

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

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

**COMMENTS OF THE  
TELECOMMUNICATIONS INDUSTRY ASSOCIATION**

The Telecommunications Industry Association (“TIA”)<sup>1</sup> hereby files these comments in response to the Notice of Inquiry (“NOI”)<sup>2</sup> in the above-captioned proceeding. TIA’s comments generally address section III-D of the NOI concerning flexible use of other bands in the 3.7 to 24 GHz range, along with general principles the Commission should follow.<sup>3</sup>

The Commission’s efforts to open additional mid-band spectrum for wireless broadband access are important for industry’s ability to deliver advanced services to the public. Mid-band spectrum is needed because it has propagation and building penetration characteristics that make it highly complementary to low-band and high-band allocations where the Commission has acted more recently. Beyond the specific bands identified in the NOI, the broader range of 3.7 to 24 GHz is likely to contain future opportunities for licensed or unlicensed use. Now that the Commission has raised the question, TIA believes the conversation should start by first listening

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<sup>1</sup> TIA is the leading trade association for the information and communications technology (“ICT”) industry, representing companies that manufacture or supply the products and services used in global communications across all technology platforms. TIA represents its members on policy issues affecting the ICT industry and forges consensus on industry standards.

<sup>2</sup> [Notice of Inquiry, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz](#), FCC 17-104, GN Docket No. 17-183 (Aug. 3, 2017) (“NOI”).

<sup>3</sup> “Other bands” means bands other than 3.7–4.2 GHz, 5.925-6.425 GHz, and 6.425-7.125 GHz.

to the reaction of incumbents in these other bands.<sup>4</sup> Their reaction to the Commission's questions will help the wireless broadband industry determine whether there are opportunities to introduce flexible use wireless broadband technologies in these other bands, and what challenges might be presented. At this time, therefore, TIA will simply offer brief comments on the spectrum policy principles that should apply to this investigation.

**I. The Commission's Actions Should Be Based on Sound General Principles For Spectrum Allocation.**

As the Commission begins its mid-band spectrum inquiry, TIA believes that the agency should continue to ensure that its spectrum policies provide:

- *Predictability.* To drive investment by commercial and government users alike, spectrum allocations need to be predictable. Identifying demand and changes in demand, understanding the pace of radio technology development by platform, and long-term planning are all essential parts of a spectrum policy that can provide predictability for both commercial and government users.
- *Flexibility.* For commercial allocations, flexible use policies consistent with baseline technical rules that are technology-neutral have proven to be the best approach.
- *Efficiency.* Policies should encourage more efficient use of spectrum where technically and economically feasible.

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<sup>4</sup> Unlike the specific bands called out in the NOI, the broader band between 3.7 to 24 GHz not been part of industry conversations to date.

- *Priority.* In cases where band sharing is technically and economically possible, policies must advance good engineering practice to best support an environment that protects those with superior spectrum rights from harmful interference.<sup>5</sup>

## **II. The Commission Should Avoid a One-Size-Fits-All Approach.**

Good spectrum policy decisions need to be made on a band-by-band basis, depending on the particular propagation characteristics of a band, existing service allocations, and existing incumbent services within a band. For example, while spectrum sharing approaches and technologies are increasingly becoming available, the existence of either should not, by itself, justify regulatory action to implement a sharing system. Rather, that should be one of multiple factors for each specific service and band. In creating a successful sharing environment, the following combination of factors should be considered:

- An economic model, especially to encourage investment;
- Availability of spectrum for nationwide use;
- The needs of existing services in a particular band, especially with regard to avoiding harmful interference;
- Limitations in significant markets, and the time, bandwidth, and geographic license boundary limitations under which the limitations exist;
- Sufficient value of the considered spectrum to warrant investment in further innovation;
- Adjacency of spectrum to, or complementary with, existing bands/services.
- Potential for innovation and growth by the incumbent service.

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<sup>5</sup> See Comments of the Telecommunications Industry Association to the White House Office of Science and Technology Policy, March 20, 2014, *in response to* FR Doc. No. 2014-03413, at 2-3, <http://www.tiaonline.org/sites/default/files/pages/TIA%20OOSTP%20Comments%203-20-2014.pdf>

*Global harmonization.* Global harmonization enables efficiencies of scale in product development and manufacturing, while also promoting roaming ability. TIA urges the Commission to prioritize attention on any globally-harmonized spectrum bands that emerge in this proceeding. Harmonization alone, however, should not determine the Commission's actions; it is one factor among several that the Commission should consider.

