

28 June 2024



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Email: [ESL@acma.gov.au](mailto:ESL@acma.gov.au)

**RE: Expiring spectrum licences: stage 2 - Information gathering, and views on uses of frequency bands and alternative licence conditions**

Dear Sean

The Communications Alliance's Satellite Services Working Group (SSWG) wishes to thank the Australian Communications and Media Authority (ACMA) for the opportunity to provide a submission on the *Expiring spectrum licences: stage 2 - Information gathering, and views on uses of frequency bands and alternative licence conditions* Consultation Paper ('Stage 2 Consultation Paper'). Please note that this submission does not represent the views of Telstra, Optus nor nbn.

The SSWG believes that the importance of satellite services in providing current and emerging direct-to-device applications<sup>1</sup> need to be taken into account in considering the conditions of these Expiring spectrum licences (ESLs). The SSWG believes that Australia will benefit enormously from direct-to-device applications, due to the following reasons:

- **Regional, rural, and remote connectivity**

Seeking to provide adequate regional, rural and remote connectivity merely through terrestrial telecommunications infrastructure has only been partially successful, mainly for commercial and economic reasons. Satellite services being used or planned to be used for direct-to-device applications need to be protected, given their importance for communities and industries in rural, and remote areas.

- **Resilience and temporary disaster responses**

Resilience of telecommunications infrastructure to natural disasters, and the availability of communications services during emergencies are important considerations in all areas of Australia. Satellite technology is significantly less reliant on local terrestrial infrastructure that might be impacted by natural disasters, due to ground-segment facilities often being distant from the natural disaster area. The use of satellite technology as part of for emergency redundancy where non-space terrestrial infrastructure might be overloaded is also an important consideration. Satellite services (including LEOSat) often have Australia wide coverage, which is important to emergency and disaster response that may be required anywhere in Australia. For these reasons, satellite services being used or planned to be used for direct-to-device applications need to be protected.

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<sup>1</sup> In this paper 'direct-to-device applications' refers equally to direct-to-device connectivity between terrestrial devices and satellites using spectrum with a Mobile Service (MS) allocation, identified for IMT and spectrum licensed in Australia, as well as direct-to-device connectivity using spectrum with a dedicated Mobile Satellite Service (MSS) allocation.

With respect to the application of the ITU Radio Regulations Article 4.4 for the provisions of direct-to-device applications in the bands within these ESLs, the SSWG members have differing opinions on our views towards the use of Article 4.4. The two views are presented in our submission to the ACMA's Satellite direct-to-mobile services: regulatory issues consultation in February 2024<sup>2</sup>.

## Proposals for Spectrum subject to ESLs due to expire 2028 to 2032

Table 1 below, adapted from Table 2 in the 'Stage 2 Consultation Paper', summarises the SSWG member's interests in the ESL bands. Their interests are explained in more detail below the table.

**Table 1: ESLs environment considerations<sup>3</sup>, timing and CA SSWG member's interests**

Band	Frequency range	Current Domestic environment	Expiry of SL	Current Global environment	Summary of SSWG member's interests <sup>4</sup>
700 MHz	703–748 MHz / 758–803 MHz	4G, 5G	31 Dec 2029	Widespread use for WBB	Band under study in ITU-R <b>WRC-27 Agenda Item 1.13</b>
850 MHz	824–845 MHz / 869–890 MHz	3G, 4G, 5G	17 Jun 2028	Widespread use for WBB	Band under study in ITU-R <b>WRC-27 Agenda Item 1.13</b>
1800 MHz	1710–1785 MHz / 1805–1880 MHz	Rail, 4G, 5G	17 Jun 2028	Widespread use for WBB	Band under study in ITU-R <b>WRC-27 Agenda Item 1.13</b>  Under study in ITU-R <b>WRC-27 Agenda Item 1.12</b>
2 GHz	1920–1980 MHz / 2110–2170 MHz	4G, 5G	11 Oct 2032	Widespread use for WBB	Band under study in <b>WRC-27 Agenda Item 1.13</b>  Under study in <b>WRC-27 Agenda Item 1.12</b>  Under study in <b>WRC-27 Agenda Item 1.14</b>  ACMA in implementation phase for <b>2 GHz MSS</b> (1980–2010 MHz (E-s) and 2170–2200 MHz (s-E)). Adjacent band conditions affecting MSS. Refer to draft FYSO 2024-29.

