

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

In the Matter of	)	
Use of Spectrum Bands Above 24 GHz For	)	GN Docket No.14-177
Mobile Radio Services	)	
	)	
Establishing a More Flexible Framework to	)	IB Docket No. 15-256
Facilitate Satellite Operations in the 27.5-28.35	)	
GHz and 37.5-40 GHz Bands	)	
	)	
Petition for Rulemaking of the Fixed Wireless	)	RM-11664
Communications Coalition to Create Service	)	
Rules for the 42-43.5 GHz Band	)	
	)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95,	)	WT Docket No. 10-112
and 101 To Establish Uniform License Renewal,	)	
Discontinuance of Operation, and Geographic	)	
Partitioning and Spectrum Disaggregation Rules	)	
and Policies for Certain Wireless Radio Services	)	
	)	
Allocation and Designation of Spectrum for	)	IB Docket No. 97-95
Fixed-Satellite Services in the 37.5-38.5 GHz,	)	
40.5-41.5 GHz and 48.2-50.2 GHz Frequency	)	
Bands; Allocation of Spectrum to Upgrade Fixed	)	
and Mobile Allocations in the 40.5-42.5 GHz	)	
Frequency Band; Allocation of Spectrum in the	)	
46.9-47.0 GHz Frequency Band for Wireless	)	
Services; and Allocation of Spectrum in the 37.0-	)	
38.0 GHz and 40.0-40.5 GHz for Government	)	
Operations	)	

**COMMENTS OF MOBILE FUTURE**

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**COMMENTS OF MOBILE FUTURE**

Mobile Future submits these comments in response to the Federal Communications Commission’s Notice of Proposed Rulemaking (“NPRM”) promoting uses of spectrum above 24 GHz for commercial purposes.<sup>1</sup> The Commission’s focus on spectrum bands that were not

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<sup>1</sup> *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, 30 FCC Rcd 11878 (2015) (“NPRM”).

previously considered viable for mobile use is a positive step in the long-term effort to ease the spectrum shortage.

## **I. INTRODUCTION AND SUMMARY**

While the United States is in the midst of a world-leading 4G wireless revolution, the wireless industry is already busy at work preparing for the deployment of fifth generation (“5G”) wireless networks. At least one provider and its partners are targeting 2016 for initial field trials.<sup>2</sup> Achieving the potential benefits of 5G will require the FCC to look at both high and low bands for additional spectrum to meet consumers’ continuing demand for greater bandwidth and faster speeds that will be necessary to enable a growing array of interconnected devices – in the home, at work, in the car, on the farm, and everywhere else. In particular, clearing and reallocating low- and mid- band spectrum for commercial wireless use continues to be the essential ingredient for achieving and assuring continued mobile gains. However, 5G technologies should also be able to take advantage of high-frequency bands including millimeter wave (“mmW”) frequencies above 24 GHz, which hold the promise of high-capacity data transfers that can be an important supplement to the mobile services offered in lower bands. Promoting use of spectrum in bands above 24 GHz is promising, provided that efforts in this proceeding do not delay or supersede Commission efforts to bring lower band spectrum to market for consumers.

As the Commission considers how to move forward in this proceeding, the priority must be to act quickly to make additional spectrum available and ensure that the service rules associated with that spectrum foster, not impede, a wide range of services and uses that will

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<sup>2</sup> See News Release, Verizon, *Verizon sets roadmap to 5G technology in U.S.; Field trials to start in 2016* (Sept. 8, 2015), <http://www.verizon.com/about/news/verizon-sets-roadmap-5g-technology-us-field-trials-start-2016>.

ensure the United States maintains its global leadership in mobile broadband. Therefore, the Commission should authorize mobile licensed operations in the 28, 37 and 39 GHz bands and adopt licensing and service rules that avoid unproven and overly complex ideas likely to lead to delays in spectrum becoming commercially available. It should also continue to explore other bands that were identified in the Notice of Inquiry (“NOI”).<sup>3</sup> With these objectives in mind, the Commission should adopt its proposal to create a new “Upper Microwave Flexible Use Service” for the 28 and 39 GHz bands but reject a hybrid licensing scheme in the 37 GHz band because it is far too complex and certain to result in delays. Finally, the Commission should make an additional 2 GHz of spectrum available for unlicensed use in the 64-66 GHz band, but should consider the 67-71 GHz band available for licensed use.

