

June 28, 2019

Ex Parte

Marlene Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: *Unlicensed Use of the 6 GHz Band*, ET Docket No. 18-295; *Expanding Flexible Use in Mid-Band Spectrum between 3.7 and 24 GHz*, GN Docket No. 17-183

Dear Ms. Dortch:

On June 26, 2019, the Dynamic Spectrum Alliance hosted the Regulator Workshop portion of its Global Summit. Among other topics, participants presented the enclosed slide presentation which relates to the ongoing 6 GHz proceeding. They discussed the importance of allowing three categories of unlicensed devices to operate throughout the 6 GHz band: 1) standard-power devices under the control of an automated frequency coordination (“AFC”) system; 2) low-power, indoor-only devices; and 3) very-low-power devices both indoors and outdoors. Presenters also discussed the need for rules that allow flexibility in the design of AFC systems. Julie Knapp, Chief of the FCC’s Office of Engineering and Technology was present for these discussions.

A handwritten signature in black ink, appearing to read 'MSA' followed by a stylized flourish.

Martha SUAREZ
President
Dynamic Spectrum Alliance

6 GHz Update

June 26, 2019

AGENDA



6 GHz RLAN Overview



Next Gen Wi-Fi Accelerates 5G Services



US and EU Update



6 GHz RLAN Overview



The Problem

- Operators are increasingly rolling out broadband gigabit access (Fiber, DOCSIS 3.1, 5G, VDSL)
 - The bottleneck in the user experience is **now the wireless interface**
- Wider channels are necessary to support reliable single user gigabit throughput
 - Operators are requesting that client devices support 160 MHz channels
 - **Manufacturers are unwilling to invest** based on limited number of 160 MHz channels available (160 MHz client devices are not mainstream except a few laptops)
- Even for 5G enabled handsets, immersive experience will be delivered through peripherals
- Content providers are **unwilling to release killer apps** requiring high throughput and low latency until the typical user experience is reliable



