. Older Australians, those living in regional areas, those with relatively lower incomes and those no fixed internet connection are likely to find any such upgrades the most challenging.

Those consumers that rely on the VAST service would continue to have access to this platform, assuming that this continues to be used to provide the safety-net service, although the channel offering would be reduced in line with terrestrial services under this scenario.

Third-party service providers

The impact on the providers of third-party services – contribution, playout, distribution and transmission[34] – would depend on the duration and operation of relevant service contracts. However, over the longer term, the use of a single multiplex (rather than the current five or six multiplex arrangement) would significantly reduce demand for these services. The demand for satellite capacity for the satellite-based safety net service may also reduce due to the reduced service offering.

The gradual decline in the number of households with an aerial connection – noted in relation to technology scenario 1 and currently at around three quarters of Australian homes – is also relevant to this scenario. These impacts may be mitigated to the extent that 'broadcast-only' households are able to make the transition online, and are therefore able to take-up BVOD services. However, in the circumstance where a cohort of households is unable or unwilling to do so, the capacity of households to connect to RF transmissions is likely to be relevant in considering the viability of this scenario.

Network operators and other spectrum users

The impact of this technology scenario on broadband networks is expected to be moderate, although this would depend on how rapidly audiences migrated to BVOD services. The relatively limited content offering on the nightlight broadcasting service may incentivise households to use the online medium to access free-to-air television, on top of the general preference for on-demand rather than linear (scheduled) programming. If this were to eventuate, there may be an additional load on networks, particularly at peak viewing times, adding to the underlying growth in data usage over broadband networks in Australia.

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[33] VOZ (2026) 'VOZ Total TV Viewing Report – H1 2026', *VOZ*, p 12.

[34] These third-party service providers own and operate relevant broadcasting infrastructure, monitor and manage the infrastructure owned by broadcasters, or provide standalone services under contract with broadcasters.

Similarly, this scenario may see a modest increase in demand for online services that help to reduce load times and improve service reliability, such as CDNs, and services that support the design of user interfaces and other elements of BVOD apps and services.

The online-dominant scenario would provide for a substantial reduction in the amount of spectrum used for television broadcasting. This is likely to provide the capacity to realise a meaningful spectrum dividend for allocation to other users. Mobile network operators have indicated an interest in 600 MHz spectrum for future 6G services.

However, the potential reallocation of 600 MHz spectrum may have impacts on wireless microphones and other wireless audio devices, which currently use gaps in this spectrum. These gaps are likely to be reduced if broadcasting services are consolidated onto fewer multiplexes and freed up spectrum is reallocated to other uses. Broadcasters are extensive users of wireless microphones themselves, and these devices are also used by other groups such as schools, places of worship, community centres and theatres, among others.

1.2.4 Scenario variations

The online-dominant scenario describes a set of fairly extensive changes to the broadcasting technology used to deliver free-to-air television services. There are a number of ways in which this scenario could be varied, and views are sought in relation to these variations, along with the main scenario.

Complete online migration

The main online-dominant scenario described above contemplates the ongoing use broadcasting; albeit in a much reduced capacity. An alternative would be the full online migration of all free-to-air broadcasting services. Television broadcasting infrastructure and services would, under this approach, be decommissioned and no longer used to provide television services to consumers.

This would be a planned and deliberate choice, and not simply the result of an organic transition from the broadcast medium to the online. It assumes that a tipping point is reached where it is no longer economically viable to broadcast free-to-air television, and that online services are a more efficient and cost-effective mechanism to reach audiences. A complete online migration could either occur immediately, or following a period of nightlight broadcasting.

The closure of a long-established network for the distribution of entertainment and news content would be a substantial undertaking with the potential for significant disruption, particularly for the segments of the Australian community that lack the skills, resources or interest in viewing television online. Substantial, long-term investment in planning, coordination and public education would be required to mitigate these potential risks.[35] Given that this would be a substantial variation on the online-dominant scenario, the indicative impacts are sketched out below.

