

**BEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON, D.C. 20554**

In the Matter of	)	
	)	
Expanding Flexible Use in Mid-Band	)	GN Docket No. 17-183
Spectrum Between 3.7 and 24 GHz	)	
	)	

To: The Commission

**COMMENTS OF LOWER COLORADO RIVER AUTHORITY**

Lower Colorado River Authority (“LCRA”) hereby submits its comments in response to the Federal Communications Commission’s (“FCC” or “Commission”) *Notice of Inquiry* (“*NOI*”) on issues regarding the 5.925-6.425 GHz (“Lower 6 GHz”) and 6.425-7.125 GHz bands (“Upper 6 GHz”) bands.<sup>1</sup>

**I. INTRODUCTION**

LCRA is a Texas conservation and reclamation district that provides many vital services to Texans, including delivering electricity, managing the water supply and environment of the lower Colorado River basin, providing public recreation areas, and supporting community development. LCRA supplies wholesale electricity to 34 Texas retail utilities, including cities and electric cooperatives that serve more than one million people in 55 counties. LCRA is a steward of the Colorado River and provides water for more than one million people, businesses, and industries in the lower Colorado River basin in Texas. LCRA operates six dams on the Colorado River that create the Highland Lakes and, through these dams, manages floodwater and

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<sup>1</sup> *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183, 32 FCC Rcd 6373 (rel. Aug. 3, 2017) (“*Mid-Band MHz NOI*”).

produces hydroelectric power. LCRA manages over 30 parks, recreation areas and natural resource areas.

LCRA's affiliate, LCRA Transmission Services Corporation ("LCRA TSC"), owns or operates about 5,200 miles of transmission lines and owns, operates, or provides services at nearly 400 substations. LCRA Transmission Services Corporation's network of facilities – located in more than 70 counties across Texas – provides a vital link among power plants and the statewide, interconnected power grid. LCRA TSC's lines and substations help provide reliable transmission service to Texas generators, including coal and gas plants as well as renewable sources such as wind and hydroelectric plants. LCRA TSC's facilities also are integral part of the overall power system for residential, business, commercial and industrial power customers across the state

LCRA TSC's transmission facilities are located statewide throughout the Electric Reliability Council of Texas ("ERCOT") region. In the Central Texas area, LCRA TSC's facilities help support the electric loads (electricity demand) of more than 40 transmission customers. These transmission customers include municipalities, electric cooperatives, other transmission providers and generators. LCRA TSC's transmission facilities are key elements of the electric grid; delivering power from the generating resources to the load centers throughout the state. The facilities connect more than 5,000 megawatts, or about 7 percent, of the total electric load in ERCOT.

## **II. EXPANDED USE OF THE 6 GHz BANDS WOULD RESULT IN INCREASED RISK OF INTERFERENCE TO CRITICAL UTILITY OPERATIONS**

The Commission seeks comment on the potential for additional flexible wireless broadband use in the Lower 6 GHz band, including whether unlicensed use may be expanded

within the band and whether the band is suitable for licensed wireless broadband.<sup>2</sup> The Commission also seeks comment on the potential for more intensive fixed or mobile use of the Upper 6 GHz band.<sup>3</sup>

The Commission acknowledges that the Lower 6 GHz and Upper 6 GHz bands are used for fixed, point-to-point microwave operations that “support a variety of critical services such as public safety (including backhaul for police and fire vehicle dispatch), coordination of railroad train movements, control of natural gas and oil pipelines, regulation of electric grids, and backhaul for commercial wireless traffic.”<sup>4</sup>

LCRA operates approximately 80 licensed microwave hops in the Lower 6 GHz and Upper 6 GHz bands to support its mission critical utility operations, including protective relaying, load management, water management, flood control, Supervisory Control and Data Acquisition (“SCADA”), and voice and data communications. These systems also support the LCRA trunked radio system, which utilizes 900 MHz Business/Industrial Land Transportation (“B/ILT”) spectrum to provide mission critical voice and data to LCRA as well as public safety and public transportation entities in central Texas.<sup>5</sup> LCRA’s microwave hops also support a 700 MHz regional system licensed by the State and several local law enforcement entities that operates on narrowband 769-775 MHz and 799-805 MHz spectrum. This 700 MHz P25 interoperable regional radio system supports emergency response efforts along the Texas gulf coast region and is accessible by any public safety agency engaged in such efforts.

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<sup>2</sup> *Mid-Band NOI*, 32 FCC Rcd at 6381-6384 ¶¶ 24-31.

<sup>3</sup> *Id.* at 6385 ¶ 36.

<sup>4</sup> *Id.* at 6381-82 ¶ 25, 6384-85 ¶ 35.

<sup>5</sup> LCRA engages in non-profit, shared use of its 900 MHz spectrum pursuant to 47 C.F.R. § 90.179.

Because 6 GHz microwave systems are used for these critical utility operations, they are designed with extremely high standards for reliability with availabilities of 99.999 percent or higher. These microwave system reliability standards ultimately support LCRA TSC's annual transmission system availability index of 99.997 percent.

LCRA appreciates the Commission's interest in exploring opportunities to make additional spectrum available for wireless broadband. However, LCRA has significant concerns about opening up the Lower 6 GHz and Upper 6 GHz bands for unlicensed and licensed wireless broadband. This would increase the potential for risk of harmful interference to existing point-to-point operations and would make it more difficult to expand capacity and coverage of existing systems because of increased demand from new entrants.

