



TELSTRA CORPORATION LIMITED

Media Reform Green Paper

Public Submission

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01 Introduction

We welcome the opportunity to provide our views to the Department of Infrastructure, Transport, Regional Development and Communications' (DoITRDC) consultation on the proposed media reform agenda as set out in the Media Reform Green Paper (Green Paper).

Strong and independent news and journalism services are essential to a well-functioning, healthy democracy, and Australian produced content entertains, informs, and makes us proud of our ability to create world-class content, not to mention generating employment. However, these services would not exist without the ability to deliver content to the community, which traditionally is the role of the broadcasters. Today, many segments of our community rely on free-to-air television to stay connected including older Australians, those who are less affluent and those in regional and remote areas. It is vital that broadcast services are enabled to continue to provide the vital service they provide into the future, especially in regional and remote areas.

At the same time, 5G networks promise to deliver substantial economic and social benefits through greater connectivity, the Internet of Things, and better access to more information anytime, anywhere. Additional low-band spectrum is pivotal to this vision, and a second "digital dividend" arising from further leveraging video compression techniques to more efficiently use scarce radio spectrum will benefit all Australians if some spectrum can be re-purposed to the provision of better mobile services.

We believe these two futures are complementary. It is possible to create a strong, long-lasting business model to propel broadcast services well into the future while simultaneously taking advantage of technology advances that will enable broadcasters to use spectrum more efficiently. It is also possible to realise benefits from the re-allocation of radio spectrum to mobile services which have a proven track record of delivering social and economic benefits.

Importantly, we believe Telstra can play a pivotal role in achieving both outcomes, and in the future of Australian television, as explored in the Green Paper. Our growing portfolio of technical and managed broadcast service capabilities and our role as a 5G mobile network operator provide us with a unique perspective on these overlapping and critical markets.

Our submission is structured as follows:

- Section 2 explains our view that a strong, ongoing broadcast industry is vital for Australia and outlines steps we believe can be taken toward achieving this, including the creation of a Broadcast Industry Advisory Group;
- Section 3 explains why reallocating some of the spectrum currently used by broadcasters would be beneficial to all Australians if repurposed for use by mobile telecommunications;
- Section 4 contains our thoughts on moving forward from here; and
- Appendix 1 contains answers to selected questions from the Green Paper.



02 Maintaining a sustainable, ongoing broadcast industry

Telstra considers it vital that there is a strong, ongoing broadcast industry in Australia, and we support our broadcast customers with a proposal to form a Broadcast Industry Advisory Group who can assist the government in better defining and shaping their future, beyond the shorter-term spectrum recommendations. We believe Telstra can play a pivotal role in the future of Australian television through our growing portfolio of technical and managed service capabilities that are already central to the broadcasting market, time required to transition, technical advice, and consistency with international standards.

2.1. A strong broadcast industry is essential for Australia.

Broadcast television in Australia continues to remain strong as a key and in many cases primary form of media communication. Consumer use of broadcast television is expected to remain strong into the foreseeable future as the ACMA's 2020 Consumer Survey of Viewing Behaviour indicates by observing that despite the growth of SVOD, internet and BVOD content, free to air television remains dominant with 56% of the total market.¹

Despite the impact of new technologies, we are of the view that free to air broadcast will remain a key distribution mechanism for live content such as news and sport, as well as high impact, wide distribution entertainment and factual content.

Key demographics will likely retain free to air television for primary or even exclusive access to news and content, in particular elderly audiences, audiences of lower socio-economic access, and in particular regional audiences who rely on free to air broadcasts for access to relevant, local content and conditions.

2.2. Telstra's history in broadcasting in Australia

Telstra, and its predecessors before privatisation, has been central to television broadcasting in Australia since the Melbourne Olympic Games in 1956 where it carried live signals to the world. It carried the moon landing broadcast to the world in 1969 and has been heavily involved in digital television since the *Television Broadcasting Services (Digital Conversion) Act 1998* was introduced.

