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Re: Notice of *Ex Parte*, ET Docket No. 18-295; GN Docket No. 17-183

The Commission should delay expanding unlicensed use of the 6 GHz band. As drafted, the Order fails to address several fundamental issues, including basic measures to prevent and promptly eliminate harmful interference to public safety communications. This likely stems from a pattern of the proponents of expanding unlicensed use (RLAN Proponents) blindly pushing for more spectrum while ignoring the real-world consequences to public safety agencies that depend on this band to carry out their life-saving missions.

Adopting rules that would introduce hundreds of millions of sources of potential interference to public safety communications could hardly come at a worse time. Public safety agencies across the country depend on the 6 GHz band, and they are stretched to their limits responding to the COVID-19 pandemic. Whereas the RLAN Proponents have attempted to use the crisis to lobby for more Wi-Fi spectrum,¹ APCO is not aware of reports that unlicensed devices lack sufficient bandwidth to support current or near-term needs.² In contrast, a crisis like this highlights the absolute necessity of protecting public safety operations, and it should certainly give pause to any policymaker contemplating changes that could further burden the already strained resources of public safety agencies.

¹ See Letter from Alexander Roytblat, Senior Director of Regulatory Affairs, Wi-Fi Alliance, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295, GN Docket No. 17-183 at 1-2 (Mar. 17, 2020) (“First, it is remarkably ironic that, at a time when so many Americans are relying on low-cost Wi-Fi for bandwidth intensive telework, tele-school, tele-medicine and other accommodations necessary to meet the national COVID-19 crisis, CTIA argues that the Commission overestimated the need for unlicensed spectrum. Our current National need painfully highlights how Americans have come to rely on Wi-Fi connectivity to conduct their lives.”).

² See Tom Sawanobori, Senior Vice President & Chief Technology Officer, CTIA, *Refilling the Licensed Mid-band Fuel Tank* (Mar. 27, 2020) (noting that RLAN proponents have said they will become spectrum-constrained in 2025), <https://www.ctia.org/news/refilling-the-licensed-mid-band-fuel-tank>.

The Commission must ensure adequate protections are in place for public safety communications before moving forward. As explained below, interference to public safety users is inevitable, the draft Order lacks a process for quickly identifying and eliminating sources of interference, several aspects of the draft Order will make developing such a process more difficult, public safety’s need for reliable communications warrants further consideration, and the Commission has reasonable alternatives to flooding the band with unlicensed devices.

I. RLAN Devices Will Cause Harmful Interference to Public Safety Users

In a record replete with contradictory technical analyses, there is one notable subject of agreement: expanding unlicensed use of the band as proposed will result in interference to incumbent users.³ The sheer number of unlicensed devices expected to operate in a band that is already heavily used make interference a statistical certainty. The draft Order states that the rules are designed to “minimize” interference to incumbent licensed users,⁴ but the rules are unlikely to be effective because the location information necessary for avoiding interference from standard power access points will be inaccurate and many devices will be operating outside of the control of an automated frequency coordination (AFC) system.

a. The Locations of Standard Power Access Points Will Not Be Known Well Enough to Prevent Them from Operating in Public Safety Exclusion Zones

The ability to prevent interference from standard power access points depends on an AFC’s ability to restrict unlicensed transmissions in locations that could interfere with incumbent users. The draft Order, however, neglects to establish location accuracy requirements for these devices and rejects APCO’s call for professional installation. Given that accurate location information is necessary to protect public safety communications, the Commission should require a ground-truth location or at least require device location to be accurate within a few meters. Instead, the draft Order goes no further than defining a 95% confidence level for standard power access point locations.⁵ This sets a requirement for how estimated locations should be provided to an AFC, not a requirement for how close the estimate must be to the true location. In other words, if the rules work as intended, 5% of the device location estimates will be incorrect, and there is no limit on how distant the devices can be from their estimated locations. Of the millions of standard power access points expected to be deployed, one in twenty could be installed in the worst possible location for a public safety microwave link, and authorized by an AFC to operate at full power in the same channel being used by public safety.

