



9 June 2021

VIA EMAIL TO [Radio.Spectrum@mbie.govt.nz](mailto:Radio.Spectrum@mbie.govt.nz)  
24 – 30 GHz use in New Zealand  
Radio Spectrum Management Policy and Planning  
Ministry of Business, Innovation and Employment  
PO Box 2847  
WELLINGTON 6140

Re: Comments on 24 – 30 GHz use in New Zealand

Dear Radio Spectrum Management:

Planet Labs Inc. (“Planet”) commends Radio Spectrum Management (“RSM”) for its continued efforts to improve its legislative, regulatory, and business frameworks and welcomes the opportunity to comment on the RSM discussion paper related to the use of 24 – 30 GHz in New Zealand (“Discussion Document”).<sup>1</sup> RSM has invited comments on the use of radio spectrum in the 24 – 30 GHz frequencies for international mobile telecommunications (“IMT”) and fifth-generation cellular technology (“5G”).<sup>2</sup> While IMT and 5G technologies and services are important to businesses and the economy, Planet urges RSM not to exclude other valuable uses of these frequency bands, where such uses would be compatible with the proposed terrestrial uses. Specifically, Planet requests that RSM allow Earth-Exploration Satellite Service (“EESS”) operators to share use of the 25.5 – 27.0 GHz band (space-to-Earth) and the 28.5 – 30 GHz band (Earth-to-space) (the “Proposed EESS Ka-band Frequencies”) with terrestrial

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<sup>1</sup> Radio Spectrum Management, Ministry of Business, Innovation & Employment, *24 – 30 GHz use in New Zealand Discussion Document* (dated Apr. 2021), available at <https://www.rsm.govt.nz/assets/Uploads/documents/consultations/2021-24-30-ghz-use-in-new-zealand/2021-discussion-document-consultation-24-30-ghz-use-in-new-zealand.pdf>.

<sup>2</sup> See *id.* The original submission period was extended to 10th June 2021 to give stakeholders additional time to respond. *Id.*



operators. Shared use of these bands is feasible because of the limited scope and use of the frequencies by EESS systems and the remote locations of EESS earth stations.

**I. Planet is a satellite imaging company providing the leading web-geo platform empowering users across the world to make impactful, timely decisions.**

Planet is a U.S.-based integrated aerospace and data analytics company that operates a constellation of EESS or Earth-imaging satellites collecting information about the changing planet. Planet is driven by its mission to image the entire Earth every day, and make global change visible, accessible, and actionable. Founded in 2010, Planet designs, builds, and operates small satellites, as well as online platforms that serve data to users, helping decision-makers solve the world's toughest challenges and entrepreneurs to build new businesses.

Planet operates a fleet of commercial, remote sensing satellites servicing organizations in agriculture and government, both intelligence and civilian agencies, as well as in newer markets like forestry, energy and natural resources, state and local government, and sustainability. Planet is the owner and operator of the Dove satellites, which form a constellation of up-to 200 cubesats that image the entire land mass of the Earth every day, and SkySat satellites, which provide high-resolution imagery. The imagery from these satellites provide products and services to a variety of customers, including governments like New Zealand, commercial clients, and non-profit organizations. Uses of the data include mapping, agriculture, and environmental change detection.



To date, Planet has successfully launched and operated over 400 satellites via a variety of launch vehicles, including New Zealand’s Rocket Lab Electron rocket.<sup>3</sup> Planet has also operated its Awarua ground station in New Zealand for over seven years and has, to date, invested over a million NZ\$ in this facility.

## **II. Planet and other EESS operators have a critical need for the use of the Proposed EESS Ka-band Frequencies.**

Businesses, governments, and research institutions leverage Planet’s data and platform to scale their operations, increase efficiency and mitigate risk, and develop novel solutions to address their most pressing challenges ranging from natural disaster management, to agricultural trends, maritime domain awareness and asset monitoring. Accordingly, the data EESS systems produce can boost economic growth, increase agricultural productivity, speed disaster response, and further other critical missions including intelligence analysis and compliance management.

Planet’s images were recently used, for example, to show the container ship blocking Egypt’s Suez Canal<sup>4</sup> and to build a comprehensive picture of events leading to a landslide in India.<sup>5</sup> Planet has plans to use its EESS systems in the future for additional projects such as

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<sup>3</sup> See, e.g., “Pics or it Didn’t Happen: The Rocket Lab Launch of Five New SuperDoves,” Planet (dated 15 June, 2020), *available at* <https://www.planet.com/pulse/pics-or-it-didnt-happen-rocket-lab/> (last visited 4 June, 2021); “Successful Launch of Flock 4e’ on Rocket Lab’s Electron,” Planet (dated 28 Oct., 2020), *available at* <https://www.planet.com/pulse/successful-launch-of-flock-4e-on-rocket-labs-electron/> (last visited 4 June, 2021).