<sup>2</sup> [February 2024 CA SSWG Submission – ACMA's Satellite direct-to-mobile services: regulatory issues](#)

<sup>3</sup> In some cases, not all frequency bands shown are entirely spectrum licensed.

<sup>4</sup> Under study in ITU-R WRC-27 AI 1.13 are possible MSS allocations for direct-to-mobile between 694/698 MHz and 2.7 GHz taking into account the IMT frequency arrangements in the most recent version of Recommendation ITU-R M.1036.

Band	Frequency range	Current Domestic environment	Expiry of SL	Current Global environment	Summary of SSWG member's interests <sup>4</sup>
2.3 GHz	2302–2400 MHz	4G, 5G, NBN	24 Jul 2030	Widespread use for WBB	Band under study in <b>WRC-27 Agenda Item 1.13</b>
2.5 GHz	2500–2570 MHz / 2620–2690 MHz	4G	30 Sep 2029	Widespread use for WBB Some use for TOB	Band under study in <b>WRC-27 Agenda Item 1.13</b> Band under study in <b>WRC-27 Agenda Item 1.11</b> Adjacent band conditions affecting MSS.
2.5 GHz Mid-band gap	2570–2620 MHz	TOB	30 Sep 2029	Widespread use for WBB Some use for TOB	Band under study in ITU-R <b>WRC-27 Agenda Item 1.13</b>
3.4 GHz	3400–3700 MHz	4G, 5G, NBN  Use by FSS ES rx in ESPZs	13 Dec 2030	Widespread use for WBB	Adjacent band conditions affecting FSS – e.g. OOB emissions. <sup>5</sup>

### ITU-R WRC-27 Agenda Item 1.13

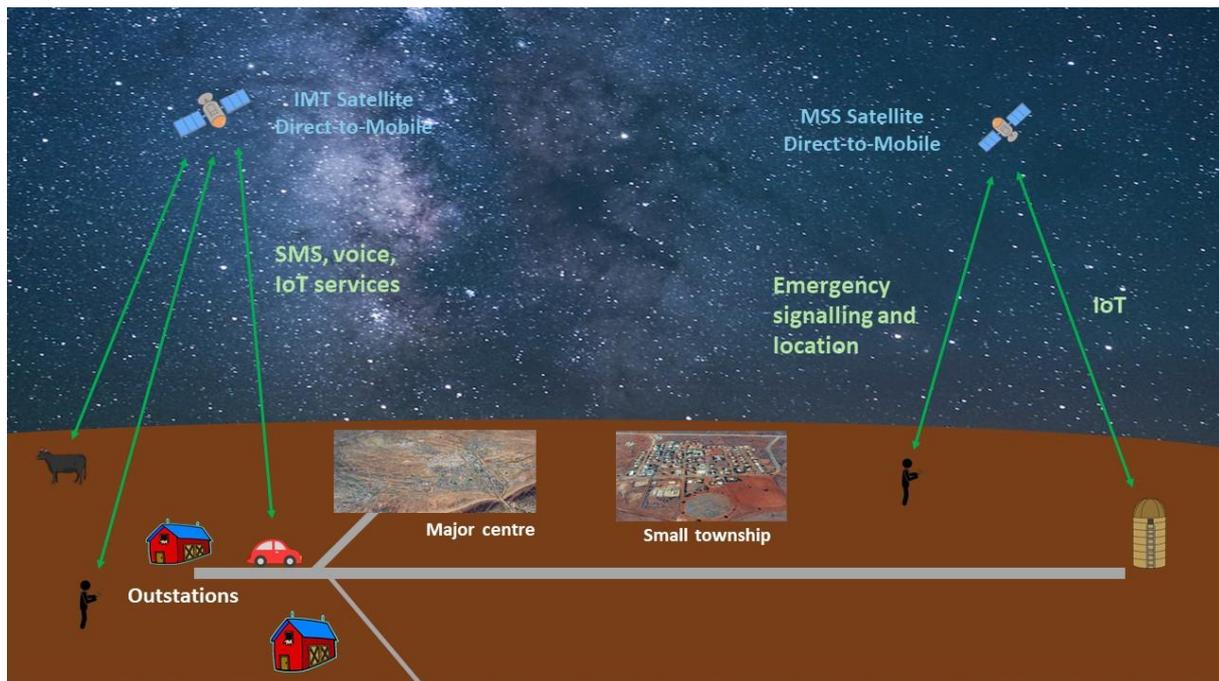
Under study in ITU-R WRC-27 Agenda Item 1.13 are possible new MSS allocations for direct connectivity between space stations and International Mobile Telecommunications (IMT) user (i.e., direct-to-mobile (DTM)) equipment to complement terrestrial IMT network coverage between 694/698 MHz and 2.7 GHz taking into account the IMT frequency arrangements in the most recent version of Recommendation ITU-R M.1036 and in accordance with Resolution 253 (WRC-23).