### **III. The Commission Should Encourage Market-Based Approaches.**

While taking into account that not all uses of spectrum can be evaluated on market-based value alone, the Commission is right to explore market-based mechanisms to increase the efficiency of spectrum use, particularly in the context of consumer services.<sup>6</sup> The recent success of the first-of-its-kind voluntary incentive auction of television broadcast spectrum has vindicated the possibility of market-based frequency reassignments on a significant scale. While it is too early in this inquiry to determine with specificity whether this mechanism is appropriate for particular bands, the model should be retained in the regulatory tool kit for future consideration where appropriate, based on the specific nature of the incumbent services involved. Facilitating robust secondary markets for spectrum also offers a promising path for increasing spectrum efficiency.

While the Commission's intentions in seeking comment on long-term approaches to spectrum management are laudable, there are dangers in specifying methods now for determining how much spectrum should be allocated to particular uses ten years from now.<sup>7</sup> For example, the Commission should tread cautiously in establishing long-term policies regarding access models for future spectrum allocations. It should not require that specific proportions of

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<sup>6</sup> NOI ¶ 41.

<sup>7</sup> NOI ¶ 43.

spectrum be allocated to licensed / unlicensed / hybrid access models in every future proceeding, since service needs may change over time.

#### **IV. Future Mobile Broadband Technologies Will Rely on Various Technologies and Spectrum Bands, Including Low, Mid, and High-Band Spectrum.**

Mid-band spectrum will play an important role in future mobile broadband wireless networks, including 5G networks and other platforms. While the future of technology is very difficult to predict, TIA believes that future wireless networks, whether terrestrial, airborne or space-based, are likely to rely upon some combination of new spectrum, leveraging existing spectrum, heterogeneous approaches, and increased spectrum sharing. All will combine to affect the ultimate design and deployment of future networks.

As mobile broadband networks progress, the market will continue to see networks focus on traditional benchmarks such as increased speed and reduced latency. In addition, new measures such as network reliability, robustness, and security could play a larger role, particularly as wireless usage paradigms extend beyond phones and tablets to embrace appliances, vehicles, health care applications, widely distributed sensor networks, etc. Furthermore, future networks are likely to be characterized by elements such as advanced antenna solutions, ultra-lean design, spectrum flexibility, the possible convergence of access and backhaul networks, and larger bandwidths.<sup>8</sup>

Ultimately, future networks seem unlikely to be based upon a single wireless standard (*e.g.*, LTE) or particular type of spectrum (*i.e.*, low, mid, or high band). Rather, future broadband networks may emerge as a suite of inter-related standards and protocols all working

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<sup>8</sup> See Ericsson Review, *5G radio access*, June 18, 2014, available at [http://www.ericsson.com/res/thecompany/docs/publications/ericsson\\_review/2014/er-5g-radio-access.pdf](http://www.ericsson.com/res/thecompany/docs/publications/ericsson_review/2014/er-5g-radio-access.pdf)

harmoniously, with the selection of particular technological tools being dependent on specific use cases.<sup>9</sup>

Mid-band spectrum will have a significant role to play in all of these developments, and will be an important new tool among several in the toolbox. For example, while much attention has focused on millimeter-wave spectrum for 5G, many of the technologies for next-generation wireless networks discussed above will rely upon lower-band spectrum. Indeed, some of the new technologies may be inherently incompatible with millimeter-wave deployments due to the latter's unique propagation characteristics – for example, millimeter-wave spectrum seems inherently unsuited to macrocell applications due to range issues. Therefore, even as the Commission explores opening millimeter-wave spectrum for commercial broadband applications, the agency's efforts to explore how it may make low and mid-band spectrum available for flexible uses including commercial mobile broadband are appropriate.

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<sup>9</sup> See Qualcomm, *5G and Wireless Broadband Evolution*, May 13, 2014, available at [http://johannesbergsummit.com/wp-content/uploads/sites/6/2013/11/Smee-Qualcomm\\_5G\\_Johannesburg\\_2014.pdf](http://johannesbergsummit.com/wp-content/uploads/sites/6/2013/11/Smee-Qualcomm_5G_Johannesburg_2014.pdf)

**V. Conclusion**

TIA appreciates the Commission's efforts to begin an inquiry into mid-band spectrum issues, and we look forward to reviewing the comments submitted.

Respectfully submitted,

TELECOMMUNICATIONS INDUSTRY  
ASSOCIATION

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