2.2.1. Impact and reach of a national Digital Video Network

Since the introduction of digital video, Telstra has carried all major broadcast content to transmission sites around the country via a dedicated network called the Digital Video Network, as depicted by the image in

¹ Trends in viewing and listening behaviour: ACMA consumer survey 2020. ACMA. November 2020.
https://www.acma.gov.au/sites/default/files/2020-11/Trends-in-viewing-and-listening-behaviour_ACMA-consumer-survey-2020.pdf

Figure 1 below. The diagram shows in a broad sense, the level of infrastructure, investment and commitment Telstra has made to professional media in Australia.

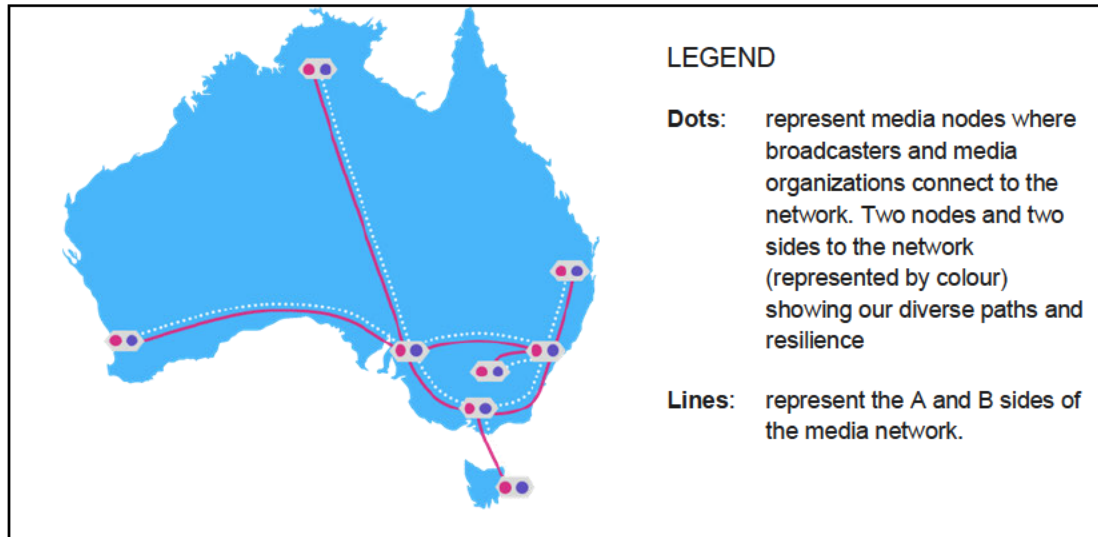


Figure 1: Representation of Telstra's Digital Video Network (DVN)

Now in its second generation, this network will, by the end of this year carry all broadcasters' national and regional transmission, delivering to over 5,000 sites including major media sites, stadiums, transmission locations and customer sites, across 20,000km of transmission links. This is something that Telstra continually invests in and will play a key element of any future consolidation or rework of transmission mechanisms.

2.2.2. Investment and commitment to regional reach

Telstra has invested considerable resources in regional connectivity both for broadcasters and the entire community. By way of example, our commitment to regional Australia notes that in the five years up to June 2020, \$3bn of our total \$7.5bn investment in mobile networks has been spent in regional areas². Our regional customers remain a key strategic imperative for Telstra, and we continue to invest in coverage, increasing by up to 100,000 square kilometres each year³ and our commitment to our rural and regional customers can be found on our website.⁴ We also recently announced a \$200 million co-investment fund to

² **Our commitment to regional Australia.** Available at the following link, then scroll to the fourth item after the description of the mobile black-spot program: <https://www.telstra.com.au/coverage-networks/mobile-black-spot-program>

³ iTWire: Telstra launches \$200 million fund to improve regional coverage over next four years. 3 May 2021. [https://itwire.com/telecoms-and-nbn/telstra-launches-\\$200-million-fund-to-improve-regional-coverage-over-next-four-years.html](https://itwire.com/telecoms-and-nbn/telstra-launches-$200-million-fund-to-improve-regional-coverage-over-next-four-years.html)

⁴ **Outback and beyond:** Connecting all Australians. <https://www.telstra.com.au/aboutus/community-environment/community-programs/rural-regional>



generate additional investment in improving regional mobile coverage, in addition to the \$150 million we will invest in the next 12 months to improve regional connectivity.⁵

Our investment covers not just mobile but also free-to-air broadcasting networks, and Telstra is currently deploying large fibre and microwave networks to carry all regional broadcasters to hill-top broadcast locations around Australia.