These ITU-R studies are proposed to concentrate on frequency bands already allocated to the Mobile Service (MS) on a primary basis and used for IMT or identified for IMT by country footnotes or on a regional or multi-regional basis.

In relation to the ESLs being considered, the WRC-27 Agenda Item 1.13 may impact the 700 MHz, 850 MHz, 1800 MHz, 2 GHz, 2.3 GHz, 2.5 GHz and 2.5 GHz mid-band gap MS bands as detailed in Table 1 above. Noting that the renewal applications and decision-making of the ESL process (Stage 4) for these bands is planning to occur in 2026–2032, further clarity on the likely global environment will be known in 2026–2027 leading up to the WRC-27, which may guide the domestic decision-making process.

The 'IMT Sat DTM' approach uses terrestrial MS spectrum to transmit between legacy user equipment (mobile handsets) and satellites, thereby complementing the terrestrial mobile network coverage, particularly in areas where it may be unavailable (i.e., outage) or does not exist.

<sup>5</sup> ITU-R WP 4A Chair's Report (16 May 2023) Annex 31 to Doc 4A/128 - Working document - Elements on mitigation measures between FSS and IMT in the frequency band 3 400-3 600 MHz



**Figure 1: Satellite Direct-to-Mobile services in rural and remote areas**

This proposed use of the ESL spectrum promotes the long-term public interest in many ways:

- **Criterion 1: Facilitates efficiency**

The ESL spectrum if renewed for WBB/IMT can also be allocated and shared with the MSS rather than use different/additional spectrum for the terrestrial and space segments, provided that mitigation techniques are implemented to avoid harmful interference to the incumbent terrestrial services. This will result in efficient use of the spectrum particularly in rural and remote areas where IMT coverage and/or performance is limited or not available.

- **Criterion 2: Promotes investment and innovation**

Once new MSS allocations are available, it is anticipated that satellite operators will need to invest in additional satellites (including LEOSat) to support the demand for these services. In addition, demand for IMT user equipment that can support satellite service will drive investment and innovation. This investment and innovation will need to continue to provide new and improved service functionality to support client needs.

- **Criterion 3: Enhances competition**

Competition between the individual MNOs and individual MSS providers to provide this new service could centre around coverage, service quality, the range of services and pricing.

- **Criterion 4: Balances public benefits and impacts**

Direct-to-device applications could bring IMT coverage to rural and remote areas where it is currently limited or not available. This would provide telecommunications services for emergency and safety applications.

