

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
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
)	

REPLY COMMENTS OF THE CITY OF LOS ANGELES

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EXECUTIVE SUMMARY

The City of Los Angeles makes extensive use of the 6 GHz band for vital public safety and critical infrastructure operations, and the record here is clear: those operations will be harmed if the Commission's proposal moves forward without extensive revisions. The FCC should not act in this matter until it has conclusive scientific evidence proving that unlicensed 6 GHz operations will not introduce interference, and will not threaten life and property, as is likely the result of the NPRM's proposals.

The Commission must recognize the risks generated by the NPRM, and the scale of the harm that will result if the Commission moves forward despite the substantial number of concerns raised in the record. Moreover, the record to date is based on limited engineering evidence, a level of review that is insufficient given the risks. The City of Los Angeles calls for additional engineering analysis and real-world testing to be conducted before any unlicensed 6 GHz systems are deployed. Furthermore, the Commission must commit to robust oversight that includes quick, strong, and meaningful enforcement. Oversight that also ensures that no incumbent user will be legally or financially responsible for harm resulting from interference.

The Commission, in sum, must follow its own version of a doctor's admonition to "first do no harm." The Commission must exercise great caution in moving forward with this proposal as the record reveals widespread disagreement, and a lack of consensus on even basic technical issues. Without substantial further debate, analysis, and revision to the proposal, the City of Los Angeles fears that life and property, and critical infrastructure, will not be sufficiently protected, and that Commission action in this docket will do more harm than good.

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I. INTRODUCTION

The City of Los Angeles, California (“City”) submits these Reply Comments in the above-captioned proceedings to highlight the serious concern and potential harms that will be forced on incumbent utility and public safety users of the 6 GHz band if a sharing program is adopted without adequate interference protections. The record demonstrates that vital public safety and critical infrastructure operations depend on highly reliable 6 GHz fixed microwave links. Therefore, before any sharing framework can be implemented, substantial further development, consideration, and real-world testing must take place. The City shares the widespread concerns in the record that “operation under the proposed rules may cause much more interference than anticipated with consumer, commercial, medical, and scientific” uses of the 6 GHz band. Such interference must be avoided, consistent with the Commission’s obligation to allocate spectrum “to provide flexibility of use”¹ only so long as “such an allocation would be in the public interest”² and “would not result in harmful interference among users.”³

II. THE RECORD REFLECTS WIDESPREAD CONCERN ABOUT DISRUPTION TO EXISTING 6 GHZ USERS

A broad array of incumbent users, including but not limited to entities like the City, make extensive use of the band to support critical functions which cannot tolerate interference. Uses range from “point-to-point microwave to interconnect cell sites”⁴ to “protective relaying for [power] transmission and distribution facilities”⁵ to public safety connectivity for public safety

¹ 47 U.S.C. § 303(y).

² 47 U.S.C. § 303(y)(2)(A).

³ 47 U.S.C. § 303(y)(2)(C).

⁴ AT&T Comments at 4. Throughout these Reply Comments, any citation to “Comments” of a party are intended to refer to those filed in the above-captioned dockets on or around February 15, 2019, unless otherwise specified.

⁵ Xcel Energy Services Inc. Comments at 2.

answering points and first responders.⁶

A. Public Safety Uses at Risk

Just as the City described its 6 GHz operations in detail in initial comments, so too have others, placing before the Commission evidence of the scope of threat to public safety answering points,⁷ region-wide centralized local government communications systems,⁸ and even the forthcoming deployment of FirstNet.⁹ As the operator of some of the nation’s largest police and fire departments, the City agrees that harm (in the form of interference or service degradation at any level) to these existing 6 GHz links has the potential to “place[] public safety officials at risk, should unforeseen outages occur.”¹⁰ 6 GHz links are essential due to their “reliability, cost effectiveness,” and reduced “susceptibility to outages during disasters.”¹¹ And since “interference to public safety communications will not be identified until after a communications failure,” any such interference inherently results in increased risk to life and property.¹²

These public safety concerns are particularly amplified in major cities, like Los Angeles, Austin, and New York. Particularly in cases where fixed 6 GHz receivers are “located in or on high buildings within dense urban areas,” the risk of interference is higher due to the “weak signal present at FS receivers supporting public safety or critical infrastructure land mobile radio operations.”¹³ The City shares this concern, as its large size and great population density, coupled with varying geographic terrain, present a particular need for longer-distance fixed links throughout the City. “Public safety concerns operations must be protected from interference to

⁶ See, e.g. Los Angeles County, et al. Comments at 2-4.

⁷ Los Angeles County, et.al., at 2-3; City of New York, New York Comments at 1-2

⁸ City of Austin, Texas Comments at 1.

⁹ AT&T Comments at 7.

¹⁰ City of New York Comments at 2.

¹¹ City of Austin, Texas Comments at 1.