2.2.3. Shared services, multiplexes, and operations across broadcasters

In addition to our Media Network solutions, Telstra Broadcast Services provide broadcast operations and media management capability including cloud-based, IP playout for live television and radio. By November 2021, we will be responsible for playout of 119 television outputs (markets) via long term contracts held with national, regional, community and free-to-air broadcasters. For many years, we have also been a major streaming provider for most of the domestic broadcasters.

Consolidation of major media operations is already occurring in Australia, and Telstra has and will continue to play a key role as a provider of managed services and operations to all Broadcasters. By way of example, after extensive design effort to ensure all the broadcasters' needs were met, Telstra built a common distribution platform for the ABC and SBS (the Telstra DVN) to connect studios and production facilities to broadcast transmitters. They also selected Telstra to manage their Digital Radio Broadcast (DAB+) operations, such that since 2020, the ABC and SBS have been able to realise the value of shared DAB+ arrangements, as well as the benefits of a common distribution platform.

2.3. Telstra's role as both telecommunications carrier and neutral provider of services to broadcasters

Telstra occupies a unique position in the market due to our presence as both a mobile telecommunications carrier as well as a commercial supplier to the broadcast industry through our partnerships and multi-technology nationwide investments. As such, we consider ourselves to have a balanced view on these matters.

We've proven our commitment to supporting the long tail terrestrial platform (evident by our 5-10 year Digital Video Network contractual commitments), whilst in parallel investing in longer term technology and platforms (5G, streaming solutions, multi-tenanted broadcast operations platforms) that may ultimately supplement and/or replace the traditional model.

Telstra also performs a role as technology advisor to many of the broadcasters; a role which has an extensive multi-decade history. Of particular note is Telstra's role, through what was then called Network

⁵ Telstra \$200 million regional co-investment fund announcement. 4 May 2021.
<https://www.telstra.com.au/aboutus/media/media-releases/telstra-coinvestment-fund-2021>



Design and Construction (ND&C) as both advisor and as one of the lead constructors for the deployment of the analogue to digital broadcast transmission project, spanning some 15 years at the start of this century.

2.4. Broadcast Technology in 2026

Viewer habits are constantly changing as consumers adopt a more “here and now” approach to accessing content. Online /VOD based content has created the opportunity for more viewers to watch individual content when and how they prefer. However, the latency difference between online and terrestrial transmission can be a factor in sports wagering and some viewer preferences.

Therefore, any adoption of new terrestrial broadcasting standards should be performed carefully to avoid compromising viewer experience in certain markets that are latency sensitive. Further, we note that terrestrial broadcasting standards are often slower and more costly to integrate compared to online transmission technologies which have been far more aggressive at adopting technology advancements in compression and higher quality video such as ultra-high definition (UHD). Therefore, it is of utmost importance that this media reform initiative takes advantage of this inflexion point to carefully consider and adopt suitable technologies that can evolve to take into account future customer needs while ensuring existing markets with specific needs accommodated by existing terrestrial broadcast technologies are met. Failure to do so risks both annexing some existing market segments such as latency-sensitive viewers as well as potentially incurring a large “technical” debt from inappropriate technology choices. This could also make future reforms more costly and prohibitive.

2.5. A Broadcast Industry Advisory Group can assist Government policy

Telstra Broadcast Services (TBS), a wholly owned subsidiary of Telstra, has met with key national and commercial metro and regional broadcasters. In their conversations, broadcasters have expressed a clear desire to collectively define a roadmap towards a future state of media and broadcasting. We believe the broadcast industry itself that is in the best position to collectively define the future state of broadcasting in Australia, as well as the timeframes for reform. We support the formation of a formal collaborative partnership between industry and government which could be known as the Broadcast Industry Advisory Group (BIAG), consisting of key stakeholders across national and regional broadcasters, as well as key parties that will likely play a key part of this transition and future model. We consider the BIAG could advise on government policy, going beyond pure advocacy to a true collaboration between government and industry on defining the vision and future commercial and technical model for broadcasters beyond 2026.

A collaborative BIAG could assess both commercial and technical feasibility of the government’s proposals, and work actively with formal governance to ensure that the long-term viability of the broadcast industry is ensured during these periods of media reform.



