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In the Matter of \_\_\_\_\_ )  
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Unlicensed Use of the 6 GHz Band \_\_\_\_\_ )  
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ET Docket No. 18-295

## Comments of the R Street Institute

Respectfully submitted,

\_\_\_\_\_/s/\_\_\_\_\_  
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Joe Kane

*Technology and Innovation Policy Fellow*

February 8, 2019

## **I. Introduction & Summary**

In this proceeding, the Federal Communications Commission (“FCC” or “Commission”) seeks comment on unlicensed use of the 6 GHz band.<sup>1</sup> The band presents a tremendous opportunity for the FCC to rationally expand the availability of unlicensed spectrum and to pursue its statutory mandate to “generally encourage the larger and more effective use of radio in the public interest.”<sup>2</sup>

Unlicensed spectrum has been an important part of the wireless ecosystem for consumers and businesses. A well-tailored, additional unlicensed allocation in the 6 GHz band has the potential to fuel the development of more bandwidth-intensive wireless services and complement wireline broadband networks, which often rely on unlicensed technologies like Wi-Fi to reach end-user devices.<sup>3</sup> Nevertheless, the concept of unlicensed—as opposed to exclusively licensed—spectrum does present economic challenges with which the Commission and spectrum users must contend.

## **II. Economics of Unlicensed Spectrum**

The Commission should not accept arguments contending that more frequencies should be allocated for unlicensed use simply because the current demand for unlicensed spectrum is high. As an unpriced asset, it is little wonder that consumers would demand more and more unlicensed spectrum. But that is only one side of the equation; the

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<sup>1</sup> Unlicensed Use of the 6 GHz Band, 83 Fed. Reg. 64506 (Oct. 23, 2018) [hereinafter NPRM], <https://goo.gl/EgQ7vy>.

<sup>2</sup> 47 U.S.C. § 303(g).

<sup>3</sup> Joe Kane, “The Role of Markets in Spectrum Policy,” R Street Institute (June 2018), <https://goo.gl/5BfuQr>.

opportunity cost of more unlicensed designations is also something that requires consideration.

To see why, take the classic “tragedy of the commons” example of commonly held grazing land. Grazing land is a scarce resource. A community can avoid overgrazing its existing grazing land by dedicating increasing amounts of land to grazing purposes, but that comes at the cost of the alternative uses of that land. Knowing when to stop allocating more of a scarce resource to one application is relatively easy when the resource in question is priced in the marketplace; eventually, the price will rise to the point where the marginal benefit of allocating more of that resource to a particular use does not warrant the marginal cost. But when a resource is unpriced, knowing when to stop is more difficult.

The mere fact that existing unlicensed spectrum is used extensively, in some cases to the point of exhaustion, does nothing to tell us about the opportunity cost of allocating additional frequencies for unlicensed use. Indeed, many scarce goods would be depleted if their price were zero. Far from being evidence for the necessity of additional unlicensed spectrum, filling up existing bands is consistent with a tragedy of the commons—a tragedy that should be remedied by a policy change.

Moreover, designating spectrum for unlicensed use has enduring consequences. The proliferation of devices using the unlicensed frequencies makes clawing back the spectrum impractical if it were expanded. Therefore, once spectrum is designated for unlicensed use, it cannot be reallocated as the most productive use of particular bands changes. This is a significant disadvantage for unlicensed, as compared to licensed, spectrum.

However, these arguments do not mean that the FCC should not allocate more frequency bands for unlicensed use; they only show that arguments for additional

unlicensed spectrum must be based on more than congestion in existing unlicensed bands, and that the Commission should act with caution before opening a band for unlicensed use.