<sup>4</sup> “Satellite Imagery Shows Mega Container Ship Blocking Egypt’s Suez Canal,” CNBC (dated 24 Mar., 2021), *available at* <https://www.cnbc.com/2021/03/24/satellite-imagery-of-ship-ever-given-blocking-egypts-suez-canal.html/> (last visited 4 June, 2021).

<sup>5</sup> “Disaster in the Himalayas,” Reuters (dated 26 Feb., 2021), *available at* <https://graphics.reuters.com/INDIA-DISASTER/LANDSLIDE/ygdvzeaxypw/index.html> (last visited 4 June, 2021).



mapping super-emitters responsible for large releases of greenhouse gases.<sup>6</sup> In 2019, Morgan Stanley estimated the EESS market to have generated \$2.67 billion.<sup>7</sup> Considering the importance of the EESS market and its expected growth, supporting use of EESS systems alongside IMT should be a part of RSM’s policy for utilization of the Proposed EESS Ka-band Frequencies.

The Ka-band frequencies are a critical part of the continued growth of EESS services. Planet, and other EESS operators, plan to or already utilize such frequencies in New Zealand and internationally for future EESS systems. Many current systems, including that of Planet, operate in the X-band (8025 – 8400 MHz) and S-band (2025 – 2110 MHz) frequencies. There is, however, a growing community of users—government and commercial — in those bands, leading to a higher density of transmissions, especially in key geographic locations, such as New Zealand. Indeed, in recognition of growing congestion in currently used EESS bands, the ITU provided guidance in ITU-R SA.1810, proposing the 25.5 – 27.0 GHz band for future EESS missions.<sup>8</sup>

Moreover, as EESS systems grow in capability, they will need additional bandwidth to provide new products and services, many of which are likely to be more data intensive. Use of

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<sup>6</sup> “Carbon Mapper Satellite Network to Find Super-Emitters,” BBC News (dated 15 Apr., 2021), available at <https://www.bbc.com/news/science-environment-56762972/> (last visited 4 June, 2021).

<sup>7</sup> “Space: Investing in the Final Frontier,” Morgan Stanley (dated 24 July, 2020), available at <https://www.morganstanley.com/ideas/investing-in-space> (last visited 7 June, 2021).

<sup>8</sup> See Int’l Telecomm. Union, *System Design Guidelines for Earth Exploration-satellites Operating in the Band 8025-8400 MHz*, Rec. ITU-R SA. 1810-1, at 3 (5 June, 2017) (“The use of the 25.5 – 27 GHz band by Earth exploration-satellites should be considered in particular if [the specified techniques] cannot adequately resolve potential spectrum-sharing and/or unwanted emission issues [in the X-band frequencies].”), available at <https://www.itu.int/rec/R-REC-SA.1810-1-201707-I/en>.



the Proposed EESS Ka-band Frequencies will facilitate the ability of new systems to accommodate these innovations. For these reasons, use of additional frequency bands, including specifically the Proposed EESS Ka-band Frequencies, as expansion bands for EESS systems is vital for continued growth of critical EESS systems.

### **III. EESS use of the Ka-band frequencies is consistent with ITU allocations.**

There is currently a primary allocation for EESS (space-to-Earth) in the 25.5 – 27.0 GHz band for International Telecommunications Union (“ITU”) Region 3 and under the New Zealand table of frequency allocations.<sup>9</sup> Similarly, there is a secondary allocation for EESS (Earth-to-space) in the 28.5 – 30 GHz bands in ITU Region 3. New Zealand does not have a corresponding uplink allocation specific to EESS, but it establishes the entirety of the 27.5 – 30.0 GHz range as a primary allocation for fixed-satellite (Earth-to-space) use, which is a comparable use. Accordingly, Planet urges RSM to maintain the primary EESS allocation in the 25.5 – 27.0 GHz band (space-to-Earth) and adopt a secondary EESS allocation in the 28.5 – 30 GHz band (Earth-to-space), in both cases consistent with ITU allocations.

### **IV. Shared use of the Proposed EESS Ka-band Frequencies is technically feasible.**

EESS use of the Proposed EESS Ka-band Frequencies is compatible with RSM’s proposed IMT use. EESS spectrum use is both limited in scope and duration. For example, Planet (and other EESS operators) are likely to operate only a limited number of ground stations in New Zealand and internationally, and these facilities can be located in remote places away from dense urban areas where 5G is more likely to be deployed. Transmissions to/from satellites

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<sup>9</sup> See Discussion Document at 4.



are also limited in duration, typically at most 10 minutes per pass, and have narrow beamwidths, and the transmissions occur towards “clear sky” at 5 degree azimuth and above, which further protects terrestrial services.

