

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

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

COMMENTS OF MOTOROLA SOLUTIONS, INC.

Motorola Solutions, Inc. (“Motorola Solutions” or “MSI”) hereby files these comments in response to the Notice of Inquiry on Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz.¹ We believe that these bands can support innovative next generation services for a wide variety of broadband users and believe that the regulatory framework developed for the 3.5 GHz Citizens Broadband Radio Service serves as a useful model to encourage new uses while protecting incumbents.

Motorola Solutions strongly supports the utilization of spectrum sharing techniques for opening the 3.7-4.2 GHz and 5.9-7.1 GHz bands to other uses. In particular, we support allowing both fixed and mobile services to operate in the 3.7-4.2 GHz band. We believe the band, in conjunction with Spectrum Access Systems (SAS), can be utilized for a wide array of public and private broadband networks, ranging from fixed (*e.g.*, last mile) link services to mobile small cell networks. A multi-tier spectrum sharing approach would best suit a wide range of applications, ensuring the highest spectrum utilization.

¹ In the Matter of Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, *Notice of Inquiry*, FCC 17-104, 32 FCC Rcd 6373 (“*Mid-Band NOI*”).

MSI believes that by using the general methods developed in the 3.55-3.7 GHz band,² including the current base station and mobile device power level limits and judicious interference protection levels, both incumbent fixed satellite service (FSS) and fixed service (FS) links can be adequately protected. Because mobile or portable devices are restricted to low power levels in this approach (*e.g.*, 23 dBm/10 MHz), there is greater probability that they will be operated in close proximity to their serving and controlling base station and, therefore, can be managed accordingly. This approach also includes utilizing registration databases of active FSS and FS sites, and fully taking into account antenna patterns, pointing angles, and receiver filter responses in aggregate interference computations. FSS or FS sites that serve public safety or critical infrastructure needs should be automatically entered into these registration databases and changes to registration information by authorized licensees (or their agents) should be allowed at any time. Other users should be expected to enter the appropriate information into the registration databases during defined time periods, as in the 3.55 – 3.7 GHz band proceeding. Robust interference reporting mechanisms to SAS providers are also necessary to quickly identify and react to any issues that may arise in practice.

We believe that a basic channel size in the band of 10 MHz is appropriate, with allowances for channel aggregation to wider bandwidths (*e.g.*, 40 or 80 MHz) for high speed services. We support the use of multi-tier spectrum access, with at least one licensed tier, and an unlicensed tier. This approach results in the highest utilization of limited spectral resources. In addition to a standard licensed tier (similar to the priority access licensed tier in the 3.55-3.7 GHz band), there should be a critical access licensed tier, potentially reserved for public safety and

² See *e.g.*, In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, *Order On Reconsideration And Second Report and Order*, GN Docket No. 12-354, 31 FCC Rcd 5011.

critical infrastructure applications. This critical access licensed tier should have a higher priority than the standard priority access licensed tier, and could be limited to 20 MHz aggregated channel bandwidths. Invariably, there will be smaller 10 and 20 MHz blocks of spectrum that are not in use by higher tier users, that will not be large enough to serve high speed 5G fixed and mobile broadband service providers, but can be efficiently utilized for critical access services that are in the public's best interest. Given the criticality of such communications, we expect this tier of spectrum to garner higher interference protection levels (*e.g.*, -90 dBm/10 MHz). As in the 3.55 GHz CBRS band multi-tiered approach, access by lower tiers should be allowed when spectrum is not in use by higher tier services (*i.e.*, incumbents, critical access, priority access, general authorized access, respectively). We further think that smaller license areas (at least several thousand nationwide) will promote the most efficient use of limited spectral resources by allowing numerous users with limited network deployments to judiciously reserve spectrum. In addition, we believe that it may be challenging to aggregate several channels over wide areas, further supporting the need for smaller license areas.

For the 5.925-7.125 GHz bands, we support database-driven (SAS) controlled general authorized access to the bands. We note that there are a higher proportion of FS users in these bands, including public safety and critical infrastructure uses that absolutely must be protected from interference. As in the 3.7-4.2 GHz bands described above, these users should be granted automatic registration in protection databases, and must have a means to rapidly report and resolve interference within minutes. Public safety and critical infrastructure users in the band should be afforded full access to other user information the SAS in order to determine any potential causes of interference. General Part 15 access to the band without participation in the SAS should be not be allowed, due to the lack of control of unlicensed equipment once fielded.

MSI believes that with SAS control and carefully designed aggregate interference protection, that similar power levels (*i.e.*, EIRP levels) to the 3.55-3.7 GHz band could be allowed for fixed base stations and mobile or portable devices in the 5.925-7.125 GHz bands. We also believe that these bands could support multiple tiers of users (*e.g.*, critical access licensed, priority access licensed, and general authorized access) over at least a portion of the band, as in the 3.7-4.2 GHz band techniques proposed above, along with smaller license areas. It is reasonable to reserve a portion of the band strictly for general authorized access use though, as in the 3.55 GHz CBRS band. We do not believe it is necessary to pair the 5.925-6.425 GHz bands with any other bands, since a robust variety of known TDD or CSMA access schemes are suitable for the band.

While we do not expect the 3.7-4.2 GHz and 5.9-7.1 GHz bands to be as dynamic as other bands that have mobile incumbents, we do believe that the SAS approach offers the most flexibility in adapting to regulatory and protection changes that may occur in the future. As in the 3.55 GHz CBRS band, domain proxy functions should be allowed to interface standards-based radio equipment to the SAS function. We also support the authorization of several SAS providers to ensure competition in the pricing of services in the band. SAS's should be required to provide non-discriminatory services to all interested customers.

We also endorse the use of multi-stakeholder industry groups, such as the Wireless Innovation Forum Spectrum Sharing Committee, to work on developing the low level details of operation in the 3.7-4.2 GHz and 5.9-7.1 GHz bands. This approach has resulted in the development of operational requirements and interface standards in the 3.55 GHz CBRS band, and that success can be repeated for these new bands.

Motorola Solutions urges the Commission to move expeditiously in this proceeding to make additional spectrum available for a wide variety of advanced broadband applications.

Respectfully Submitted,

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