Keynote Speech of Michael O'Rielly, FCC Commissioner
"Broadband for All" Seminar
Stockholm, Sweden
June 27, 2016

Thank you for that very kind introduction. I am pleased to join this distinguished group of international communications and technology ministers, regulators and guests.

This being my first trip to Stockholm, Sweden, or Scandinavia, I must admit that the sun rising around 3:30 am takes some getting used to, so please bear with me. This seasonal benefit reminds me of the words by Sir Arthur Conan Doyle, "How small we feel with our petty ambitions and strivings in the presence of the great elemental forces of Nature!"

I would like to start by thanking Ericsson for inviting me to keynote its seminar and PTS for its coordination and organization. At the risk of being impolite to our host and your good sensibilities, I do feel it necessary to comment on the recent public revelations regarding the investigation by the U.S. Justice Department into possible violations of the Foreign Corrupt Practices Act. Many in this audience know well that the U.S. Federal Communications Commission (the FCC or Commission) is a regulatory body independent of our Executive Branch. As such, I have no insight or involvement into any Justice Department investigation. Further, the timing of the alleged incidents seems to have occurred prior to my arrival at the FCC. I do not mean to suggest that I am insensitive to the possible violations of U.S. law. Instead, I suggest to you that nothing has raised concerns with regard to my attendance here today, therefore allowing me to join you. In the end, we will all just have to allow the legal proceedings to take their due course.

Also, I should acknowledge that I generally accept the premise and practice that U.S. policy differences end at our shoreline. In other words, we at the FCC try to not expose our differing views internationally. In this case, however, sharing my perspectives is not meant as a means of division but an opportunity to consider

1http://www.goodreads.com/work/quotes/6658462

http://www.goodreads.com/work/quotes/6658462

and discuss alternative approaches in a measured setting without disrupting common comity or decency.

So now, let me get to the business at hand, which will hopefully be of interest. I am pleased to leave some time at the end to take any questions you may have and to discuss other perspectives from the U.S. that I may not have addressed. I find the longer I talk the less people are interested in my comments.

I. The Growing Demand for Wireless Broadband and Next Generation Technology

This timely seminar focuses on an issue facing all of our countries – how to keep pace with the growing demand for wireless services. Mobile broadband use continues to accelerate, and all indicators suggest that we are just at the tip of the iceberg. Consumers expect to use their smartphones and tablets to access the Internet, conduct business, maintain relationships with friends and family, download movies and play games wherever and whenever. From wearables and connected cars and appliances to water and energy metering, agriculture and livestock monitoring, and security systems, the Internet of Things also continues to develop and come to fruition. The sheer number of devices and data-intensive uses can push the capabilities of our existing networks to a higher degree.

In addition to continuing to deploy and expand 4G networks to meet overall demand, the entire wireless ecosystem is going to need to adopt and welcome next generation, or 5G, networks. We have all heard the promise of 5G's high speeds and capacity and low latency. In fact, I have even labeled 5G as finally delivering that broadband utopia: wireless fiber. But, in truth, different applications will have different requirements – not all uses require the same bandwidth, latency or speeds. While recognizing that there is no consensus definition of 5G, most agree that it will integrate current and future infrastructure, along with low-, mid- and high-band spectrum to achieve the connectivity we seek. In the end, physics, engineering and consumer demand will determine the fate of 5G, but only if governments enable, as opposed to get in the way of, innovation and investment.

2http://www.goodreads.com/work/quotes/6658462

http://www.goodreads.com/work/quotes/6658462

II. Spectrum

The primary means for governments to make 5G a reality is to provide the spectrum resources needed for this technology. Like other nations, the United States has been vigorously pushing ahead to ensure that industry has the necessary bandwidth. As you all know, finding additional spectrum for future innovative purposes is not an easy task – fallow spectrum is not easily identified. At the FCC, we continuously face the question of how to most efficiently use the nation's airwaves and how we can put our spectrum to its highest and best use.

My philosophy on this complex problem may seem simplistic and potentially problematic but, upon closer inspection, it may provide the greatest opportunity for success. I humbly suggest that we put as many bands as possible on the table to determine whether individually or collectively they can be used for dynamic, new wireless offerings. For each band, we must look at the incumbent uses and study whether sharing is possible without causing harmful interference to current offerings. There is the risk that such an approach leads to unnecessary work. In the short term, that may be accurate but this won't be the last pass at this project.

At the same time, we need to make a baseline determination as to whether a particular spectrum band should be licensed or unlicensed. While I firmly believe that, if spectrum can be cleared, it should be auctioned for exclusive use licenses, this in no way undermines the importance of unlicensed. Good spectrum policy requires both spectrum types. And both licensed and unlicensed are represented in our current spectrum initiatives. Ultimately, I fully recognize that, after a close look, some bands may be found incompatible for some or all wireless use and even discarded from consideration. But, this isn't a failure. It is simply part of the process of ensuring effective spectrum policy and identifying the bands that may be used for wireless.