Broadcasting

Collectively, free-to-air television broadcasters would have the opportunity to realise substantial ongoing cost savings as a result of not operating broadcasting multiplexes, including in relation to electricity, rent and maintenance, although the net impact would depend on the nature and quantum of any site decommissioning costs and the operation of third-party service contracts.

Broadcasters may also be able to avoid additional capital expenditure, given that powered components at many remote and regional broadcast sites are in need of replacement. Commercial television broadcasters would also face no spectrum charges, in the event that any such charges are in place in the long-term, while the cessation of the VAST service would realise cost savings for the holders of relevant licences and the Commonwealth.

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[35] The 2024 Regional Telecommunications Review found that greater government oversight, reporting and support are needed to ensure that major technological transitions are well-managed and do not leave regional, rural and remote communities feeling exposed. Australian Government Regional Telecommunications Review (2024) *2024 Regional Telecommunications Review*, Australian Government, p 110.

Consumers

For consumers, the online medium provides scope to expand the range and quality of programming and deliver service enhancements, particularly if broadcasters are able to re-invest savings from the cessation of broadcasting into these services. This assumes that all viewers have suitable broadband connectivity and are willing and able to take up the online offering. This isn't the case today, with around 20% of households only watching free-to-air television via traditional means.[36] The proportion of broadcast-only households is expected to decline over time, but to the extent that they are present in the longer term, they would potentially be adversely affected by this scenario. Broadcast-only households are typically comprised of older Australians, living in regional areas, with relatively lower incomes, and no fixed internet connection. Separately, if broadcasters intend to provide UHD (4K) content via the internet, a proportion of Australian households may need to upgrade their existing internet plans over time to access those services. The ultimate consumer outcome under this scenario would also be influenced by the technology and broadband plan they use to access the internet.

Third-party service providers

There are likely to be significant impacts on third-party service providers under this scenario, although this will depend on whether the services being provided are supporting broadcast or online distribution. Third-party providers of broadcasting-aligned services are likely to face significant negative impacts as there would be a cessation of these services by broadcasters. However, a positive impact is likely for third-party providers of services that enable BVODs, with an increase in the demand for digital agencies and similar firms. Any reduction in the number of broadcasting transmission sites may also affect telecommunications service providers that utilise these towers to provide services.

Network operators and other spectrum users

The impact on broadband networks is likely to be significant, depending on the transition to and timing of the closure of broadcast services. This may result in additional pressures on networks and data congestion, particularly at peak viewing points, and in turn necessitate further network investment.

The online-only scenario would free-up 42 MHz of VHF spectrum and 168 MHz of UHF spectrum for other possible uses, although consideration would need to be given to other users of UHF spectrum (including microphones and audio equipment).

Satellite broadcasting as the sole platform for the nightlight service

A satellite platform could be used to provide the nightlight broadcasting service, with no terrestrial broadcasting. This could potentially reduce the overall costs of providing the nightlight service. The satellite platform could be a dedicated, direct-to-home offering akin to VAST, provided via geostationary satellites where consumers install a roof-mounted dish and cabling and use a dedicated set-top-box to access the service. This would require viewers who wished to receive broadcast services, and who don't currently do so via VAST, to install relevant reception equipment.

It may also be possible to use a different satellite technology to deliver the nightlight service, such as LEO satellites. LEO sat networks generally provide broadband access, and hence the provision of free-to-air television services would be a streaming option, rather than a dedicated medium for broadcasting. Consumers would need to install the necessary LEO sat reception equipment and pay for broadband access. As such, a LEO sat-delivered nightlight television offering would not be 'free' to viewers at the point of consumption in the same way as a traditional satellite broadcasting.

Different methods for delivering free-to-air services online

The online elements of each of the future technology scenarios depicted in this paper assume that online free-to-air television content is provided OTT (via the open internet), and via a unicast model (one-to-one). As noted in relation to technology scenario 1, there are alternatives.

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[36] DITRDCSA (September 2026) *Television and Media Survey 2025 – final report*, DITRDCSA, p 13.

