

November 3, 2015

The Hon. John Thune  
Chairman  
Committee on Commerce, Science,  
& Transportation  
United States Senate  
511 Dirksen Senate Office Building  
Washington, DC 20510

The Hon. Bill Nelson  
Ranking Member  
Committee on Commerce, Science,  
& Transportation  
United States Senate  
716 Hart Senate Office Building  
Washington, DC 20510

The Hon. Roger Wicker  
Chairman  
Subcommittee on Communications,  
Technology, Innovation, and the Internet  
United States Senate  
555 Dirksen Senate Office Building  
Washington, DC 20510

The Hon. Brian Schatz  
Ranking Member  
Subcommittee on Communications,  
Technology, Innovation, and the Internet  
United States Senate  
722 Hart Senate Office Building  
Washington, DC 20510

The Hon. Fred Upton  
Chairman  
Committee on Energy & Commerce  
United States House of Representatives  
2183 Rayburn House Office Building  
Washington, DC 20515

The Hon. Frank Pallone, Jr.  
Ranking Member  
Committee on Energy & Commerce  
United States House of Representatives  
237 Cannon House Office Building  
Washington, DC 20515

The Hon. Greg Walden  
Chairman  
Subcommittee on Communications and  
Technology  
United States House of Representatives  
2185 Rayburn House Office Building  
Washington, DC 20515

The Hon. Anna Eshoo  
Ranking Member  
Subcommittee on Communications and  
Technology  
United States House of Representatives  
241 Cannon House Office Building  
Washington, DC 20515

Dear Chairman Thune, Ranking Member Nelson, Chairman Wicker, Ranking Member Schatz, Chairman Upton, Ranking Member Pallone, Chairman Walden, and Ranking Member Eshoo:

We write today to express our enthusiasm for the opportunity to work with you and your colleagues on the Senate Committee on Commerce, Science, and Transportation and the House Committee on Energy & Commerce on legislation to increase the spectrum available to the private sector and general public for innovative and economically beneficial purposes. The Spectrum Pipeline Act of 2015 takes several important first steps, notably in recognizing the need for appropriate balance between licensed and unlicensed spectrum. However, much more remains to be done if our country is to continue to lead the world in wireless technologies and secure to all Americans the bright digital future they deserve.

Public Knowledge is particularly interested in the opportunity that comprehensive spectrum legislation presents to expand the availability of spectrum for unlicensed uses. As the Federal Communications Commission (“FCC” or “Commission”) recognized in its recent “spectrum frontiers” rulemaking, 5G services will combine traditional licensed services, traditional unlicensed services, and hybrid use models. Unlicensed spectrum is a major economic driver, providing key connectivity for Wi-Fi and other mobile technologies, including the rapidly expanding Internet of Things (“IoT”). Additionally,

unlicensed spectrum is a public commons – it allows the public to freely access airwaves that are a public resource.

Unlicensed spectrum already plays a critical role in mobile connectivity. Today, more traffic travels over unlicensed spectrum than over licensed frequencies. Without the capability to offload mobile broadband traffic onto unlicensed frequencies over Wi-Fi, our wireless networks would be overwhelmed by consumer demand for mobile connectivity. Domestic economic activity related to unlicensed spectrum is valued at more than \$220 billion annually.<sup>1</sup> Unlicensed spectrum is critical for technologies like Wi-Fi, Bluetooth, near field communication for mobile payments, and other applications, including medical devices, traffic monitoring systems, and public safety applications. Further, unlicensed spectrum has democratized Internet access, encouraging permissionless innovation and permitting substantial economic growth.

In the future, unlicensed spectrum will be even more important for U.S. economic growth. According to Cisco, by 2020, the IoT will connect 50 billion devices, with an economic impact estimated at \$19 trillion.<sup>2</sup> Similarly, McKinsey has estimated that IoT applications could have an economic impact of up to \$33 trillion by 2025.<sup>3</sup> The vast majority of IoT traffic travels over unlicensed spectrum, and that will continue to be true. Without significantly more unlicensed spectrum, our unlicensed frequencies will become overly congested, harming both the IoT and our licensed mobile networks that rely on unlicensed bands to offload traffic. Thus, substantial additional unlicensed spectrum is necessary in order for us to fully realize the economic promise of our connected world.

Given the importance of unlicensed spectrum to the economy, it is critical that any effort to facilitate more efficient federal use of spectrum; promote spectrum sharing amongst government users, commercial carriers, and the general public; and free up spectrum for non-governmental uses should include provisions to support the continued growth of the unlicensed ecosystem. Public Knowledge proposes two, non-mutually exclusive mechanisms to increase the amount of unlicensed spectrum: 1) direct the FCC to allow for a non-interfering unlicensed underlay of all federal spectrum, with exceptions for sensitive national security and public safety uses in critical bands; and 2) designate that whenever federal spectrum is made available for commercial use, an equivalent amount spectrum shall be allocated for license-exempt use.