The draft Order contains additional shortcomings specific to the vertical location information required for standard power access points. As the draft Order states, an AFC needs to know the height of an access point “to accurately calculate exclusion zones to protect fixed service receivers.”⁶ First, it’s unclear if the vertical location information would be subject to the 95% confidence requirement described above or any accuracy

³ Letter from Bruce Olcott, Counsel to The Boeing Company, to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 18-295, GN Docket No. 17-183 at 3-5 (Nov. 1, 2019) (stating that “[t]he parties also appear in agreement that . . . interference events inevitably will occur for some fixed links”). The draft Order itself acknowledges interference will occur in “suggesting” the need for a multi-stakeholder group to “address issues such as interference detection and mitigation” and “develop additional procedures to resolve interference concerns.” Draft Order paras. 48, 86.

⁴ Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, Draft Report and Order and Further Notice of Proposed Rulemaking, ET Docket No. 18-295 and GN Docket No. 17-183 (rel. Apr. 2, 2020) para. 216 (“Draft Order”).

⁵ *Id.* para. 41.

⁶ *Id.* para. 44.

requirements at all.⁷ Second, in requiring vertical information to be provided as a height above ground level, the draft Order fails to explain whether or how an AFC will be able to compare the height of an unlicensed device to the height of the incumbent receivers that it must avoid interfering with. Ground level height varies with terrain and therefore is not sufficient for comparing the absolute heights of a public safety microwave receiver and a nearby RLAN device potentially located within the exclusion zone.

If an AFC lacks the location information it needs to prevent unlicensed devices from operating in exclusion zones, the framework for protecting incumbent operations will fail. That the draft Order does not account for such a fundamental aspect of preventing interference to public safety communications speaks to the need for serious reconsideration before moving forward. Requiring professional installation with ground-truth location accuracy in both the horizontal and vertical planes would be a necessary step in the right direction. But the Commission should establish clear and stringent requirements to ensure location information for unlicensed devices is accurately known to the AFC and that the AFC is able to compare this information to what's known about incumbent operations.

b. The Approach to Limiting Interference from Low-Power Devices Will Not Be Effective

APCO continues to believe that allowing low-power indoor access points to operate without being subject to an AFC is likely to cause interference to public safety communications. APCO remains concerned that assumptions regarding signal attenuation from buildings are too optimistic but will focus here on the impracticality of restricting low-power access points to indoor use. Preventing outdoor operation will be difficult, if not impossible. The draft Order's strategies for limiting these devices to indoor use, such as requiring that devices are labeled as "for indoor use only" and prohibiting weather-proofing,⁸ will not prevent consumers from placing these devices on balconies, rooftop decks, or any other outdoor location that suits their needs. Hoping that consumers are aware of and follow the Commission's rules is not an effective method of preventing interference to public safety communications. Similarly, the draft Order's prohibition on operating these devices (as well as standard power access points) in moving vehicles seems to rest on hopes that consumers will not decide to operate them there.⁹ The Commission should instead impose requirements upon unlicensed devices to, for example, detect operation outside of buildings or when in motion.

II. The Draft Order Does Not Include a Process for Eliminating Interference to Public Safety Communications

In the Notice of Proposed Rulemaking, the Commission asked what requirements are necessary to ensure that any instances of harmful interference can be resolved expeditiously.¹⁰ Despite this being one of the most important issues for public safety, the draft Order establishes no requirement to ensure interference can be quickly identified and terminated. Instead, the draft Order encourages – but does not require – the industry to convene a group of interested stakeholders to address interference detection and mitigation as part of a slate of

⁷ The draft rules require 95% confidence for "geo-location" capabilities, but the draft Order separates the geo-location capabilities from the antenna height reporting requirements. *See id.* 40-45. As explained above, even if vertical location information is subject to the 95% confidence requirement, that would not constitute a requirement on how close to the device's true height the location estimate would need to be.

⁸ *Id.* para. 109.

⁹ *See id.* paras. 194-99.

¹⁰ In the Matter of Unlicensed Use of the 6 GHz Band, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, ET Docket No. 18-295, GN Docket No. 17-183, Notice of Proposed Rulemaking, FCC 18-147 (rel. Oct. 24, 2018) para. 86.

other topics.¹¹ Any such voluntary initiative is unlikely to result in effective mechanisms for public safety agencies to quickly restore mission critical communications when harmful interference occurs.

