



---

# TELSTRA CORPORATION LIMITED

## Five year spectrum outlook 2021-2026

**Public submission**

**May 2021**



---

## CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>3</b>
<b>01 Introduction</b>	<b>5</b>
<b>02 Proposed 2021-22 annual spectrum management work program</b>	<b>6</b>
2.1. Our views on specific spectrum bands	6
2.2. Forward allocation work plan	7
2.3. Licensing and licensing systems	8
2.4. Pricing	9
2.5. Other matters	9
<b>ATTACHMENT A: Answers to specific questions</b>	<b>11</b>



---

## EXECUTIVE SUMMARY

We welcome the opportunity to make this submission to the Australian Communications and Media Authority (ACMA) in response to its most recent version of the *Five-year spectrum outlook 2021-2026* (FYSO) document. As acknowledged by the ACMA, the COVID-19 pandemic has accelerated the deployment and adoption of digital communications technologies. On a global scale, some estimates are that we vaulted 5 years in terms of digital adoption in a matter of a few months<sup>1</sup>. While it is still unclear as to how this pandemic will evolve, what difference the vaccine will make, when we will be able to travel again and to where or when we will be able to get back into the office consistently, what is clear is that wireless communication including mobile broadband communication continues to play a crucial role in the path to recovery with businesses increased reliance on remote communications and the work from home trend continuing. It is more crucial than ever that spectrum resources are effectively allocated and managed so that we have the flexibility and certainty required to provide services that are reliable, cost effective and use the latest technologies.

We are pleased that the 26 GHz band spectrum licence allocation has been completed and agree with the ACMA that the associated arrangements for the assignment of 26 GHz and 28 GHz apparatus licences should be the highest priority over Q2/Q3 2021.

The release of additional low and mid band spectrum for IMT is also important as we look to maximise the opportunity for 5G in regional areas over the period covered by the FYSO. It is helpful to see the ACMA progressing the reallocation of the 900 MHz and the 850 MHz expansion band with a view to conducting an auction by Q4 2021. Further down the path, we see potential for a combined auction of the 3.4 and 3.8 GHz bands by the end of 2022.

We also support spectrum in the 6 GHz band (5925-7125 MHz) being made available for RLAN use in Australia under the LIPD class licence, and recommend a position that goes further than the ACMA's preliminary view, both in terms of the quantum of spectrum to be made available, and for the provision of Standard Power outdoor devices. As a result of COVID-19 and working from home becoming the "new normal" for many people, Wi-Fi networks are becoming more congested. We propose this band should be the third highest priority on the ACMA's spectrum work program.

### Prioritisation of the ACMA's forward allocation work plan

Following the administrative allocation of the 26 and 28 GHz apparatus licences, we recommend the following prioritisation of the spectrum work program for 5G and mobile broadband (MBB). While these bands have been sequentially ranked, this does not imply the activities should be conducted sequentially as all the bands listed in this table are of high priority for delivering 5G in Australia. Rather, in a resource constrained environment, we present this ranking to the ACMA to assist in planning activities in a pragmatic way to ensure activities that deliver the highest value to Australians and the Australian economy are given the highest resource allocation.

---

<sup>1</sup> <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/the-covid-19-recovery-will-be-digital-a-plan-for-the-first-90-days>



Band	Priority	Comment
<b>Combined 850 MHz/900 MHz (814-825/859-870 MHz and 890-915/935-960 MHz)</b>	1	Reconfiguring and releasing spectrum in the 900 MHz and 850 MHz expansion bands is important for making adequate low-band spectrum available for mobile broadband coverage and should remain the ACMA's highest priority in the immediate term.
<b>3.4 GHz (3400-3575 MHz) &amp; 3.8 GHz (3700 -4200 MHz)</b>	2	We support the ACMA's proposal for the allocation of the 3.4 GHz "urban excise" spectrum to be allocated with the lower 100 MHz of the 3.8 GHz band (i.e. 3700-3800) in Q1 of 2023, and consider this should be the ACMA's second highest priority.
<b>600 MHz (617-694 MHz)</b>	3	The high value of low-band spectrum for mobile coverage (due to its propagation and building penetration characteristics), especially for delivering services in regional areas, means this band should be prioritised by ACMA, subject to the outcomes of the Media Reform Green Paper. We consider further low-band spectrum should take priority over adding additional mm-wave bands, given the recent completion of the reallocation of the 26 GHz mm-wave band.
<b>1800 MHz (1710–1785 MHz and 1805–1880 MHz) in remote areas</b>	4	1800 MHz is a key band for 4G/5G services, and we support the ACMA's plan to release a discussion paper in Q4 2021, which may consider reallocating this band in remote areas, potentially completing national spectrum licensing of this band.
<b>40 GHz (37-43.5 GHz)</b>	5	Given the recent completion of the 26 GHz band spectrum licence auction, the lowest priority on the spectrum workplan for 5G and wide-area MBB should be additional mmWave bands such as the 40, 46 and 47 GHz bands.