## **II. THE FCC MUST ACT NOW TO ENSURE AMERICANS FULLY BENEFIT FROM THE NEXT GENERATION OF WIRELESS SERVICES.**

Mobile broadband has reshaped society, creating new opportunities for employment, health care, education, social and political interaction, and economic growth. Nearly 100 percent of consumers in America now have access to a high-speed 4G LTE mobile broadband network, with approximately 98 percent having access to multiple providers.<sup>4</sup> Even in rural areas, 98 percent of the population is covered by a 4G LTE network with 90 percent having access to multiple providers.<sup>5</sup> As a result, consumers are increasingly relying on mobile broadband to

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<sup>3</sup> *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Inquiry, 29 FCC Rcd 13020, 13021 ¶ 2 (2014) (“NOI”).

<sup>4</sup> *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, Eighteenth Report, DA 15-1487, ¶ 38, Chart III.A.3 (WTB rel. Dec. 23, 2015) (“Eighteenth Wireless Competition Report”).

<sup>5</sup> Eighteenth Wireless Competition Report ¶ 41, Chart III.A.5.

meet their communications needs. According to a recent Pew Research Center study, nearly 70 percent of Americans now own a smartphone and 13 percent use *only* their mobile device to access the Internet.<sup>6</sup> In addition to enriching the daily lives of consumers, due to massive wireless industry investment and innovation, the mobile broadband ecosystem has also been a key growth engine of the U.S. economy. As the Commission recognizes, “mobile wireless [is] one of the most important sectors in the national economy.”<sup>7</sup>

While the American mobile broadband story is unparalleled internationally, the consumer and economic benefits of 5G have the potential to significantly expand on today’s 4G capabilities. Consumer demand and economic growth will only increase as providers of wireless networks, devices and applications continue to innovate. Every new technological breakthrough, service, or application that will be enabled in the future cannot be imagined today, but it is clear that the 5G world will be about much more than simply increasing the speeds of individual smartphones. It is estimated that there are more than nine billion connected devices around the world today and that number will grow rapidly, with estimates ranging from 25 billion to 50 billion devices by 2025.<sup>8</sup> As the Internet of Things takes off, homes, cars, tractors, and

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<sup>6</sup> John B. Horrigan and Maeve Duggan, Pew Research Center, *Home Broadband 2015: The Share of Americans with Broadband at Home Has Plateaued, and More Rely Only on Their Smartphones for Online Access*, at 2 (Dec. 2015), <http://www.pewinternet.org/files/2015/12/Broadband-adoption-full.pdf>.

<sup>7</sup> Eighteenth Wireless Competition Report at ¶ 1; *See also* Executive Office of the President Council of Economic Advisors, *The Economic Benefits of More Spectrum for Wireless Broadband*, at Exec. Summary (Feb. 2012), [http://www.whitehouse.gov/sites/default/files/cea\\_spectrum\\_report\\_2-21-2012.pdf](http://www.whitehouse.gov/sites/default/files/cea_spectrum_report_2-21-2012.pdf) (stating that increased wireless broadband deployment will “increase the rate of growth in per capita income; spur economic activity through new business investment; and support many new high-quality jobs.”).

<sup>8</sup> McKinsey Global Institute, *The Internet of Things: Mapping the Value Beyond the Hype*, at 17 (June 2015), <http://www.mckinsey.com/~media/McKinsey/dotcom/Insights/Business%20Technology/>

countless devices will become part of an increasingly interconnected world, transforming whole sectors of our economy. Chairman Wheeler is correct that “everything will be online in the future, from our clothes to our cars, and every sector of our economy and society will be changed by ubiquitous connectivity.”<sup>9</sup>

To take the leap from 4G to 5G, and to ensure the United States continues to lead the wireless world, the Commission, along with the Administration, must double down on its efforts to free up additional spectrum for mobile broadband use. Thus, while Mobile Future continues to urge the Commission to unlock additional lower band spectrum below 6 GHz for exclusive licensed commercial use, it also supports the Commission’s efforts to make available spectrum above 24 GHz.