When interference occurs, the only information available to public safety agencies will be that the microwave link has stopped providing the mission critical communications it was designed for. As APCO has noted, with little to no acknowledgement, fixed service systems are not designed to detect interference and are incapable of attributing it to a particular source. While it should be the responsibility of the new RLAN entrants, absent changes to the draft Order public safety agencies will have to undertake a long, expensive process to attempt to identify the source(s) of interference. Meanwhile, the public safety agency may have few if any options to meet its mission critical communications needs. Microwave links typically span twenty-five to thirty-five miles, and as much as fifty miles, and therefore could be impacted by transmissions within a very large geographic area. How many apartment buildings, businesses, schools, and houses might hold the source of interference? Given the “sporadic and bursty nature of Wi-Fi transmissions,” as the Commission describes them,¹² and the fact that devices will be growing in vast numbers and changing the frequencies they’re using, will it even be possible for public safety agencies to identify the source(s) of interference? As this process drags on, without certainty of how long it will take or whether the result will be a termination of interference, public safety will suffer irreparable harm.

Assuming that the source(s) of interference can be identified, what steps are RLAN Proponents required to take? What recourse is available to public safety? The draft Order specifies no procedures for how public safety can report interference and have the interference promptly addressed. Must an AFC operator take action following a complaint directly from public safety, or only from direction by the Commission? The public safety agency harmed by the interference will have no way of knowing the location of a source of interference or the type of device at issue – a standard power device operating subject to an AFC or a low-power indoor device. How will devices, particularly when indoors, even be identified absent the transmission of digital identifying information?¹³ Would resolving interference for either standard power or low power devices require manual, time-consuming, and labor-intensive direction-finding, and even the need to enter private homes and businesses in proximity to the source of interference? Even with the most optimistic expectations, public safety agencies will face significant expenses and an extremely time-consuming process for attempting to eliminate interference.

The draft Order’s omission of a mechanism for quickly resolving interference is inexplicable.¹⁴ For the Citizens Broadband Radio Service cited so frequently as a model for the 6 GHz spectrum sharing approach, the Commission at least established a token requirement for an AFC to demonstrate the ability to promptly respond to complaints.¹⁵ Failing to adopt even this nominal measure for protecting life-safety communications in the 6 GHz band further evidences the need for the Commission to pause and require the unlicensed spectrum

¹¹ Draft Order para. 48.

¹² *Id.* para. 142.

¹³ *See id.* at para. 216.

¹⁴ The lack of a process cannot be attributed to a lack of suggestions. For example, APCO pointed out that AFCs could maintain (and share with one another) records of the transmissions and frequencies used by standard power access points. Then, public safety agencies could provide logs of disruptions that the AFCs could compare to their own records to check for correlations with unlicensed transmissions. *See* Comments of APCO 9, 19. Under the draft Order, however, this will not be feasible because neither AFCs nor devices will be required to keep the records necessary for this process. In any event, this approach would not by itself be an adequate mechanism for quickly resolving interference. APCO reiterates this suggestion as an example of the dire need for the Commission to reevaluate the spectrum sharing approach before moving forward.

¹⁵ *See* 47 CFR 96.53(o). Note that in the CBRS, an automated frequency coordination system is referred to as a spectrum access system.

proponents to address these concerns. If the likelihood of interference is truly minimal, the proponents of expanding unlicensed use of the band should not balk at establishing a rigorous process to identify and eliminate sources of interference to public safety.

III. Several Elements of the Draft Order Will Make Resolving Interference More Difficult

Not only does the draft Order lack a process for resolving interference, several elements of the Order will make developing such a process more difficult.

a. Unlicensed Access Points Should Not Be Permitted Without Control of an AFC

Opening the entire 6 GHz band for unlicensed indoor operations without the need for AFC-controlled access will create many problems. As APCO explained, even opening the U-NII-6 and U-NII-8 bands (which are not the primary portions used by public safety) for indoor-only low-power access points without requiring the use of a frequency coordination system, poses a threat to public safety communications.¹⁶ If these devices cause interference, how will public safety agencies know whether the interference is coming from a low-power access point rather than a standard power access point that is not being effectively limited by an AFC? How could any interference resolution process quickly address interference resulting from devices that aren't controlled by an AFC?