Indeed, unlicensed spectrum is not always a bad idea; the tragedy of the commons does not always befall resources that are not subject to traditional property rights.<sup>4</sup> Other means of managing a commons can prevent the tragedy and allow productive arrangements to prevail.<sup>5</sup> For unlicensed spectrum, technical protocols and limitations have facilitated their productive use. Low power requirements and operation in frequency bands with containable propagation can prevent harmful interference from destroying the productive potential of unlicensed spectrum. The 2.4 and 5 GHz bands are examples of these governance mechanisms providing benefits that outweigh the costs associated with unlicensed spectrum.

With the successes and drawbacks of unlicensed spectrum in mind, the Commission should look for other bands that could maximize this cost-benefit tradeoff. The 6 GHz band is such a candidate. Because of its proximity to the 5 GHz unlicensed frequencies, the Commission could, with limited disruption to other services, allow for the creation of wide channels in both the 5 and 6 GHz bands, which would facilitate high throughput and fuel the proliferation of new wireless services.

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<sup>4</sup> Jerry Brito, "The Spectrum Commons in Theory and Practice," 2007 Stan. Tech. L. Rev. 1, ¶ 19 (2007), [http://www.comlab.hut.fi/studies/4210/papers/7\\_1.pdf](http://www.comlab.hut.fi/studies/4210/papers/7_1.pdf).

<sup>5</sup> See generally Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press, 1990).

### III. Frequency coordination mechanisms

The Notice proposes frequency coordination mechanisms that are akin to the Spectrum Access System intended to be deployed for the 3.5 GHz band.<sup>6</sup> Such systems hold great potential to effectively govern the commons of unlicensed spectrum by technical means and thereby enhance its productive capacity. Since these systems remain unproven at a large scale, the Commission should facilitate the experimentation and innovation necessary to roll out such mechanisms successfully.

The Commission asks<sup>7</sup> about what data the automated frequency coordination (“AFC”) system should use to determine which frequencies are available. Insofar as it is technically feasible, the AFC system should operate with as much data flexibility as possible, determining the maximum permissible power for each frequency across all ranges of frequencies, rather than in predefined channels. Unlicensed devices do not all need to operate at full power or on particular channel widths at all times, so instead of forcing devices into a preordained framework, the AFC should simply provide a list of what frequencies and power levels are available. By nature, unlicensed spectrum is open to all comers, so the AFC system should seek to maximize the flexibility afforded to a wide variety of devices.

The Commission should also seek to create an AFC system that is compatible with other frequency coordination mechanisms in lower unlicensed bands. In the U-NII-2A and U-NII-2C band, dynamic frequency coordination requirements have made deployment more

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<sup>6</sup> NPRM, ¶¶ 17, 23.

<sup>7</sup> *Id.* ¶26.

difficult.<sup>8</sup> A more harmonious system with many unlicensed bands governed by compatible frequency selection mechanisms will allow device manufacturers to amortize the costs of making their devices compliant with the Commission's rules over more devices. It would also provide consumers with devices that can access a greater range of frequencies, thereby increasing the productivity of unlicensed spectrum in both the 5 GHz and 6 GHz bands while reducing congestion.

The Commission is right to provide for low-power, indoor usage in the U-NII-6 and U-NII-8 bands.<sup>9</sup> These provide an example of governing the commons through technical rules that we know are necessary to preventing a tragedy from diminishing the productivity of the band. Taking advantage of the propagation characteristics of radio waves in these frequencies allows for indoor use while preventing harmful interference with neighboring users and thereby allow frequencies to be reused many times in a geographical area.

We thank the Commission for initiating this proceeding to allow for unlicensed use of the 6 GHz band. Wise unlicensed designations will continue to fuel productive spectrum use and the Internet economy.

Respectfully submitted,

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February 8, 2019

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<sup>8</sup> Richard Bennet, "Taking Wi-Fi to the Next Level," High Tech Forum (Jan. 12, 2007), <https://goo.gl/qq6NcV> ("[M]any of the high frequency channels are hampered by DFS requirements (related to military radar) that mandate less-than-ideal operation for Wi-Fi systems.").

<sup>9</sup> NPRM, ¶59.