

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

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

**REPLY COMMENTS OF UNITED STATES CELLULAR CORPORATION**

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United States Cellular Corporation (“USCC”) submits these reply comments in response to the Notice of Proposed Rulemaking (“NPRM”) released October 23, 2015 in the above-captioned proceedings and the comments filed in response to the NPRM.<sup>1</sup> USCC greatly appreciates the Commission’s efforts in this proceeding to authorize mobile use of the millimeter

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<sup>1</sup> See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, et al.*, Notice of Proposed Rulemaking, 30 FCC Rcd 11878 (2015). All comments cited herein were filed in the above-listed dockets in response to the NPRM.

wave (“mmW”) bands as this spectrum will be a crucial component of carriers’ efforts in the coming years to deploy Fifth Generation (“5G”) wireless broadband networks. In these reply comments, USCC focuses on a few issues that it believes will best advance the Commission’s efforts to promote much-needed competition in the wireless industry and to ensure that every American, including those living in rural areas, has a chance to benefit from the vast opportunities made possible by broadband access. Specifically, USCC strongly supports the Commission’s proposals to license the mmW bands on the basis of counties and to adopt an interoperability requirement for these bands. In addition, USCC urges the Commission not to permit package bidding for Upper Microwave Flexible Use Service (“UMFUS”) licenses.

## **I. INTRODUCTION & SUMMARY**

As the Commission notes, spectrum is an “essential input for the provision of mobile wireless services, and ensuring access to and the availability of sufficient spectrum is crucial to promoting the competition that drives innovation and investment.”<sup>2</sup> While crucial, making additional spectrum available for mobile broadband services does not, in and of itself, sufficiently promote the level of competition sought by the Commission and required by the public. Rather, such competition will only arise if the Commission takes certain actions to ensure that a variety of carriers have an opportunity to acquire rights to those spectrum bands that are newly-authorized for mobile broadband services. USCC focuses on three such actions it believes will be particularly important for ensuring that carriers of all sizes are able to acquire UMFUS licenses, and thus be able to deploy 5G mobile broadband networks, including in rural and other underserved areas.

First, USCC supports the Commission’s proposal to license the mmW bands on the basis of counties. As the Commission notes, smaller license areas are a better fit for the localized

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<sup>2</sup> *Id.* at 11933.

types of services that carriers generally will deploy in the mmW bands as a result of the inferior propagation characteristics of this spectrum. In addition, whereas larger license areas often cover expansive geography and invariably include one or more urban areas, many counties do not, and thus will not be out of the financial reach of small and regional carriers. Further, counties are better suited for the targeted, often rural-focused business plans of these carriers. Moreover, large carriers seeking expansive mmW band footprints will be able to aggregate counties, which “nest” into the larger license areas used for other spectrum bands, into larger footprints, and thereby achieve economies of scale.

Second, USCC urges the Commission not to permit any form of package bidding in the UMFUS auctions. As detailed below, package bidding makes it very difficult for smaller bidders with targeted, rural-focused business plans to acquire the licenses they need to serve these areas because large bidders are able to package these licenses with licenses for high-priced urban areas. At the same time, package bidding is unnecessary because adequate spectrum aggregation opportunities are available under the Commission’s standard auction procedures.

Finally, USCC supports the Commission’s proposed interoperability requirement for the mmW bands. There is no dispute that broad interoperability for a given spectrum band produces significant public interest benefits, including timely and affordable access to the latest devices by carriers of all sizes. Nevertheless, certain commenters oppose the Commission’s proposal. However, as detailed below, these commenters’ opposition appears to stem from a misreading of the Commission’s proposed interoperability requirement, and thus, should not cause the Commission to rethink its proposal. Moreover, while those who oppose an express interoperability requirement urge the Commission to instead allow the industry’s standards-setting process to ensure interoperability in the mmW bands, the recent experience with the

Lower 700 MHz band clearly demonstrates that the Commission should not presume that full interoperability will arise for a given spectrum band absent an *ex ante* requirement.