- Multicasting might, in theory, provide for a more efficient use of available broadband capacity than unicast. However, multicasting would generally only allow for linear content delivery (not on demand), along with some push VOD functionality (if relevant devices had sufficient hard drive capability). Multicasting may also have network implications that could require changes in the configuration of infrastructure at various levels.
- A dedicated Internet Protocol television (IPTV) service could be developed to provide free-to-air television content to households over broadband in a way that does not utilise the open internet (i.e. a dedicated distribution network rather than an OTT service). However, further work would be needed to assess the technical and financial feasibility of any such IPTV model.
- Similarly, free-to-air television content could be provided via consolidated apps that provide the linear and on-demand content of more than one broadcaster, rather than solely via consumer-facing apps. This content could also be provided on integrated content platforms that operate alongside, or instead of, BVOD apps.

1.3 Technology scenario 3 – broadcast enhancement

1.3.1 Outline

The broadcast enhancement scenario would see the broadcasting medium upgraded to a newer, more efficient standard, to operate alongside the online medium.

- The key proposed change under this scenario would be the use of the DVB-T2 standard[37] for terrestrial television broadcasting, rather than DVB-T. This would permit free-to-air broadcasters to operate using fewer multiplexes and (potentially) to offer more services at a higher quality.
- BVOD services would be provided as they currently are, and a satellite-based safety net service (currently VAST) would continue to operate, providing viewers in remote areas, or those in areas with inadequate terrestrial reception, with access to free-to-air television services.

Table 3: Possible elements of the broadcast enhancement scenario for free-to-air television

Elements	Details
Broadcasting technology	DVB-T2 standard, using the MPEG-4 compression format for SD or HD content and (potentially) HEVC[38] for Full HD or UHD content. DVB-S2 standard, using the MPEG-4 compression format for SD or HD content and (potentially) HEVC for Full HD or UHD content.
Multiplex configuration	Planned multiplex sharing: for example, four shared multiplexes for commercial services, national and community services in all markets.
Services	Broadcast – maintain / improve the number and the quality of channels for each broadcaster. Online – maintain the BVOD offering for linear and on-demand content.
Online technology	OTT for BVOD services.

Note: potential variations to these elements of the broadcast enhancement scenario are considered in section 1.2.4.

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[37] DVB-T2 is an advanced digital terrestrial broadcasting standard that would allow greater capacity in a given amount of spectrum, compared to the DVB-T standard currently in use for free-to-air television in Australia.
[38] The High Efficiency Video Coding (HEVC) standard is a more efficient coding standard than the MPEG-2 and MPEG-4 standards currently in use for free-to-air television in Australia. Content compressed using the HEVC standard uses around 25% of the bandwidth that would be required to broadcast the same content using the MPEG-2 standard.

The adoption of a new broadcasting standard for free-to-air television would be highly complex in terms of design, implementation and operation, and would require significant investment in new transmission infrastructure. It would also require all Australian households to have DVB-T2-capable reception equipment (televisions or other connected TV devices) if they wished to receive and watch broadcast services.

To enable consideration of a tangible option, this paper assumes that the broadcast enhancement scenario would comprise:

- The provision of terrestrial free-to-air television services using the DVB-T2 standard, using the MPEG-4 and (potentially) HEVC compression formats, operating on four shared multiplexes in each market.
- The continuation of the VAST safety net service, to ensure that viewers in remote areas and those without adequate terrestrial reception could continue to receive a minimum level of broadcast content.
- The provision of BVOD services in parallel to broadcast services.

A range of interdependent decisions would also need to be made regarding the implementation method and timing of an enhanced broadcasting arrangement. These choices would include whether:

- to establish a DVB-T2 multiplex in each market using the 'sixth channel'[39] as a first step to a full transition to the more efficient standard;
- certain broadcasters and certain markets would move first as part of pilot arrangements for DVB-T2, or whether all broadcasters and all markets would move to DVB-T2 uniformly; or
- to operate DVB-T2 multiplexes alongside DVB-T in a simulcast arrangement, or whether to make a 'hard-switch' in each market to DVB-T2.