03 Mobile communications and the decade of 5G

The Green Paper contains commentary⁶ indicating mobile telecommunications is the likely candidate for spectrum recovered through more efficient use of the ultra-high frequency (UHF) broadcasting band (526-694 MHz). We support the government's proposal for more efficient use of low-band spectrum due to its scarcity and its preliminary view that the mobile telecommunications industry is the most likely candidate. While it is our view that a well-planned and orderly transition of this low-band spectrum in an appropriate timeframe is essential to the ongoing success of the broadcast industry (see section 02), it is important to understand the potential economic and social benefits mobile telecommunications provides Australians in order to gain a full picture of why these two goals need to be, and indeed are, complementary.

3.1. 5G delivers social and economic benefits to all Australians

The demand for mobile technologies both for business and social uses continues to be strong and ever increasing. The November 2020 edition of the **Ericsson Mobility Report** predicts that by the end of 2026 there will be 3.5 billion 5G subscriptions for enhanced mobile broadband globally, with 5G networks covering 60 percent of the world's population and carrying 54 percent of the world's mobile data traffic.⁷

The Deloitte Access Economics report **Mobile Nation 2019: The 5G Future**⁸ projects that an additional \$65bn GDP will be added to Australia's economy by 2023 through mobile technology; the equivalent of \$2,500 per person. 5G alone is estimated to be worth between \$1,300 and \$2,000 in additional GDP per person by 2030 according to the Bureau of Communications and Arts Research⁹.

Mobile technology achieves this uplift in GDP by boosting labour productivity. Today, every sector of our economy (office-based, construction, hospitality, health, agriculture, etc) operate and rely on data and information, and none of these sectors can function fully or efficiently without access to it. Mobile technology allows workers to realise genuine productive gains through real-time access to this information no matter where they are. Health workers are able to access patient information while caring for a patient in their own home, construction workers are able to obtain updated plans on site, agricultural workers are able to obtain up to date weather information and professional office-based workers are able to access information at a client's premises allowing them to spend more time with their customers. This is in addition to benefits such as teleworking and being able to work while commuting. We also observe an increasing use of mobile devices for streaming video, including broadcast television.

⁶ Media Reform Green Paper, pp.7, 8, 22 and 24.

⁷ **Ericsson Mobility Report**, November 2020. <https://www.ericsson.com/4adc87/assets/local/mobility-report/documents/2020/november-2020-ericsson-mobility-report.pdf>

⁸ **Mobile Nation 2019: The 5G Future**. Deloitte Access Economics, prepared for the Australian Mobile Telecommunications Association (AMTA), 2019. <https://www2.deloitte.com/au/en/pages/economics/articles/mobile-nation.html>

⁹ Impacts of 5G on Productivity and Economic Growth, April 2018. <https://www.communications.gov.au/publications/impacts-5g-productivity-and-economic-growth>



3.2. Low-band spectrum is vital for 5G networks to avoid a “digital divide”

Fifth generation (5G) mobile technology is the first generation to operate on a combination of low-, mid- and high-band spectrum¹⁰, i.e., on three different bands, and all three bands are required for 5G to realise its potential. As the Global mobile Suppliers Association (GSA) notes in its article **Getting the 5G band together**¹¹, “*Low-band spectrum is important for expanding 5G NR coverage in all urban/suburban/rural deployment scenarios, ensuring service continuity across different geographies, enhancing service quality in indoor environments, and helping to close the digital divide. Lower Frequencies ensure wide area coverage and fundamentally complement higher frequencies ensuring consistent wide area services, including deep in-building coverage.*” The Global Standard for Mobiles Association (GSMA) echoes this sentiment in its March 2021 edition of **Spectrum Positions**¹², where it says “*Increased low-band (i.e. <1 GHz) capacity will be required to create greater equality between urban and rural broadband connectivity thus reducing the digital divide. It will also improve in-building 5G services everywhere and help support the growth of IoT.*”

In other words, low-band spectrum is essential for providing area-wide coverage across Australia’s vast landscape to avoid creating a digital divide between urban and rural areas, as well as providing deep in-building coverage and supporting growth of the Internet of Things (IoT).