## **II. THE COMMISSION SHOULD ADOPT COUNTY-BASED LICENSES**

USCC supports the Commission’s proposal to use counties as the geographic area for licenses in the 28 GHz, 39 GHz, and 37 GHz bands.<sup>3</sup> As the Commission notes, because the mmW bands “do not propagate well over long distances,” county-based licenses would “best fit the localized types of services” expected to be offered in these bands.<sup>4</sup> Similarly, T-Mobile explained that, because the mmW bands “may at least initially be used to supplement capacity, providers may not need it in large geographic areas, making counties an appropriate license area.”<sup>5</sup>

Equally important, county-based licenses are needed in order to provide smaller bidders with a reasonable opportunity to acquire UMFUS licenses, and thereby be able to deploy 5G networks in rural and other underserved areas. Larger license areas encompass far more geography than the areas served by small and regional carriers, meaning these carriers would need to acquire spectrum rights for unwanted areas in order to provide 5G service to current and potential customers in their service areas. This consequence of larger license areas would be particularly inappropriate here given that carriers will generally use mmW spectrum to add capacity to their existing networks, not to expand their networks beyond their current service footprints. The mmW bands therefore should be licensed on the basis of counties, which the Commission notes would “allow smaller carriers to better tailor their spectrum acquisitions...”<sup>6</sup>

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<sup>3</sup> *Id.* at 11912.

<sup>4</sup> *Id.*

<sup>5</sup> Comments of T-Mobile USA, Inc., p. 9 (Jan. 27, 2016) (“T-Mobile Comments”); *see* Comments of Open Technology Institute at New America and Public Knowledge, p. 12 (Jan. 28, 2016) (“The targeted, small cell capacity in-fill that is anticipated for 5G wireless is a use case that best fits smaller areas...”).

<sup>6</sup> NPRM, 30 FCC Rcd at 11912.

Larger license areas also typically include one or more densely-populated urban areas which command a premium at auction, and thereby make the licenses prohibitively expensive for smaller bidders. In this respect, USCC notes that, even if smaller bidders had the significant funding necessary to acquire large license areas, they could not reasonably justify purchasing these licenses in the hopes that they would subsequently be able to divest the spectrum rights for the unwanted, high-priced urban areas. In addition to being far too speculative, which would make obtaining the necessary outside financing that much more difficult, the urban portions of a large license area cause the overall price per MHz-pop to exceed what the less densely-populated counties would command if auctioned on an individual basis.

USCC stresses, however, that separately auctioning the counties that otherwise would be grouped together in a larger license area would not lead to lower auction proceeds, or otherwise provide a “discount” to those bidding on less densely-populated counties. Rather, the average price per MHz-pop of the various counties that would have been included within the larger license area would be at least as high as the price that would have resulted from an auction of the larger license area. In fact, the average price per MHz-pop for the individual counties likely would exceed that of the larger license area given that bidders, both large and small, would be bidding only on those areas of greatest interest, as well as the fact that smaller license areas would result in more robust bidding competition due to the greater auction participation by small and regional carriers.

In addition to being essential for small and regional carriers and the rural customers they serve, county-based licenses also would benefit large carriers. For instance, the Commission notes how the use of counties “would facilitate access by larger carriers because such carriers

could [ ] narrowly target the areas in which they need the additional spectrum...”<sup>7</sup> The targeted spectrum acquisitions made possible by county-based licensing also would increase the likelihood that a bidder, regardless of size, is able to acquire one of the finite number of UMFUS licenses for those areas most crucial to its current and future business plans. As T-Mobile explained, “smaller geographic areas, such as counties, will permit others access to the same spectrum in adjacent areas from which they may be foreclosed if that spectrum is licensed as part of a larger geographic region.”<sup>8</sup>

At the same time, large carriers seeking expansive mmW band footprints would not be disadvantaged by county-based licensing because, as the Commission notes, they could “aggregate the counties – which serve as the building blocks for traditional license areas – into larger license areas, thus achieving economies of scale.”<sup>9</sup> On the other hand, contrary to the suggestion of some commenters, if the Commission licenses the mmW bands on the basis of larger areas, small and regional carriers are unlikely to ever gain sufficient access to this spectrum. Although USCC supports the Commission’s proposal to permit the assignment of UMFUS spectrum rights in the secondary market, such divestitures have been, and likely will continue to be, the exception rather than the rule. As a consequence, the theoretical availability of these secondary market transactions is unlikely to provide small and regional carriers with timely or adequate access to mmW band spectrum. Accordingly, the Commission should license these bands on the basis of counties in order to permit these carriers to bid directly on UMFUS licenses rather than be forced to subsequently rely on problematic secondary markets.