Implementation options and choices such as these are not considered in detail in this paper, but would be critical issues in any further consideration of this scenario.

1.3.2 Technology configuration

Broadcasting

Terrestrial broadcasting

Under this scenario, and for the purposes of this paper, it is assumed that free-to-air television services would be provided on four DVB-T2 multiplexes in all markets, using either the MPEG-4 or HEVC compression format.

- A DVB-T2 multiplex operating on a 7 MHz channel operates with a gross data rate of approximately 32 Mbps, compared with 23 Mbps for a DVB-T multiplex, for a given level of coverage. All things being equal, a DVB-T2 multiplex can carry approximately 40% more content than a DVB-T multiplex.
- DVB-T2 transmissions also use more advanced compression formats, including HEVC. Content compressed using the HEVC format uses around 25% of the bandwidth that would be required to broadcast the same content with similar video quality using the MPEG-2 standard, and around 50% of the bandwidth compared with MPEG-4.

The indicative data rate requirements for MPEG-4 and HEVC services are depicted in Table 4.

Table 4: Indicative bit rates for MPEG-4 and HEVC

	SD	HD	UHD
MPEG-4	1.5 Mbps	4.3 Mbps	N/A
HEVC	2 Mbps	5 Mbps	15 Mbps

Note: there would be no material efficiency gains between MPEG-4 and HEVC for SD channels, as HEVC is not optimised for SD content. HD in HEVC would be Full HD, encoded at 1080p, but would be 1080i using MPEG-4.

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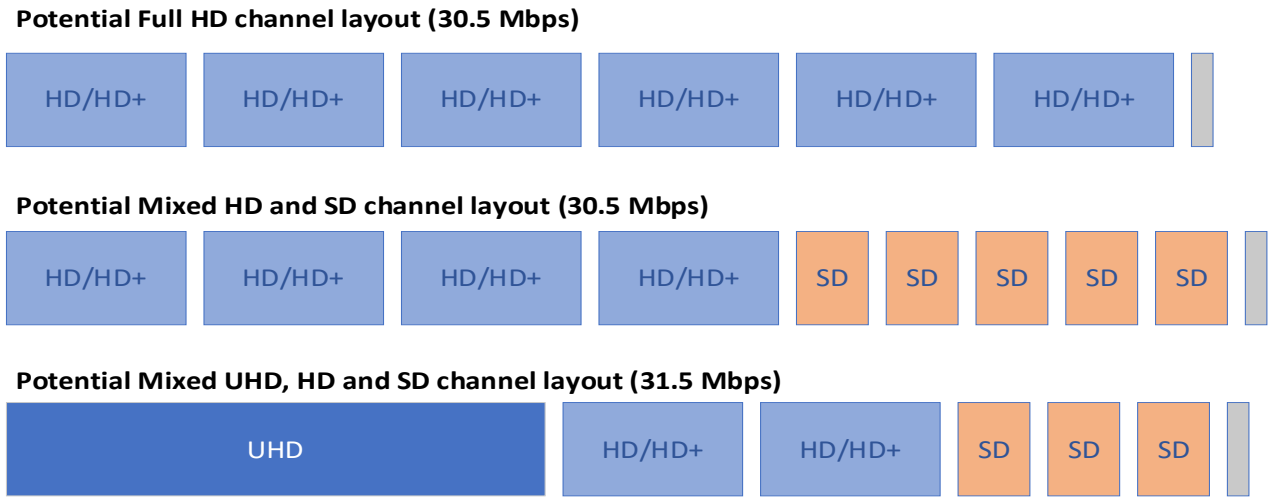
[39] A 7MHz VHF or UHF channel that is planned for television but is not currently in use, with the exception of Adelaide and Melbourne.

Indicative channel capacity

The broadcast enhancement scenario depicted in this paper assumes that MPEG-4 is used for any SD or HD programming, and that HEVC is used for any Full HD or UHD channels or programming.[40]

The use of MPEG-4 and HEVC would permit a single multiplex to carry channels in a range of quality configurations, as depicted in Figure 3.