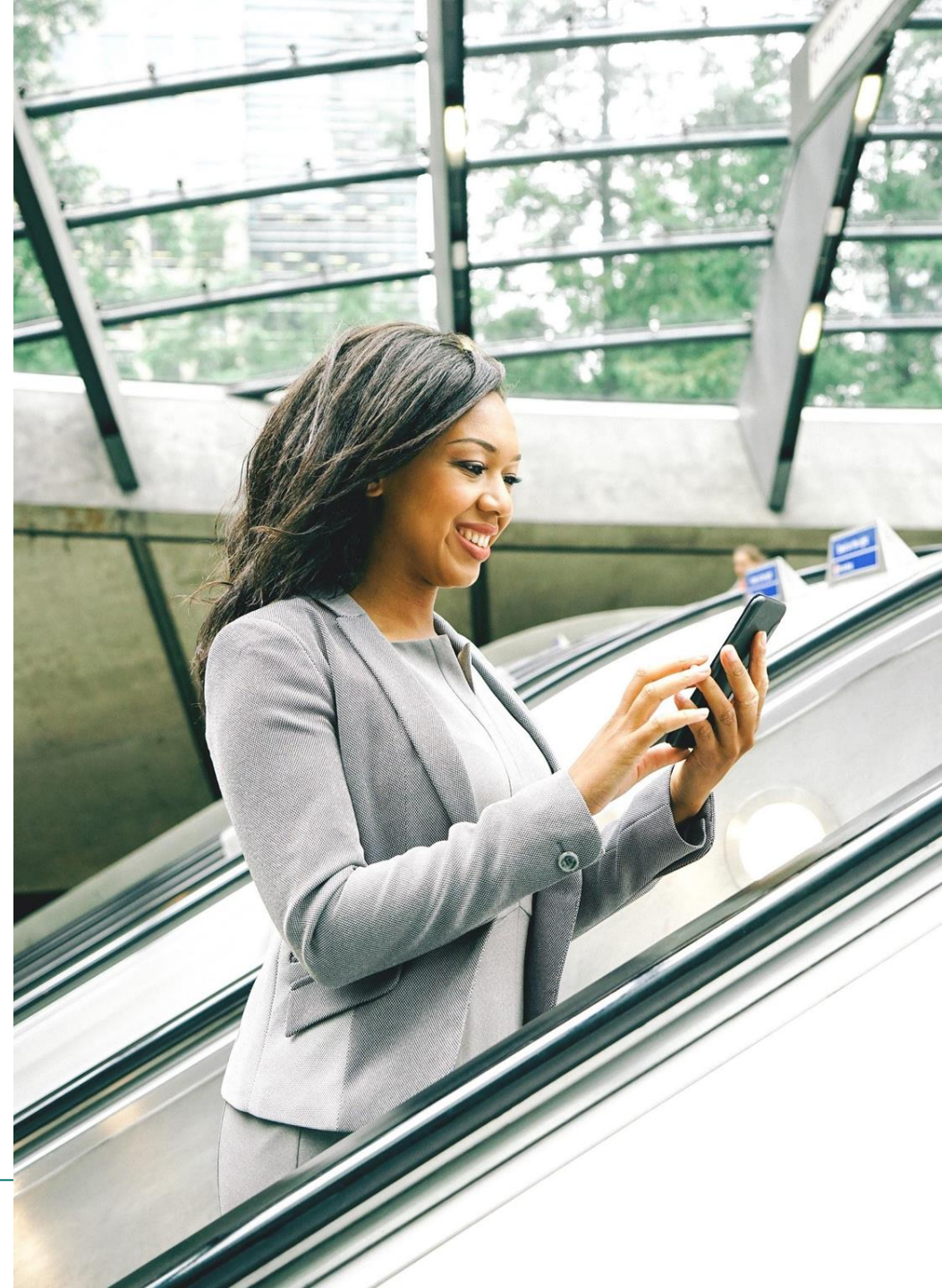


The Solution

- 6 GHz is proximate to the already heavily used 5 GHz bands
 - **Will enable more rapid deployment** using existing operator backhaul infrastructure because network coverage areas are essentially the same
 - Radios can be tuned to support the both the 5 and 6 GHz bands
- Only **the most modern RLAN technology**, which is designed to operate at extremely high efficiency, is expected to operate in this band
- Because there are **no legacy RLAN devices cluttering the airwaves**, the typical user experience is expected to be much better even in congested operating environments
- **Allocations and current operations are similar** throughout the world
 - There is already a mobile ITU allocation so no WRC agenda items is required
 - Coexistence and sharing methodology developed by one administration may be applicable as a baseline for other administrations depending on density of incumbent operations

Industry Readiness

- The RLAN ecosystem has banded together to actively work towards 6 GHz access; most active companies include:
 - Major chipset providers (Broadcom, Intel, Marvell, Qualcomm)
 - OS vendors (Apple, Google, Microsoft)
 - Major AP vendors (Cisco, HPE, Ruckus)
 - Content provider (Facebook)
- Standards work has **already begun**
 - IEEE 802.11ax amended for 6 GHz
 - 3GPP 5G NR-U has identified 6 GHz band for operation
- ETSI Standardization to start once stable regulatory environment
 - ETSI Systems Reference Document completed