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<sup>7</sup> *Id.*

<sup>8</sup> T-Mobile Comments at 9-10.

<sup>9</sup> NPRM, 30 FCC Rcd at 11912 (internal citation omitted).

USCC also agrees with T-Mobile regarding the importance of adopting a UMFUS licensing scheme that will allow carriers “to secure licenses that conform to their current coverage footprints.”<sup>10</sup> This consideration strongly weighs in favor of the smaller, county-based license areas proposed by the Commission. Given the variety of geographic areas used by the Commission to license different spectrum bands throughout the years, if the Commission were to instead adopt larger license areas (such as the BTAs and EAs currently used for the 28 GHz and 39 GHz bands, respectively), the UMFUS license areas likely would not align well with most carriers’ existing service areas. This would be especially true for small and regional carriers given that the boundaries of EAs and BTAs do not align with those of the CMA-based licenses that make up a significant portion of many small and regional carriers’ existing spectrum holdings. As an example, USCC would need to acquire BTA-based licenses covering a population more than four times greater than the population covered by its existing networks in order to supplement the capacity of those networks with mmW band spectrum, and thereby be able to offer robust 5G services to those residing within its current service areas. On the other hand, due to their smaller size and because their boundaries align with the boundaries of carriers’ existing license areas, counties would permit all carriers, regardless of their size or current spectrum holdings, to acquire mmW band spectrum rights that conform to their current coverage footprints.

USCC also notes that existing LMDS and 39 GHz licensees would not be disadvantaged by the Commission’s proposal to subdivide their licenses on a county basis. As the Commission notes, “because counties nest into both BTAs and EAs,” these licensees would “retain the exact same coverage,” while also receiving additional “flexibility to tailor the license holdings to meet

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<sup>10</sup> T-Mobile Comments at 10.

their business needs.”<sup>11</sup> County-based license areas also would be a more equitable licensing framework with respect to FSS operators if the Commission adopts its proposal for allowing FSS operators to gain co-primary status by acquiring UMFUS licenses. As EchoStar noted, “the area around a 28 GHz gateway where mobile operations might be affected has a radius of no more than about 170 meters, while the coordination distance required for a 39 GHz gateway is likely no more than about two kilometers.”<sup>12</sup> Accordingly, while FSS operators generally oppose the Commission’s proposed market-based mechanism for acquiring co-primary status, presumably, they would greatly prefer to acquire terrestrial spectrum rights for a single county, rather than for a much larger BTA or EA, in order to receive interference protection. Another benefit of this approach is that it would not exclude others from acquiring UMFUS licenses for every county located within a given BTA or EA simply because an FSS operator seeks to acquire co-primary status.<sup>13</sup>

USCC further agrees with the Commission that county-based licensing also would advance the public interest because “smaller license areas reduce the potential for warehousing spectrum...”<sup>14</sup> As the Commission explained in the earlier Notice of Inquiry in this proceeding, given that any form of geographic area licensing could allow “portions of license areas outside of high-traffic areas [to] end up lying fallow,” the best approach would be to adopt small license areas in order “to minimize the amount of unserved area in any given license.”<sup>15</sup> While Verizon claims that the adoption of buildout requirements for the mmW bands weighs against licensing

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<sup>11</sup> NPRM, 30 FCC Rcd at 11913.

<sup>12</sup> Comments of EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC, and Alta Wireless, Inc., p. 33 (Jan. 27, 2016) (“EchoStar Comments”).

<sup>13</sup> See NPRM, 30 FCC Rcd at 11912 (finding that “counties are an appropriate size to allow FSS operators to seek the protection they might desire through the license without over or under excluding other uses or users”).