Figure 3: Indicative channel configurations on a single multiplex under the broadcast enhancement scenario



Note: Bitrate attributions: UHD – 15 Mbps, HD/HD+ – 4.3 Mbps and SD – 1.5 Mbps, inclusive of video, audio, subtitles and service information. Mux overhead – 1.1 Mbps. Radio services have not been included. Source: departmental analysis

These configurations are indicative only, and a range of factors may impact the ability to provide a particular set of channels on any given multiplex.

Shared multiplexing

Under the broadcast enhancement scenario, broadcasters would share capacity on four multiplexes. As would also be the case in relation to technology scenario two, this would necessitate changes to contribution, playout and distribution arrangements.

- Contribution and playout: shared multiplex arrangements would require all uncompressed broadcast signals to be brought together at a central location. It is likely that the shared multiplex would need to be played out of the same facility and would also need to use a common hardware and software set up for encoding and multiplexing.
- Distribution: commercial television services are typically off-air fed (i.e. receiving and rebroadcasting a terrestrial signal from a distant terrestrial transmitter), while the television services of the national broadcasters are satellite-fed (with the exception of the metropolitan markets). Off-air inputs may need to be upgraded to microwave links or fibre, and this requirement would be elevated for any additional use of SFNs,[41] which typically require the use of direct-link feeds such as microwave to meet stricter timing requirements.
- Transmission: commercial and national broadcasters don't always have the same coverage patterns, particularly at higher power sites. As such, there may be a need to install new antennas at certain sites to accommodate these differences, which may affect overall coverage outcomes. Shared multiplexing may

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[40] HEVC is not optimised for SD and HD (1080i) content and is no more efficient for these quality levels compared with MPEG-4. It is therefore assumed that any SD or HD channels would continue to be encoded using MPEG-4.

[41] Single Frequency Networks (SFNs) are a type of transmission network where different transmitters in the network broadcast identical content, synchronised in time and on the same frequency. They are used extensively in many areas of Australia as part of the provision of free-to-air television services. SFNs differ from Multi-Frequency Networks (MFNs), where a series of transmitters use different frequencies in a coordinated manner to provide broadcast coverage of the same programming for a given area. One advantage of SFNs is that they permit more efficient spectrum use, as a number of transmitters can share the same frequency to provide coverage to an area without introducing unwanted interference. However, they can be more complicated to implement and operate.

also necessitate re-housing of equipment at transmission sites to one building and tower and (where necessary) upgrade equipment and renegotiate site access arrangements.

Single Frequency Networks

The '4/4' multiplex model depicted in this scenario is likely to necessitate greater use of SFNs in order to manage spectrum planning challenges and enhance the amount of spectrum that could be realised as a dividend. This would particularly be in the case of metropolitan markets and in regional markets that are adjacent to (overlapping with) metropolitan markets.

Spectrum and planning issues specific to this scenario

Although the broadcasting enhancement scenario would reduce the number of multiplexes used to provide free-to-air television services, this wouldn't necessarily allow more spectrum to be freed-up.

The 4/4 multiplex model is likely to be very complex from a spectrum planning and interference management perspective, with particular complexity likely to arise with respect to:

- the planning of wide-area SFNs[42]
- the overlap areas between the metropolitan and adjacent regional markets
- the configuration of in-fill services in metropolitan markets.

Potential interference between mobile phone services and television broadcasters may also complicate planning arrangements. This could affect viewers directly, or affect broadcasting transmitters that are in close proximity to mobile base-stations, and may require the installation of filters to mitigate the unwanted signal noise.

For these and other reasons, additional RF channels may be required in specific markets, and this would reduce the amount of spectrum that could be freed up in these areas. Determining the precise amount of spectrum that may be able to be released under this scenario would require detailed technical planning work to be undertaken and decisions to be made on the technical and coverage-related parameters of the new multiplexes.