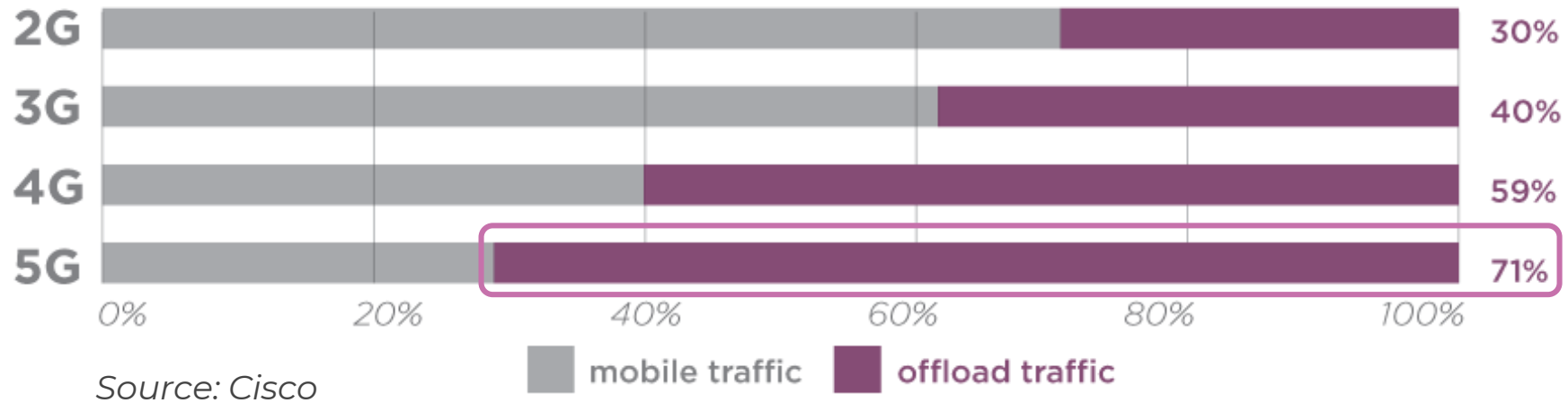




6 GHz: Next Gen Wi-Fi Accelerating 5G Services

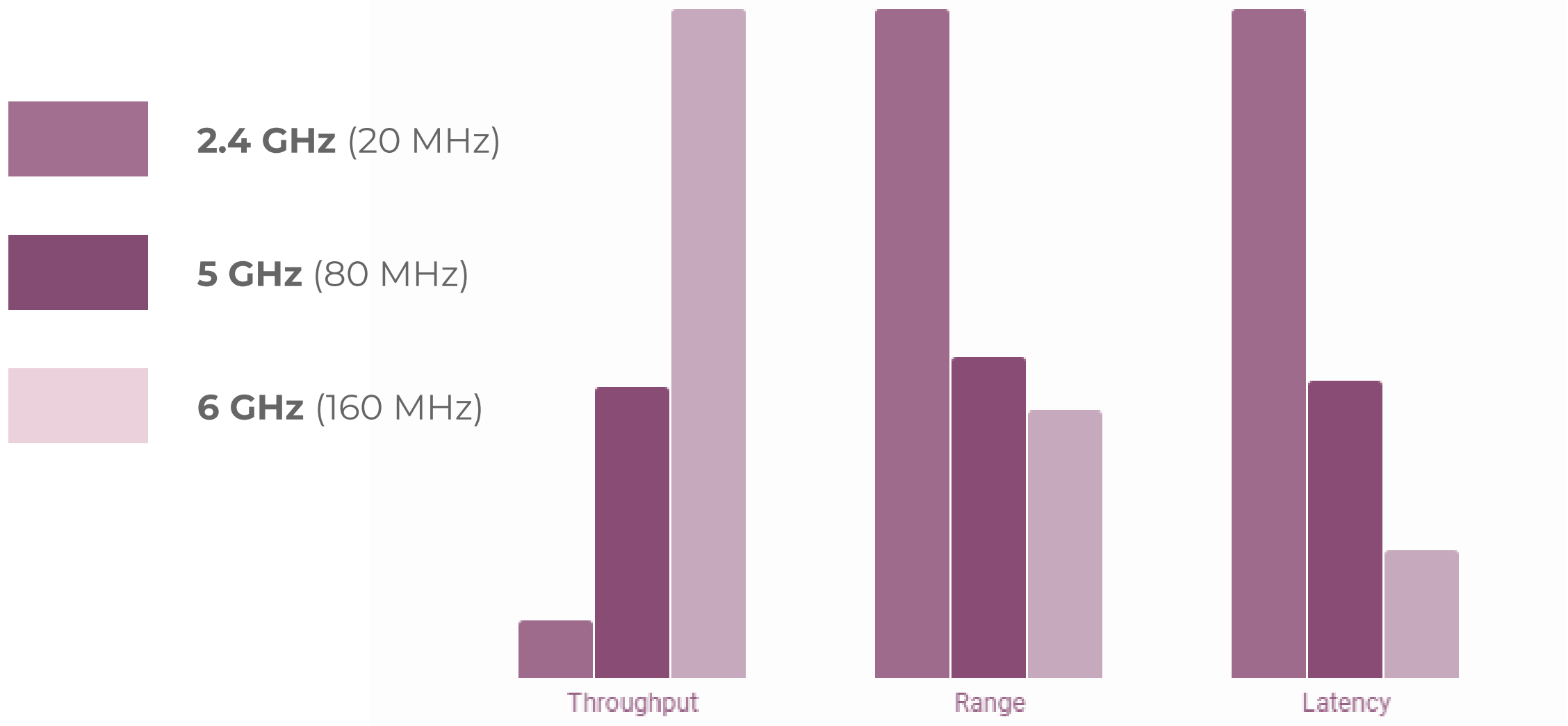


6 GHz RLAN Accelerates 5G Services



- Cisco VNI asserts Wi-Fi 6 is important for 5G era driving increased offload from cellular networks
- 71% data offload to unlicensed spectrum for 5G networks; Total data offload to unlicensed going from 74% to 79% in 2022
- 5G use cases will be accelerated by three critical operating classes in 6 GHz:
 - Standard Power;
 - Low Power Indoor (LPI); and
 - Very Low Power Portable (VLP)

Boost Wi-Fi performance with 6 GHz



6 GHz enables robust Low Power indoor use cases



6 GHz delivers **1.4 Gbps at 7m** distance even with obstructions

Use Cases

- Residential Multi-AP / mesh networks
- Multiple dwelling unit (MDU) Single-AP networks
- High-density enterprise networks
- Indoor public venues
- Industrial IoT