<sup>14</sup> *Id.*

<sup>15</sup> *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, et al.*, Notice of Inquiry, 29 FCC Rcd 13020, 13046 (2014).

this spectrum on the basis of counties, its argument fails to acknowledge that nationwide carriers focused on acquiring spectrum in urban areas will make up only a fraction of the likely bidders for UMFUS licenses. According to Verizon, because it would be more difficult to satisfy a population-based buildout requirement with respect to a rural county than with respect to an EA or BTA that includes both the rural county and more densely-populated counties, such a buildout requirement would “deter an operator from purchasing the *county*-level license, but not a larger license that includes the county.”<sup>16</sup> Verizon further contends that, if an “operator purchases a license for an EA that includes the rural county, it will *likely* invest in the county...”<sup>17</sup>

In making this argument, however, Verizon fails to consider that most small and regional carriers focus on serving rural areas, perhaps even exclusively. Consequently, these carriers would seek to acquire the rural county in Verizon’s example despite the fact that it may be more difficult to satisfy a population-based buildout requirement for that county. Thereafter, such carriers could only satisfy their buildout obligations by providing service to this rural county. In other words, with county-based license areas, licensees would be *required* to provide service to those living in more rural counties.<sup>18</sup> On the other hand, under Verizon’s reasoning, if the Commission instead uses BTAs and EAs, the most it can expect is that a licensee will turn its attention to the rural portions of that large license area at some point in the future, after it has satisfied any buildout requirements via network deployments in only the most densely-populated portions of the license area.

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<sup>16</sup> Comments of Verizon, pp. 11-12 (Jan. 28, 2016) (“Verizon Comments”) (emphasis in original).

<sup>17</sup> *Id.* at 12 (emphasis added).

<sup>18</sup> See *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102, 16122 (2012) (noting that “licensing smaller geographic blocks averts the phenomenon of huge tracts of licensed territory being left unserved”).

### **III. THE COMMISSION SHOULD NOT PERMIT PACKAGE BIDDING**

Assuming the Commission adopts its proposal to license the mmW bands on the basis of counties, USCC strongly urges it to decline Verizon's request to permit package bidding in the UMFUS auctions. Although Verizon claims that package bidding procedures would be needed with county-based licenses to allow operators to "assemble nationwide or region-wide footprints,"<sup>19</sup> most carriers have neither the desire nor the ability to acquire the licenses and build out the networks required for such an expansive service area. But these carriers nevertheless greatly benefit the public by providing much-needed competition to the nationwide carriers within their localized service areas, as well as by deploying networks in areas that typically have been underserved by the largest carriers. If, however, the Commission permits package bidding in the UMFUS auctions, it would be very difficult for these same carriers to acquire the mmW spectrum rights needed to deploy robust 5G networks, and thus, to provide those residing within their service areas next generation mobile broadband services and competitive alternatives to the dominant nationwide carriers.

As USCC and a majority of other commenters have detailed in previous proceedings, package bidding creates significant and unwarranted biases in favor of the largest bidders. For instance, package bidding greatly increases the likelihood that large bidders will tie up multiple licenses in large package bids to the exclusion of smaller bidders focused on individual license areas.<sup>20</sup> Although the bids for individual licenses theoretically could defeat a package bid, for a variety of reasons this outcome is highly unlikely. For instance, package bidding gives rise to the widely-acknowledged "threshold problem," which occurs because bidders for individual

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<sup>19</sup> Verizon Comments at 12.

<sup>20</sup> See EchoStar Comments at 40 (opposing the use of package bidding "as it is systematically biased against bidders interested in only one or a small handful of licenses available at auction").

licenses may be restrained in their bidding in the hope that bidders for other individual licenses included in the same package will increase their bids enough to defeat the package bid.

Moreover, even with robust bidding by those seeking individual licenses, a package bid will almost always triumph because the individual bids often relate to only a subset of the licenses included in the package – *i.e.*, the less densely-populated license areas generally desired by non-nationwide carriers. In this situation, because the individual bids would apply to fewer licenses, the aggregate amount of those bids will not defeat the package bid even if the valuations assigned to that subset of individual licenses exceed the valuations the package bidders assigned to the same licenses in formulating their package bid amounts. In other words, in addition to significantly disadvantaging smaller bidders, package bidding also can allow large bidders to acquire certain licenses at a discount. In turn, such discounts, coupled with decreased auction participation by smaller bidders as a result of package bidding’s well-known bias against these bidders, lead to lower auction revenues.

