



September 18, 2020

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**RE: Consultation Paper on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed**

Dear Colleagues,

Wi-Fi Alliance commends the Telecom Regulatory Authority of India (“TRAI”) on its ongoing effort to expand broadband connectivity. The Consultation Paper on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed (“Consultation Paper”)<sup>1</sup> will further inform TRAI on ways to transform India into a digital society by enabling a range of industries and sectors. In particular, Wi-Fi Alliance applauds TRAI for its intentions to achieve the National Digital Communications Policy 2018 (NDCP-2018) goal by considering wireless technologies, promoting a more efficient use of spectrum, championing innovative methods for spectrum sharing, and making spectrum available for the Wi-Fi ecosystem. In this regard, Wi-Fi Alliance urges TRAI to consider making spectrum available for unlicensed access in the 5 9257 125 MHz band that is urgently needed to maintain Wi-Fi performance in light of significant and rapidly increasing demand.

**Introduction**

Wi-Fi Alliance is a global, non-profit industry association of over 850 leading companies from dozens of countries devoted to seamless interoperability. With technology development, market building, and regulatory programs, Wi-Fi Alliance has enabled widespread adoption of Wi-Fi worldwide, certifying thousands of Wi-Fi products each year.

In the Consultation Paper, TRAI accurately observes that “*Wi-Fi technologies can play a significant role in the penetration of mobile broadband due to ease of deployment and faster rollout. In rural and remote locations where spread of houses is limited to a smaller area, wireless coverage using Wi-Fi technology may be cost effective and easy to maintain. In this manner, cellular and Wi-Fi technologies could complement each other in delivering the mobile broadband services.*”<sup>2</sup> In recognition of this fact, in March 2017, TRAI issued a

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<sup>1</sup> [https://traigov.in/sites/default/files/Broadband\\_CP\\_20082020.pdf](https://traigov.in/sites/default/files/Broadband_CP_20082020.pdf)

<sup>2</sup> See Consultation Paper at Paragraph 5.4

recommendation on "Proliferation of Broadband through Public Wi-Fi Networks" to promote use of Wi-Fi technology, which uses the unlicensed spectrum. The spectrum currently available for Wi-Fi access, however, remains insufficient to support growing Wi-Fi ecosystem and demand (see figure below). TRAI has an important opportunity to open 5925-7125 MHz (the "6 GHz band") to license-exempt use as part of an overall strategy to support broadband connectivity and advance the transformation to the digital future. Global momentum is building behind this opportunity as regulators see the benefit of allowing license-exempt devices to access the band at low power levels and on a non-interference basis immediately, rather than deal with the delay and cost of relocating incumbents. Wi-Fi Alliance urges TRAI to consider this initiative as part of its efforts to promote broadband connectivity more broadly, and to move forward expeditiously with a consultation to examine the technical considerations associated with opening the 6 GHz band for license-exempt use.