**A. The Economic and Consumer Welfare Benefits of 5G Will Be Substantial.**

America is the unquestioned world leader in 4G as a result of smart policy choices, a vibrant innovation ecosystem, and substantial private investment. To appreciate the potential economic benefits of 5G, it is important to recognize the success of America’s licensed spectrum policy to date. Economists estimate that the economic value of licensed spectrum made available for mobile wireless use is almost \$500 billion and calculate the total social benefits from that spectrum to be at least 10 to 20 times the direct economic value of the spectrum.<sup>10</sup>

That value generates significant investment and spending by wireless carriers and their suppliers,

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[Unlocking%20the%20potential%20of%20the%20Internet%20of%20Things/Unlocking\\_the\\_potential\\_of\\_the\\_Internet\\_of\\_Things\\_Full\\_report.ashx](https://www.fcc.gov/news-events/blog/2016/01/07/kickstarting-new-year).

<sup>9</sup> Tom Wheeler, FCC Chairman, Kickstarting the New Year, FCC Blog (Jan. 7, 2016, 4:30 PM), <https://www.fcc.gov/news-events/blog/2016/01/07/kickstarting-new-year>.

<sup>10</sup> Coleman Bazelon and Giulia McHenry, *Mobile Broadband Spectrum: A Vital Resource for the U.S. Economy*, at 1 (May 11, 2015), [http://www.ctia.org/docs/default-source/default-document-library/brattle\\_spectrum\\_051115.pdf](http://www.ctia.org/docs/default-source/default-document-library/brattle_spectrum_051115.pdf).

and the employees of all the firms in the wireless ecosystem, which translates into a \$400 billion annual economic impact in the U.S. That economic impact results in substantial job creation; for every one person employed in the wireless industry, an additional 6.5 people are employed.<sup>11</sup> For example, a report from Recon Analytics released this week indicates that for every 10 MHz of spectrum made available, the U.S. economy grows by \$3.1 billion and creates over 100,000 new jobs. Additionally, government revenue goes up \$500 million as a result of a \$2.6 billion increase in wireless service provider revenue and \$1.6 billion growth in wireless application and content sales.<sup>12</sup> While the specific economic benefits of spectrum above 24 GHz are currently unknown, there is no question that the ability of carriers to use this spectrum to supplement services offered in lower bands and create new service offerings will produce major economic gains.

In addition to economic growth, the 5G transition may unleash substantial consumer benefits and improved government services. 5G networks are likely to usher in new paradigms in connectivity to support, among other things, extremely high-definition video services, smart grid and critical infrastructure monitoring, smart city and smart agriculture applications, enhanced public safety capabilities, and improved access to health care. For example, “smart transportation systems” could address increasing traffic congestion (and associated productivity losses) by enabling real-time collection of data from vehicles, drivers, pedestrians, road sensors and cameras to help streamline traffic flow, optimize traffic lights and road usage, navigate vehicles to avoid congestion and direct public transportation to where it is needed most. In the healthcare context, 5G could facilitate the comprehensive use of cloud-based electronic medical

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<sup>11</sup> *Id.* at 23.

<sup>12</sup> Recon Analytics LLC, *The Impact of 10 MHz of Wireless Spectrum*, at 1-2 (January 26, 2016), <http://www.ctia.org/docs/default-source/default-document-library/for-every-10-mhz.pdf>.

records, as well as continuous and automatic medical telemetry (e.g., temperature, blood pressure, heart-rate, blood glucose) collection via wearable sensors. 5G may enable these and other future medical applications through significant improvements to wireless data throughput and network capacity.<sup>13</sup> Access to additional spectrum above 24 GHz is a key element of an “all-of-the-above” spectrum strategy necessary to ensure these possibilities are realized.

**B. Additional Spectrum is Needed to Ensure Consumers Reap the Benefits of 5G and America Retains its Global Leadership Position.**

In addition to the freedom to evolve existing bands to new technological uses, every wireless transition from 1G to 4G has also required new spectrum in order to meet consumer demand. Spectrum is the key ingredient that makes possible the significant benefits of today’s 4G LTE networks and tomorrow’s 5G networks. Consumer demand for mobile broadband continues to grow exponentially. Indeed, data traffic across America’s mobile networks increased 25.7 percent from 2013 to 2014 alone, from 3.23 trillion MB in 2013 to 4.06 trillion MB in 2014.<sup>14</sup> That demand will only continue to rise since nearly 70 percent of Americans now own a smartphone and use it as a primary pathway to the Internet in many instances, including access to bandwidth-dependent streaming video services. For example, average smartphone usage grew 45 percent in 2014, with the average amount of traffic per smartphone growing from 563 MB to 819 MB per month between 2013 and 2014.<sup>15</sup> Looking ahead, in North America,

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<sup>13</sup> Jim Kohlenberger, *Mobilizing America: Accelerating Next Generation Wireless Opportunities Everywhere*, at 10 (Sept. 2015), <http://mobilefuture.org/wp-content/uploads/2015/09/5G-Paper-1.pdf>.