6 GHz Very Low Power Portable Wi-Fi for Ultra High Performance for AR/VR



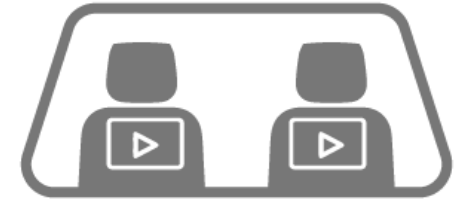
**Mobile
AR/VR**



**UHD Video
Streaming**



**High Speed
Tethering**



**In-Vehicle
Entertainment**

~2 Gbps throughput with sub-ms latency at 3m

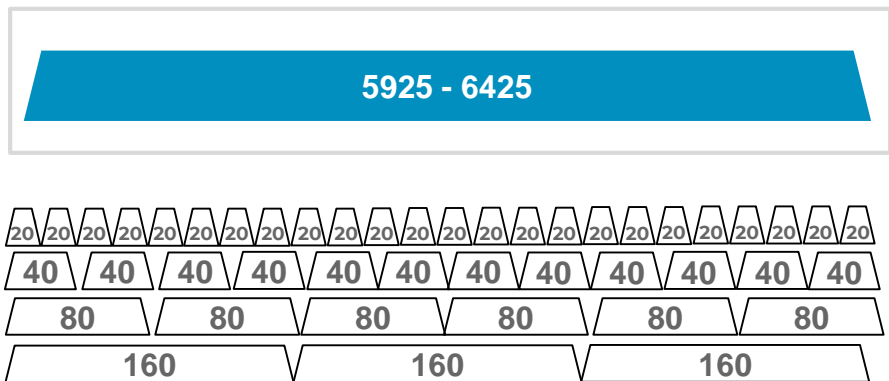


EU and U.S. Update

Bands & Channelization Under Study in Europe & US



24 x 20 MHz
12 x 40 MHz
6 x 80 MHz
3 x 160 MHz



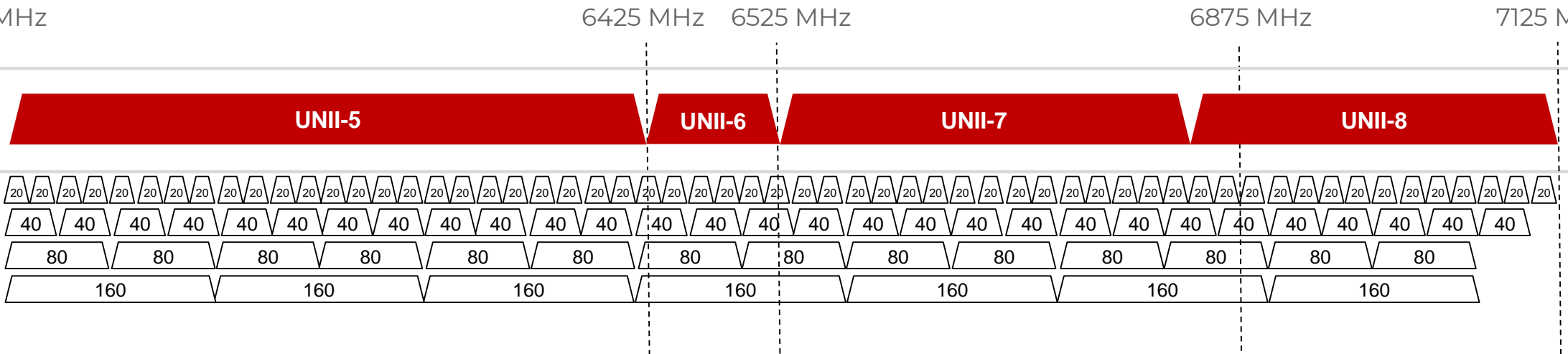
500*
Megahertz
in Europe

and

1.2
Gigahertz
in USA



59 x 20 MHz
29 x 40 MHz
14 x 80 MHz
7 x 160 MHz



* While the EC Mandate was only for the bottom 500 MHz, the original draft mandate went up to 7125. Furthermore the ETSI Systems Reference Document