COMMENTS OF XO COMMUNICATIONS, LLC

XO Communications, LLC (“XO”) commends the Commission for issuing the above-captioned Notice of Inquiry (“NOI”) and exploring the development of 5G mobile radio services in commercial spectrum bands above 24 GHz (the “upper microwave bands”).¹ XO is committed to the innovative use of its upper microwave spectrum, and it supports Commission action to promote 5G mobile services in these bands. To this end, XO urges the Commission to adopt an appropriate regulatory framework that will enable new 5G mobile technologies to thrive above 24 GHz while protecting prior deployments in these bands. The Commission should provide existing upper microwave band licensees with the flexibility to provide 5G mobile services utilizing their choice of technology, while avoiding new overlay services that threaten harmful interference to wireless backhaul and other services currently provided in this spectrum.

¹ Use of Spectrum Bands Above 24 GHz for Mobile Radio Services; Amendment of the Commission’s Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands; Implementation of Section 309(j) of the Communications Act – Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz Bands; Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band, Notice of Inquiry, 29 FCC Rcd 13020 (2014) (“NOI”).
I. INTRODUCTION AND BACKGROUND

XO is a leading nationwide provider of advanced communications, managed network, and IT infrastructure services for business, large enterprise, and wholesale customers.\(^2\) XO operates one of the largest networks in the United States and has a long history of innovation. XO’s operating affiliate, Nextlink Wireless, LLC (“Nextlink”), currently holds ninety-one licenses in the Local Multipoint Distribution Service (“LMDS”) band and nine licenses in the 39 GHz band. XO remains committed to the development of these upper microwave spectrum holdings as a key component of its innovative service offerings. Nextlink is actively utilizing its spectrum assets throughout the country, having deployed over 750 links throughout its LMDS and 39 GHz service areas, and Nextlink continues to deploy additional facilities and links throughout the United States.

Through Nextlink, XO provides its fixed wireless customers with last mile access, cell tower backhaul, and small cell backhaul services.\(^3\) Nextlink serves these customers with both point-to-point and point-to-multipoint fixed wireless configurations, and is also currently exploring the deployment of mesh backhaul facilities where numerous radios establish small-scale, point-to-point links with each other, ultimately connecting designated endpoints. Based on its significant experience operating in the upper microwave bands, XO understands the potential of these bands for the development of 5G mobile radio services.

\(^2\) See XO company description and service offerings at http://www.xo.com/#.

\(^3\) Nextlink markets its wireless microwave services directly through an internal sales force as well as through a well-developed network of agents numbering in the thousands. XO’s website actively promotes Nextlink’s wireless broadband access services and provides specific product information and guides to business solutions using LMDS and 39 GHz spectrum. Nextlink and XO have a dedicated staff of RF engineers, material specialists, and management personnel focused on Nextlink’s LMDS and 39 GHz assets.
II. THE COMMISSION SHOULD ADOPT RULES AND POLICIES TO PROMOTE THE DEVELOPMENT OF 5G MOBILE SERVICES IN THE UPPER MICROWAVE BANDS

XO favors Commission action that provides additional spectrum and greater bandwidth for 5G commercial mobile services. In particular, the Commission should adopt the rules and policies necessary to promote the development of 5G commercial mobile services in the upper microwave bands above 24 GHz.

As an initial matter, it appears that wireless operators can overcome technical obstacles in the upper microwave bands and successfully deploy 5G mobile facilities in this spectrum. As the NOI recognizes, the upper microwave bands’ line-of-sight limitations can be addressed through multiple operational techniques, such as combining multiple reflected signals and steerable antennae. Moreover, the technical viability of 5G mobile operations above 24 GHz has been confirmed by recent experimental testing, which demonstrates the high-speed capabilities of a 5G network at 28 GHz. Among the upper microwave bands, XO believes that LMDS spectrum is well-suited for 5G commercial mobile operations. Licensees should be able to provide 5G services both in the LMDS A1 block, where the majority of LMDS point-to-point and point-to-multipoint backhaul operations are concentrated, and in the LMDS A2, A3, and B blocks, which are comparatively less utilized. Similarly, the 39 GHz band should successfully support 5G mobile operations. The Commission should capitalize on the technical feasibility of these bands with specific actions that encourage successful 5G deployments.

