

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Use of Spectrum Bands Above 24 GHz For) Docket No. 14-177
Mobile Radio Services)

COMMENTS OF THE HIGH TECH SPECTRUM COALITION

The High Tech Spectrum Coalition (HTSC) which includes Alcatel-Lucent, Cisco, Ericsson, Intel, Nokia, Qualcomm, and Samsung, hereby responds to the Commission’s *Notice of Proposed Rulemaking* in the above captioned proceeding.¹ HTSC members strongly supports the Commission’s NPRM and urge expeditious action in this important proceeding. All of our members agree with the Commission’s proposals to make spectrum above 24 GHz available for 5G but we also urge the Commission to take a broad view on spectrum opportunities not just those above 24 GHz. HTSC strongly supports flexible licensing of 28-71 GHz to drive investment and innovation in 5G.

I. INTRODUCTION

Spectrum policy in the coming decades will need to address rising demand on wireless technology, and in particular for commercial mobile networks as they continue to help support our nation’s broadband needs, but also as they expand to support the diverse needs of that 5G will serve. Meeting this challenge will benefit the quality of life for all Americans, stimulate the economy with jobs, and foster innovation and growth. This NPRM is critical to the success of

¹ *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Docket No. 14-177, Notice of Proposed Rulemaking, FCC 15-138 (October 22, 2015) (“NPRM”).

the U.S. wireless ecosystem. HTSC strongly supports flexible licensing rules for 28-71 GHz bands. Ushering 5G with the correctly balanced legal and regulatory foundation, will drive innovation, jobs, and our nation's economy.

II. EXPLOSIVE DEMAND DRIVES INNOVATION

This NPRM is critical for our members to meet the explosive growth in demand for capacity on wireless networks which is expected to increase dramatically in the next few years. Cisco's VNI Mobile Forecast predicts that wireless data demand will increase at least 6.8 fold from 2014 to 2019, a compound annual growth rate of 47 percent.²

The cause of this skyrocketing consumer demand is linked to advances made in device processing power and access to enriched data, most namely video content. It is also driven by consumer confidence in the performance of LTE networks. LTE networks can deliver real data-intensive experiences. By 2019, 75 percent of data will be video.³ This year smartphones make up the majority of mobile devices according to Ericsson.⁴ By 2019, 60 percent of devices will be M2M in the U.S.⁵ Smartphones will consume 4.8 times more data in 2019 than they do today.⁶ Alcatel-Lucent reports that tablets' share of subscriber growth has risen 66 percent.⁷ In its latest Mobility Report, Ericsson estimates that 55 percent of data on tablets will be video.⁸ By 2021, there will be 410 million smartphone subscriptions in North America.⁹ Another driver of wireless data demand is the number of user devices. The average household has over five

² Cisco, *Visual Networking Index (VNI): Mobile Forecast Highlights 2014–2019*, http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country

³ Cisco VNI.

⁴ Ericsson, *Mobility Report*, <http://www.ericsson.com/res/docs/2015/mobility-report/ericsson-mobility-report-nov-2015.pdf> (November 2015), pg. 6.

⁵ Cisco VNI.

⁶ *Id.*

⁷ Alcatel-Lucent, *Mobile Device Report*, <http://www2.alcatel-lucent.com/landing/mobile-devices-report/> (June 2015), pg. 20.

⁸ Ericsson, *Mobility Report*, pg. 15.

⁹ *Id.* pg. 2.

wireless-connected devices.¹⁰ All of this data will put strain on our networks which will require a new generation of mobile broadband by 2020.¹¹ The innovation and investment associated with 5G will enable this new generation network to meet this rising demand.

III. 5G INNOVATION

5G will usher in a new wave of innovation and provide the network for unprecedented applications. Samsung expects 5G will “support groundbreaking applications that demand exceptionally high-speed wireless connections, a fully realized Internet of Things, simplified wireless network design, and enhanced versions of the existing mobile services.”¹² Ericsson envisions 5G “will be a very flexible, heterogeneous system employing numerous technological enhancements that can be configured to provide connectivity simultaneously” 5G according to Qualcomm will “support ultra-low latency, ultra-low power, ultra-high reliability and ultra-high security with flawless connectivity”¹³ Nokia also asserts that “5G will lower costs and consumption of energy” as well as support, “industries of the future such as innovated health care services that provide real time monitoring capabilities, self-driving cars, and deliver the next generation industry automation.”¹⁴ Alcatel-Lucent “believes that emerging 5G technologies will allow provision of services with higher and more consistent bitrates, lower end-to-end latency, high connections densities to support” a wide array of applications and services.¹⁵ For HTSC

¹⁰ Ericsson Comments, *In the Matter of use of Spectrum Above 24 GHz for Mobile Radio Devices*, GN Docket No. 14-177, (January 15, 2015) pg 3.

¹¹ Ericsson Comments pg 4.

¹² Samsung Comments, *In the Matter of use of Spectrum Above 24 GHz for Mobile Radio Devices*, GN Docket No. 14-177, (January 15, 2015) pg. 2.

¹³ Qualcomm Comments, *In the Matter of use of Spectrum Above 24 GHz for Mobile Radio Devices*, GN Docket No. 14-177, (January 15, 2015) pg 2.

¹⁴ Nokia Comments, *In the Matter of use of Spectrum Above 24 GHz for Mobile Radio Devices*, GN Docket No. 14-177, (February 17, 2015) pg 2.

¹⁵ Alcatel-Lucent Comments, *In the Matter of use of Spectrum Above 24 GHz for Mobile Radio Devices*, GN Docket No. 14-177, (January 15, 2015) pg 3.

members, 5G will build on the progress made with 4G while enabling new services and applications with enhanced network capabilities. The advancements can only be fully realized if the Commission lays the correct legal and regulatory underpinning with a focus on flexibility. It is critical for the Commission to thoughtfully make decisions that will enable the U.S. to maintain its global leadership on wireless innovation.