<sup>14</sup> Eighteenth Wireless Competition Report ¶ 149.

<sup>15</sup> Cisco, *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2014-2019*, at 2 (Feb. 3, 2015), [http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white\\_paper\\_c11-520862.pdf](http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.pdf).

consumer mobile traffic is expected to grow 6.8-fold from 2014 to 2019, a compound annual growth rate of 47 percent.<sup>16</sup>

To meet this rapidly growing consumer demand for spectrum-dependent services, the FCC must look to all possible spectrum sources to meet that demand, including spectrum above 24 GHz. As described below, the FCC's policy choices in this proceeding must reflect the same straight forward, proven licensing policies that led to U.S. dominance in 4G – supporting flexible use of spectrum and innovation, and relying on the highly competitive mobile wireless ecosystem to determine the best use of spectrum resources.

### **III. THE FCC MUST ESTABLISH A REGULATORY FRAMEWORK FOR THE ABOVE 24 GHZ BANDS THAT ENABLES THE WIDEST VARIETY OF SERVICES AS QUICKLY AS POSSIBLE.**

If Americans are going to fully benefit from the promise of 5G, the Commission must move quickly to make additional spectrum available and ensure that the service rules associated with that spectrum foster, not impede, a wide range of services and uses.

#### **A. The FCC Should Promptly Authorize Mobile Operations in the 28, 37 and 39 GHz Bands, and Continue to Explore Other Bands Above 24 GHz.**

While traditionally thought unsuitable for mobile operations, technological advances have increased the momentum behind developing new technologies and solutions that can operate in the spectrum bands above 24 GHz. To promote developments, the Commission should permit mobile operations in the 28, 37 and 39 GHz bands with all due haste. As the Commission discusses in the NPRM, these bands offer great potential for mobile operations and

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<sup>16</sup> See Cisco, Mobile VNI Forecast Highlights, 2014-2019 (North America, 2019 Forecast Highlights) [http://www.cisco.com/assets/sol/sp/vni/forecast\\_highlights\\_mobile/index.html](http://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/index.html) (last visited Jan. 14, 2016).

5G services.<sup>17</sup> Each band does have its own unique challenges, including various private and federal incumbent licensees currently operating in the bands or in adjacent bands.<sup>18</sup> The Commission should permit operations in these three bands as soon as possible.

The Commission should also apply proven licensing policies to the 28, 37 and 39 GHz bands rather than creative, but speculative licensing models that could result in spectrum lying unnecessarily fallow. The market-based, flexible use policies that the Commission has created over the last two decades have fostered unparalleled investment and innovation. Sticking to these tried and true policies will help provide certainty to those developing technologies and services for the 28, 37 and 39 GHz bands, promote additional investment and innovation, and ensure that the spectrum is put to use as quickly as possible.

The Commission also should continue aggressively pursuing the other spectrum bands above 24 GHz, including but not limited to the 24.25-24.45 GHz, 25.05-25.25 GHz, 29.1-29.25 GHz, 31-31.3 GHz, 42.0-42.5 GHz, 57-64 GHz, 71-76 GHz and 81-86 GHz bands.<sup>19</sup> Identifying more bands is necessary to ensure the realization of the National Broadband Plan's call to make 500 megahertz of additional spectrum available for mobile broadband by 2020. The criteria used by the Commission to evaluate the suitability of spectrum for mmW mobile service were useful for identifying the spectrum on which the Commission could focus initially and presumably

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<sup>17</sup> See NPRM, 30 FCC Rcd at 11882 ¶¶ 5-6, 11884-85 ¶¶ 12, 11894-92 ¶ 30, 11895 ¶¶ 42-43, 11897 ¶ 51.