We support the government’s proposal for more efficient use of low-band spectrum due to its scarcity and high value for delivering coverage to regional and remote communities.

3.3. The 600 MHz band is standardised for 5G use, and is being adopted globally

The very recent Global mobile Suppliers Association (GSA) May 2021 report observes¹³ “*37 operators are identified as investing in spectrum at 600 MHz, at least three of which have launched both LTE and 5G services in the range and another two have launched 5G*”. (LTE, or Long-Term Evolution, is what we refer to as 4G). The report goes on to list that there are 251 LTE (i.e., 4G) and a further 71 5G devices currently available that are capable of using the 600 MHz band.¹⁴ The report further observes that spectrum has already been awarded in Canada and the USA (plus territories)¹⁵, and that Guatemala, Hong Kong, Mexico and Saudi Arabia have all announced formal (i.e., date-specific) plans¹⁶ for allocating 600 MHz band spectrum for mobile telecommunications.

What this report demonstrates is that base station equipment and mobile devices such as phones, tablets and hotspots exist and are being used elsewhere around the world, and it can be reasonably expected that

¹⁰ “Low band” spectrum means frequencies below 1 GHz, “mid band” means frequencies between 1 and 6 GHz, and “high band” is frequencies over 6 GHz.

¹¹ Getting the 5G Band Together. Global mobile Suppliers Association (GSA). 5 October 2020.
<https://gsacom.com/getting-the-5g-band-together/>

¹² 5G Spectrum Positions, March 2021. Global Standard for Mobiles Association (GSMA). p.6.
<https://www.gsma.com/spectrum/resources/5g-spectrum-positions/>

¹³ Low Band Spectrum for LTE and 5G, May 2021. Global mobile Suppliers Association (GSA) p.3.
<https://gsacom.com/paper/low-band-spectrum-for-lte-and-5g-may-2021/>

¹⁴ Ibid. Tables 3 and 4 on p.13 and p.14 respectively.

¹⁵ Ibid. Table 1, pp. 5-6.

¹⁶ Ibid. Table 2, pp.14-15.



over the next few years, many other jurisdictions will look to follow suit. This means that this equipment and these devices could readily be deployed in Australia in the future, should the 600 MHz band be allocated to IMT, so we can take greater advantage of 5G.

04 The way forward

Telstra believes that proposals outlined in the Green Paper for achieving the stated outcomes of efficient spectrum use, lower cost for broadcasters, and new funds for Australian content will likely not be possible without a deeper investigation into the broadcast business models and the sustainability of the broadcast industry over the next ten years.

As a key provider to the broadcast market, we have several recommendations for the government to consider.

4.1. Establish a Broadcast Industry Advisory Group

Telstra believes that the broadcast industry themselves are in the best position to collectively define the future state of broadcasting in Australia, as well as the timeframes for reform. We support the formation of a formal collaborative partnership between industry and government, consisting of key stakeholders across national and regional broadcasters, as well as key parties that will likely play a key part of this transition and future model, which would include Telstra for the reasons stated earlier in this response.

Telstra recommends that this industry group be formed with the objectives to:

- Define and outline what a sustainable broadcast industry will look like beyond 2026, to ensure the viability and social impact of free universal broadcast remains accessible to all Australians.
- Advise and collaborate with government stakeholders on proposed changes, including not just spectrum reallocation but other mechanisms of reform that require government policy.
- Agree and collaborate on appropriate timeframes to ensure that government policy achieves its goals, with considered technical and commercial inputs from experts in the industry.

4.2. Further evaluation of the multiplex licence model

As the proposed spectrum reallocations necessitates the consolidation of broadcast multiplexes from five to three, the Green Paper lacks appropriate detail on how these multiplexes will be licensed and the roles that the broadcasters, Government, and service providers will play in this model.

In particular, the following aspects require further development:

- the role of ACMA and any other regulatory agencies in assigning multiplex models;
- how access to multiplexes would be assigned;



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- who would govern and maintain multiplexes from a technical perspective; and
 - how five broadcasters would be equitably served across three multiplexes, across national and regional markets.

4.3. Identify the timeframe for implementation

It is expected that once the full scope of the transition is agreed, a likely outcome will be to define a phased approach to reform over time, which we believe is unlikely to be achieved by 2025. Telstra, as a key provider of the shared infrastructure and knowledge required to implement this change, would be well placed to consult and advise on this process once the scope is agreed.