¹² APCO International Comments at 4.

¹³ City of New York Comments at 3.

the maximum extent possible.”¹⁴

B. Threats to Critical Infrastructure Operations

The threats to critical infrastructure operations are also well-documented in the record. As detailed in the City’s initial comments, it is the largest municipal utility in the nation, operating thousands of miles of transmission and distribution lines, more than two hundred substations, and other facilities, all of which rely in one form or another on 6 GHz links whose reliability is measured in the number of seconds each link is inoperable, annually.¹⁵ The City shares the concerns of the Utilities Technology Council and others, that the proposal “threatens to cause harmful interference to microwave systems that electric companies [. . .] use to ensure the safe, reliable, and secure delivery of essential energy and water services.”¹⁶ The record reflects that, like the City, many power companies “use the 6 GHz band for supervisory control and data acquisition (‘SCADA’) and teleprotection systems that monitor and control the balance of power on the grid.”¹⁷ The City shares UTC’s concern that these systems “are highly intolerant of latency resulting from interference” and that “outages or other accidents that could be caused by interference from unlicensed operations could be significant.”¹⁸ The City agrees that there appears to be “limited understanding of the liability” incurred by unlicensed operations in the band.¹⁹ Not only is there serious risk to life and property if the reliability of critical infrastructure communications is reduced, but an entity causing or enabling that interference may also be subject to liability.

¹⁴ APCO International Comments at 4.

¹⁵ *Id.* (“Public safety fixed service operations are designed for availability times of 99.9999%, which means a downtime of no longer than 30 seconds per year.”)

¹⁶ Utilities Technology Council, et al. Comments at 3.

¹⁷ *Id.* at 4.

¹⁸ *Id.* at 11.

¹⁹ *Id.*

III. THE RECORD DEMONSTRATES THE NEED FOR FURTHER THOUGHT & STUDY TO SETTLE UNANSWERED QUESTIONS AND UNADDRESSED CONCERNS.

In light of the concerns described above, the Commission must exercise great care if it nevertheless elects to move forward with some form of spectrum sharing in the 6 GHz band. The City believes that at most, the current proposal “must be just the beginning of an ongoing dialog.”²⁰ The NPRM asked as many questions as it proposed solutions, and the record documents even more concerns. These must be studied and discussed before action can be taken, as the proposal in its current form lacks critical detail necessary to ensure the safety of the public and the protection of sensitive incumbent operations

The City agrees that “those seeking to introduce potentially disruptive, unlicensed uses into the 6 GHz band [. . .] should therefore bear the burden of demonstrating, by clear and convincing evidence, that the proposed uses would cause no harmful interference.”²¹ The burden cannot be on incumbents to prove that they require protection; nevertheless, the sensitivity of uses documented in the record speaks for itself in that respect. The standard applied in evaluating these proposals, furthermore, must be high. The uses here are different, and far more sensitive, than those implicated in other bands where sharing has been implemented, so the standard must be different, too.

At the core of the discussion, moving forward, must be the question of which the Commission deems more important – maximizing unlicensed spectrum access, or protecting critical infrastructure and public safety. The Commission cannot move forward, based on this record, in a manner which arbitrarily disregards the sensitivity of existing operations, and the harms which will result from interference. It must, therefore, take additional time to further

²⁰ AT&T Comments at 5.

²¹ *Id.* at 4.

develop its proposal, and propose answers both to those questions asked in the NPRM, and to those raised by commenters in the record. The guiding principle in answering these questions must be how the Commission can best “protect this critical national infrastructure before it considers turning unlicensed users loose in this crowded, vitally important band.”²²

A. The Governance Framework for Unlicensed Sharing Requires Further Development.

The record reflects numerous unanswered questions about the framework, and Commission oversight, which will supervise unlicensed users in the band. The City agrees first and foremost that any action must place protection of incumbent operations center-stage, as the Commission has done in other sharing proceedings but appears hesitant to do here.

There is a clear need for the Commission to commit to robust enforcement against interfering devices, manufacturers, and operators. The Commission must stand ready to “take swift enforcement action when appropriate, to ensure that interference to incumbent licensees does not occur”²³ and must ensure it has the information and authority readily at hand in order to do so. Incumbent users are exposed to great liability in the event their communications are interrupted, furthermore, and the Commission must make it clear that any person who causes interference will be held fully responsible, not only for the interference under the Commission’s rules, but also for the consequences that stem from disrupted communications.²⁴ Because “the liability resulting from a widespread outage or some other accident”²⁵ is so great, the Commission must make clear that the party causing the interference – or even the AFC operator if their system is at fault – must bear responsibility for the damages.

The core framework must reflect the burdens sharing will impose on licensees, as well.

²² *Id.* at 7.

²³ City of New York Comments at 5.

²⁴ *See* UTC et al. Comments at 16-17.

