

European 5G Conference
Tuesday, February 13, 2018
Tom Sullivan Session 8 Introductory Presentation

Thank you Samer for the kind introduction, and thank you to Forum Europe for inviting the FCC to participate in the conference. We have thoroughly enjoyed the dialogue over the past two days and are encouraged by what we are seeing and hearing on this side of the Atlantic!

As we have heard from the panels at the conference, the 5G future is a truly exciting one. As regulators, we all want to see 5G deployed as quickly and ubiquitously as possible. We all want to see consumers benefit from the advanced services and technologies that a 5G network can enable—everything from autonomous cars to smart city applications. And as we have reinforced throughout the past two days, one of the key enablers for all these technological advances and applications is the topic of our panel this afternoon – spectrum – especially, millimeter wave spectrum.

The discussion about 26 GHz and 28 GHz – the leading candidates in the millimeter wave band for 5G connectivity in many countries -- does offer important insights and lessons to be learned for those of us focused on WRC-19. **[slide]**

While the 28 GHz is not among the candidate bands currently being studied at the ITU under Agenda Item 1.13, we are excited about the progress being made in this band, including the commercial deployments planned in the U.S., its incorporation into the recent 3GPP standard, which includes 26.5 – 29.5, and how the FCC has addressed the sharing environment between mobile and satellite in this band. During the NFL Super Bowl two weeks ago, one of our carriers completed the first live international video call to South Korea using a pre-commercial 5G network. This trial was done using 28 GHz frequencies in the U.S. and South Korea. And as our

colleague from NTT DoCoMo noted yesterday, Japan is poised to introduce 5G services commercially in advance of the upcoming Summer Olympics.

Domestically, the FCC has been exploring the use of millimeter wave spectrum since 2014, acting on the advice from the FCC's Technology Advisory Council that was examining the prospects for operating mobile radio services in frequency bands above 24 GHz. By the summer of 2016, the FCC set the world's first spectrum policy for "5G" – more accurately, next generation mobile broadband - by creating flexible use service rules, including sharing policies, for four spectrum bands above 24 GHz. These bands included the 28 GHz, 37 GHz, 39 GHz, and 64-71 GHz bands. **[SLIDE]**

And just last fall, the FCC made available an additional 1.7 gigahertz of spectrum for mobile use in the 24 GHz and 47 GHz bands, **[slide]**

while providing satellite services with spectrum they needed for their next generation networks.

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In total, the FCC has now opened nearly 13 GHz of millimeter wave spectrum for flexible wireless broadband. That is a lot of Gigahertz.

And while that is impressive, the FCC is not done there. We are continuing to evaluate the practicality of using additional millimeter bands. As my colleague Matthew Berry noted, we have also launched a proceeding looking at spectrum in the 3 to 24 GHz band, and as announced last week, we are now looking above the 95 GHz band for spectrum to support wireless broadband technologies.

As we've made available bands for 5G and other advanced services, we have been conscious to step back and allow the private sector to drive the standards-setting process and development of applications and use cases. We are already seeing this approach pay dividends as multiple U.S. operators are conducting 5G trials in communities across the United States, each hoping to soon follow with introduction of commercial service.

I think it is important to note that – as we have heard this week – 5G use cases will vary greatly – and so will their associated spectrum requirements. At the FCC – like in Europe - we have taken a comprehensive approach for spectrum enabling 5G – with recent regulatory actions enabling next generation mobile broadband deployments in low, mid and high-band spectrum.

We are also focused domestically on modernizing our rules and removing burdensome regulations that deter innovation and investment – another critical step in creating an environment that encourages the rapid deployment of 5G infrastructure.

Our domestic decisions did not come with a singular focus on enabling mobile technologies. These millimeter wave bands have traditionally been used by a number of other incumbent services, including terrestrial fixed, satellite and federal operations including many of the space science services. A critical element of our regulatory approach was to create a path for continued and expanded satellite operations so that industry can advance their next generation networks to connect our citizens. So, we do not see this as a zero-sum game, where someone must lose if another is to gain.

To the contrary, our goal is to do all we can to avoid picking winners and losers and to accommodate as many services and use cases as possible.

To that end, we have adopted flexible sharing schemes that promote coexistence among services. For example, in the 28 GHz band, the FCC adopted specific mechanisms to provide flexibility to satellite operators and predictability to terrestrial operators. And in fact, in our Spectrum Frontiers Second Report and Order, we permitted an even more flexible earth station siting process in the 28 GHz band. So it no longer has to be either Satellite or Mobile. It can be satellite **and** mobile.

I want to emphasize this key point about spectrum sharing, flexibility and co-existence. Given the pressures on limited spectrum resources by a range of new technologies – including terrestrial mobile – all of us here must look at spectrum management in a different way. Just as technological advancements are allowing expanded uses for millimeter wave spectrum, technological advancements are also allowing for more innovative approaches to managing and licensing spectrum – to allow for shared use by incumbents and new users.

Domestically, the FCC has followed these principles and as a result, we have been able to allocate a great deal of spectrum for new uses for our consumers while ensuring that existing users are able to continue and even expand their operations.

This is equally important as we think about international spectrum management and the upcoming WRC-19 – and the opportunities that the World Radio Conference gives us in terms of enabling a range of technological solutions and uses for spectrum. Just as we've shied away from choosing winners and losers in our domestic proceedings, the FCC carries that same philosophy forward internationally. We believe our domestic experience in the United States demonstrates that we can and should be open to the possibility of a more flexible approach at WRC-19.

We can be successful at WRC if we evolve our understanding of what it means to have harmonized spectrum and recognize that identifying bands for global use does not have to be the zero-sum game it once was. **[slide]**

Global harmonization is no longer limited to the situation where all regions must have identical spectrum allocations; instead, harmonization can now be facilitated through technological innovations such as using radio tuning ranges that allow many services and use cases. Tuning ranges allow manufacturers to develop equipment that can operate across multiple bands within a contiguous range while allowing regulators flexibility to manage spectrum resources for domestic requirements. Importantly, tuning ranges can allow for regional, and even national, differences, while still achieving the benefits of economies of scale and global roaming and securing the interference protection granted by the Radio Regulations. This is the type of harmonization we intend to support regionally and, ultimately, globally at the WRC in Egypt in 2019.

WRC-15 may have resulted in everyone being equally unhappy; we are here to offer collaboration and find a way for WRC-19 to result in everyone being equally happy.

I'm very appreciative of opportunities like this one where we can start the dialog early between multiple industries, different regional policy viewpoints, and help build a foundation of understanding before WRC-19. These opportunities will hopefully save us a little time, a little patience and most definitely provide us some additional creativity towards a productive WRC.

Thank you and I look forward to more discussion with my fellow panelists.