4.4. Inadvertently setting high expectations on the digital dividend proceeds

Chapter 5 of the Media Reform Green Paper states that “... a portion of the proceeds from the auction of digital dividend spectrum would be set aside to support a stronger media sector and public policy outcomes”. Some public commentary has also proposed reforms as a second digital dividend that are likely to generate strong revenue for Government.¹⁷ Telstra maintains a strong view that genuine competitive auctions are the best approach to ensuring spectrum goes to the highest value use.

¹⁷ For example, the **Inside Story** article by Jock Givens and Giles Tanner observes “...switching TV broadcasters from analogue to digital transmission netted over \$3 billion from selling the vacated “digital dividend” spectrum to the big mobile operators...”. 8 December 2020. <https://insidestory.org.au/television-on-the-line/>
Similarly, **MinterEllison** observes “This would be Australia’s second digital dividend, the first being when television switched from analog to digital transmission in 2013, and the surplus spectrum was sold for over \$1.9 billion.” 16 December, 2020. <https://www.minterellison.com/articles/modernising-television-regulation-in-australia>



Appendix 1: Response to selected consultation questions

This appendix contains our responses to selected questions contained in the consultation paper.

4.1 Should Australia continue to operate digital television systems using the DVB-T standard and the MPEG-4 compression technique? Are there other options that should be considered?

As a major supplier to the broadcast industry, we have conducted preliminary discussions with many of our broadcast partners on this topic. As a result of those conversations, we recommend further options should be considered to maximise the opportunity that this reform might have. We explore four options here.

Opportunity to migrate to DVB—T2

Reflecting on the historic timing (~15yrs) for the transition to DVB-T in Australia:

- July 1998 Introduction of the *Television Broadcasting Services (Digital Conversion) Act 1998*;
- Jan 2001 DVB-T commences transmitting in Australia;
- 2008 DVB-T matches analogue coverage;
- Dec 2013 last Analogue transmitter switched off.

DVB-T2 is the next evolution. The DVB-T2 standard was adopted by European Telecommunications Standards Institute (ETSI) in September 2009. The first production transmission commenced in November 2009. DVB-T2 uses the same radio transmission medium (Orthogonal Frequency Division Multiplex) as currently used with DVB-T in Australia. The evolution of DVB-T2 allows for greater modulation formats such as 256 Quadrature Amplitude Modulation (256QAM) resulting in greater payload bandwidth.

Migration to DVB-T2 in Australia presents an opportunity to take advantage of this standard and the benefits it can bring through either higher definition/quality broadcast television and/or more efficient spectrum use. However, careful consideration of the spectrum planning and current site configurations must be performed to minimise customer disruptions while maximising infrastructure reuse. Also, while mainstream television receivers have been DVB-T2 enabled for at least the past 4-5 years, many television receivers in use in Australia today will not be DVB-T2 enabled. Given an average consumer television receiver lifespan of around 10 years, it is likely that by around 2026 most will be DVB-T2 enabled, but further research will need to be conducted to ensure sufficient adoption of DVB-T2 enabled televisions and/or digital broadcast receivers.

Opportunity to retire MPEG-2

MPEG-2 has been the base compression standard since the inception of digital broadcasting in Australia.

- MPEG-2 was standardised in 1995,
- MPEG-4 [Pt 10] was standardised in 2003,
- H.265 / HEVC was standardised in 2013,



Ceasing the mandatory MPEG-2 and simulcast of HD/SD terrestrial broadcast services should be considered to alleviate payload bandwidth pressures and create opportunity for higher quality video consumption.

While we don't deny further research is required to understand the current penetration of MPEG-2 as a primary access mechanism, our own research and investigation with major consumer technology providers indicates that by 2026, when these changes are proposed, there may be little coverage impact from removing MPEG-2 transmission.

Opportunity for differentiation and engagement via high value services (UHD, HEVC, etc)

As mentioned in the previous section, H.265 High-Efficiency Video Coding (HEVC) has been a standard for 8 years already, and should be considered as an option to provide better value for broadcasters, particularly in services that may afford more revenue and commercial sustainability such as premium sport and high value content. Further, H.266 Versatile Video Coding (VVC) is poised as the successor of H.265 with an aim to make 4K/UHD broadcast and streaming commercially viable. As more 8K displays become commercially available (they're already out), broadcasters may also investigate H.266 to deliver 4K/UHD content as it's more efficient per bit than H.265.

