REMARKS OF
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Good morning. It is an honor to be with you here in Barcelona for Mobile World Congress and a treat to kick off this discussion of Policymaking for the Dynamic Digital Age.

I believe the future belongs to the connected. No matter who you are or where you live on this planet, to have a fair shot at success in the 21st century requires connectivity. And I think wireless technologies will play a wondrous role in making that happen.

To seize the potential of next generation wireless, this morning, I want to focus on three things that require our attention: new bands, new models and new business cases.

First, to power 5G networks we need new spectrum bands.

Our airwaves may be invisible, but they are some of the most important infrastructure we have. To build a bold future for this infrastructure we need to do more than rely on the narrow range of spectrum we have used in the past. The historic sweet spot for wireless service was between 600 MHz and 3 GHz. But now it's time to get up, get going, and explore new spectrum frontiers.

In the United States, we are doing just that. In fact, we have open dockets proposing new possibilities in the 3.5 GHz, 3.7-4.2 GHz, 6 GHz, 24 GHz, 28 GHz, 32 GHz, 37 GHz, 39 GHz, 42 GHz, 47 GHz, 50 GHz, 70 GHz, 80 GHz, and above 95 GHz bands, among others. The point is the list is long—and we are looking at mid-band and millimeter wave to power the 5G future. The propagation challenges are real, but so is the potential for capacity with network densification. Of course, what we need to do next is get these airwaves to market and unconditionally hold an auction this year. In fact, it's something I am pressing my colleagues at the Federal Communications Commission to do.

Second, to power 5G networks we need new models for spectrum access.

To talk about the power of new models for spectrum access, let's imagine for a moment that we leave the confines of this ministerial gathering. Imagine we get out of the Fira, get into a car and head out on the road.

The C-58 is a Spanish motorway. It begins in Barcelona and ends in Terrassa, crossing cities like Cedanyola del Vallés and Sabadell. It is only 25 kilometers long. But it is one of the busiest highways in all of Spain. Spain, however, did something about it. To address crowding on the road, a special bus lane was added at the entrance point to Barcelona. Then reversible lanes for high-occupancy vehicles were placed down the middle. The side lanes were broadened. The C-58 created a new model for Spanish traffic management—and it worked!

I think our spectrum models can take a cue from the C-58. With 5G service we will see unprecedented demand for our airwaves. To manage what is coming we need to look at new models for spectrum management. We need innovative ways to make more room on the road.

Three years ago, the FCC got this effort started with its work in the 3.5 GHz band. We took 150 megahertz of spectrum and opened it up to a mix of uses. We crafted rules that gave government, satellite, licensed, and unlicensed users a right to be on the same road. Then we proposed a spectrum access system to manage all these different types of traffic. This proposal was a milestone in spectrum sharing and management.

This sharing in the 3.5 GHz band works because of our spectrum access systems. They maintain centralized lists of all of the devices that want to use the 3.5 GHz band, including their type, geographic location, sensing capabilities, and contact information. Then they use and share this data to assign frequencies, manage power levels, prevent interference, and even facilitate short leases. This effort is modern. But it's time to take this model further into the future. We can do that by leveraging new technologies that are smarter and more decentralized.

Take blockchain. So much of the excitement for this ledger technology has focused on the financial services industry. And it's easy for the benefits of this technology to be obscured by the frenzy of initial coin offerings and the volatility of cryptocurrencies like bitcoin itself. But it's important to see through this haze—because the opportunities are real.

Blockchains are distributed databases that can be securely updated without the need for central intermediaries. That makes them ideal for a whole host of uses—including everything from food safety to digital identity to medical records. It's time for us to add to that list dynamic spectrum access. Instead of having a centralized database to support shared access in specific spectrum bands, we could explore the use of this technology as a lower cost alternative. This could increase efficiency, create new opportunities for lightweight leasing, and inspire new technical innovations by exposing patterns in use.

But blockchain is not the only new technology model we can pursue. We have increases in computing power and data storage that are leading to incredible advances in artificial intelligence. Now we need to take this new-found cognitive ability and teach wireless devices to manage their transmissions on their own.

It might sound far out there but in the United States, the Defense Advanced Research Projects Agency is hosting a competition, inviting innovators from around the world to come together and design new wireless networks that use artificial intelligence. Smarter networks can work with each other without a central authority in order to determine the best use of spectrum in any environment. This has the potential to radically increase spectrum efficiency and decrease interference challenges. Stay tuned. Because revolutionary new models are coming down the road.

Third, to power 5G networks we need new business cases.

Last year, GSMA polled 750 telecommunications leaders and asked what they believe is the biggest impediment to delivering 5G. More than half cited the lack of a clear business case.

That's a problem. Selling the benefits of 5G will not be easy if all we can do is talk about spectrum and dynamic access systems. I mean that stuff interests me and probably you, too. But we need to think bigger. Because we have problems to solve, resources that are constrained, and communities worldwide that need help navigating what is possible in the digital age. Let's focus on that.

So instead of talking about the diffuse possibilities of 5G, let's focus on building new business models that use both data and connectivity to solve very specific problems. Here's one: traffic. What if we were to have cities compete to reduce commute times? We could go beyond C-58 and add sensors to streetlights, roadside architecture, and cars to see where traffic patterns can be more efficient and public transportation can be more effective.

Here's another: diabetes. The inability to produce insulin is responsible for more than 1.5 million deaths a year. But the disease can be managed—and connectivity is key. Wearable wristbands can alert users when glucose levels drop while also monitoring activity, sleep, and heart rate.

And here's yet other: air pollution. Seven million people die every year from health risks associated with air pollution. And the cost of addressing this problem is growing. In the United States, for instance, asthma treatments are now rising $14 billion a year. We can challenge our communities to address this problem with monitors to measure air quality that detect microscopic pollutants in real time and help recognize the patterns that shape solutions.

In short, wireless technologies can help solve these problems. But we need to focus now on the new business cases that can make it happen.

I think that's what the future looks like. To get there, we will need to combine new spectrum bands, new wireless models, and new business cases. When we do—a whole new world of wireless awaits. I, for one, can't wait.