---

## 01 Introduction

We welcome the opportunity to provide our comments to the Australian Communications and Media Authority (ACMA) in response to its draft *Five-year spectrum outlook 2021-26* (FYSO) consultation – the first under the *Radiocommunications Legislation Amendment (Reform and Modernisation) Act 2020* (the *Modernisation Act*).

We broadly agree with the assessment of demand drivers for new spectrum as provided in the FYSO, in particular about data growth driving continued investment in 5G networks and complementary technologies spurring spectrum demand. Each year we see data usage across our mobile network increase by an average of 40%<sup>2</sup>. With more devices and more things that use more data, like 4K video streaming and virtual reality, we need more bandwidth to continue to provide the quality of service that Australian consumers demand and expect of us. To this end, we are pleased to see 2021 being referred to as the ‘Year of 5G’ and the ACMA’s acknowledgment of the importance of addressing 5G spectrum needs and its commitment to ensuring that Australia is well-placed to take advantage of the opportunities offered by 5G<sup>3</sup>.

The rest of this submission addresses the ACMA’s spectrum work program and specific questions. Our submission is structured as follows:

- Section 2 responds to the spectrum work program, forward allocation work plan and our views on WRC-19 implementation.
- Attachment A contains our specific responses to the questions posed in the FYSO.

---

<sup>2</sup> <https://exchange.telstra.com.au/investing-in-spectrum-to-build-5g/>

<sup>3</sup> Draft FYSO 2021-2026 p.1



---

## 02 Proposed 2021-22 annual spectrum management work program

Reallocating the spectrum in the 900 MHz and the 850 MHz expansion bands is important for making adequate low-band spectrum available for 5G mobile broadband coverage. Beyond this, we consider additional mid-band spectrum from the urban excise in the 3.4 GHz band and the 3.8 GHz band should remain the next highest priority and we are pleased the ACMA is planning a simultaneous reallocation of spectrum from these two bands. In parallel with these two allocations, we consider the ACMA should progress making spectrum in the 6 GHz band available for RLAN under the LIPD class licence.

In the mid-term, we consider further low-band spectrum in the 600 MHz band should continue to be progressed by ACMA, subject to the outcomes of the Media Reform Green Paper, followed by further mm-wave spectrum in the 40, 47 and 46 GHz bands as a lower priority.

### 2.1. Our views on specific spectrum bands

#### Monitoring

##### **600 MHz band (617-698 MHz)**

The potential reallocation of the 600 MHz band has a long lead time given the incumbent use by broadcasters, the social and political aspects associated with technology and business model changes in the broadcast media and associated industries, and because the government is still only at the early stage of consulting on the many issues through the Media Reforms Green Paper. Nevertheless, the high value of low-band spectrum for mobile coverage due to its propagation and building penetration characteristics, especially in regional areas, means this band is one the ACMA needs to keep working on. We consider this additional low-band spectrum should take priority over adding additional mmWave bands, given the recent allocation of the 26 GHz mmWave band.

##### **Future mm-wave (40, 46 and 47 GHz bands)**

We recommend the 40 GHz band be progressed to initial investigation stage ahead of the other mm-wave bands i.e. 46 and 47 GHz bands. Considering the developments overseas and the emerging device ecosystem for this band, we believe this band is further along the maturity curve than other mm-wave bands. For example, 39 GHz (band n260) has already been allocated in the USA and is supported by the US version of the iPhone 12.