goes up to 6725 MHz, and an ETSI Technical Reference Document goes from 6725 to 7125 MHz. This may lead to additional 6 GHz spectrum in Europe for RLANs in the future.



Proposed Equipment Classes

Class	Power (dBm) EIRP	Access Requirements
Indoor Low Power AP	24	Indoor Use Only
Standard Power AP	30	AFC
Portable Client Device	Same as AP*	Under Control of Access Point
Very Low Power Portable AP	14-16	Very Low Power



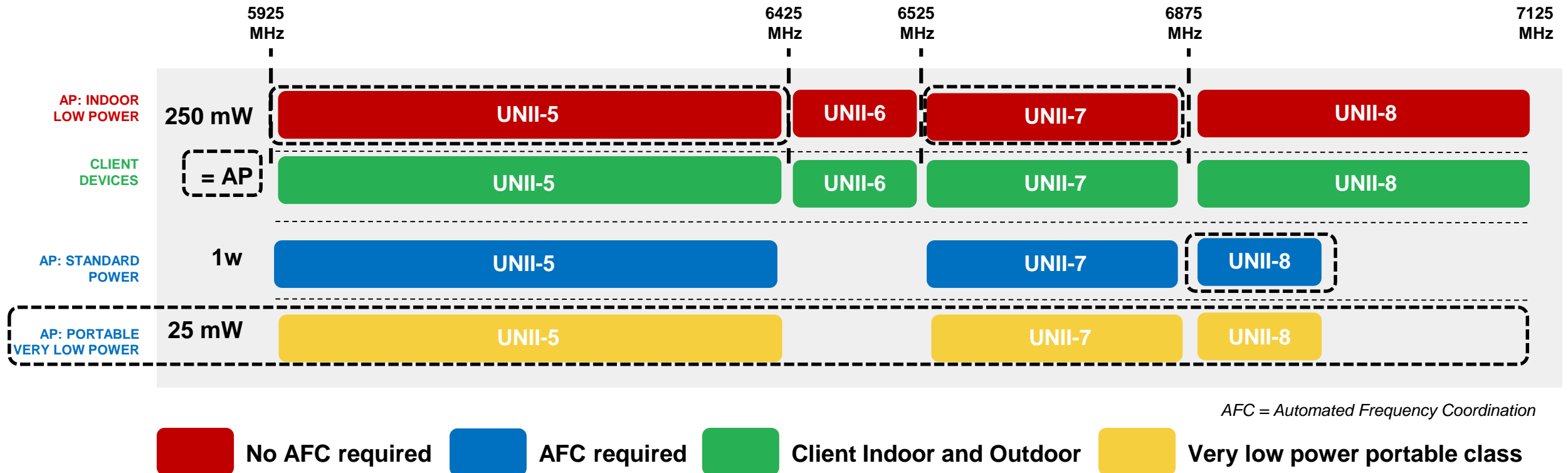
US FCC Proposed Equipment Classes

Class	Power (dBm) Conducted	Access Requirements
Indoor Low Power AP	24	Indoor Use Only
Standard Power AP	30	AFC
Portable Client Device	Same as AP*	Under Control of Access Point
Very Low Power Portable AP*	14 dBm EIRP*	Very Low Power*