Satellite broadcasting

Under this scenario, it is assumed that a safety-net broadcasting service would be provided under a direct-to-home model using geostationary satellites. This is the basis of the current government-funded VAST platform that provides access to commercial television services for viewers in remote areas, or those who are otherwise unable to access terrestrial television broadcasting signals. If this were to operate in a similar manner to VAST, this could use the DVB-S2 transmission standard and MPEG-4 video compression format. However, the DVB-S2 standard has the ability to provide services using HEVC.[43] If satellite services were to be provided terrestrially using HEVC, and this was to be mirrored on the satellite service, consumers with older devices may need to upgrade. It is assumed that the commercial television services carried on the satellite service would continue to match those provided in the corresponding remote terrestrial markets.

Online

Under this scenario, it is assumed that free-to-air broadcasters would continue to provide services online in much the same manner as they currently do. This is primarily via standalone BVOD apps that are developed by broadcasters. In order to present a simple, tangible option, this scenario assumes that BVODs would continue to be the main online distribution format. However, as outlined in section 1.3.4, online delivery could also utilise consolidated apps (on which the linear and on-demand content of more than one broadcaster is provided), or integrated content platforms operate alongside, or instead of, BVOD apps.

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[42] The DVB-T2 standard allows for permissible transmitter distances within the SFN to be larger when compared to DVB-T, which provides for the deployment of wide-area SFNs. This allows more distant transmitters to share the same frequencies and increases the SFN size without causing self-interference. However, wide-area SFNs are more complex to plan than SFNs used in DVB-T.

[43] Optus (2018) *VAST review*, DITRDC, p 11.

As with each of the scenarios depicted in this paper, it is assumed that the provision of free-to-air television online would be on an OTT basis, rather than through a dedicated distribution or transmission network, and one-to-one or 'unicast', rather than multicast' (one to-many), supported by CDNs that help to manage traffic flows. Again, these assumptions could be varied.

1.3.3 Indicative impacts

The broadcast enhancement scenario would mark a significant change in the technology used to deliver free-to-air television, albeit in the form of upgrades to the capability of broadcasting rather than enhanced reliance on the online medium.

Broadcasters

The impact on broadcasters is likely to be significant, given that this scenario would involve the deployment of new transmission infrastructure at sites across the country, or the commissioning of partially- or fully-managed transmission and other services that use the newer standard from third-party providers. As with scenarios 1 and 2, the overall viability of this scenario would ultimately hinge on whether operating broadcast and online services concurrently is financially sustainable over the long-term.

The upgrade to DVB-T2 may deliver long-term savings for free-to-air broadcasters from a reduction in the number of multiplexes used to provide broadcast services (subject to the operation of third-party service contracts), and spectrum charges (assuming any such charges are in place in the long-term). However, there would be a substantial, up-front capital costs associated with upgrading transmission facilities to the DVB-T2 standard in terms of both powered equipment and site-based infrastructure. There are also likely to be additional costs associated with changes to contribution, playout and distribution arrangements, and the deployment of SFNs (as outlined in the previous section).

The costs of providing the satellite-based safety net service would be relatively stable if it were to continue in a manner similar to the current VAST offering.

The new broadcasting standard may provide scope for an uplift in the number and quality of broadcast services that, in turn, may boost audiences and (for commercial broadcasters) advertising revenue. However, this may also lift costs if additional investment in programming is required.

The long-term impact of the adoption of DVB-T2 will also depend on the take-up of DVB-T2 equipment by households, and the viewing patterns of Australian consumers (discussed further below). Although potentially less reliant on the online medium for growth than the other scenarios depicted in this paper, this would still be key driver of long-term sustainability for free-to-air broadcasting given the clear trend towards online and on-demand content consumption.

Consumers

For most Australian consumers, the broadcast enhancement scenario is likely to enhance the overall service offering, assuming broadcasters are able to sustain their investment in both traditional and online platforms. However, some consumers would face costs to upgrade devices and reception equipment, as not all households are DVB-T2-ready.