- **Criterion 5: Supports relevant policy objectives and priorities (including regional, rural, and remote connectivity, investment and competition)**

The following policy objectives identified in the 'Stage 2 Consultation Paper' are relevant:

- a. Uses of the spectrum that address digital inclusion for First Nations Australians. In the *First Nations Digital Inclusion Plan (2023-26)* it identifies a 7.5 point gap between non-First Nations people and First Nations people in digital inclusion around access, affordability and digital ability. The case studies identified that access and affordability diminish with remoteness. Direct-to-device applications are capable of addressing both of these elements.

The direct-to-device applications do not require terrestrial infrastructure (base stations or terrestrial backhaul) in rural and remote areas to provide the service as the user equipment connects directly with satellites. Satellites provide Australia wide coverage. This results in access to the service Australia wide including all rural and remote areas.

Also, spectrum is more efficiently used by the terrestrial and satellite components of the service by sharing the same band. With the infrastructure (capital cost) and spectrum (operational cost) costs minimised, affordability to the service connection and data allowances improves.

- b. The National Agreement on Closing the Gap, Outcome 17 is that "Aboriginal and Torres Strait Islander people have access to information and services enabling participation in informed decision-making regarding their own lives." The Target for Aboriginal and Torres Strait Islander people having equal levels of digital inclusion is 2026. Use of the ESL bands for direct-to-device applications services may be possible before the expiration of these licences, in order to meet Target 17.

#### **ITU-R WRC-27 Agenda Item 1.12 study possible new 1.9 GHz MSS allocation**

Under study in the ITU-R for **WRC-27 Agenda Item 1.12** is the possible MSS allocation in the frequency band 1880 – 1920 MHz (space-to-Earth) (Earth-to-space) required for the future development of low-data-rate non-geostationary mobile-satellite systems.

The ACMA is also in the implementation phase of introducing MSS into this 1.9 GHz band, 1880 – 1920 MHz, as detailed in the draft FYSO 2024-29. This new MSS band is adjacent to the 1800 MHz and 2 GHz ESL bands. If the adjacent ESL bands are renewed for spectrum licences, adjacent band conditions need to be determined that will not adversely affect the future use of this band by MSS. Noting that the ESL renewal begins June 2026 and expiry is not until 17 June 2028, these conditions could be derived from WRC-27 and domestic studies.

#### **ACMA in implementation phase for 2 GHz MSS (1980–2010 MHz (E-s) and 2170–2200 MHz (s-E))**

The ACMA is in the implementation phase of introducing MSS into the 2 GHz bands, 1980 – 2010 MHz (E-s) and 2170 – 2200 MHz (s-E)) as detailed in the draft FYSO 2024-29.

These MSS allocations (3GPP band class n256 comprising 1980 – 2010 and 2170 – 2200 MHz) are in the 3GPP NTN framework and therefore may support direct-to-device applications where user equipment including mobile phones can connect

directly to satellites providing MSS services. The eco-system is being created, and no additional regulatory action is needed to access these existing MSS allocations.

These MSS bands are adjacent to the 2 GHz ESL bands. As parts of the 2 GHz ESL bands are being considered under WRC-27 Agenda Item 1.14, and the 2 GHz ESL bands are not subject to renewal application until Oct 2030, Australian stakeholders should participate in the WRC-27 studies for Australia's needs to be best considered. From this, stakeholders working with the ACMA should determine what licensing methodology(s) should be used and what conditions will need to be applied.

#### **ITU-R WRC-27 Agenda Item 1.14 study possible new S-band MSS allocations**

Under study in the ITU-R for **WRC-27 Agenda Item 1.14** is the possible MSS allocations in the 2160 – 2170 MHz (s-E) band in Region 1 and Region 3, and the 2120 – 2160 MHz (E-s) band globally. These possible MSS allocations overlap the 2 GHz ESL band of 2110 – 2170 MHz.

These new S-band MSS allocations are being considered for direct-to-device and other applications, in addition to the adjacent bands 1980 – 2010 MHz (E-s) and 2170 – 2200 MHz (s-E) already allocated to MSS (see section above).

Noting that the 2 GHz ESL bands are not subject to renewal application until Oct 2030, Australian stakeholders should participate in the WRC-27 studies for Australia's needs to be best considered. From this, stakeholders working with the ACMA should determine what licensing methodology(s) should be used and what conditions will need to be applied.

