

Before the  
**Federal Communications Commission**  
Washington DC 20554

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

**COMMENTS OF COMSEARCH**

Comsearch, a CommScope company, files these comments on the Notice of Inquiry in the above-captioned docket.<sup>1</sup>

Within the mid-band 3.7 to 24 GHz range, the NOI focuses on three non-federal bands that presently have significant incumbent usage: 3.7-4.2 GHz, 5.925-6.425 GHz, and 6.425-7.125 GHz. These incumbent operations include Fixed Service (FS) links, Fixed Satellite Service (FSS) earth stations, and mobile (temporary-fixed) microwave services.

Comsearch recognizes the necessity of the FCC's initiative to explore various sharing mechanisms and relocation options to unlock mid-band spectrum opportunities for both fixed and mobile wireless broadband. The particular bands of focus, attractive since they are not allocated to Federal usage, nevertheless have extensive non-federal incumbent usage that will make sharing, repacking, and relocation strategies challenging and costly to implement. The incumbent services are valuable and should be fully protected and allowed to grow, or those licensees should be provided with alternative spectrum. Licensees should be compensated for

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<sup>1</sup> *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, FCC 17-104, 32 FCC Rcd 6373 (2017) (NOI).

fair relocation costs if and when operating systems must be displaced prior to the end of their service lifetimes.

Comsearch is a leading provider of spectrum sharing services in the Part 101 bands, implementing satellite and terrestrial sharing through frequency coordination. In addition, we support other types of sharing, including developing Spectrum Access System (SAS) and Environmental Sensing Capability (ESC) operations in the 3.5 GHz Citizens Broadband Radio Service (CBRS) band, and operating as an FCC-appointed database manager under light-licensing for the 70/80/90 GHz band. We also have supported and provided services for relocation of the 2 GHz microwave bands in favor of PCS and AWS, and for repacking of the TV and 2 GHz broadcast auxiliary service (BAS) bands. Likewise, we intend to develop solutions to help implement whatever sharing, repacking, or relocation policies the FCC may choose for the mid-band spectrum.

FS bands 3.7-4.2 GHz (“4 GHz”), 5.925-6.425 GHz (“Lower 6 GHz”), and 6.525-6.875 GHz (“Upper 6 GHz”) include tens of thousands of common carrier and private operational-fixed point-to-point microwave links. These links serve to interconnect and backhaul traffic for communications networks of public safety, critical infrastructure, mobile wireless, and private business licensees. These licensees share and reuse frequencies in an extremely efficient way through frequency coordination. While FS usage in the 4 GHz band has declined substantially due primarily to the difficulty of sharing with FSS downlink earth stations, the Lower 6 and Upper 6 GHz bands are continuing to grow as they are the last remaining low-band frequencies for microwave links that are not susceptible to rain fading. The NOI proposes unlicensed use of

the 6 GHz bands. To protect FS receivers, unlicensed transmitters will require large separation distances at any useful power level. Operation will not be possible without control of transmitter frequency and power parameters by specific location. A sophisticated database system appears necessary to control these parameters and allow the transmitters of an underlay service to access the spectrum.

FSS earth stations in the C-band include 4 GHz downlinks (space-to-earth) and 6 GHz uplinks (earth-to-space) that number in the thousands. These earth stations are used for fixed communications and broadcast services that include maritime communications, aeronautical services, and VPNs for government and private businesses. The uplink portion of the band at 6 GHz is transmit-only from a terrestrial perspective, thus any impact would be into the new proposed service from the earth stations. Conversely, the downlink at 4 GHz presents a significant challenge to protect incumbents as the interference potential is from the mobile broadband system transmitters into the sensitive earth stations receiving a very low signal from the satellite in orbit. Comsearch believes that sharing could be possible by using a SAS or database that is aware of actual frequencies received by the earth stations and can suggest frequencies to the mobile broadband system that do not conflict. Having the ability to suggest frequencies in an alternate band (*e.g.*, 3.5 GHz CBRS band) could be an effective strategy. However, as previous studies have shown, the required stand-off distance to protect a co-frequency C-band earth station from interference can be significant. For example coordination with grandfathered earth stations in the 3650 MHz band considered a potential for interference out to 150 km. We believe engineering solutions can significantly decrease the required

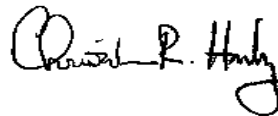
separation distances while fully protecting the earth station receivers. Significant study may be needed to arrive at the best approach.

The 6.425-6.525 GHz and 6.875-7.125 GHz (“7 GHz”) bands have extensive mobile (temporary fixed) usage such as TV pickups under BAS and local television transmission service (LTTS) licensing. Previously, in establishing sharing rules for the 7 GHz band, the FCC blocked Part 101 fixed links from intersecting any BAS TV pickup service area (regardless of frequency). This restriction has relegated Part 101 usage to remote areas and kept the number of links sharing the band very low. Comsearch expects that protecting incumbent TV pickup central receivers in these bands from unlicensed transmitters might require similar geographic limits that could undermine the utility of sharing these segments. In addition, the 7 GHz band has numerous fixed studio-to-transmitter and intercity relay links. Sharing with these fixed links could be accommodated by use of a database access system to control the underlay transmitters as discussed previously. We note that many of these links are one-way which would present a particular challenge if the Commission considers a sensing solution to enable unlicensed transmitters.

Comsearch continues to recommend that the Commission and NTIA jointly look into the possibility of allowing non-federal users to share the federal 7.125-8.500 GHz bands for point-to-point microwave. If allowed, these bands could provide a new home for displaced 6 GHz links in repacking or relocation scenarios.

Comsearch supports the Commission's efforts to identify and discuss methods for sharing and relocation options in the mid-band frequencies to encourage efficient and best utilization of spectrum. We have significant expertise, software resources and databases to help support these efforts. We also believe that for sharing to be successful, sufficient detail must be presented on mitigation mechanisms and detailed engineering analysis to show that licensed incumbents will be protected by new broadband wireless systems whether licensed or unlicensed.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Christopher R. Hardy". The signature is fluid and cursive, with the first name "Christopher" being more legible than the last name "Hardy".

Christopher R. Hardy  
Vice President

**COMSEARCH**  
19700 Janelia Farm Boulevard  
Ashburn, Virginia 20147

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