At the same time, large bidders do not require package bidding in order to attain the efficiencies associated with expansive service areas. As the Commission explains, because counties “nest” into both BTAs and EAs, as well as even larger license areas, bidders seeking expansive mmW spectrum coverage will be able to “aggregate the counties ... into larger license areas, thus achieving economies of scale.”<sup>21</sup> Notably, with regard to the new Citizens Broadband Radio Service in the 3.5 GHz band, the Commission found that even census tract-based license areas will allow “easy aggregation to accommodate a larger network footprint.”<sup>22</sup> Given that

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<sup>21</sup> NPRM, 30 FCC Rcd at 11912.

<sup>22</sup> *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, 3991 (2015); *see also Auction of Advanced Wireless Services (AWS-3) Licenses Scheduled for November 13, 2014*, Public Notice, 29 FCC Rcd 8386, 8427 (2014) (concluding “that a standard SMR format will provide bidders with a simple and efficient means of bidding on single or multiple licenses and will offer adequate opportunity for bidders in Auction 97 to aggregate licenses in order to obtain the level of coverage they desire consistent with their business plans”).

there are over 74,000 census tracts but only 3,143 counties,<sup>23</sup> there is no reason to believe that large carriers with superior financial resources will not also be able to easily aggregate county-based UMFUS licenses.

Finally, USCC notes that the Commission proposes to license the mmW bands on the basis of counties in part to facilitate access to this spectrum by smaller service providers.<sup>24</sup> However, if the Commission permits package bidding in the UMFUS auctions, the effective result would be larger – and perhaps significantly larger – license areas, at least with respect to any licenses that large bidders include in their package bids. In other words, package bidding would undermine the Commission’s pro-competition objective when it proposed to license this spectrum on the basis of counties.

#### **IV. THE COMMISSION SHOULD ADOPT ITS PROPOSED INTEROPERABILITY REQUIREMENT**

USCC strongly urges the Commission to adopt its proposal “to require that mobile equipment operating within each mmW band be interoperable using all air interfaces that the equipment utilizes on the frequencies.”<sup>25</sup> As the Commission has recognized on numerous occasions with respect to other spectrum bands, ensuring interoperability in the mmW bands will be essential to achieving the potential of this spectrum to promote competition and the deployment of 5G networks, particularly in rural and other underserved areas.<sup>26</sup>

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<sup>23</sup> NPRM, 30 FCC Rcd at 11912.

<sup>24</sup> *See id.*

<sup>25</sup> *Id.* at 11964.

<sup>26</sup> *See, e.g., Promoting Interoperability in the 700 MHz Commercial Spectrum*, Report and Order and Order of Proposed Modification, 28 FCC Rcd 15122, 15145 (2013) (“*Lower 700 MHz Interoperability Order*”) (noting that interoperability will “promote the efficient use of spectrum, the availability of higher quality and lower priced offerings and enhanced choices for customers of all wireless broadband providers, overall timely deployment of nationwide wireless broadband coverage, and the delivery of such service to rural and underserved areas”); *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357, 12415 (2012) (“Interoperability has often been important in ensuring rapid and widespread deployment of mobile devices in a new spectrum band.”).

USCC and the overwhelming majority of commenters in this and other recent proceedings wholly agree with the Commission’s continued belief “that interoperability delivers important benefits to consumers.”<sup>27</sup> For instance, the Commission notes how interoperability “helps ensure a robust market for equipment, and helps ensure that such equipment is available equally to all licensees.”<sup>28</sup> This consequence of full interoperability for a given spectrum band is particularly important for small and regional carriers, which lack the considerable leverage *vis-à-vis* equipment manufacturers enjoyed by the nationwide carriers as a result of their volume purchases. Because of this leverage, if “boutique” band classes develop for the mmW spectrum, manufacturers would initially, and perhaps exclusively, focus on the needs of the largest carriers. As a result, at a minimum, smaller carriers would experience significant delays in gaining initial access to mmW band equipment, and thereafter likely would continue to face higher equipment costs and delayed access to the latest 5G technology. Notably, while full interoperability is especially important for smaller carriers, the largest carriers also would benefit from the resulting increased economies of scale.