#### Implementation

##### **3400-3575 and 3700-3800 MHz**

We support the ACMA's proposal for the allocation of the 3.4 GHz "urban excise" spectrum to be allocated with the lower 100 MHz of the 3.8 GHz band (i.e., 3700-3800) in Q1 of 2023, and consider this should be the ACMA's second highest priority for activities in the implementation phase behind the 850/900 MHz price allocation in Q4 2021.



### 1800 MHz (1710–1785 MHz and 1805–1880 MHz) in remote areas

1800 MHz is a key band for 4G/5G services, and we support the ACMA's plan to release a discussion paper in Q4 2021, which may consider reallocating this band in remote areas, potentially completing national spectrum licensing of this band.

There are a significant number of incumbent users of this band in remote areas which of course will be an important consideration in how and when this band could be reallocated. Adequate protection of incumbent services, and/or the timeframes in which incumbent services would be required to exit the band are significant considerations that we expect would be addressed as part of the consultation process.

## 2.2. Forward allocation work plan

Our views on the prioritisation of the spectrum work program for 5G, and mobile broadband (MBB) more generally, are shown in the following table. We generally support the ACMA's proposed forward allocation work plan and potential timing of allocations (table 2 of the FYSO p.65).

Please note that itemising the work plan activities in a "priority order" does not imply the activities should be conducted sequentially, as all the bands listed in this table are of high priority for delivering 5G in Australia. Rather, in a resource constrained environment, we present this prioritisation to the ACMA to assist in planning activities in a pragmatic way to ensure activities that deliver the highest value to Australians and the Australian economy are given the highest resourcing priority.

Band	Priority	Comment
<b>Combined 850 MHz/900 MHz (809-824/854-869 MHz and 890-915/935-960 MHz)</b>	1	Reconfiguring and releasing spectrum in the 900 MHz and 850 MHz expansion bands is important for making adequate low-band spectrum available for mobile broadband coverage, especially in regional areas, and should remain the ACMA's next priority after mm-wave. We are pleased to see the ACMA continuing to plan for an allocation on in Q4 2021.
<b>3.4 GHz (3400-3575 MHz) &amp; 3.8 GHz (3700 - 4200 MHz)</b>	2	We support the ACMA's proposal for the allocation of the 3.4 GHz "urban excise" spectrum to be allocated with the lower 100 MHz of the 3.8 GHz band (i.e., 3700-3800) in Q1 of 2023, and consider this should be the ACMA's second highest priority. A full restack of the n78 band could then be considered and coordinated with a new allocation of n78 spectrum, to maximise the likelihood that all n78 spectrum holdings among all licensees could be consolidated as part of the reallocation process.
<b>600 MHz (617-694 MHz)</b>	3	The immense value of low-band spectrum for mobile communications (due to its propagation and building penetration characteristics) means this band is an area the ACMA should focus on, and we consider further low-band spectrum should take priority over adding additional mm-wave bands, given the recent completion of the reallocation of the 26 GHz mm-wave band.



<b>1800 MHz (1710–1785 MHz and 1805–1880 MHz) in remote areas</b>	4	1800 MHz is a key band for 4G/5G services, and we support the ACMA’s plan to release a discussion paper in Q4 2021, which may consider reallocating this band in remote areas, potentially completing national spectrum licensing of this band.
<b>40 GHz (37-43.5 GHz)</b>	5	Given the recent completion of the 26 GHz band spectrum licence auction, the lowest priority on the spectrum workplan for 5G and wide-area MBB should be additional mmWave bands such as the 40, 46 and 47 GHz bands.

Table 1: Prioritisation of spectrum work program for 5G and mobile broadband

## 2.3. Licensing and licensing systems

### Class licensing

#### Wi-Fi

Wi-Fi has become an indispensable part of our daily lives and is essential to the country’s economic and social prosperity. COVID-19 has reset many norms in society with many Australians transitioning to working from home, while increased streaming of high and ultra-high definition content create further demands on home Wi-Fi. We also envisage a number of scenarios for enterprise and industrial deployment of RLAN services in the 5 GHz and 6 GHz bands.