The best regulatory approach for realizing a rapid, efficient 5G deployment above 24 GHz is for the Commission to permit XO and other upper microwave band licensees to operate

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4 See NOI ¶¶ 10-13.
5G commercial mobile facilities under the existing, exclusive geographic area licensing regime in each frequency band. As an existing licensee, XO has extensive experience and expertise in the upper microwave bands and will be able to deploy 5G facilities in a manner that enables those systems to co-exist with incumbent backhaul and other existing deployments. With effective management of this spectrum, 5G commercial mobile operations should even be able to share spectrum with new widely deployed mesh networks for wireless backhaul. Significantly, providing existing upper microwave licensees with the operational flexibility to offer 5G service is consistent with the Commission’s previous statements regarding mobile operations in these bands, its prior regulatory treatment of lower-band wireless licensees, and its decisions to give terrestrial flexibility to satellite licensees.

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6 See, e.g., Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission’s Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services; Petitions for Reconsideration of the Denial of Applications for Waiver of the Commission’s Common Carrier Point-to-Point Microwave Radio Service Rules; Suite 12 Group Petition for Pioneer Preference, Second Report and Order, Order on Reconsideration, and Fifth Notice of Proposed Rulemaking, 12 FCC Rcd 12545, ¶ 207 (1997) (“[W]e know of no reason why we would not allow mobile operations if they are proposed and we obtain a record in support of such an allocation. We believe this would be consistent with our goal of providing LMDS licensees with maximum flexibility in designing their systems.”); Amendment of the Commission’s Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands; Implementation of Section 309(j) of the Communications Act – Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz, Report and Order and Second Notice of Proposed Rulemaking, 12 FCC Rcd 18600, ¶¶ 24-25 (1997) (agreeing “that 39 GHz licensees should have the flexibility to provide mobile services” but declining to permit such operations until “inter-licensee and inter-service standards and criteria” for mitigating interference are addressed).


8 See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 1962, ¶ 1 (2003); Service Rules for Advanced Wireless
Integrating 5G operational authority into the existing licensing and regulatory regimes in the upper microwave bands will also help to minimize interference between different licensees’ 5G mobile systems (as well as interference between licensees’ fixed wireless operations). The Commission has recognized that the existing licensing frameworks above 24 GHz “offer the simplest way to prevent harmful interference to other providers of mobile service operating on the same channels, because such interference would need to be managed only along the perimeters of large service areas.” 9 Consistent with its approach to licensing mobile services in other spectrum bands, 10 the Commission should require new 5G operators in the upper microwave bands to comply with field strength limits at the edge of their geographic service areas in order to avoid interference to adjacent-area licensees. 11

With respect to any unassigned spectrum in the upper microwave bands, the Commission should assign such spectrum under the existing licensing schemes already in use in each band. 12

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9 NOI ¶ 92.

10 See, e.g., Service Rules for Advanced Wireless Services H Block – Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands, Report and Order, 28 FCC Rcd 9483, ¶ 77 (2013) (setting a field strength limit for the H Block, noting that the Commission has “generally adopted a boundary field strength limit” in the PCS, AWS-1, and AWS-4 bands, where it “has worked well in limiting co-channel interference”).

11 See NOI ¶ 43 (seeking comment on whether it “would be appropriate to establish field strength limits at the borders of license areas”).

12 Because the LMDS band has been licensed on a basic trading area (“BTA”) basis, any new licenses also should be based on BTAs. Likewise, the 39 GHz spectrum band is licensed on an economic area (“EA”) basis, so any new licenses that are granted in that spectrum for 5G operations should be based on EAs as well.
Just like existing upper microwave licensees, any party obtaining these new licenses should have the right to provide either fixed or 5G mobile services in their spectrum on an exclusive basis.

XO also urges the Commission to give existing upper microwave licensees the flexibility to utilize time-division duplexing (“TDD”) technology for their 5G operations. TDD will enable 5G operators in these bands to utilize their spectrum more efficiently. Unlike in lower-frequency spectrum bands, 5G providers in the upper microwave bands will not be able to rely on large, contiguous blocks of spectrum. Rather, the configuration of spectrum above 24 GHz will require 5G mobile operators to aggregate multiple sub-channels across different bands in order to realize their throughput goals. Accordingly, XO supports the Commission’s tentative conclusion that it would “be appropriate to allow licensees to choose their methods of duplexing for mobile wireless use in higher frequency bands.”13 This action would be consistent with the duplexing flexibility that the Commission has provided for other mobile service allocations.14

XO recognizes that 5G mobile services in the upper microwave bands will be complementary to commercial mobile services provided in the traditional wireless bands below 3 GHz. Due to the limited-propagation, high-bandwidth nature of RF transmissions above 24 GHz, 5G mobile operations will likely be most commercially practical in high-density areas such as urban centers, office buildings, and sports venues. Equipment and device manufacturers for