Although some commenters expressed their concern with, or even opposition to, the Commission’s proposed interoperability requirement for the mmW bands, such opposition appears to relate solely to the Commission separately seeking “comment on Straight Path’s contention that it should be possible to achieve interoperability between different technologies, *e.g.*, switching between LTE and Wi-Fi.”<sup>29</sup> For instance, in asking the Commission to provide additional information regarding its proposal, CTIA asserted that, because “a single mobile device may employ a variety of air interfaces, while others may employ only one or two,” the

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<sup>27</sup> NPRM, 30 FCC Rcd at 11964.

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

proposal “seems to contemplate that a device must be able to use *any of these air interfaces* throughout the millimeter wave bands.”<sup>30</sup> In other words, according to CTIA, “it is unclear whether the Commission is essentially mandating particular equipment capabilities.”<sup>31</sup> Similarly, in opposing any interoperability requirement, T-Mobile urged the Commission not to “require that mobile equipment operating within each millimeter wave band be interoperable across *all air interfaces*” because “[i]mposing interoperability requirements *across different technologies* now will only hamper innovation.”<sup>32</sup> Likewise, Qualcomm opposes the Commission’s proposal because, by “[r]equiring all mobile equipment to support *all air interfaces*,” it contends that the proposal would make it “impossible for anyone to design a device for use in these bands because it is impossible to know in advance all the air interfaces that *another device will use* in these bands.”<sup>33</sup>

As USCC understands the Commission’s proposal, however, the concerns expressed by these commenters are misplaced. Rather than requiring that every mobile device that operates on any mmW spectrum incorporate every air interface used by any other mmW band device, USCC views the Commission’s proposed requirement as simply mandating “spectral interoperability,” and only within a given mmW band, not across every mmW band authorized for mobile broadband services now or in the future. In other words, the Commission’s proposal would simply require that, to the extent a mobile device *itself* utilizes one or more air interfaces in a

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<sup>30</sup> Comments of CTIA, pp. 30-31 (Jan. 28, 2016) (emphasis added).

<sup>31</sup> *Id.* at 30.

<sup>32</sup> T-Mobile Comments at 20 (emphasis added).

<sup>33</sup> Comments of Qualcomm Incorporated, p. 17 (Jan. 27, 2016) (emphasis added); *see also* Verizon Comments at 18 (“No public policy justification exists to require operators and manufacturers using mmW spectrum for one purpose (e.g., driverless cars) to modify their devices so that they can ‘interoperate’ *with devices using very different technologies* for very different use cases (e.g., data-intensive video).”) (emphasis added); Comments of the Consumer Technology Association f/k/a the Consumer Electronics Association, pp. 15-16 (Jan. 27, 2016) (“The Commission should not require the use of any particular technology on any block of spectrum...”).

given mmW band, the device must be capable of operating across the entirety of *that particular* mmW band using the air interface(s) which *that device* already uses to operate within any portion of *that same* mmW band.

Stated yet another way, the requirement would simply prohibit an air interface to be used by a device if it can operate within only a portion of a given mmW band (*e.g.*, 27.5-28.0 GHz) rather than across all of the frequencies included within that particular mmW band. On the other hand, it would *not* require a device that is capable of operating in the 28 GHz band using a given air interface to also be capable of operating in any other mmW band using that same air interface. In fact, the proposed rule would not even require that the device be capable of operating in another mmW band, let alone specify the particular air interface(s) that it would need to be capable of using in other mmW bands. However, if the device is capable of operating within another mmW band using that (or another) air interface, the device also would need to be capable of operating with *that* air interface across *that* entire mmW band.

