

Apple Inc. (Apple) Feedback to ACMA consultation on “Draft Five-year spectrum outlook 2022–27 and 2022-23 Work Program”

Executive Summary

Apple Inc. (Apple) appreciates the opportunity to submit this filing in response to the Australian Communications and Media Authority (ACMA) “Draft Five-year spectrum outlook 2022–27 and 2022-23 Work Program”.

1. Apple proposes ACMA considers an additional VLP scenario with higher PSD limits (10dBm/MHz) for Narrowband FHSS applications at 5945 - 6425MHz in the LIPD Class Licence activities planned for 2022 - 2023, which will be in line with current regulation EU 2021/1067.
2. Apple fully supports the 700MHz (6425 - 7125 MHz) frequency range for Wifi and other similar applications without any technology-specific identifications allowed in the LIPD Class License to enable the digital economy to benefit immediately from global economies of scale.

Feedbacks

Lower 500MHz @6 GHz band/proposed update to the LIPD Class Licence

Regarding EC Decision - COMMISSION IMPLEMENTING DECISION (EU) 2021/1067, the power spectral density up to 10dBm/MHz for VLP Narrowband will encourage more innovation of wireless access system applications in 5945 - 6425 MHz.

The Harmonised technical conditions for WAS/RLANs in the 5945 - 6425 MHz frequency band were extracted from COMMISSION IMPLEMENTING DECISION (EU) 2021/1067. Relevant Extract below.

-----Start of Extract-----

Very Low Power (VLP) WAS/RLAN devices

Parameter	Technical conditions
Permissible operation	Indoors and outdoors. Use on Unmanned Aircraft Systems (UAS) is not permitted.
Category of device	The VLP device is a portable device.
Frequency band	5 945 - 6 425 MHz
Maximum mean e.i.r.p. for in-band emissions (note 1)	14 dBm
Maximum mean e.i.r.p. density for in-band emissions (note 1)	1 dBm/MHz
Narrowband usage maximum mean e.i.r.p. density for in-band emissions (note 1) (note 2)	10 dBm/MHz
Note 1: The mean e.i.r.p. refers to the e.i.r.p. during the transmission burst which corresponds to the highest power, if power control is implemented.	
Note 2: Narrowband (NB) devices are devices that operate in channel bandwidths below 20 MHz. NB devices also require a frequency hopping mechanism based on at least 15 hop channels to operate at a value of in-band power spectral density (PSD) above 1 dBm/MHz.	

Techniques to access spectrum and mitigate interference that provides an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. Where relevant techniques are described in harmonised standards or parts thereof, which have been published in the *Official Journal of the European Union* in accordance with Directive 2014/53/EU, performance at least equivalent to the performance level associated with those techniques shall be ensured.

-----End of Extract-----

Apple proposes ACMA consider an additional VLP scenario with higher PSD limits (10dBm/MHz) for Narrowband FHSS applications in 5945 - 6425MHz in the LIPD Class Licence activities planned for 2022 - 23, which will be in line with current regulation EU 2021/1067.

Higher 700MHz @6GHz band to the LIPD Class Licence

Apple fully supports the 700MHz (6425 - 7125 MHz) frequency range for Wifi and other similar applications without any technology-specific identifications that could be allowed in the LIPD Class License.

Cisco's Visual Networking Index (VNI) considers the impact that users, devices and other trends will have on global IP networks over five years, and they conclude that by 2022, more IP traffic will cross global networks than in all prior "internet years" combined up to the end of 2016. In other words, more traffic will be created in 2022 than in the 32 years since the internet started.

Wi-Fi currently delivers more than half of all internet traffic and by 2022, 71% of total IP traffic will be wireless (Wi-Fi and Mobile); a 25% CAGR between 2017-and 2022.

It is well known that Wi-Fi is the most important wireless technology for business and consumer internet connectivity overall and has become essential even for the mobile segment of internet connectivity, where, worldwide, it carries more traffic than licensed wireless technologies. This is the case because one of the solutions to address the growing demands made on cellular networks due to the increasing demand for bandwidth has long been leveraging Wi-Fi networks, which enables Mobile Network Operators to scale capacity to meet their subscribers' needs. From 2G to 3G, from 3G to 4G and now moving towards 5G, Wi-Fi offload continues to increase in importance. It is anticipated that approximately 70% of 5G offloaded traffic will be on Wi-Fi.

Ensuring a sufficient mid-band license-exempt spectrum is available is critical for supporting existing and ever-growing demand for Wi-Fi as well as playing a critical element in enabling 5G services. As mobile and Wi-Fi technologies evolve and continue to be integrated to meet wireless and mobile communications needs, demand for license-exempt spectrums will continue to grow. However, it is estimated that by 2025 there will be a worldwide Wi-Fi spectrum shortfall of up to 1.6 GHz in the mid-frequency range that will limit the performance and availability of broadband (Quotient Associates, Wi-Fi Spectrum Needs Study, for Wi-Fi Alliance, February 2017). The need for wide-channel Wi-Fi is even more acute, as existing bands in LIPD Class Licence generally do not permit the use of the wider channels that are critical to the newest Wi-Fi technologies.

Access to 5925 - 7125 MHz is critical to assist meet the needs for LIPD Class Licence WAS/RLAN technologies, such as Wi-Fi (Wi-Fi 6E). The proximity to the existing 5 GHz bands in LIPD Class Licence means that 6 GHz chipsets and RF front-end modules are readily available, and this band's wider channels will bring the latest Wi-Fi technologies to countries that open it to technologies in LIPD Class Licence.

The 6425 - 7125 MHz frequency range contains similar incumbents to the 5925 - 6425 MHz range; plus the compatibility and sharing studies between primary services performed between Wi-Fi and incumbents (Fixed Service and Fixed Satellite Service) are equally valid in both 5925-6425 MHz and 6425 - 7125 MHz. These studies currently indicate that sharing is possible when using low power indoors (~250 mW) and very low power portable that may operate indoors and/or outdoors (~25 mW). It is anticipated that higher power outdoor use would likely be possible as a second stage under some form of the light-licensed or equivalent regulatory framework.

We strongly encourage opening the entire 5925 - 7125 MHz for LIPD Class Licence usage to enable the digital economy to benefit immediately from global economies of scale.