- In 2024, 56.7% of televisions already in Australian homes in 2024 were capable of receiving DVB-T2 signals.[44] This is expected to increase over time, given the fact that the majority of new television sets purchased in Australia are DVB-T2 capable. In 2024, 88% of television sets purchased in the 12 months to July were capable of receiving DVB-T2 broadcasts.[45]
- However, the willingness and capacity to renew television reception equipment is not evenly distributed across the Australian population, with older Australians, those on lower incomes, those with lower

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[44] OzTAM (September 2026) *Capability Assessment of Australia's Television Fleet Report*, report to the DITRDCA, DITRDCSA, p 10.
[45] R Lobato, J Wallace, A Dharmawardhana, A Scarlata, D Featherstone (September 2026) *TV Technology and Market Assessment*, DITRDCSA, p 56.

education levels, and those located in regional areas, less likely to purchase new television equipment with more advanced technical specifications.[46]

Use of the online medium for accessing free-to-air television content will also require viewers to have a suitable internet connection, and there will be ongoing costs associated with this connectivity.

Third-party service providers

To the extent that third parties are contracted to provide partially- or fully-managed DVB-T2 capability, or to manage and operate upgraded transmission networks owned by broadcasters, this would be of significant benefit to these parties.

These benefits would extend to the manufacturers and installers of transmission equipment. There are also likely to be changes to contribution, playout and distribution functions under this scenario. To the extent that these functions are contracted out by broadcasters (as they currently are), this is likely to be of benefit to these providers.

Demand for satellite capacity would continue under this scenario, assuming the safety-net service mirrors the terrestrial offering, dependent on contractual arrangements and other technical factors.

As with scenarios 1 and 2, the gradual, expected decline in the number of households with the ability to receive broadcast signals may also impact broadcasters, consumers and broadcast infrastructure providers. This will be particularly relevant to this scenario, given the significant investment involved in upgrading to a new broadcasting standard.

Network operators and other spectrum users

The impact on broadband networks may be relatively modest, assuming that the progressive, gradual transition of viewers to the BVOD service offering to date continues over the medium- to long-term, and that the enhanced broadcast offering is able to attract viewers and moderate the demands on broadband networks from BVOD usage. However, data traffic and congestion may be more marked if the audience transition to online were to accelerate.

Similarly, this scenario may see a modest increase in demand for online services that help to reduce load times and improve service reliability, such as CDNs, and services that support the design of user interfaces and other elements of BVOD apps and services.

The broadcast enhancement scenario would provide for a reduction in the amount of spectrum used for television broadcasting. However, the assumption of a 4/4 multiplex model, and the move to DVB-T2, would create a very complex planning environment. Determining the precise amount of spectrum released under this scenario would require detailed technical planning work to be undertaken and decisions to be taken on the technical and coverage-related parameters of the new multiplexes. This may or may not yield a meaningful spectrum dividend for allocation to other users. Mobile network operators have indicated an interest in 600 MHz spectrum for future 6G services.

The potential reallocation of 600 MHz spectrum may have impacts on wireless microphones and other wireless audio devices, which currently use gaps in this spectrum. These gaps are likely to be reduced if broadcasting services are consolidated onto fewer multiplexes and freed up spectrum is reallocated to other uses.

1.3.4 Scenario variations

The broadcast enhancement scenario describes an extensive upgrade to the broadcasting technology used to deliver free-to-air television services. There are a number of ways in which this scenario could be varied, and views are sought in relation to these alternatives, along with the main scenario.

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[46] R Lobato, J Wallace, A Dharmawardhana, A Scarlata, D Featherstone (September 2026) *TV Technology and Market Assessment*, DITRDCSA, p 83.

Alternative multiplex configurations

Under the broadcast enhancement scenario, free-to-air television services could be provided using more or fewer DVB-T2 multiplexes, although this is not a requirement of the scenario. Ultimately, the number of multiplexes necessary to broadcast services would depend on the number and quality of services to be broadcast, the availability and costs of programming, and the capital and ongoing costs of infrastructure to provide them.

There are a range of alternatives to the 4/4 multiplex model depicted in this scenario. These could include a 3/3 model, in which three multiplexes are operating in all markets, or non-uniform models where there are a higher number of multiplexes operating in the metropolitan markets compared with regional and remote areas (i.e. a '5/4' or '5/3' model).