²⁵ *Id.* at 17.

First and foremost, the City agrees that “incumbent users must be made financially whole.”²⁶ Any costs resulting from interference resolution and mitigation must be compensated by those seeking new access to the spectrum, just as the Commission required when it permitted AWS and MSS services to displace fixed microwave and broadband radio service users in the past.²⁷ Due to the “vast amount of unlicensed devices that are likely to be deployed and the fluctuating nature of unlicensed activity,” identifying causes of interference will be difficult in most, if not all cases.²⁸ These costs must not be imposed on incumbent users already making lawful use of the band. To the extent feasible, any proposal to integrate unlicensed use into the band “must propose a technical solution to detect, locate, and resolve interference as rapidly as possible”²⁹ and ideally without licensee action. Unlicensed devices must be strictly self-regulating, in other words, as “fixed service systems such as those relied upon by public safety for mission critical communications are not designed to detect interference and are incapable of attributing it to a particular source.”³⁰

Flexibility for licensed users must also be preserved. Incumbent users must remain able to revise and expand their networks as necessary, and unlicensed uses must not be permitted to inhibit that growth. The City and others use temporary links, as well, for disaster response and special event management; unlicensed users must not be permitted to interfere with these links, either.

B. Further Consideration of AFC Operator Requirements, AFC Structure, and AFC Data is Necessary

The record reflects widespread disagreement on core aspects of the AFC proposal. Some

²⁶ AT&T Comments at 18.

²⁷ *Id.* at fn. 48.

²⁸ APCO International Comments at 2.

²⁹ AT&T Comments at 18.

³⁰ APCO International Comments at 2.

argue for a single, centralized AFC operator; others argue for only bare-bones requirements and an open-ended approach. Apple, for example, goes so far as to suggest that AFC databases should not be required to interoperate, communicate with one another, utilize any particular channelization scheme, or keep any records of access points, or even operate with all devices operating in the band.³¹ The City strongly opposes so laissez-faire an approach to incumbent protections. The wide gulf in perspectives in the record clearly demonstrates, however, just how much work is left to be done before the Commission may even consider moving forward. Whatever the Commission decides, it must provide sufficient opportunity to comment on a complete proposal; it cannot simply assemble a collection of elements from the record and push forward to a final vote.

Another concerning aspect of the current AFC proposal is its suggested reliance on universal licensing system (“ULS”) data. The record demonstrates substantial concern about the accuracy and reliability of this data, and its suitability for the proposed purpose. The City believes that AFC operations must rely on the best data available. Past experiences with spectrum sharing, as documented in the record, give good cause for this concern. Verizon notes difficulties in implementing the TV White Spaces sharing database and widespread difficulties with inaccurate location data. The record further reflects that the “ULS is plagued with inaccuracies or lacks critical data.”³² “Relying on ULS data alone would also fail to take into account situations where microwave systems may be deployed under conditional authority” or may be subject to wide-area licenses.³³ The City operates one such system using a blanket authorization, transmitting video from public safety aviation units to support law enforcement

³¹ Apple Comments at 12-13.

³² National Spectrum Management Association Comments at 4.

³³ Xcel Energy Comments at 6.

and other first responder operations on the ground. Relying on ULS data alone simply would not protect this use. The City lastly shares concerns raised in the record by the Fixed Wireless Communications Coalition regarding the inadequacy of ULS data for interference protection purposes.³⁴ Any ultimate AFC proposal must ensure the best data, from multiple sources, is relied upon, and is shared among any and all AFC operators to ensure maximum protection for all incumbent operations.

C. Further Engineering Study is Necessary To Validate the Viability of Sharing Under the Commission's Plan

In addition to the uncertainty and disagreement as to the policy framework under which the 6 GHz band should be shared, there also persists significant disagreement as to the technical viability of sharing under any framework, and the degree of protection necessary. Numerous commenters share the City's belief that any final proposal must be backed by strong technical analyses,³⁵ and prior to deployment must also be subjected to real-world testing using prototype devices, in a variety of environments, to ensure that the ultimate framework is in fact working as intended.³⁶ Due to the sensitivity of incumbent uses, simply hoping for the best based on projections and engineering assumptions is not adequate. Every precaution must be taken.

Further engineering analysis may also help resolve substantial technical concerns reflected in the record and shared by the City. In particular, assertions of the insignificance of aggregate interference remain highly disputed; real-world testing and further technical study may resolve this. The same is true of concerns about antenna height, particularly in dense urban areas. The City shares the concerns of APCO and other commenters regarding a two-dimensional

³⁴ See, e.g., FWCC Ex Parte, GN Docket No. 17-183 (Aug. 28, 2018).

³⁵ See, e.g. AT&T Comments at 15-16.