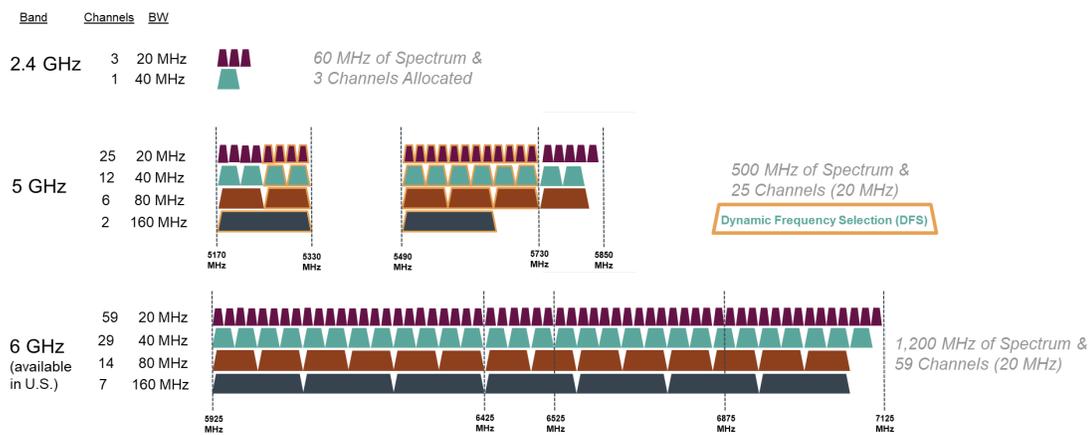


Figure illustrates Wi-Fi channels available in 2.4 GHz, 5 GHz and 6 GHz frequency bands. Wi-Fi channels in 2.4 GHz and 5 GHz are bandwidth limited and regulatorily constrained. The 6 GHz band provides 1200 MHz of contiguous spectrum accommodates fourteen 80 MHz channels and seven 160 MHz channels which are needed for high-bandwidth applications that require faster data throughput.

Source: Broadcom

## WI-FI ALLIANCE RESPONSES

***Q.21: Even though mobile broadband services are easily available and accessible, what could be the probable reasons that approximately 40% of total mobile subscribers do not access data services? Kindly suggest the policy and regulatory measures, which could facilitate increase in mobile broadband penetration.***

Wi-Fi devices have become increasingly important in connecting people and devices everywhere. Hundreds of millions of people rely on Wi-Fi to connect billions of devices every day, and studies show this is increasing rapidly.<sup>3/</sup> Devices using spectrum that supports Wi-Fi

are now the primary means by which majority of Indians connect to the Internet.<sup>4/</sup> This central role will only increase in the future, since Wi-Fi technology will be an essential complement to Fifth Generation wireless (“5G”) networks, as highlighted by the recently released Cisco VNI Mobile Report showing that traffic offloaded to Wi-Fi increase with each successive technology generation.<sup>5/</sup> All of this traffic over Wi-Fi-enabled devices requires spectrum. Wi-Fi Alliance’s previously released *Spectrum Needs Study*<sup>6/</sup> demonstrated that significantly more spectrum access is required to meet immediate connectivity needs.

Wi-Fi Alliance urges TRAI to note that other countries are taking regulatory actions to address the urgent issue of the Wi-Fi spectrum shortfall and respectfully asks TRAI to consider similar actions. Specifically, in April 2020, the US Federal Communications Commission (“FCC”) unanimously approved unlicensed (e.g., Wi-Fi) access to 1,200 MHz in the 5.925-7.125 GHz band. This decision will transform Wi-Fi technology and play a major role in the growth of the Internet of Things, connecting appliances, machines, meters, wearables, smart televisions, and other consumer electronics, as well as industrial automation and manufacturing. At the same time, the FCC regulatory approach ensures that incumbent microwave and satellite operations are fully protected from harmful interference. In July 2020, the UK Ofcom made an initial decision to make the lower 5.925-6.425 GHz available for Wi-Fi and other license-exempt technologies.<sup>7</sup> As a follow on to this decision, it is expected that UK Ofcom will consider additional spectrum for the license-exempt technologies in the 6.425-7.125 GHz range. Similarly, policymakers in Europe are actively working on opening the 6 GHz band to Wi-Fi technologies needed to support Gigabit connectivity objectives (see for example ref. EC [Mandate](#)). In Korea, the Ministry of Science and ICT has published an Administrative Notice regarding its intention to make the full 6 GHz band (5925-7125 MHz) license-exempt for use by low power indoor devices and the lower half of the band for use by portable very low power devices.<sup>8</sup> In addition, ANATEL, the

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<sup>3/</sup> See *Wi-Fi Celebrates 20 Years with More Than 20 Billion Anticipated Device Shipments over the Next Six Years*, ABI Research (Jun. 13, 2019) available at: <https://www.abiresearch.com/press/wi-fi-celebrates-20-years-more-20-billion-anticipated-device-shipments-over-next-six-years/>,

<sup>4/</sup> CISCO, *VNI Complete Forecast Highlights Tool*, Asia Pacific, Wired Wi-Fi and Mobile Growth (2016), [http://www.cisco.com/c/m/en\\_us/solutions/service-provider/vni-forecast-highlights.html](http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html) (select “Asia Pacific” drop-down menu select “India” and check “Devices/Connection and applications” --- note that according to VNI, in India, there will be 697.4 million wired/Wi-Fi connected devices by 2023, up from 359.8 million in 2018 (14.2% CAGR).