<sup>18</sup> See *id.* at 11890-91 ¶¶ 26-27, 11893-94 ¶¶ 36-38, 11896-97 ¶¶ 48-49.

<sup>19</sup> See NOI, 29 FCC Rcd at 13035-37 ¶¶ 51-55, 13039-45 ¶¶ 62-87; NPRM, 30 FCC Rcd at 11900-07 ¶¶ 60-91.

reallocate promptly.<sup>20</sup> To the extent other bands above 24 GHz do not meet all of the criteria, however, it should not preclude further consideration of those bands.

**B. The FCC Should Create a New “Upper Microwave Flexible Use Service” For the 28 and 39 GHz Bands.**

The Commission should adopt its proposal to create a new service – the Upper Microwave Flexible Use Service – for the 28 and 39 GHz bands.<sup>21</sup> The rules for this service should allow licensees to provide any form of fixed or mobile service within their licensed geographic area.<sup>22</sup> To the extent there are incumbents in the bands, their licenses should be reissued for the same frequencies and geographic area for which they are currently licensed, but with the new flexible rights to provide fixed and mobile services. Separately licensing mobile rights from existing fixed rights would add unnecessary complexity to the licensing framework and limit some licensees’ use of the band to certain types of services, which would have negative implications for consumers, existing licensees, as well as those who may obtain the spectrum through secondary market transactions. Indeed, innovation has increasingly blurred the lines between fixed and mobile technologies and services, and having to arbitrarily distinguish between the two would hamper full use of the spectrum. Granting both fixed and mobile rights under all licenses will instead ensure that the spectrum is put to use in an efficient manner by giving licensees maximum flexibility to use the solution or combination of solutions that best meets the needs of their customers.

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<sup>20</sup> See NPRM, 30 FCC Rcd at 11887-88 ¶¶ 20-23. Those criteria included spectrum bands that: (1) have at least 500 MHz of contiguous spectrum, (2) are being considered internationally for mmW mobile service, (3) are compatible with incumbent license assignments and uses, and (4) can accommodate a flexible regulatory framework for a wide variety of services.

<sup>21</sup> See *id.* at 11907-08 ¶ 93.

<sup>22</sup> See *id.* at 11907-08 ¶¶ 93-95.

**C. The FCC Should Apply a Proven and Flexible Licensing Scheme to the 37 GHz Band.**

The Commission should adopt a proven and flexible licensing scheme for the 37 GHz band rather than the hybrid authorization licensing scheme proposed in the NPRM.<sup>23</sup> Similar to rules for the 28 GHz and 39 GHz bands, the Commission can move swiftly in the 37 GHz band, which lacks any non-Federal incumbents, to make the spectrum available under proven licensing policies. The hybrid approach, which would convey by rule licensed “local area” operating rights to occupants of premises and auction geographic area licenses for wide use, is untested, unproven, and extraordinarily complex. It would unnecessarily delay making much needed spectrum available for 5G services. While the local area licensing approach is creative and warrants further study, the future of 5G is simply too important to experiment with it.

A monumental collection of legal, technical, and practical issues would need to be resolved in order to create and implement a functional hybrid licensing framework. For example, establishing the geographic boundaries of the local area licenses depends on whether local areas should include indoor and outdoor use, whether they should apply to private and public space, and whether local areas would be subject to a certain minimum or maximum property size. The Commission also would need to define who is a “premises occupant” for purposes of qualifying for a local area license, such as only property owners, or also tenants, lessees, or others with a right to use a property, and whether private and public/government entities would qualify. Whether and how a local area license and operating rights could be conveyed between new or different occupants also would need to be established. In addition, the Commission would have to determine if the rights of the wide area licensees should be fixed at the time of auction based upon then existing local area licenses, or would change each time a

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<sup>23</sup> See *id.* at 11909-11 ¶¶ 99-104.

premises occupant decides to install a new network or new properties are constructed. Various technical concerns also must be considered, such as if and how local area licensees could co-exist with each other and with wide area licensees, and how interference matters would be resolved, including as new networks and premises are constructed. All of these issues are further compounded when considering that the framework would have to encompass the wide variety of localities and types of properties throughout the United States, including rural areas with few buildings and more urban areas that have closely-situated and multi-tenant buildings.