#### **WRC-27 Agenda Item 1.11 study possible MSS space links including the band 2483.5 – 2500 MHz**

**WRC-27 Agenda Item 1.11** is to consider the technical and operational issues, and regulatory provisions, for space-to-space links among non-GSO and GSO in a number of MSS frequency bands allocated to MSS including 2483.5 – 2500 MHz. As with WRC-27 Agenda Item 1.14, if the adjacent ESL band (2.5 GHz) is renewed for spectrum licences, adjacent band conditions need to be determined that will not adversely affect the current and future of this MSS band.

#### **Use of the 3400-3700 MHz and adjacent band by FSS**

The SSWG members have significant investment in the 3400 – 3700 MHz and 3700 – 4200 MHz bands for C-band FSS in Australia, which will continue, accelerated by technological innovation in satellite systems.

Currently FSS earth stations are licensed in the 3400 – 3700 MHz and 3700 – 4200 MHz bands in the Earth Station Protection Zones (ESPZs) and the protection from interference of these areas for FSS licensees should be maintained with any changes to the ESL bands.

FSS earth stations are also licensed in the adjacent band 3700 – 4200 MHz in non-ESPZ areas, and protection of existing and future FSS should be maintained, and in some areas improved, in any changes to the ESL in the 3400 – 3700 MHz band.

- The SSWG is opposed to any move to vary ESL unwanted emission limits such that the frequency boundary between non-spurious and spurious emission limits (currently

3840 MHz) be increased to 4040 MHz, since FSS ES receivers are extremely sensitive to out-of-band emissions.

- The SSWG encourages the ACMA to maintain limits on the unwanted (out of band spurious) emissions of base stations<sup>6</sup> and devices operating in the ESL, noting that this is the predominant interference factor for adjacent channel FSS.

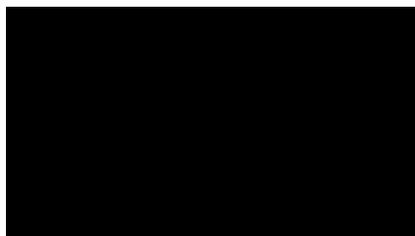
## Considerations of the Spectrum licence methodology

The decision on the elements of spectrum licensing needs to be carefully considered in the light of its impact on the current era of highly innovative developments. The spectrum licensing methodology probably represents the greatest constraint to other services, because of its significant duration. Spectrum management is relinquished to the spectrum proprietor, who then can control spectrum usage. There needs to be careful attention given to establishing relevant coordination and sharing within and adjacent to the ESL bands especially in regard to satellites services that have a long lifetime.

Spectrum licences can be issued for up to 20 years, which is significant when considering the rapid technology developments of alternative licensees including satellite services which may be in adjacent bands and/or want access to the band. For these extended tenures, to make better use of the bands being spectrum licensed, the use-it-or-lose-it (UIOLI) or use-it-or-share-it (UIOSI) conditions should be seriously considered.

If you have any questions with respect to this submission, please contact [REDACTED].

Yours sincerely,



John Stanton  
**Chief Executive Officer**

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<sup>6</sup> Maintain the protection requirements in Section 4.3 (3) of *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters – 3.4 GHz Band)* 2015.

## **Communications Alliance**

Communications Alliance is the primary communications industry body in Australia. Its membership is drawn from a wide cross-section of the communications industry, including carriers, carriage and internet service providers, content providers, platform providers, equipment vendors, IT companies, consultants and business groups.

Its vision is to be the most influential association in Australian communications, co-operatively initiating programs that promote sustainable industry development, innovation and growth, while generating positive outcomes for customers and society.

The prime mission of Communications Alliance is to create a co-operative stakeholder environment that allows the industry to take the lead on initiatives which grow the Australian communications industry, enhance the connectivity of all Australians and foster the highest standards of business behaviour.

For more details about Communications Alliance, see <http://www.commsalliance.com.au>.