LCRA has significant concerns in particular regarding the potential for unlicensed use to cause interference to licensed fixed, point-to-point operations. LCRA is extremely concerned with an increase in the noise floor with the potential of unlicensed users present in the existing 6 GHz bands. Any interference from unlicensed users would not be reasonably predicted until these unlicensed services have been implemented and fully utilized. LCRA has factored existing noise floor levels into its reliability calculations along with antenna system details. The additional noise created across the 6 GHz band by widespread unlicensed use would severely affect these calculations and ultimately the reliability of LCRA's systems.

While LCRA may be able to modify its antenna systems to compensate for the additional noise, this would be an extremely costly endeavor and its effectiveness would remain unknown until the unlicensed use in the 6 GHz band has fully been implemented. Moreover, utilities simply cannot risk interference to their systems. LCRA, like other utilities, relocated from 2 GHz and lacks other realistic alternatives. It is imperative that utilities must be able to continue

to rely on their 6 GHz systems, which they have significantly invested in, to support their mission critical operations without interference. LCRA is strongly opposed to any sharing regime that would require utilities to risk interference and place them in the position of having to engage in *post hoc* interference mitigation measures. LCRA objects to rules that would require incumbent licensees to concede to accepting interference while awaiting longer-term remedies.

LCRA submits that the record is incomplete and that more information is needed regarding proposed unlicensed operation in the 6 GHz band before the impact on licensed, point-to-point operations for mission critical utility operations can be adequately evaluated. Among the unanswered questions that remain includes what mechanisms do the device manufacturers or system operators propose in the 6 GHz band that will ensure incumbent operations are not adversely affected by interference. When incumbent mission critical operations experience interference from unlicensed devices, it will be extremely difficult to track down the source and there would be no guarantee on how quickly the interference would last.

LCRA's experience in the 900 MHz B/ILT pool is a prime example of the potential for interference from unlicensed operations in neighboring bands. LCRA has encountered wireless Internet service providers ("WISPs") using unlicensed spectrum in adjacent bands that were operating transmitters with improper filtering that bled into the adjacent licensed spectrum and interfered with LCRA's operations. LCRA has also experienced WISPs operating on adjacent band unlicensed spectrum that were exceeding power level thresholds for the unlicensed transmission. These cases, even if isolated instances, often take weeks for LCRA to resolve.

As proposed in this proceeding, unlicensed transmitters would be capable of operating in the same band as licensed users and operational issues relating to interference of 6 GHz microwave links would be much greater. If LCRA is experiencing this sort of neighboring

interference between devices in separate bands, it's reasonable to expect similar operations in the same band to interfere. The likelihood that hundreds or thousands of devices technically capable of transmitting on the same frequencies as LCRA's licensed transmitters would be able to reliably sense and avoid LCRA's use is highly doubtful. Another unknown is the likelihood of malfunction of those programmed unlicensed transmitters which could result in interference to licensed mission critical utility operations.

Under no circumstances should the Commission force incumbent fixed users to relocate or retune their operations to accommodate expanded licensed or unlicensed use for wireless broadband.<sup>6</sup> Realignment or retuning of incumbent critical utility operations would be extremely costly and disruptive and the costs of doing so would far outweigh any limited benefit.

Moreover, LCRA lacks alternatives to the 6 GHz band for its operations. LCRA's reliability requirements allow for very little annual combined loss of service, approximately 30 aggregate error-seconds annually. As discussed above, LCRA operates approximately 80 licensed microwave hops in the 6 GHz space. Over time, LCRA has increasingly relied more on licensed spectrum compared to unlicensed spectrum due to observed and foreseeable interference associated in the congested 2.4 and 5.8 GHz bands.

In the early 2000s, LCRA underwent a migration from congested unlicensed bands to licensed bands in an effort to increase bandwidth and reduce interference. As part of this migration, LCRA conducted a detailed analysis of which band it should utilize. The primary candidates identified by LCRA were the 6 GHz and 11 GHz bands due to the balance of throughput and range. The rural areas and size of the LCRA system requires microwave links in the range of approximately 20-30 miles to cost effectively provide services.

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<sup>6</sup> *Mid-Band NOI*, 32 FCC Rcd at 6383 ¶ 29.

LCRA found that operations in the 11 GHz band can be highly affected by the intensity and rain drop size of a heavy thunderstorm typically experienced in Texas. LCRA's communications needs for monitoring and managing river conditions, substation controls, and power plant operations are especially critical during these sorts of weather events. The alignment of increased operational need for reliable communications and decreased reliability due to the physical interaction of 11 GHz with common thunderstorms in LCRA's territory played a major role in LCRA standardizing on 6 GHz.

LCRA has made substantial investments in its 6 GHz equipment. A major factor in LCRA's ability to justify this investment is the throughput capabilities, hop range capabilities, and interference protections provided by the current FCC regulations. If LCRA had to relocate to other spectrum bands, such as 11 GHz, it would result in higher site density to provide the current level of reliability across the existing microwave hop length in the 6 GHz bands. In order to achieve the required levels of reliability currently provided in the 6 GHz band, LCRA would need access to additional infrastructure at significant cost, including building or leasing space on towers, installing shelters, generators and other infrastructure.

### **III. CONCLUSION**

For the reasons discussed herein, LCRA submits that it is not in the public interest to expand use of the 6 GHz bands for unlicensed use or licensed wireless broadband. The Commission should preserve the bands for licensed fixed, point-to-point microwave operations that are subject to prior frequency coordination. LCRA is concerned about the increase in noise floor that would result from increased unlicensed use and the potential for interference, as well as the lack of other suitable bands that could be used to support mission critical services.

**WHEREFORE, THE PREMISES CONSIDERED,** Lower Colorado River Authority respectfully requests the Commission to take action in this docket consistent with the views expressed herein.

Respectfully submitted,

**LOWER COLORADO RIVER AUTHORITY**

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