A. Millimeter Wave

3http://www.goodreads.com/work/quotes/6658462

http://www.goodreads.com/work/quotes/6658462

This process is currently underway as the Commission considers opening up millimeter wave frequencies – those above 24 GHz – for commercial wireless use. If all goes according to plan, the Commission will adopt rules allowing wireless use in the 28, 37 and 39 GHz bands on a licensed basis and 64 to 71 GHz band for unlicensed within the next few weeks.

The Commission initially targeted these bands for future wireless technologies back in October 2015, because 5G testing was already underway in some bands and because they were seen as having comparatively fewer complications than other potential bands. Since the notice, the Commission has engaged with the incumbents – primarily other U.S. government agencies and satellite providers – on how to protect current services and provide flexibility for these operators to expand use in the future. While each and every detail may not be flushed out and further comment may be necessary on some issues, it appears that we are headed in the right direction and that these bands will soon be available for wireless use.

Although this is good news, it is unfortunate that many other countries did not join with the United States in supporting studies on many of these spectrum bands at the World Radio Conference (WRC-15). While some may prefer a globally- or regionally-approved standard before allocating spectrum and others may want to protect incumbent operators or even delay next generation services until 4G investment is recouped, under no circumstances should studies to determine whether there is even an ability to use spectrum more efficiently be blocked.

In fact, such actions undermine the WRC process and diminish the importance of the International Telecommunication Union (ITU). Instead of the ITU taking the lead and promoting international harmonization of spectrum use, its role will be supplanted by other standards bodies, because a number of nations, including the U.S., are not able to wait. It's not a lack of patience, but an unwillingness to halt necessary progress. Make no mistake about it, the U.S. is fully committed to remaining a leader in wireless innovation and ushering in the next generation of

4http://www.goodreads.com/work/quotes/6658462

http://www.goodreads.com/work/quotes/6658462

services. We are ready to test and deploy in these bands and others as quickly as possible.

Although we started with these four spectrum blocks, more work needs to be done to find high-band spectrum. Experts predict that the four targeted bands will be insufficient to address future wireless industry needs, and we need to start the process of identifying more frequencies now. As part of our 5G efforts, later this month, we will start looking at additional frequencies to open up for wireless use. It is expected that these bands will include those considered by the Commission earlier in the proceeding and identified for study at WRC-15, as well as a couple of surprises. Admittedly, wireless use in these bands may present challenges and complications, and we may, to some extent, spend time studying spectrum bands that we may ultimately decide not to pursue, but that is a risk worth taking.

B. 600 MHz Broadcast Incentive Auction

We are also following up our successful AWS-3 auction that reclaimed spectrum from government users by repurposing broadcast spectrum for wireless use. In particular, the United States is currently in the midst of the broadcast incentive auction – a first of its kind opportunity where broadcasters can relinquish their licenses in return for payments from an auction of the 600 MHz spectrum to the wireless industry.

I know many people are watching the incentive auction with interest. I wish I could give you more of an update, but we are still in the early stages of what could be a long process. There was sufficient broadcaster interest in the auction to set a clearing target of 126 megahertz. This generally equates to 100 megahertz – or ten five-by-five megahertz licenses – being auctioned for wireless use. But, in some markets due to the need to protect stations in Mexico or Canada or because of the sheer number of broadcasters, fewer licenses will be offered.

5http://www.goodreads.com/work/quotes/6658462

http://www.goodreads.com/work/quotes/6658462

The main question now is whether the wireless -- or forward -- auction can raise enough money to cover the cost of buying out that many broadcasters. At this point, we do not know how expensive it will be to acquire the broadcast spectrum. Today, rounds 46, 47 and 48 will take place, and this first stage of the broadcast -- or reverse -- auction is likely to conclude sometime this week. When the reverse auction is completed, the Commission will announce the amount that broadcasters seek to relinquish their stations.

If the revenues of the forthcoming forward auction do not exceed the reverse auction cost, the Commission will decrease the amount of spectrum it seeks to clear to 114 megahertz and the next "stage" of the auction commences. If once again, the forward auction proceeds do not exceed the reverse auction costs, the spectrum clearing target will reduce to 108 MHz, and so on. Many seem to believe that the sweet spot is around 84 megahertz, but we will have to wait and see. What we do know is that the incentive auction is the ultimate use of our auction program to ensure that spectrum – whether it will be for broadcast or wireless services – goes to its highest value use.

III. Investment

While the U.S. government is making spectrum resources available, it also must ensure an environment that encourages growth. The 4G LTE and Wi-Fi networks in the United States are what they are today because of a philosophy centered on a light regulatory touch and structure, which has created a setting that allowed for investment, innovation and deployment. From our auction program and licensing structure to our general hands-off approach, industry has always had certainty about the availability of spectrum, that their investments would not be stranded, and that they could innovate and manage their systems to compete in a highly competitive marketplace.

As noted, the U.S. wireless industry is headed into a period of extraordinary expansion of network capability and reach. In fact, the anticipated use of high-band spectrum will necessitate vast new investment in physical infrastructure, perhaps more than ever before. However, at a time when investment will be

http://www.goodreads.com/work/quotes/6658462

crucial to the success of 5G, questionable policies are being considered that would abandon or neglect the fundamental ideals that made our wireless industry second to none.