### **Non-Interfering Unlicensed Underlay**

Implementing a non-interfering unlicensed underlay for federal spectrum bands would significantly increase the amount of spectrum available for innovative unlicensed uses. An unlicensed underlay would permit non-interfering spectrum sharing on all bands currently used by federal agencies, subject to mechanisms established by the FCC to prevent interference and protect important federal operations and critical bands. Such an underlay would provide access to substantial access to additional spectrum for unlicensed uses. And, because the underlay would explicitly require non-interference with the

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<sup>1</sup> Telecom Advisory Services, LLC, *Assessment of the Economic Value of Unlicensed Spectrum in the United States*, 73 (2014), available at <http://www.wififorward.org/wp-content/uploads/2014/01/Value-of-Unlicensed-Spectrum-to-the-US-Economy-Full-Report.pdf>.

<sup>2</sup> Olga Kharif, *Cisco CEO Pegs Internet of Things as \$19 Trillion Market*, BLOOMBERG BUSINESS, Jan. 8, 2014, available at <http://www.bloomberg.com/news/articles/2014-01-08/cisco-ceo-pegs-internet-of-things-as-19-trillion-market>.

<sup>3</sup> Mohana Ravindranath, *Cisco CEO at CES 2014: Internet of Things is a \$19 trillion opportunity*, WASH. POST, Jan. 8, 2014, available at [http://www.washingtonpost.com/business/on-it/cisco-ceo-at-ces-2014-internet-of-things-is-a-19-trillion-opportunity/2014/01/08/8d456fba-789b-11e3-8963-b4b654bcc9b2\\_story.html](http://www.washingtonpost.com/business/on-it/cisco-ceo-at-ces-2014-internet-of-things-is-a-19-trillion-opportunity/2014/01/08/8d456fba-789b-11e3-8963-b4b654bcc9b2_story.html).

designated users in the band, agencies would not need to worry about interference impeding their ability to complete their missions.

### **Unlicensed “Wi-Fi” Dividend**

To provide additional needed spectrum for unlicensed use, Congress should allocate an equivalent amount of spectrum for unlicensed use whenever it frees up spectrum for licensed, commercial use. FCC Commissioner Jessica Rosenworcel has described this concept as the “Wi-Fi dividend.”<sup>4</sup>

An unlicensed dividend of this type would ensure that, when a band is designated for auction on a licensed basis, a similar amount of spectrum, in a higher band, would be designated for unlicensed use. Clearing of both bands would be accomplished using funds raised through the license auction. In addition to the important economic benefits this would bring to the economy generally, and to the licensees themselves, we believe that adoption of the Wi-Fi Dividend represents the logic evolution of the public interest for wireless in the 21<sup>st</sup> Century.

In the 20<sup>th</sup> Century, the limits of technology limited the number of potential wireless operators to a mere handful of licensees. As a consequence, these licensees acted as trustees for the hundreds of millions of Americans denied direct access to spectrum. When licenses were primarily for radio and television broadcasting, the Congress and the Commission focused on promoting diversity of voices and localism. When mobile services became more common, the Congress and the Commission sought to use spectrum auctions to distribute licenses to rural communities, and to provide opportunities for traditionally marginalized communities, such as businesses owned by women and people of color. However, the limitation on the number of licenses limited the ability to confer these benefits on the American people, and forced the American people to rely on unreliable corporate proxies to determine what best served the public interest.

If Congress adopts the proposed Wi-Fi Dividend approach, the American people will have no need to rely on corporate trustees to manage the spectrum for them. Instead, by using auctions to clear federal spectrum for unlicensed use, Congress and the Commission will enable *all* Americans – including rural communities and communities of color – to access the public airwaves on equal terms. After nearly 100 years, the public airwaves will – at least in part – genuinely be accessible by the public.

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Unlicensed spectrum plays a critical role in the rapidly growing mobile ecosystem, and will be even more critical as the Internet of Things expands in coming years. Spectrum pipeline legislation presents a unique opportunity for all interested parties to win, with increased spectrum for both licensed and unlicensed users, as well as increased revenue for the federal government. An unlicensed underlay, coupled with a mandatory unlicensed dividend, are the best ways forward to ensure the unlicensed ecosystem continues to have the opportunity to drive innovation and economic growth throughout the United States. We look forward to working with you and your colleagues on this important issue.

Sincerely,

/s/ Harold Feld  
Senior Vice President  
Public Knowledge

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<sup>4</sup> Written Testimony of Commissioner Jessica Rosenworcel, before the Senate Committee on Commerce, Science, and Transportation, Jul. 29, 2015, *available at* [http://apps.fcc.gov/edocs\\_public/attachmatch/DOC-334645A1.pdf](http://apps.fcc.gov/edocs_public/attachmatch/DOC-334645A1.pdf).