* Broadcom Recommendation

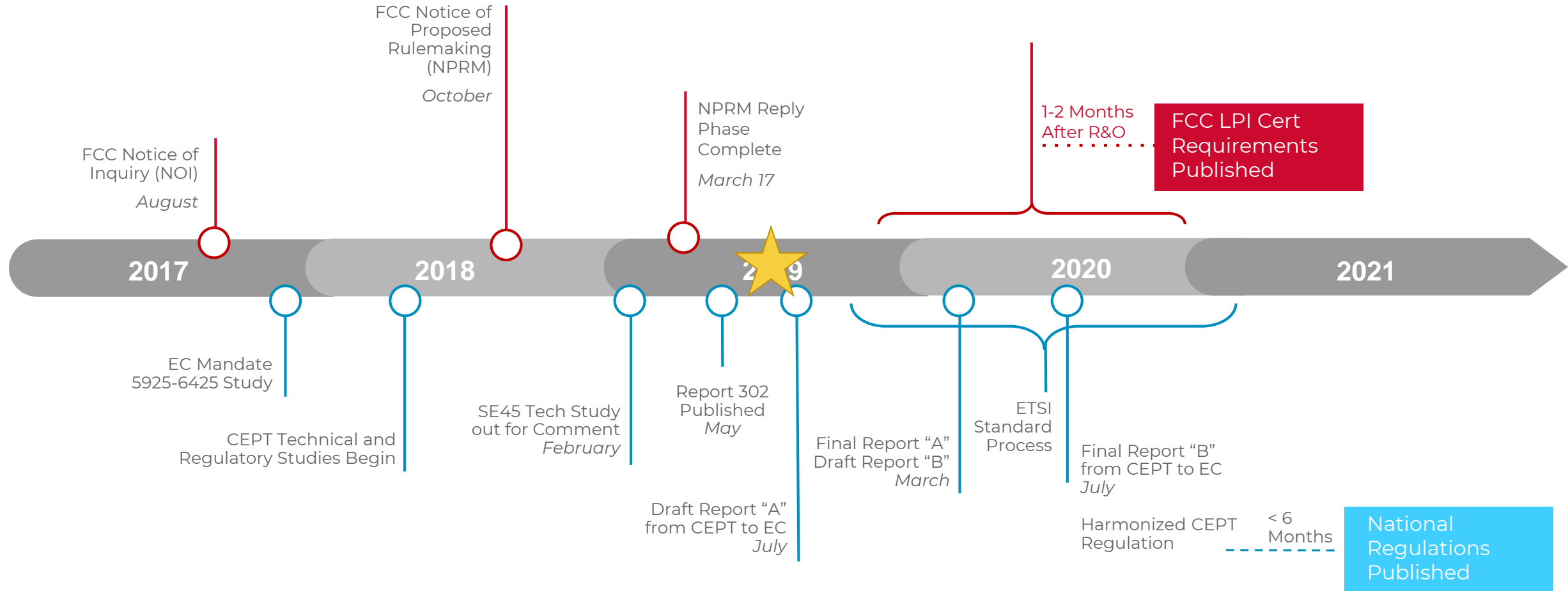
NPRM Overview

- The [FCC's NPRM](#) contemplates 1200 MHz of additional spectrum available for licence exempt use
- RLAN industry recommends some changes to maximize use of the band



US R&O expected completion 2019/2020

“The 6 GHz band can help drive the next generation of Wi-Fi, and I am optimistic that we will be able to make it available for unlicensed use in 2019” - FCC Chairman Ajit Pai



CEPT Response to EC Mandate & Harmonized Regulation by July 2020

[Report 302](#) and well established 5GHz regulatory precedent pave the way for very low power portable and indoor low power operations

Thank You