<sup>5/</sup> Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2017–2022, White Paper at page 18, available at <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-738429.pdf>

<sup>6/</sup> Wi-Fi Alliance, *Spectrum Needs Study* at p. 23, Feb. 2017, available at [https://www.wi-fi.org/downloads-registered-guest/Wi-Fi%2BSpectrum%2BNeeds%2BStudy\\_0.pdf/33364](https://www.wi-fi.org/downloads-registered-guest/Wi-Fi%2BSpectrum%2BNeeds%2BStudy_0.pdf/33364)

<sup>7</sup> See UK Ofcom Statement: Improving spectrum access for Wi-Fi – spectrum use in the 5 and 6 GHz bands, available at [https://www.ofcom.org.uk/data/assets/pdf\\_file/0036/198927/6ghz-statement.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0036/198927/6ghz-statement.pdf)

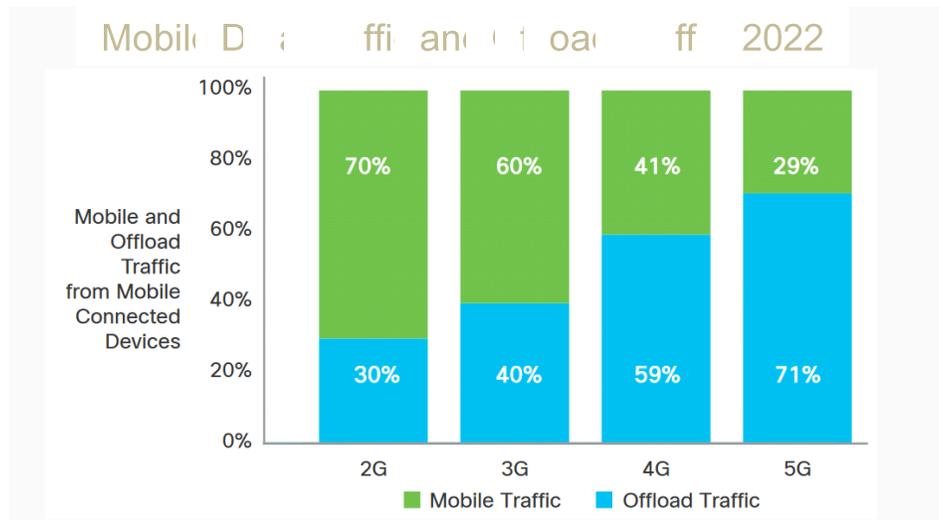
<sup>8</sup> Ministry of Science and ICT, Announcement No. 2020-384, Administrative notice of amendment of technical standards for radio equipment for radio stations that can be opened without reporting (June 26, 2020) <https://msit.go.kr/web/msipContents/contentsView.do?catId= law4&artId=2942268> (“MSIT Korea Administrative Notice”).

regulatory authority of Brazil, initiated a proceeding to examine license-exempt use of the full 6 GHz band (5925-7125 MHz).<sup>9</sup> Furthermore, Taiwan has launched a consultation exploring the technical parameters of making the 6 GHz band license-exempt, and a number of other regulatory authorities have already devoted staff resources to examine the issue, including in Canada, Argentina, Columbia, and Mexico.

While countries consider different 6 GHz approaches, the demand for Wi-Fi spectrum access continues to grow. As projected by UK Ofcom, the demand for Wi-Fi will increase by up to 10 to 15 times over the next 10 year period (ref. UK Ofcom [consultation](#) Appendix 6). Because of the 6 GHz bands unique characteristics, it is evident that policymakers worldwide will continue to expand Wi-Fi access to this spectrum.

**Q.29: What could be the probable reasons for slower mobile broadband speeds in India, especially when the underlying technology and equipment being used for mobile networks are similar across the world? Is it due to the RAN design and capacity? Please provide the complete details.**

The amount of traffic offloaded to Wi-Fi from cellular networks has increased with each generation of cellular technology (*i.e.*, from 2G, to 3G, to 4G). This trend is expected to continue at an even greater rate with 5G data-intensive applications spurring the demand for Wi-Fi capacity. Wi-Fi will be essential to extending carrier 5G networks’ coverage and enabling ubiquitous broadband, low-latency connections.<sup>10/</sup> Wi-Fi is a “key enabler” of carrier 5G networks, because those 5G networks cannot, on their own, fulfill the promise of ubiquitous broadband coverage.