A. Auctions

U.S. spectrum auction rules were adopted at a time when large swaths of unused bandwidth were available. Subsequently, these bands were auctioned in sizeable geographic areas and demand for nationwide footprints was at a premium. Frankly, it would have never entered someone's mind that only one applicant would be interested in a particular mobile voice and broadband license. Until now, the requirement that mutual exclusive applications have to be filed for a particular license in order to trigger an auction – or else the license would be allocated for free – wasn't given a second thought.

But, as we move to higher frequencies with multiple users and reduced propagation, there is a need to reconsider what mutual exclusivity looks like in a sharing world. This is a situation the FCC recently faced when allocating the 3.5 GHz band for wireless use, and it may be helpful as you consider the subject in the future. Labeled as an experiment, incumbents, in this case federal government users and fixed satellite, will have the most protection, followed by licensees who can acquire a priority access license (or PAL) for up to 70 megahertz of this 150 megahertz band, while the remaining spectrum is available for general unlicensed use.

The Commission also decided to license this spectrum by census tracts, of which there are more than 74,000 across the U.S. Unlike in past auctions, it is unlikely that entities will be looking for nationwide footprints or even be willing or have the capability to bid on 74,000 licenses. This, along with the presence of incumbents, provides no assurance that there will always be multiple applicants, especially outside large urban markets. However, there are still good reasons to allocate these licenses through auction.

7http://www.goodreads.com/work/quotes/6658462

http://www.goodreads.com/work/quotes/6658462

Many wireless providers and entrepreneurs expressed interest in this spectrum, but I continuously heard that a license is necessary to obtain investment and to make a business case for the capital-intensive research and development and deployment of the band. Regardless, the Commission decided that more than one applicant had to apply for a PAL for an auction to occur and for licenses to even exist in most census tracts.

Mutual exclusivity is arguably met, in my opinion, because a license with priority access is mutually exclusive to unlicensed use. In fact, the Commission held a similar view in the context of the incentive auction. Stating that broadcast and wireless use are mutually exclusive, only one application for a 600 MHz license is needed to meet our mutual exclusivity rules. There is no reason why the Commission couldn't have extended this idea to find that mutual exclusivity is achieved in cases where licensed use prevents unlicensed access to the same frequencies.

It is unfortunate that the Commission declined to do so, but we must look forward. This situation is likely to happen again. And while I fully support that a license or priority access should not be given for free, we must find a way to license this spectrum. I am sure some are thinking that an auction with only one participant will result in a license being acquired for free, but our auction process has evolved to contain opening and reserve prices to ensure that fair market value is achieved. If the Commission continues to stray from auction mechanisms that have successfully allocated spectrum in the past, Congressional intervention may be appropriate, either to clarify the mutual exclusivity rule or to consider other processes, such as spectrum fees.

B. Licensing

The problems created by the suspect licensing structure in 3.5 GHz only starts with the auction mechanism. Hallmarks of our successful licensing system have been long-term licenses with renewability. Typically, our auctioned licenses have ten or more year terms and are renewable upon meeting certain requirements at the end of the license term. However, in the 3.5 GHz auction, we once again

http://www.goodreads.com/work/quotes/6658462

abandoned what has worked in the past. Instead, we adopted three-year, non-renewable licenses that do not incentivize investment.

To make matters even worse, if you actually manage to achieve mutual exclusivity in the first auction and acquire a license, there is no guarantee that more than one entity would participate in a subsequent auction. If only one entity shows up for the re-auction, the PAL is lost and the investment would be stranded. Not surprisingly, many have expressed doubt as to whether there is a business case for investing or developing this band. This unproven paradigm should not be extended to other bands, especially 5G.

C. Backhaul & Special Access

Substantial investment is also needed for the backhaul required for the expanded 5G wireless infrastructure. While I have heard that wireless backhaul may be used, in part, so that every small cell does not have to have a fiber connection, at some point, the communications need to reach a wireline network. While promoting wireline expansion is tough, the Commission has taken steps that are counterintuitive and likely to slow wireline backhaul expansion.

The Commission's recent proceeding to regulate special access will force providers to rethink deployment plans. Why would any provider continue to buildout wireline networks and provide backhaul knowing that the Commission intends to regulate their rates? I worry that such an approach will indirectly hamper 5G buildout in certain markets, because wireline providers may simply decide not to build the needed backhaul to connect the vast 5G infrastructure. The answer to a lack of competition in the special access market, to the extent that it exists, is not to add additional layers of costly regulation and price constraints but to provide incentives for new competitors to enter. Making local entry as frictionless as possible will induce companies to compete for business and build facilities to meet demand.

***

9http://www.goodreads.com/work/quotes/6658462

http://www.goodreads.com/work/quotes/6658462

In conclusion, hopefully, I was able to share the US perspective on a number of pertinent spectrum issues. There is much commonality in our roles and the issues before us.

To the extent I may be of any assistance to you in the future, please do not hesitate to contact me.

10http://www.goodreads.com/work/quotes/6658462

http://www.goodreads.com/work/quotes/6658462