Another alternative would be to retain some use of DVB-T multiplexes. While the final configuration would need to match the needs of a given market, this could involve upgrading one or more multiplexes to DVB-T2 and keeping the remainder as DVB-T. The DVB-T multiplex could be used to simulcast primary services during the transition to full DVB-T2, or as a less expensive alternative for transmission of multichannels.

Decisions regarding the number of multiplexes, and the technologies they employ, will influence the capacity to realise a spectrum dividend from any freed-up spectrum, and the complexity and costs of replanning and reallocating the spectrum for other uses.

The use of alternative broadcasting technologies

This scenario assumes (as a starting point) that DVB-T2 and DVB-S2 would be the standards used for terrestrial and satellite television, respectively. However, there are other standards that could be deployed.

- DVB-I (Digital Video Broadcasting – Internet): DVB-I uses the internet to receive broadcasting and streaming content distributed to the end user via the internet, as well as content distributed via terrestrial or satellite. It would enable broadcasters to use a broadband network entirely to distribute content instead of spectrum. From a consumer perspective, DVB-I provides a similar television viewing experience to traditional terrestrial broadcasting, through a single interface for accessing both live and on-demand content regardless of the delivery medium (free-to-air or streaming).[47] DVB-I has been deployed or established as a pilot in a number of markets across Europe, and is being considered in others.[48; 49; 50]
- DVB-S2X (Digital Video Broadcasting – Second Generation Satellite Extensions): DVB-S2X is a refinement of the DVB-S2 standard which offers the potential for higher capacity and efficiency, particularly with respect to UHD services.[51] However, the DVB-S2 receivers are not forward compatible with DVB-S2X,[52] meaning that the existing fleet of 330,000 VAST set-top-boxes would be unable to receive and demodulate a DVB-SX2 carrier.[53]

Different methods for delivering free-to-air services online

The online elements of each of the future technology scenarios depicted in this paper assume that online free-to-air television content is provided OTT (via the open internet), and via a unicast model (one-to-one). As noted in relation to technology scenario 1, there are alternatives.

- Multicasting might, in theory, provide for a more efficient use of available broadband capacity than unicast. However, multicasting would generally only allow for linear content delivery (not on demand),

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[47] S Braghieri (2025) 'Exploring the Role of HbbTV in the DVB-I Environment', *HbbTV*.
[48] Sat.tv Connect was launched in Europe in 2024 and Integrating DVB-I. Sat.tv Connect is the new version Eutelsat's free-to-air DTH satellite service, extending the reach of the service to new generations of connected TV sets with integrated satellite tuners.
[49] Saorview is the national DTT platform in Ireland, owned and managed by the public broadcaster RTE. The company is currently investigating the creation of a next-generation hybrid platform.
[50] In Germany both public and private television broadcasters are working together with associations and organizations to develop a framework for the market launch of DVB-I.
[51] DVB (March 2015) *White Papers*, DVB, p 13. Refer to the *DVB-S2X Highlights* paper; DVB (21 August 2024) 'DVB-S2X (Second Generation Satellite Extensions)', *DVB*.
[52] DVB (March 2015) *White Papers*, DVB, p 1. Refer to the *DVB-S2X Highlights* paper.
[53] Optus (2018) *VAST review*, DITRDC, p 10.

along with some push VOD functionality (if relevant devices had sufficient hard drive capability). Multicasting may also have network implications that could require changes in the configuration of infrastructure at various levels.

- A dedicated Internet Protocol television (IPTV) service could be developed to provide free-to-air television content to households over broadband in a way that does not utilise the open internet (i.e. a dedicated distribution network rather than an OTT service). However, further work would be needed to assess the technical and financial feasibility of any such IPTV model.
- Similarly, free-to-air television content could be provided via consolidated apps that provide the linear and on-demand content of more than one broadcaster, rather than solely via consumer-facing apps. This content could also be provided on integrated content platforms that operate alongside, or instead of, BVOD apps.