Despite the massive growth in Wi-Fi usage since its introduction 20 years ago, there has not been a corresponding increase in the spectrum available to it. In fact, only a few hundred

<sup>9</sup> See ANATEL, National Telecommunications Agency, Proposed review of the radio frequencies set forth in the Regulation on Equipment for Restricted Radiation approved by Resolution n. 680 of June 27, 2017, on the terms of the draft SEI n. 5181470.” ANALYSIS N. 29/2020/CB, Case n. 53500.012176/2019-58 (Apr. 30, 2020).

<sup>10/</sup> See *e.g.* Brian Santo, *Wi-Fi vs. 5G? Nope, it’s both*, EDN Network, Dec. 5, 2017 (available at <https://www.edn.com/electronics-blogs/5g-waves/4459120/Wi-Fi-versus-5G--Nope--it-s-both>).

megahertz are delivering the majority of India's mobile traffic,<sup>117</sup> a remarkable feat, but one which cannot be expected to be supported forever. The 2.4 GHz band, which includes only 83.5 megahertz and carries a large portion of Wi-Fi traffic, is highly congested. Moreover, it can only accommodate 20 megahertz channels, which are too narrow to support today's use cases such as video and virtual reality.

The next generation of Wi-Fi technology: **Wi-Fi 6** (based on IEEE 802.11ax) is designed to implement 80 and 160 megahertz channels where the spectrum access permits. This standard will operate within the 2.4 GHz and 5 GHz bands and is ideally suited to expand to the adjacent 5925-7125 MHz band ("6 GHz band"). Wi-Fi Alliance introduced new terminology to distinguish forthcoming Wi-Fi 6 devices that are capable of 6 GHz operation, an important portion of unlicensed spectrum that may soon be **made available** by regulators around the world. **Wi-Fi 6E** brings a common industry name for Wi-Fi® users to identify devices that will offer the features and capabilities of **Wi-Fi 6** – including higher performance, lower latency, and faster data rates – extended into the 6 GHz band. Wi-Fi 6E devices are expected to become available quickly following 6 GHz regulatory approvals, utilizing this additional spectrum capacity to deliver continuous Wi-Fi innovation and valuable contributions to consumers, businesses, and economies. Products with this technology are coming online now, and any delay in designating spectrum that supports its use will unnecessarily delay its adoption by consumers and businesses. Increasing access to both licensed and unlicensed spectrum will be essential for fostering innovation and commercial uses of radio spectrum. New technologies operating in unlicensed spectrum such as Wi-Fi 6 provide high-capacity, low latency, and high Quality of Service required by future enterprise and industrial applications. And the 6 GHz spectrum will be essential for providing innovative high-capacity and low-latency broadband services to consumers, enterprises, and public institutions in India.

## Conclusion

The future of the Internet is more: more wireless data, more devices, more uses. Wi-Fi devices will be at the center of this growth. Wi-Fi has been recognized as a **foundational technology for the Internet of Things**, a necessary complement to **delivering 5G**, an important tool bringing communication networks to **underserved areas**, and a strong **contributor to national economies**. Expanding Wi-Fi access to the 6 GHz spectrum will advance the TRAI's goal to make broadband connectivity available to all Indians, especially those in rural and underserved areas. In pursuit of that goal, TRAI should initiate consideration of unlicensed (i.e., Wi-Fi) access to the 5.925-7.125 GHz band.

Respectfully submitted,

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<sup>117</sup> CISCO, VNI Complete Forecast Highlights Tool, North America, United States, Wired Wi-Fi and Mobile Growth (2017), [http://www.cisco.com/c/m/en\\_us/solutions/service-provider/vni-forecast-highlights.html](http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html) (select "Canada" from the "North America" drop-down menu, select "2021 Forecast Highlights" and expand "Wired Wi-Fi and Mobile Growth."). CISCO expects Wi-Fi traffic to account for almost half of all Internet traffic by 2020. CISCO, Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021 at 21, Feb. 7, 2017, available at <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.pdf>.

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