A similar proposal was raised in the 3.5 GHz proceeding, which would have established indoor use licenses for “contained access facilities” such as hospitals, public safety, and local governments, but was ultimately discarded.<sup>24</sup> The hybrid proposal for the 37 GHz band is even more complex as local area licenses would be open to all premises occupants, not simply a limited number of contained access facilities. Notably, there is scant support in the NOI record for a hybrid local area and wide area licensing scheme. It should therefore also be abandoned.

The lack of non-Federal incumbents in the 37 GHz band means that the Commission can move more quickly to make the spectrum available under proven licensing policies. Existing licensing policies also would provide more certainty for those looking to invest in a band in which many of the operational aspects remain in development.

**D. Other Licensing and Service Rules Should Be Designed To Minimize Complexity and Implementation Time.**

It is extremely important that the licensing and service rules for the bands above 24 GHz provide certainty and do not hamper the development of the bands for mobile operations.

Unnecessary complexities and obligations will delay, and potentially extinguish, further

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<sup>24</sup> See *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, 4012-14 ¶¶ 164-69 (2015).

investment and innovation, to the detriment of consumers and the United States' position as a global leader in the wireless marketplace. Ensuring that the licensing and service rules reflect the following basic tenets will help ensure that the bands above 24 GHz can reach their full potential as quickly as possible.

**Licenses Should Allocated By Geographic Area.** The Commission should use geographic area licensing for the 28, 39, and 37 GHz bands.<sup>25</sup> A geographic area licensing approach is well suited and administratively more efficient for licenses that include both fixed and mobile services, and indeed has become the industry standard for flexible use allocations. The Commission should license these bands using their existing license areas for the 28 and 39 GHz bands, which use Basic Trading Areas (“BTAs”) and Economic Areas (“EAs”) respectively. Similarly, the 37 GHz band should be licensed at the EA level. As noted in the NPRM, there are substantially more counties (3,143) than BTAs (493) and EAs (176).<sup>26</sup> Establishing a licensing scheme at the county level would create substantial administrative burdens for the Commission and licensees, thereby decreasing the potential value and usability of the spectrum. Allocating licenses on a county basis also would make it difficult for bidders to cobble together larger geographic licensed areas at auction. On the other hand, the combination of BTAs and EAs provides a reasonable selection of license sizes for both small and larger providers. While the NPRM notes that services using these bands will likely be highly localized, that may not translate into a need to license the bands at an equally granular level.

**The License Term Should Be Ten Years.** The Commission should adopt its proposal to establish a 10-year term, with renewal expectancy, for licenses in the 28, 37, and 39 GHz

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<sup>25</sup> See NPRM, 30 FCC Rcd at 11907-08 ¶¶ 92-94.

<sup>26</sup> See *id.* at 11912 ¶ 110.

bands.<sup>27</sup> Given that many of the licensees in the 28 and 39 GHz bands are already subject to 10-year terms, it is logical to adopt 10-year terms for all licensees in these bands. Doing so would also be consistent with the license terms of other flexible use spectrum bands and take into consideration the still evolving mmW technologies.

**Existing Satellite Licensee Spectrum Rights Should Not Be Upgraded.** There is no need to “upgrade” existing satellite licensees’ spectrum rights. Instead, the market-based mechanism for allowing gateway earth stations to acquire terrestrial licenses (either at auction or on the secondary market) as proposed by the Commission would be consistent with its longstanding approach to allowing the marketplace to determine the best use of spectrum resources.<sup>28</sup> Similarly, to the extent the Commission considers repealing the restriction on FSS fixed user equipment in the 28 GHz band, it should adopt simple solutions and encourage private agreements to facilitate sharing rather than mandate complex technical mechanisms.<sup>29</sup> If regulatory mechanisms are established, however, satellite operators should bear the cost.

**The Commission Should Continue To Work On Facilitating Federal Sharing.** Mobile Future supports the Commission’s continuing efforts to work with NTIA and other federal agencies through the inter-agency process to ensure efficient use of spectrum and, where necessary, a sharing environment that meets the needs of all parties.<sup>30</sup> The on-going collaborative process between agencies and federal users plays a very important role in the efforts to free up and make available additional spectrum for commercial use. The future of

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<sup>27</sup> See *id.* at 11915-16 ¶¶ 121-22.

<sup>28</sup> See *id.* at 11918-21 ¶¶ 129-45.