Although USCC believes the Commission's wording in the body of the NPRM is clear in this regard, the language of the proposed rule, as set forth in Appendix A to the NPRM, removes any doubt with respect to the intended scope of the Commission's proposal. Specifically, as proposed, Section 30.209(a) would read:

Mobile and portable stations that operate on any portion of frequencies within the 27.5-28.35 GHz or the 37-40 GHz bands must be capable of operating on all frequencies within *those particular bands* using the same air interfaces that *the equipment utilizes* on any frequencies in the 27.5-28.35 GHz or the 37-40 GHz bands, *respectively*.<sup>34</sup>

Moreover, in apparent recognition that some commenters could seize upon certain language in order to argue against the adoption of any interoperability requirement whatsoever,

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<sup>34</sup> NPRM, 30 FCC Rcd at 11990 (Appendix A) (emphasis added).

the Commission included clarifying language in subsection (b) of the proposed rule which reads as follows:

The basic interoperability requirement in paragraph (a) of this section *does not require* a licensee to use any particular industry standard.<sup>35</sup>

Given the significant public interest benefits that would result from an interoperable device ecosystem for the mmW bands, the Commission should not let the misplaced concerns expressed by some commenters dissuade it from adopting the limited, sensible interoperability requirement proposed in the NPRM.<sup>36</sup> Although neither the 5G standard nor mobile operations in the mmW bands have been defined at this time, USCC is confident that compliance with this “spectral interoperability” requirement will be readily achievable without any material increase in design complexities or manufacturing costs. In this respect, USCC notes that, in adopting a more expansive interoperability requirement for the 600 MHz band, the Commission concluded that the “benefits of requiring interoperability to promote rapid deployment of the 600 MHz Band, particularly in rural areas, outweigh any potential costs relating to increased device complexity.”<sup>37</sup>

While those commenters that oppose an interoperability requirement generally urge the Commission to instead rely on the industry standards-setting process, the Commission must not presume that full interoperability, and the resulting public interest benefits discussed above, will develop absent an explicit *ex ante* interoperability requirement. For instance, as the Commission noted in adopting an interoperability requirement for the 600 MHz band, the experience of both

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<sup>35</sup> *Id.* (emphasis added).

<sup>36</sup> See Comments of Nokia, pp. 29-30 (Jan. 27, 2016) (opposing a requirement that “an air interface supported in the mmW bands [ ] be supported in a band below 6 GHz and vice versa if the equipment operates in both bands,” but supporting the proposed interoperability requirement as set forth in Appendix A to the NPRM).

<sup>37</sup> *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd 6567, 6868 (2014).

the industry and the Commission with regard to “deployment in the Lower 700 MHz Band highlights the need for clear *ex ante* interoperability rules to promote rapid deployment..., particularly in rural areas.”<sup>38</sup>

An *ex ante* interoperability requirement is necessary for other reasons as well. For instance, absent such a requirement, small and regional carriers would lack any assurances that they could acquire the necessary equipment for mmW band operations, which would make it difficult for these carriers to justify expending the substantial sums needed to purchase UMFUS licenses.<sup>39</sup> Not only would the reduced auction participation by small and regional carriers reduce auction revenue and further increase concentration in the wireless industry, it would decrease the likelihood that the mmW bands will be used to provide 5G services to rural and other underserved areas, where these carriers typically focus their deployment efforts. Thus, absent an interoperability requirement, ultimately it will be consumers in these areas who will suffer. In contrast, the Commission has explained how interoperability “serve[s] the public interest by enabling consumers, especially in rural areas, to enjoy the benefits of greater competition and more choices, and by encouraging efficient use of spectrum, investment, job creation, and the development of innovative mobile broadband services and equipment.”<sup>40</sup>

## V. CONCLUSION

For the foregoing reasons, USCC strongly supports the Commission’s proposal to license the mmW bands on the basis of counties, as well as its proposed interoperability requirement for these bands. USCC also strongly urges the Commission to decline any requests to permit

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<sup>38</sup> *Id.* at 6869 (emphasis added).

<sup>39</sup> See *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, 29 FCC Rcd 4610, 4698-99 (2014) (finding that adopting an interoperability requirement “prior to licensing best serves the public interest” because “potential licensees, particularly smaller ones, will face less uncertainty over the development of a healthy device ecosystem.”).

<sup>40</sup> *Lower 700 MHz Interoperability Order*, 28 FCC Rcd at 15123 (emphasis added).