As explained in our submission to the ACMA’s consultation on RLAN use in the 5 GHz and 6 GHz bands, we make five key recommendations for the ACMA’s consideration:

1. The full 1200 MHz (5925-7125 MHz) of the 6 GHz band should be made available for RLAN use under the LIPD class licence in Australia;
2. Higher EIRP power limits for LPI devices can be accommodated (although the PSD limits should be capped) and to the extent possible, indoor deployment should be enforced for LPI in the 6 GHz band (5925-7125 MHz);
3. Higher power, outdoor ‘standard’ devices can also be accommodated in the lower sub-band (5925-6425 MHz), although Automatic Frequency Control (AFC) is mandatory and the ACMA should develop deployment guidelines;
4. Power levels should be increased for indoor use of the 5150-5250 MHz segment of the 5 GHz band, as contemplated under Resolution 229 (Rev. WRC-19); and
5. The 5600-5650 MHz segment of the 5 GHz band should be made available for both indoor and outdoor class-licensed Wi-Fi equipment in Australia.

We also consider it essential that incumbent service types including the fixed satellite service and fixed links are protected, not just for services currently deployed, but also for future deployment of these apparatus licensed services.

#### Drone regulation

Mobile networks can play an important role in drone regulation covering aspects such as registration, activation and identification (using low bit-rate coverage such as NB-IoT) through to low latency remote



---

command and control and hi-res video carriage (on 5G networks). We have run several drone-related technology assessments and trials with various industry customers, within Law Enforcement, Humanitarian Aid, Post Disaster, First Responders and City Councils over the past few years.

We have also done significant work in network-based communication, navigation, and surveillance (CNS) technologies to support Unmanned Traffic Management (UTM). We support the notion of Australia's UTM including a centralised Government platform – a flight information management system (FIMS).

We support the ACMA exploring the use of the 5030–5091 MHz band for line-of-sight (LoS) control and non-payload communications (CNPC) operations in controlled airspace. While we agree with the ACMA that over time, this is expected to increasingly be transferred to mobile (including 5G) networks<sup>4</sup>, it is still important to explore dedicated spectrum arrangements for drone operation in controlled airspace and for alignment with ITU. We note the ACMA has issued a consultation paper for use of the 5030–5091 MHz band for drones which we are considering.

## 2.4. Pricing

We support the ACMA's pricing work program and consider the implementation of the spectrum pricing review, including the reduction in apparatus licence taxes for higher-band services (above 5 GHz), to be of particular importance to the satellite industry. We would welcome the ACMA making the implementation of the spectrum pricing review the highest priority activity in the pricing work program, with the goal of implementing the reduced apparatus licence taxes as early as possible in Q3 of 2021.

## 2.5. Other matters

### 850 MHz spectrum licence expiry and renewal

Existing 850 MHz band licences (called 800 MHz band in the old terminology) are scheduled to expire on Saturday 17 June 2028; just over seven years from now. Consistent with our advocacy<sup>5</sup> on Renewal Statements as part of the modernisation of the Radiocommunications Act, we consider it is essential for industry that at least five years' notice is given if licences are not going to be renewed. This means that should the government decide not to renew spectrum licences in the band, it should be informing the industry in just over two years' time. Even if the government intends to renew the licences, it is equally vital for existing licensees that the renewal mechanism (fixed renewal price based on market rates, a price-based reallocation, etc) is known well in advance of licence expiry so that investment decisions can be made.

For a renewal decision to be made and communicated to industry, we expect that under the new (modernised) Radiocommunications Act, a Ministerial Policy Statement (MPS) will be required<sup>6</sup> to guide

---

<sup>4</sup> FYSO 2021-26, p55

<sup>5</sup> Telstra advocated for the renewal application period to be five years rather than two years as proposed by the government.

<sup>6</sup> For clarity, we acknowledge that the Explanatory Memorandum for section 65A(5) as read with s65A(21) of the new Act makes it clear that the ACMA cannot retrospectively generate a renewal statement for an existing spectrum licence. Hence, we are not asking for a renewal statement in the strict sense of the modernised Act to be generated for existing 850 MHz spectrum



---

the ACMA, existing licensees and industry more generally. We consider the ACMA should be seeking advice in the form of an MPS early in FY22 (notionally, Q3 of 2021) on this matter, and that this activity should be added to the ACMA's licensing work program.