³⁶ See, e.g. New York City Comments at 5-6.

exclusion zone approach.³⁷ The question of adjacent channel protection may also benefit from further technical study, though the City strongly believes that arguments against adjacent channel protections reflect more a lack of appreciation for the sensitivity of incumbent uses than and the consequences of harm, than they do a grounded understanding of the technical issues at hand. Assertions, for instance, that because fixed links operate at higher power levels, they shouldn't need adjacent channel protections,³⁸ are not only unsubstantiated, but also miss the enhanced sensitivity of longer-range links due to signal fade over long distances. Further technical study can shed greater light on these and other concerns, and hopefully provide a basis for further discussion that is based on facts, rather than conclusory statements.

IV. THE COMMISSION MUST REJECT UNTENABLE PROPOSALS.

Some proposals advanced in the record must be dismissed as untenable, both technically and because their basis is wholly inconsistent with any reasonable concept of sharing, or any appreciable degree of respect for the rights and concerns of incumbent operators.

For example, a number of entities aggressively promoting unlicensed use of the band, with minimal incumbent protections, urge the Commission to permit operations in automobiles throughout the band. Apple argues, without any technical substantiation, that the construction of vehicles will sufficiently affect signal propagation as to render interference concerns moot.³⁹ Qualcomm shares this view.⁴⁰ In areas like Los Angeles, however, the movement of millions of cars across thousands of miles of roads will bring hundreds of vehicles past, or through the path of, existing microwave links, every single day. Operations in moving vehicles will substantially *amplify* the already great challenges faced in identifying unlicensed interference, giving

³⁷ APCO International Comments at 13.

³⁸ Qualcomm Comments at 15.

³⁹ Apple Comments at 5-10.

⁴⁰ Qualcomm Comments at 15.

incumbent operators not only limited information to use to detect interference, but also guaranteeing that, with respect to any particular link, such interference is inherently transitory and difficult to pin down. While it may take only seconds for a car to pass by a fixed link, as described above these links' downtime is measured in seconds, annually – even a shred of interference is unacceptable.

The City also urges the Commission to reject calls to remove any device registration requirements from 6 GHz devices.⁴¹ The City shares many commenters' concerns about potential privacy harms which may result from tracking of unlicensed 6 GHz devices and users. But use of spectrum in general, and any particular band, is a privilege, not a right, and that use of spectrum must be weighed against the uses of others in the same band. As described in detail in the record, interference detection and mitigation will be a significant challenge to incumbent users; insisting that no data be available to even trace access points renders this task even harder.

The City does not believe registration information should be made public, or provided generally to all users – it should be registered, instead, with the AFC, and be made available at most to incumbent licensees who can document the presence of a licensed link experiencing interference. The AFC could then compare the link location(s) to its database, and provide *only* that information which is relevant to access points which may be interfering. The Commission, of course, should also have access to this data to support what the City and other incumbent users hope will be a robust commitment to protecting vital operations in the band. Little additional data collection is likely necessary, furthermore; access points must already identify their location and transmit that to the AFC in order to receive guidance as to permissible operation frequencies. In short, privacy concerns must be addressed and considered, and consumer privacy must be

⁴¹ See, e.g. Apple Comments at 13-16.

respected. But privacy concerns are no more or less important than the reliability of public safety and critical infrastructure communications – compromising one for the sake of the other is not an acceptable outcome. If, ultimately, the two are irreconcilable, the Commission should not simply set either concern aside and move forward anyway.

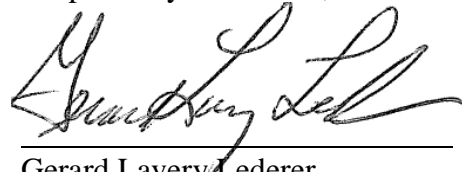
Finally, any suggestion that AFC updates should take place at intervals greater than, at most, 24 hours, must be dismissed. Such proposals not only reflect a lack of interest in protecting incumbent operations, but also fail to appreciate the temporary nature of some incumbent uses. Critical temporary and emergency fixed 6 GHz links would have absolutely no expectation of interference protection from the AFC, even if operational for days. As the City suggested in its initial comments, any AFC framework *must* be paired with technical requirements for AFC devices which prioritize interference avoidance. Thus, any AFC must update “as frequently as possible but at no less than 24 hour intervals.”⁴² Spectrum sharing is just that – sharing. A sharing plan which grants only that protection which is convenient or easy is not truly sharing.

V. CONCLUSION

For the foregoing reasons, the City strongly urges the Commission to exercise all due care in evaluating the record before it, and recognize the substantial need for further study, and a greatly revised approach, before any further action can be taken. A sharing framework which degrades our nation’s critical infrastructure and interferes with the work of public safety agencies nationwide should not be, in anyone’s eyes, an acceptable result.

⁴² UTC et al. Comments at 16.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Gerard Lavery Lederer". The signature is written in a cursive style with a horizontal line underneath it.

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