

**Remarks of FCC Commissioner Michael O’Rielly
Before The 6th Annual Americas Spectrum Management Conference
October 13, 2017**

Thank you, Carolyn, for that very kind introduction, and for Forum Global for inviting me to participate at today’s event. Most of all, I thank everyone for being here early on a Friday morning to hear me speak about “Spectrum for Next Generation Wireless Services including 5G.” I hope you all are sufficiently caffeinated as I delve into the details of the Federal Communications Commission’s activities to secure spectrum for future wireless technologies. While there are other topics that are germane to the next generation landscape – 600 MHz and the incentive auction, future NGSO systems, and the potential of new broadcast standards to name a few – I will spare you such a long speech and try to limit my keynote to the topics covered by today’s morning sessions. My goal is to help set the stage, in a broader sense, to allow individual panelists to explore the respective discussion topics in greater depth.

Towards that end, before preparing my remarks, I examined the event’s agenda. The accompanying questions provided for the various panels were insightful, focusing on what spectrum is needed for next generation networks, how U.S. plans correlate with those of the international community, how incumbents will be protected, and how we ensure investment. All good questions and ones that challenge the Commission every day.

Some of the questions focused on trying to predict the future, which can be a difficult task. With the risk of sounding too glib, I wish I knew what the future held. If I did, I wouldn’t be standing here as a government employee, but as a retiree living on some private tropical island. As a regulator, I don’t believe that it is my role to prognosticate the future. Instead, I would argue that my job is to make available the basic resources and create an environment for the private sector to invest, allowing industry to develop and deploy the latest and greatest innovations for American consumers. In its simplest form, we put the raw materials out there and let the marketplace work its magic.

This is the appropriate approach to next generation wireless services, especially when there is no universal or commonly accepted definition of 5G. Experts agree that we need spectrum to meet the demands of a broad range of applications and to provide greater capacity, faster speeds and lower latency. Next generation systems will capitalize on both new and existing licensed and unlicensed networks, utilizing low-, mid- and high-band spectrum, including millimeter wave frequencies. Today, I will discuss how the Commission plans to make these raw materials available.

Millimeter Wave Bands

In July 2016, the Commission released its order allocating millimeter wave bands for commercial wireless use. By opening up the 28, 37, 39 and the 64 to 71 GHz bands, the U.S. was the first country to identify potential 5G bands.

But this was just a first step. Petitions for reconsideration were filed and issues were raised in the further notice, including proposals about future sharing mechanisms, that need to be resolved to provide industry with certainty to invest in these bands. I appreciate Chairman Pai’s recent announcement that there will be a follow-up Spectrum Frontiers item by year’s end, which will respond to outstanding issues and finalize rules. Further, I believe the Commission should auction the licensed bands as soon as possible, but at a minimum we need to announce the auction schedule so that interested parties can plan accordingly.

The forthcoming item will also act on additional bands, establishing the spectrum pipeline of the future. I would like the Commission to move on all bands previously identified, but I recognize that some may present fewer issues and can be considered sooner. I am sure today's panelists will discuss sharing and the potential protection mechanisms for specific spectrum. We must keep in mind that, as we continue to identify frequencies, incumbency issues become even more difficult to resolve.

Regardless of the difficulties presented, we should prioritize spectrum in the further notice that is of greatest interest to manufacturers and providers. The U.S. industry appears to be focusing on the 24 GHz and 42 GHz bands as these have the greatest likelihood of reaching the marketplace quickly. Considering these bands also makes sense due to their proximity to the 28 GHz and the 37 and 39 GHz bands the FCC has already allocated and where several wireless providers are conducting trials.

There are also international benefits to studying these frequencies. In the past, I have spoken of the unfortunate events that happened at the World Radiocommunication Conference 2015 where countries blocked studies of 28 GHz. Some countries are reconsidering their previous views, which have precluded the global harmonization of this band for mobile use. Thankfully, devices can be manufactured to operate over tuning ranges, allowing them to operate on 28 GHz in the U.S., but also on 24 GHz, 26 GHz or other nearby bands while in other countries. Presto, de facto global harmonization.

While tuning ranges can be used to overcome international challenges, it is still preferable to globally harmonize a band to facilitate use of devices abroad and allow industry to realize the economies of scale that come from the global market. Additionally, it is important that the U.S. has an active voice in the standards process for all bands to maintain its global leadership in the wireless sector. And, the 24 and 42 GHz bands are frequencies other nations are specifically studying for 5G networks. For instance, both the European Union and China are looking at ranges from 24 to 27 GHz for their networks and China is also considering 42 GHz.

Mid-Band Spectrum

While we have made good strides in the millimeter waves, more work needs to be done to provide mid-band spectrum for next generation technologies. It became readily apparent, at last year's Mobile World Congress and subsequent events, that the overall focus switched to the mid bands. Admittedly, the lines are a bit blurred regarding where the mid bands start and end these days, but for today's purpose I will focus my comments on the bands that the panelists will discuss, with a few others thrown in. Internationally speaking, different countries are looking at different bands, but Europe and Asia, along with our regional partners, are generally looking at a range between 3.4 to 4.2 GHz. In the United States, we should focus on making as much of this spectrum available for wireless use as possible.

3.7 to 4.2 GHz Band

The Commission's recent Notice of Inquiry (NOI) seeking comment on any bands of interest between 3.7 and 24 GHz sure has stirred up quite a bit of activity. While we undertook a broad inquiry, the focus is clearly on the 3.7 to 4.2 band for licensed use. The comments filed last week include extensive discussions about the possibilities for wireless services in this band.