### **Review of spectrum licence technical frameworks - 700 MHz and 2600 MHz TLGs**

We are pleased to see the ACMA has both the 700 MHz and the 2600 MHz bands technical framework on its radar, with the 2600 MHz spectrum licensed band prioritised as the next band for consideration.<sup>7</sup> We would prefer to see the two TLGs prioritised in the reverse order, with 700 MHz conducted before the 2600 MHz band. Ideally, we would like to see the 700 MHz TLG completed in 2021.

### **Radcomms**

We encourage the ACMA to restart Radcomms in FY22. Telstra considers Radcomms to be a crucial event on the annual calendar and an invaluable opportunity to meet with representatives from all industries that use radio spectrum (mobiles, satellite, broadcasters, etc), to hear from key stakeholders across government and to learn about technology evolution and development. We consider a physical event to be the best forum to facilitate the many outcomes Radcomms achieves, although we see immense benefit in a "hybrid" event that also makes each of the presenter and panel sessions available through a live-stream.

---

licences. Nevertheless, it is vital that industry is given clear guidance on what it can expect in terms of the renewal of existing licences.

<sup>7</sup> Draft FYSO FY21-26, last paragraph of p.50.



---

## ATTACHMENT A: Answers to specific questions

### **1. Do you have any feedback on the ACMA's approach to the five-year spectrum outlook?**

We thank the ACMA for its continued investment in the production and consultation on its five-year spectrum planning activities through the FYSO. This is a valuable exercise, and industry appreciates the visibility it provides of the ACMA's work plan and the opportunity to comment and shape the priorities in that work plan. We also consider that the alignment with the fiscal year is important for our own planning cycles, and the structure and content of the document into the various planning phases and other activities such as pricing and compliance is easy to follow and understand.

The one change we would ask of the FYSO is a more time to consider and reply to the draft FYSO in each cycle. The consultation period for this year's FYSO was originally four weeks, inclusive of Easter and school holidays (meaning key staff in Telstra may be taking holidays), as well as coinciding with the 26 GHz band auction (also taking many of the same key staff away). While the time to respond was increased by one week to a total of five weeks, we had effectively less than three weeks to draw together a response that required cross-company consideration from all areas of Telstra that use radio spectrum, including mobiles, fixed services, satellite services and class licensed services. In future, we would appreciate a minimum of four "uncompromised" weeks (i.e., weeks that are absent public and school holidays, as well as any live reallocation processes) and ideally six weeks.

### **2. Are there other technology developments or sources of spectrum demand that the ACMA should be aware of in considering spectrum management over the next five years?**

There are no new technology developments or sources of spectrum demand that we are aware of at this time that hasn't already been covered in the FYSO. While there is some embryonic discussion about what future '6G' services might entail, it is premature to consider what impact that might have on spectrum management within the next five years.

### **3. Do you have any other feedback on the ACMA's plans for monitoring, initial investigation, preliminary replanning or replanning of bands?**

Please refer to section 2 of our submission.

### **4. Do you have any comments about the ACMA's approach to forward allocations?**

Please refer to section 2.2 of our submission for our comments on the ACMA's approach to forward allocations.

### **5. Do you have any other comments on Part 2?**

We have no other comments on Part 2 beyond those made in section 2 of our submission.



---

**6. How do you use the FYSO (for example, read once a year or regularly refer to)?**

Different parts of Telstra use the FYSO in different ways. For most parts of Telstra, engagement with the FYSO is once annually through the review of the draft FYSO. Other parts of Telstra such as some of the key engineering planning areas, staff involved in ITU-R WRC activities and the Regulatory team will refer to the FYSO several times throughout the year to ensure understanding of the ACMA's priorities and to review progress against stated timelines.

**7. Do you find the 6-month and annual progress reports useful?**

We find the 6-month and annual progress reports useful to understand how the ACMA is tracking against stated timelines and also to identify where timelines may have shifted. As per our answer to the previous question, Telstra staff most likely to engage with the progress reports are those in engineering planning areas, staff involved in ITU-R WRC activities and the Regulatory team.

In addition to the 6-month and annual progress reports, we consider that ad hoc alerts of activities that may be subject to significant changes in priority or slippage against stated timelines may be a useful addition to the progress reporting cycle. These ad hoc alerts would not need to be substantial pieces of work; on the contrary, a simple alert on the ACMA's website for FYSO matters with a short explanation would suffice. This way, industry could receive timely notification of any major changes to stated timelines rather than having to wait for the next reporting cycle.