

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Use of Spectrum Bands Above 24 GHz for Mobile Radio Service)	GN Docket No. 14-177
)	
Amendment of the Commission’s Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands)	ET Docket No. 95-183 (Terminated)
)	
Implementation of Section 309(j) of the Communications Act – Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz Bands)	PP Docket No. 93-253 (Terminated)
)	
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band)	RM-11664
)	

**VIVINT WIRELESS, INC.
COMMENTS**

I. INTRODUCTION

Vivint Wireless, Inc. (“Vivint”) submits these comments on the Commission’s October 17, 2014 Notice of Inquiry (“NOI”).¹

Vivint is a leading smart home technology provider, offering home security, energy management, home automation, local cloud storage, and high-speed Internet solutions to more than 850,000 customers throughout the United States and Canada. Vivint’s unique approach to fixed-wireless broadband requires millimeter wave (“mmW”) spectrum for backhaul, which is more cost-effective than fiber, to stimulate competition in suburban areas. Vivint has operational

¹ *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Inquiry, FCC 14-154 (rel. Oct. 17, 2014). *See also*, *Wireless Telecommunications Bureau and Office of Engineering and Technology Extend Period to File Comments and Reply Comments in Response to Notice of Inquiry on Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Public Notice, DA 14-1703 (rel. Nov. 25, 2014).

networks in El Paso, Texas and in Utah where it provides 50+ mbps broadband to residential customers and we're expanding to other areas. Vivint believes it can use mmW frequencies for both backhaul and access to allow delivery of gigabit speeds in the next few years.

The NOI seeks comment on several matters, including alternative uses for mmW bands other than mobile services² and licensing mechanisms for incumbent licensees and new or unassigned rights for mobile operations in the mmW bands.³ As described herein, the Commission should protect existing mmW band operations, which include access and backhaul services, by establishing priority rights for fixed services. Mobile services should only have secondary rights, and such rights must be complementary and subordinate to existing fixed services. The Commission should refrain from bifurcating fixed and mobile licensing rights in the same geographic area. Any such bifurcation is likely to result in interference to existing services that rely on line-of-sight technology. But, it may be possible to disaggregate or partition licenses within the same geographic area to protect existing fixed operation and allow for future mobile operation.

Vivint also urges the Commission to make available for licensing fallow mmW band spectrum. Companies like Vivint are able and willing to use this spectrum to provide fixed broadband services under the current rules in the immediate future.

II. EXISTING AND ALTERNATIVE USES

Existing operators in the mmW bands use line-of-sight technology to provide fixed service. There are many applications for such fixed service.

Under the current Commission rules, the LMDS Band (27.5-28.35 GHz, 29.1-29.25 GHz and 31-31.3 GHz), the 39 GHz Band (38.6-40 GHz), and the 37/42 GHz Bands (37.0-38.6 GHz

² *NOI* at ¶44.

³ *Id.* at ¶88.

and 42.0-42.5 GHz) are suitable for both access and backhaul. Given the shorter wavelengths and generally less favorable propagation characteristics for frequencies higher in the electromagnetic band, the 60 GHz Bands (57-64 GHz and 64-71 GHz) and the 70/80 GHz Bands (71-76 GHz and 81-86 GHz) are suitable for access applications, but not always backhaul. In particular, the propagation characteristics of the 60 GHz and 70/80 GHz Bands can limit range and availability, and can prevent these bands from being a suitable backhaul transmission medium, including in suburban environments where the distance between antennas may be several miles.

The Commission must protect existing fixed service operations from harmful interference and should establish priority rights for fixed services. It is unclear today what mobile applications may develop, but mobile transmissions are likely to be incompatible with existing fixed service in the same geographic area even with strict interference protection requirements.

Existing mmW applications employ directional antennas that are generally oriented horizontally. Such antennas may be deployed on towers, but many are installed on residential rooftops and other modest structures. As a result, mmW antennas would likely experience a strong reduction in clean signal-to-noise ratio as itinerant, mobile devices employing omnidirectional antennas passed in front of them. Although existing mmW applications employ antennas with narrow beamwidths and significant discrimination to off-axis energy, there will be no practical way of completely protecting them from itinerant mobile devices that inadvertently cross directly in front of the fixed antenna's boresight. For example, no amount of discrimination will be enough to adequately protect a fixed antenna mounted on the side of a one-story residential home from an itinerant device that wanders directly into its path. Such an itinerant device will degrade or completely disrupt communications into a co-channel legacy

fixed device in this scenario regardless of the sophistication of the fixed device's antennas, filters or other front-end RF components.

Coordination between unaffiliated fixed operators and itinerant mobile devices would be impractical (perhaps impossible), given the scale and scope of the fixed operations in many mmW bands. In certain markets, there are thousands of antennas creating a grid of overlapping paths that likely prevents mobile operations altogether. Creating even modest exclusion zones around these fixed operations would effectively prohibit any mobile or otherwise itinerant application in the metropolitan area where a legacy fixed service exists. The implementation of a geolocation database, which is really just a dynamic technique to manage exclusion zones around incumbent services, would not facilitate the introduction of mobile or otherwise itinerant services in such a market because fixed access services are stationary and not intermittent, requiring protection 24 hours a day, 7 days a week without interruption.

Disaggregation and/or partitioning of existing licenses for the purpose of providing mobile service may be possible in markets where the underlying incumbent licensee can make spectrum available. Disaggregation and/or partitioning, however, should be solely at the discretion of the fixed licensee and conducted under existing secondary market rules as addressed in Section III below. Mobile services should therefore have secondary rights, and such rights should be complementary and subordinate to existing fixed service operations.

III. LICENSING

The Commission should refrain from bifurcating fixed and mobile licensing rights in the mmW bands in the same geographic area. Any such bifurcation is likely to result in interference to existing services because, as described above, itinerant devices that inadvertently cross directly in front of the fixed antenna's boresight will degrade or completely disrupt communications into a co-channel legacy fixed device.

It may be possible to disaggregate or partition licenses within the same geographic area to protect existing fixed operation and allow for future mobile operation. An incumbent licensee has the requisite information today to determine when it is possible to disaggregate or partition a license for fixed services to avoid potential interference. Such information includes, but is not limited to, the location(s) of operation, type(s) of equipment used, and application(s) provided. Similar information may be used by an incumbent licensee to determine, at its sole discretion, when it is possible to disaggregate or partition licenses within the same geographic area to allow mobile operation in the future.

The Commission already permits disaggregation and partitioning of mmW licenses and might extend this approach to allow incumbent fixed licensee to disaggregate or partition a license for mobile operation. If an incumbent licensee decides to disaggregate or partition a license for mobile operation, the Commission should allow the parties to file an assignment application pursuant to existing rules.⁴

Finally, the Commission should make available for licensing fallow mmW band spectrum for fixed service. There is existing market demand for fixed services such as broadband access and backhaul services. Companies like Vivint have the ability to utilize this spectrum, if made available, in the immediate future under the current licensing and technical rules for fixed service. The Commission should therefore afford interested parties the opportunity to utilize the fallow mmW spectrum for fixed service to respond to existing market demands.

⁴ See e.g., 47 C.F.R. §1.948.

IV. CONCLUSION

Vivint requests that the FCC consider the points discussed herein when examining the potential for mobile radio services in the mmW bands. Vivint also urges the Commission to make available for licensing fallow mmW band spectrum for fixed service.

Respectfully submitted,

/s/ Luke Langford

Luke Langford, Chief Operating Officer
Vivint Wireless, Inc.
4931 North 300 West
Provo, UT 84604
Tel: 617-860-3537

Dated: January 15, 2015