Almost everyone seems to agree that the lower portion of the C-band provides great opportunities and is very important, because the U.S. is at a disadvantage to other countries when it comes to licensed spectrum below 5 GHz. Some commenters suggest that the U.S. must act with haste, as standards are already being worked on and other countries are charging ahead. In fact, Deutsche Telekom and Huawei just announced the completion of a 5G trial using 3.7 GHz spectrum.

The majority of commenters agree that it is possible to share this spectrum with incumbents or even repack or clear the band for flexible use, including mobile services. Many note that the Commission has relocated incumbents before, using relocation funds, such as with AWS, or through an incentive auction type process. Qualcomm also suggests that sharing can occur while the band is being cleared in preparation for auction in order to expedite access to the band. Intel and Intelsat submit that a faster way to introduce wireless would be a market based approach where Intelsat, one of the largest satellite providers in the band, and other incumbents would repack or clear spectrum and then enter into commercial arrangements with mobile providers for the right to use the spectrum.

These are just some of the interesting ideas raised in the record and, in my opinion, it is too early to determine which are the most viable. The details still must be worked out as to how these various proposals would work and whether sharing is feasible. While the meat still has to be put on the bones, this is a good start and I am happy to see the various stakeholders working together. However, I am not able to support an idea proposed by some commenters that would favor fixed operations, which is counter to the flexible use policies that I have advocated for.

I also suggest that the Commission should start by ensuring that updated and complete information about incumbent operations is in the FCC databases. At a minimum, the Commission needs a better understanding of the current number of C-band earth stations in existence. This is the only means for the Commission to truly evaluate current use and protection mechanisms, to the extent they are needed.

3.5 GHz

Directly below this band is the 3.5 GHz band, which ranges from 3550 to 3700 MHz. As you most likely know, the Commission has posted the draft of the 3.5 GHz Notice of Proposed Rulemaking (NPRM) for consideration at this month's meeting.

In response to petitions seeking review of these rules, many stakeholders argued convincingly that, for large scale 5G deployments, companies require greater certainty to ensure that investment would not be stranded. To provide such an environment, many commenters appropriately requested longer license terms, larger geographic areas, and renewability. I will keep my discussion short since this item is currently before the Commission, but many of these views are reflected in the draft NPRM.

Some critics have stated that the proposed changes are mere stale ideas from policies past. Gibberish. Those "stale" ideas are what have produced the highly successful and envy-of-the-world spectrum auctions, provided state of the art wireless networks, and made the U.S. the leader in wireless technologies. In fact, the NPRM fixes the three tier structure to protect incumbents, maintain GAA services, and actually ensure that the maximum number of licenses are available per market for *all* providers – small, medium and large. What it doesn't do is retain artificial restrictions – both implicit and explicit – through license and auction structure. You may remember how great the "special"

auction provisions, like set asides, worked in the incentive auction. Let me refresh your memory: they didn't.

The other argument made is that these licenses were secretly promised to rural providers because of a sentiment that big providers warehouse spectrum in smaller markets. That is false on both accounts. But, to the extent that we need to fix wireless licenses to ensure broadband buildout in rural markets, the solution is stricter construction obligations going forward and facilitating the partition of licenses.

3.4 GHz Band

I also believe the U.S. should examine opening up the 3100 to 3550 MHz band, and specifically the 3.4 GHz range. I recognize that there are military incumbents in this spectrum. But, we should start studying these frequencies now to figure out what steps can be taken to determine whether some or all could be cleared for licensed use. If this spectrum cannot be cleared, then we can also look at sharing mechanisms.

Unlicensed Spectrum

While I have focused most of my discussion of licensed spectrum, I would like to take a few minutes to discuss unlicensed uses. Although the millimeter wave proceeding has opened considerable opportunities for unlicensed use, there are also opportunities in the mid bands to extend and expand the use of 5 GHz, which is the workhorse of unlicensed.

6 GHz

The Mid-Band NOI contemplates opening the 6 GHz band for wireless use. Many are looking at this band – in whole or in part – for unlicensed use. Further, the IEEE has already started the process of expanding next-generation unlicensed standards to this band. Combining this spectrum with, and adopting similar technical rules as the 5 GHz band, will allow for wider bandwidths and faster gigabit speeds.

Most believe that wireless use can be introduced in this band while protecting current operations, along with future incumbent uses. There is a recognition by proponents that this large swath of spectrum, 5925 to 7125 MHz, is not homogenous and different sub-bands may need different sharing mechanisms. Commenters seem confident that the Part 15 rules, along with additional co-existence mechanisms, should allow for sharing, but similar to the bands above, it is necessary to determine exactly what is needed to protect incumbent uses. Hopefully, further analysis will ease the minds of those entities that have expressed concerns about the ability to protect existing operations.

5.9 GHz

Finally, it is time to bring the 5.9 GHz proceeding to an end. The Commission has run its tests on nine prototypes and is currently analyzing the results. It is my understanding that the devices perform as claimed in our lab tests, but stay tuned for further reports and next steps from the Commission.

More importantly, the time has come to determine whether we still need DSRC altogether. Clearly, DSRC spectrum should only be used to provide safety functionalities. In other words, it should not be used for any services that can be offered using other technologies available today. Moreover, there are

real questions about the cost efficiencies for DSRC systems that must be examined in light of the government resources that will be needed to deploy and maintain these technologies.

If DSRC no longer makes sense, the Commission could combine the 5.9 and 6 GHz bands to expand current unlicensed operations and promote continued growth, especially since efforts to open additional frequencies in the 5 GHz band, known as UNII-2B, were unsuccessful.

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I thank you for listening to me and I leave it to the expert panelists to take it from here. Thank you.