In addition, although Planet requests that RSM establish a secondary EESS allocation in the entire 28.5 – 30.0 GHz band, Planet (and likely other EESS users as well) require only a relatively modest amount of spectrum (often less than 100 MHz) in this band for control uplinks. Operators require that downlinks and uplinks be in the same frequency bands to simplify system design, take advantage of equipment weight savings, and enhance cost efficiency for both the space and ground segments.

Technical sharing in the uplink band could be accomplished by using a spectrum sharing approach similar to that proposed by RSM for FSS and IMT operators in the 28 GHz band.<sup>10</sup> Under this approach, EESS earth stations and IMT base stations would be licensed for specific locations with EESS earth stations focused on rural areas and IMT base stations focused on urban areas.<sup>11</sup> EESS earth stations and IMT base stations would each have coordination zones to ensure shared use of the bands.<sup>12</sup> All these factors mitigate interference to IMT systems operating in the same frequency bands and make feasible sharing of the Proposed EESS Ka-band Frequencies between EESS and IMT systems.

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<sup>10</sup> Radio Spectrum Management, Ministry of Business, Innovation & Employment, *24 – 30 GHz use in New Zealand Discussion Document*, 35 (dated Apr. 2021), available at <https://www.rsm.govt.nz/assets/Uploads/documents/consultations/2021-24-30-ghz-use-in-new-zealand/2021-discussion-document-consultation-24-30-ghz-use-in-new-zealand.pdf>.

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*



**V. Planet responses to specific RSM questions.**

Provided below in italics are certain specific questions from the RSM Discussion Document. Planet's responses to those questions follow.

*Q2: What are the likely use cases for Ka-band satellite services in New Zealand in the short and long term?*

As described in Section II above, Planet and other EESS companies will or currently have a need to use Ka-band frequencies to support their EESS systems, including earth stations in New Zealand. For these reasons, Planet requests that RSM allow for the shared use of the Proposed EESS Ka-band Frequencies by IMT and EESS operators.

*Q6: Do you agree New Zealand should allocate 24.25 – 27.5 GHz primarily for IMT use?*

Planet has no objections to the allocation of the 24.25 – 27.5 GHz band for IMT use. As discussed in Sections III and IV above, however, Planet requests that RSM also maintain its allocation of the 25.5 – 27.5 GHz band for EESS (space-to-Earth) on a primary basis and allocate the 28.5 – 30.0 GHz band for EESS (Earth-to-space) on a secondary basis.

*Q7: How should RSM accommodate other use in this band such as space services?*

As discussed in Section IV above, EESS and IMT can share the Proposed Ka-band Frequencies given the limited scope and use of the frequencies by EESS systems and the remote location of ground stations.

*Q8: How do you see our proposal of the 28 GHz band allocation?*

Planet requests that RSM maintain its allocation of the 25.5 – 27.5 GHz band for EESS (space-to-Earth) on a primary basis and allocate the 28.5 – 30.0 GHz band for EESS (Earth-to-



space) on a secondary basis. This proposal is consistent with the ITU table of frequency allocations for Region 3.

*Q27: Do you see a need for RSM to allow EESS and SRS earth stations to operate in the band?*

Yes. As discussed in Section II above, Planet, as well as other EESS operators, plan to or already utilize the Proposed EESS Ka-band Frequencies in New Zealand and internationally for EESS systems. Businesses, governments, and research institutions leverage EESS data to scale their operations, increase efficiency and mitigate risk, and develop novel solutions to address their most pressing challenges ranging from natural disaster management, to agricultural trends, maritime domain awareness and asset monitoring. As EESS systems grow in capability, they will need additional bandwidth to provide new products and services, many of which are likely to be more data intensive. Accordingly, it is critical that RSM maintain its allocation of the 25.5 – 27.5 GHz band for EESS (space-to-Earth) on a primary basis and allocate the 28.5 – 30.0 GHz band for EESS (Earth-to-space) on a secondary basis.

*Q33: Do you have any comments regarding the spectrum sharing approach proposed by RSM between FSS and IMT FWA in the 28 GHz band?*

Use of this spectrum sharing approach could be applied to sharing in the 28.5-30.0 GHz band between EESS earth stations and IMT base stations, as discussed above in Section IV.





Respectfully submitted,

/s/Mike Safyan

Vice President, Launch and Regulatory Affairs

PLANET LABS INC.