IV. COMMISSION SHOULD CONSIDER BANDS BELOW 24 GHz

The Commission should review a wide range of spectrum bands below 6 GHz and from 6-100 GHz, and continue its practice of technology-neutral spectrum allocations that enables operators to evolve networks over time. 5G will demand spectrum at all ranges. We urge the Commission to review bands at 24 GHz and even below 6 GHz. Opening up wide swaths of spectrum including below 6 GHz would enable a wide range of 5G services.

V. RULES SHOULD MAXIMIZE FLEXIBLE LICENSING

HTSC strongly supports flexible licensing approach which reflects the uncertainty of the mmW market in this early stage of development. All incumbent licensees in the 28-71 GHz range should be granted mobile service authority. We support the Commission's conclusion that terrestrial incumbents receive rights to operate mobile services in their existing commercial licensed service areas. Spectrum leasing should also be permitted. Ten-year license terms with renewal expectancy should be granted. A ten-year license term is reasonable given the uncertainties associated with mmW nascent market development. The license term should reflect the necessary development, deployment and adoption of new services. Licensees should be given the certainty of a renewal expectancy as long as they meet the performance requirements. Licensees should be permitted access to secondary markets as well as full flexibility on

aggregation, partitioning, and disaggregation in their license areas in all the bands. The full benefits of secondary market transactions provided enhance the value of the spectrum. Such bands should not be subject to the spectrum screen including no aggregation limits. We also recommend broad geographic licensing and do not support the use-it or share-it approach which would be imposed on licensees in the mmW bands and take effect five years after the license issuance.¹⁶ The definition of “unused” could stifle innovative new services that are adopted at an unpredictable pace and in differing geographies. The rule would also impose unnecessary burdens stifling secondary markets. These flexible rules will drive investment while accommodating a wide range of applications and services without stifling innovation of 5G.

A. Oppose the Hybrid Plan

The Commission proposes utilizing a hybrid licensing regime for 37 GHz.¹⁷ HTSC supports licensing and auction of 37 GHz in order to maximize the utility of spectrum in this, and the adjoining 39 GHz, bands. This will ensure a wide swath of spectrum is available for 5G use on a licensed basis. The hybrid model could undermine investment by introducing unnecessary uncertainty with respect to use of the spectrum by licensees.

VI. ECONOMIC BENEFITS OF WIRELESS BROADBAND

With the correct policies in place, 5G will drive economic growth like its predecessors. The wireless broadband industry is a critical and rapidly growing sector of the U.S. economy. Its contribution to the overall economy is significant. In a report released on January 26th by Recon Analytics just the release of 10 MHz of spectrum resulted in an increase in over 100,000 jobs and

¹⁶ NPRM ¶ 312.

¹⁷ NPRM para 100

GDP growth of \$3 billion.¹⁸ Releasing 100 MHz of spectrum, according to this report, would generate 1 million jobs and increase GDP by \$31 billion.¹⁹ Deloitte produced a study that demonstrates a positive, causal relationship between mobile broadband penetration and country GDP growth.²⁰ Using econometric analysis, Deloitte demonstrates that a doubling of mobile data causes GDP per capita to grow by 0.5%.²¹ This is a significant economic analysis that goes beyond associating mobile broadband penetration with GDP growth, and instead verifies a causal link between increasing mobile data and GDP. Thus the more licensed spectrum the Commission can transition, the more data will flow on our networks resulting in significant economic growth.

Most importantly, this extraordinary growth in the mobile broadband sector has generated hundreds of thousands of U.S. jobs over the last two decades – and it has the potential to grow hundreds of thousands more jobs if the Commission is able to open significant bands of spectrum above and below 24 GHz for 5G. New capital and new jobs are likely to be higher than these conservative figures because economists cannot fully anticipate the effects of future innovation just as a few years ago, they could not predict the explosion of mobile “apps”, the popularity of tablets, or the Internet of Things.

Spectrum is the lifeblood of the wireless broadband industry. Without access to an increasing amount of this finite resource, the U.S. economy will not enjoy the economic and social benefits that our country needs to stay innovative and competitive in the future. Increases

¹⁸ Recon Analytic, *The Impact of 10 MHz of Wireless Licensed Spectrum*, <http://www.ctia.org/docs/default-source/default-document-library/for-every-10-mhz.pdf> (December 2015) pg 1.

¹⁹ Recon Analytics, pg. 2.

²⁰ *What is the Impact of Mobile Telephone on Economic Growth?*, Deloitte, November 2012, <http://www.deloitte.com/assets/Dcom-UnitedKingdom/Local%20Assets/Documents/Industries/TMT/uk-tmt-GSMA-report-112012.pdf>.

²¹ *Id.*

in wireless broadband have measurable impacts and benefits for the entire American economy. 5G represents an opportunity for the Commission to usher a new era of economic growth through policies that incent investment and innovation.

VII. CONCLUSION

HTSC commends the Commission on initiating this important NPRM that will lay the foundation for 5G. This is a critical time for the development of 5G which will be the innovative solution to meet rising mobile data demand. HTSC agrees with the Commission proposals to make spectrum above 24 GHz available for 5G but we urge the Commission to take a broad view on spectrum opportunities not just those above 24 GHz. HTSC strongly supports flexible licensing of 28-71 GHz which will drive investment and innovation in 5G. The larger economic benefits of a vibrant wireless ecosystem will have huge implications on job and economic growth in this country.

Respectfully Submitted,

HIGH TECH SPECTRUM COALITION

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