<sup>29</sup> See *id.* at 11922 ¶¶ 147-49.

<sup>30</sup> See *id.* at 11927-30 ¶¶ 166-76.

mmW technologies might be able to support a platform that could enable two-way shared use between Federal and non-Federal users, but the Commission should tread cautiously to ensure that commercial users are able to fully utilize their spectrum holdings at all times in a manner that meets the needs of their customers.

**The Bands Above 24 GHz Should Not Be Subject to The Commission’s Mobile Spectrum Holdings Policies.** Consistent with its tentative conclusion, the Commission should not adopt band-specific spectrum aggregation limits (for individual bands above 24 GHz or a combination of bands), nor should it include the bands in the Commission’s spectrum screen.<sup>31</sup> Given the nascent stage of mmW technology, is it too early to determine with any certainty how these bands will ultimately be used and whether the spectrum will be suitable and available for the provision of mobile telephony/broadband services. Adopting any such limits or restrictions now would be arbitrary and could stymie the development of mmW technology and these bands.

**Performance Requirements, If Any, Should Provide Licensees With Flexibility In Demonstrating Use of the Spectrum.** Traditional performance requirements are unnecessary if the Commission adopts truly flexible secondary-market policies that allow parties to enter into leasing and other arrangements without a cumbersome regulatory approval process.<sup>32</sup> The marketplace will ensure that spectrum will not remain fallow. If the Commission concludes that performance requirements are appropriate, however, any such requirements should provide licensees with maximum flexibility in demonstrating construction and use of spectrum. Given the nascent state of mmW technology, the wide variety of possible use cases, and the unique difficulties for licensees operating in these bands, the Commission should avoid adopting

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<sup>31</sup> See *id.* at 11933-35 ¶¶ 190-92.

<sup>32</sup> See *id.* at 11938-40 ¶¶ 203-11.

specific performance metrics that could force licensees to forego innovative technologies and uses in favor of services and networks designed simply meet those metrics.

*A Use-Or-Share Obligation Should Not be Applied.* Given the early development of mmW technology and the uncertainty of what business cases will support use of the bands above 24 GHz, the Commission should not adopt a “use-or-share” requirement at this time.<sup>33</sup> Doing so would unnecessarily limit licensees’ flexibility and opportunities to explore different types of uses and technologies, which would ultimately restrain development of these bands and 5G.

*The Commission’s Competitive Bidding Procedures and Secondary Market Policies Should Apply.* The Commission should apply its standard competitive bidding procedures and secondary market rules to the 28, 39, and 37 GHz bands. These rules and policies are well established and have been used successfully for many years, which will provide certainty regarding the licensing process to potential licensees as well as Commission staff. These policies also will provide all interested parties with a wide range of opportunities to obtain spectrum through auction and on the secondary market, which will help ensure that the spectrum is put to its best and most efficient use.

**E. The FCC Should Make an Additional 2 GHz of Spectrum Available for Unlicensed Use in the 64-66 GHz Band.**

The Commission must continue to free up additional spectrum for both licensed and unlicensed spectrum. The social and economic benefits of unlicensed spectrum are important and the Commission must continue to look for ways make additional unlicensed spectrum available. Bands that had once been “garbage” are today the “innovation” bands,<sup>34</sup> consistently

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<sup>33</sup> See *id.* at 11941 ¶¶ 215-17.

<sup>34</sup> See Remarks of Commissioner Jessica Rosenworcel, Federal Communications Commission, *The Future of Unlicensed Spectrum*, Computer History Museum, Mountain View, CA (Sept. 11, 2014).

producing new capabilities and enabling services and applications that add significant value to mobile broadband networks powered by licensed spectrum. Accordingly, the FCC should make an additional 2 GHz of spectrum available for unlicensed use in the 64-66 GHz band. Adjacent to the 57-64 GHz band which is already available for unlicensed use, doing so would create a 9 GHz block of contiguous spectrum for unlicensed use. Additionally, the Commission should consider making the 67-71 GHz band available for licensed use.

#### **IV. CONCLUSION**

Mobile Future supports the Commission's efforts to make spectrum above 24 GHz available for commercial use consistent with the above comments. But these efforts must not supplant the Commission's ongoing efforts to bring additional low- and mid-band spectrum to market for consumers.

Respectfully submitted,

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