By 2026, it is likely that HEVC decoding capability will have a far greater penetration and will provide opportunity for substantial bitrate savings that will either increase quality or quantity of content for the same spectrum.

Use of ultra-high definition (UHD) may also provide broadcasters a substantial differentiator against online or other digital forms of content distribution, owing to a broadcaster's unique ability to guarantee content quality end to end.

Opportunity for consolidation of VAST

With the proposals for a consolidation of terrestrial networks, a reform and collaboration of this magnitude also offers the opportunity to explore how Viewer Access Satellite Television (VAST) can also be used to provide ubiquitous access.

There exists an opportunity to consolidate orbital slots in the space segment for VAST, allowing for greater penetration and access to free to air services by reducing the number of satellite dishes required for consumers to access media services. As a result, a further opportunity should be explored for a harmonised terrestrial, VAST and internet-delivered content experience for true universal content to all Australians, whilst maintaining the viability of an Australian satellite fleet.



4.3 How can the Government work with industry to minimise disruption for households during the proposed transition?

Telstra proposes that the timeline for transition and the processes required to minimise disruption can best be defined through collaboration between government and industry to minimise disruption while transitioning to more efficient technology and compression techniques.

To this end, Telstra supports the formation of a Broadcast Industry Advisory Group, which has been detailed earlier in this response.

8.1 Is the timeframe proposed in this chapter realistic?

To complete a national transition such as this, considering the complexity of the infrastructure, the need to maintain services during transition, and the need to transition operational and financial models to this new paradigm, more time will likely be required.

This is evidenced by our experience with the initial analogue to digital rollout, including the frequency restacks and migration process required. This activity took 15 years.

In this instance, migration to a shared operational model, frequency restacks, transmitter upgrades, compression and possible DVB-T2 considerations, is substantial in scope and will require very careful planning and execution, once the model has been agreed.

We believe a realistic timeframe estimate can be achieved by forming the Broadcast Industry Advisory Group as soon as practical with broadcasters and those who will implement or support the change, to discuss the proposals and collaborate on an agreed timeline.

8.2 Are there any particular stages that would require a greater or lesser period of time?

Telstra believes that several areas will require more time to implement.



Finalise reform model	<p>May 2021</p> <p>Telstra believes this is unlikely. Broadcasters may wish the scope to be increased and the current proposed model may need to be amended.</p>
Restack planning and restack implementation planning	<p>Mid-2022 to Mid-2024</p> <p>With experience in the network design and technical implementation for a restack and reform of this magnitude, Telstra believes that this planning will take longer to implement, particularly if it is conducted in stages as advised.</p>
Commencement of restack	<p>Mid-2024</p> <p>Telstra does not believe this is likely, due to the level and depth of planning both technically and commercially for this transition, however a better estimate can be obtained with further collaboration.</p>
Completion of restack	<p>December 2025—assuming that this could be undertaken over an 18-month period.</p> <p>This is highly unlikely, due to limitations on transmitters, consideration of DVB-T2 if opted for, and requirements for a seamless transition on a phased basis.</p> <p>As previously mentioned, the analogue to digital national restack took far longer than 18 months.</p>
Reassignment of auctioned spectrum	<p>2026 and beyond.</p>

8.3 Are there particular risks and factors that need to be taken into account in terms of the timing for the transition to the new licensing and regulatory model?

Telstra believes that the detail on the current proposed licensing model is too sparse to comment on its effectiveness in meeting its timeframe.

In general, further detail is needed on:

- How will broadcasters manage bandwidth, particularly when five broadcasters are proposed to share three 23 Mbit/s multiplexes (in DVB-T domain)
- Who will operate the multiplexes, and what role will the ACMA play in the standards definition, operation and execution of the multiplexer licence(s)?
- Whether statistical multiplexing will be implemented, which can achieve a 20% increase in quality or content for the same bitrate but requires adaptive real-time manipulation of bandwidth across an entire multiplexer to be effective.