The Commission must get this right on day one. Once hundreds of millions of unlicensed devices are unleashed into this band, subject to an AFC or not, there is no going back. The best technical assumptions and intentions will mean little when interference begins to harm public safety, and the band becomes unsuitable for mission critical use.

b. The Requirements on AFC Operators Are Inadequate

The draft Order does not define a clear process for designating AFC operators, deferring important details such as the appropriate AFC system test procedures for development at a later date.¹⁷ The Commission should clearly specify the scope, conditions, and extent of the required testing. For example, the Commission could require AFC testing to be conducted in cooperation with public safety agencies, under realistic conditions, and in a sufficiently representative distribution of morphologies. All costs should be borne by the prospective AFC operator.

The data maintained by AFC operators will be important for resolving interference complaints. AFC operators should be required to store information about registered devices for a length of time that is sufficient for effective interference investigation and mitigation. Instead, the draft Order would impose an arbitrary period of three months.¹⁸ Additionally, as explained above, it will be important for AFC operators to maintain records of the frequencies used for each transmission by an access point.¹⁹

The draft Order also fails to impose sufficient requirements on AFC operators that seek to discontinue services. While an AFC operator that no longer wishes to provide services would be required to transfer its data to

¹⁶ Comments of APCO at 15-16.

¹⁷ See Draft Order at para. 52.

¹⁸ *Id.* at para. 88.

¹⁹ See *supra* n. 14.

another designated AFC,²⁰ this requirement only preserves the data if the operator acts in good faith and has the resources to do so. The Commission should consider further safeguards such as requiring AFC operators to post a bond as a condition of the approval to provide services. For an AFC operator going out of business, return of the bond could provide an effective incentive for completing the required data transfer.

IV. Public Safety's Need for Reliable Communications Deserves Further Consideration

The draft Order does not reflect appropriate consideration for public's safety's reliance on the 6 GHz band for mission critical communications. In the Wi-Fi world, interference means slower download speeds. For public safety, interference can mean irreparable harm to the public and first responders' safety. The draft Order fails to appreciate these concerns and even neglects to acknowledge the impact of interference to public safety as part of the cost/benefit analysis.²¹ These costs must be weighed against the benefits.

As further evidence of neglecting public safety considerations, the draft Order overlooks the need to protect public safety links operating under an emergency Special Temporary Authority (STA). As APCO pointed out, STAs are an important use of the band for public safety, particularly in the wake of major disasters.²² The draft Order addresses other types of temporary authorization, requiring operators to register the details of their operations in ULS to receive protection from standard power unlicensed devices,²³ but that approach would not be workable for public safety's STAs. Emergency STAs can be obtained in times of crisis, without filing in ULS until after the new channel is in use. Public safety agencies should not be asked to forfeit this tool for emergency response during disasters or required to undertake new administrative burdens as a prerequisite. This may present a challenge for the unlicensed spectrum sharing goals, but the needs of public safety cannot be ignored because solving these problems is inconvenient.

V. The Commission Has Reasonable Alternatives to Irreversibly Flooding the Band with Unlicensed Devices

The Commission does not have to choose between putting public safety operations at risk and rejecting the expansion of unlicensed use of the 6 GHz band. After all, this is the first instance of the Commission considering the introduction of a massive number of new unlicensed commercial users into a band that is heavily encumbered and relied upon for mission critical communications. For example, after further consideration and revision of the spectrum sharing approach to ensure adequate protections for public safety, a small portion of the band could be opened for real-world evaluation of devices controlled by AFCs. Unlicensed use could then expand in phases, with additional portions of the band becoming available gradually and as the number of unlicensed devices in the band grows. This would allow a more effective evaluation of the unlicensed framework with a reduced risk to public safety. If, at the conclusion of this phased approach, the AFC and technical requirements have been shown to protect public safety communications, the Commission could consider additional proposals for unlicensed use.

VI. Conclusion

²⁰ See Draft Order at para. 56.

²¹ See *id.* paras. 215-16.

²² Comments of APCO at 11.

²³ See Draft Order para. 32.

Public safety's needs are not receiving the attention this proceeding demands. Expanding unlicensed use of the 6 GHz band without further consideration would impose an unjustifiable risk. When interference inevitably occurs, public safety will suffer unless there are measures in place to immediately detect and eliminate the source of interference. Proceeding with an Order that lacks sufficient safeguards and attention to public safety's concerns, and allowing hundreds of millions of unlicensed devices to begin operating in the 6 GHz band, could result in irreversible harm and render the band unsuitable for mission critical use. The Commission should delay expanding unlicensed access to the 6 GHz band and ensure adequate protections are in place for public safety communications before moving forward.

Respectfully submitted,

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