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13 NOI ¶ 31.
14 See, e.g., Amendment of Parts 1, 21, 73, 74 and 101 of the Commission’s Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, Fifth Report and Order, 29 FCC Rcd 6331, ¶¶ 13, 16, 20 (2014) (relaxing OOBE limits for broadband mobile equipment operating in the 2.5 GHz band, which would “facilitate the use of TDD technologies” and “provide operators with additional flexibility to use the 2.5 GHz band more efficiently and more intensively”); Amendment of Section 73.202(b), Table of Allotments, FM Broadcast Stations (Elko, Nevada), Report and Order, 23 FCC Rcd 14724, sec. VI (2008) (discussing the Commission’s OOBE standards “based on flexible rules that permit TDD or FDD operation” in both the upper and lower 700 MHz bands).
these complementary new services would benefit greatly from global economies of scale as they undertake the formation of a new 5G ecosystem, and, as a result, XO urges the Commission to promote global harmonization of the upper microwave bands for 5G purposes.

III. THE COMMISSION SHOULD ACCOMMODATE AND PROTECT EXISTING SERVICES IN THE UPPER MICROWAVE BANDS

As indicated above, XO and other upper microwave licensees today primarily operate point-to-point and point-to-multipoint facilities that are designed to provide last mile access to enterprises or backhaul service for cell towers and small-cell deployments. XO is also currently exploring the deployment of mesh networks for backhaul operations. Any Commission rulemaking that enables 5G commercial mobile operations in the upper microwave bands should accommodate and protect these existing fixed wireless services.

To protect existing wireless operations in these bands, the Commission should not adopt any licensing mechanism that would enable other entities to operate 5G facilities in upper microwave licensees’ exclusively authorized frequencies. New, overlay 5G license rights in the LMDS and 39 GHz bands would create a significant risk of interference to existing operations and would diminish existing licensees’ rights. For similar reasons, XO also opposes any non-exclusive licensing approach that would allow other parties to re-use or share upper microwave licensees’ spectrum, such as through beam-forming, coordination, or through a dynamic spectrum access system similar to what the Commission has adopted in the TV White Spaces context or proposed in the 3.5 GHz proceeding. Finally, the Commission should not allow the provision of 5G mobile services on an unlicensed basis under Part 15 of its rules. Permitting

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such unlicensed operations in the exclusively-licensed 39 GHz and LMDS bands would create a substantial risk of interference to existing services and also to any new 5G services provided by the existing licensees.

If the Commission creates 5G mobile “carve-outs” in the existing upper microwave bands and reduces the amount of spectrum available for backhaul and other existing fixed wireless uses, it should simultaneously make additional lower-frequency spectrum available for such fixed point-to-point and point-to-multipoint operations. The supply of spectrum for fixed wireless backhaul is already limited, and the wireless industry’s need for new backhaul solutions is only growing. In formulating appropriate 5G policies above 24 GHz, the Commission should bear in mind this increasing demand and ensure that adequate spectrum is available for backhaul and other fixed services.


See, e.g., NOI ¶ 45 (recognizing “that availability of economical backhaul solutions for small cell deployment is a challenge in today’s environment”); Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services, Sixteenth Report, 28 FCC Rcd 3700, ¶ 333 (2013) (noting that “one study estimated that 44 percent of backhaul traffic in 2012 would be carried via copper, 13 percent via fiber, and 40 percent via microwave” and that another study projected “that in North America, microwave radio’s share of backhaul connections will increase from about 15 percent in 2011 to at least 25 percent in 2015”); Caroline Gabriel, Exalt and XO in Second LMDS Backhaul Deal in a Week, RETHINK WIRELESS, Apr. 4, 2011, http://www.rethink-wireless.com/2011/04/04/exalt-xo-lmds-backhaul-deal-week.htm (noting that, “over the past two years [LMDS] has attracted new attention in the US as a backhaul option, as operators overcome their old aversion to microwave and look for new IP choices for their 4G build-outs”).
IV. CONCLUSION

For the foregoing reasons, XO urges the Commission to promote the development and deployment of 5G mobile services in spectrum bands above 24 GHz while protecting existing services in these bands. In crafting a regulatory framework for these services, the Commission should give existing upper microwave band licensees the flexibility to provide 5G mobile services and should avoid creating new overlay services in these bands that would threaten harmful interference to current services. The Commission should also give licensees substantial technological flexibility in the provision of 5G mobile services, including the ability to utilize TDD technology.

Respectfully submitted,

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