**REMARKS OF
COMMISSIONER JESSICA ROSENWORCEL
FEDERAL COMMUNICATIONS COMMISSION
SXSW INTERACTIVE
AUSTIN, TEXAS
MARCH 16, 2015**

Let's Supersize Wi-Fi and Change the Future

Good afternoon. It's a treat to be here in Austin and exciting to be a part of South by Southwest Interactive. Texas this time of year is a hot bed of ideas, culture, and innovation. It's a place full of folks who are proud to let their geek flag fly.

Now at the start, I think I need a disclaimer. As a Commissioner at the Federal Communications Commission, I am going to defy expectations today. I am not going to talk about network neutrality. I support network neutrality. But no matter where you stand, I think we can all agree that this issue does not lack attention. So I want to upend expectations and talk about something else. I want to talk about something that warrants more attention and deserves more support.

I want to talk about Wi-Fi.

Right here at SXSW Interactive there are more than 800 sessions on everything from robots to wearables to self-driving cars to the convergence of music and technology. That covers a lot of ground. But if you've had the chance to look around, you've probably noticed that so many of the technologies we are seeing and talking about rely on something special in the air. That something special is Wi-Fi. Wi-Fi keeps us connected. It keeps us innovating. And it helps keep things weird here in Austin.

So I think it is time to supersize Wi-Fi—because we need more.

We need more Wi-Fi because it is an essential on-ramp for Internet connectivity.

We need more Wi-Fi because unlicensed spectrum is our best bet for wireless innovation.

We need more Wi-Fi because in a world of constant connections it is responsible for billions of dollars of economic activity—and growth.

But I'm getting ahead of myself. So I'm going to take a step back and tell you three stories—stories about education in the California desert, city services in Portugal, and New York City subway musicians. What do these things possibly have to do with one another? Well, stick with me—and you'll see.

First up, Coachella, California. Most people at SXSW probably know Coachella for that *other* music and arts festival that takes place in April every year. But if you are not familiar with it, Coachella lies in California's vast Inland Empire, about 65 miles north of the Mexican border.

That other festival may grab a lot of attention, but in Coachella agriculture is at the heart of the economy.

The local school district in Coachella spans more than 1200 miles of rugged mountains and sandy valleys. Nearly nine out of ten students qualify for free or reduced price lunches and more than half are not fluent in English. Many of these students are the children of migrant farm workers who help harvest citrus fruit, vegetables, and grains.

Last year, school district leaders decided teaching tools in this agricultural setting should better reflect the opportunities of the digital age. So they set up a program to make sure every child—every child—had a tablet computer to use in the classroom and at home. They wanted to take their students and introduce them to a world beyond the low-income farming community in their backyard.

This sounds promising, right? But in Coachella, many homes lack the high-speed Internet access necessary for students to complete basic homework assignments. As a result, Superintendent Darryl Adams says he found students camped out in the hallway by his office as late as 6 PM. They sat there, with devices in hand, taping and writing in the only place where they knew they could get a reliable signal—and the connectivity they needed just to do their homework.

So the school district had good intentions, but they were coming up against some hard realities. They had a choice. They could roll back their efforts with digital age tools—or they could do something creative. So they did something creative. They installed Wi-Fi routers on district school buses.

In this rural community, many students ride buses more than an hour just to get to school. Then most of them take the same ride home at the end of the day. With Wi-Fi on board, they can make the hours they ride connected time for homework. Even better, the school system parks buses next to some of the most remote trailer parks in the district, leaving the routers on so students least likely to have broadband at home have yet another way to connect.

The Coachella school district efforts are inspiring. They are using Wi-Fi in new ways, connecting their community and making their students stronger.

Next story. Let's move from desert California to the City of Porto. Porto is the second largest city in Portugal. It is an urban place, built along the hillsides overlooking the mouth of the Douro River. Here's a fact—it's one of the oldest cities in Europe. And here's a surprise—it's also one of the most forward looking.

In Porto, a local start-up worked with the city to equip more than six hundred buses and taxis with routers. These routers serve as mobile Wi-Fi hotspots for tens of thousands of riders. This massive, vehicle-based Wi-Fi network absorbs 50 to 80 percent of the wireless traffic from its ridership. Now that sounds convenient. That sounds good for any of us who have ever wrestled with keeping connected while in transit.

But this Wi-Fi system is special. Because it does so much more. The routers collect data every time the buses and taxis pass wireless sensors set up on public property around the city. This information is then used for planning city services. So, for instance, that means as buses go about their regular routes, they pick up information from trash bins with sensors. So the city knows when garbage containers are full—and they have the information they need to plan smarter trash routes. Here's another example: When multiple taxis hit a sharp bump in the same place on a street, suspension sensors relay the information to city hall. In turn, city hall will know where there is a pothole or a street that needs repair. These are the kind of innovations that make government more efficient. These are the kind of innovations that make cities better places to live—and Wi-Fi is making them happen.

Now back across the Atlantic from Porto to New York. If you've spent any time in the Big Apple, you've probably descended into the subterranean—and by that I mean you've used the subway system.

I briefly lived in New York. The subway is glorious at getting the job done. It reliably gets you from here to there—and often in a lot less time than it would take above ground. The subway is steamy in the summer, dark and dank in the winter. But regardless of the weather, you'll find crowds. They are milling about on every platform, waiting for trains. And in the background you usually see subway musicians, typically solo acts busking about. In fact, if you travel the subway long enough, underground you will find musicians playing just about every instrument under the sun.

Last year, filmmaker Chris Shimojima had an idea. He decided to bring together a group of subway musicians to form the first wireless orchestra.

He started by recruiting Lev Zhurbin, a film score composer known as Ljova. Ljova was tasked with composing an original piece of music.

Next, the filmmaker found eleven subway musicians willing to round out his orchestra. This was an eclectic group. No one would confuse them with the Philharmonic. He had a musician playing a musical saw, a viola, a cello, a bass guitar, a trumpet, an accordion, a beatbox, and a couple of percussionists.

He set up this motley group of musicians in nine different subway stations. They were stations he chose because they had good Wi-Fi signals.

Using smartphones and Skype, these musicians connected to Ljova—who was above ground in Bryant Park, just behind the New York Public Library. Ljova stood in front of a collection of laptops perched on chairs. The laptops each displayed an image of the musicians below ground. And with the grand authority of a conductor in a symphony hall, he stood before these computers and conducted this ragtag orchestra. The results are amazing—and you should go check it out online in the short film *Signal Strength*. It's a film, an orchestra, and an experiment all built on Wi-Fi.

So if you thought Wi-Fi was just for getting online, I think these stories from Coachella, Porto, and New York remind us that it can be so much more. It can help build a stronger school system. It can lay the foundation for more efficient and effective city services. It can make art more cool—and more accessible. We should all want more of this in more places.

But to really understand why we would benefit from having more Wi-Fi in more places, I think it's important to understand the history of Wi-Fi. Because it didn't start supersized. It started with a small, renegade band of engineers at the FCC.

So roll back three decades. To help you out, here's some color: Back to the Future was on the big screen. Apple watches didn't exist; Swatch watches were the smart watches on our wrists. Commodore meant computing and compact discs were emerging as the end-all, be-all future of music. It was a long time ago. But three decades ago—just like today—the FCC was tasked with managing the airwaves. So the agency where I work churned out licenses—for radio, for television, for satellite services—and a bunch of other things.

Not all of these licensed airwaves, however, were occupied. We had a handful of underused frequencies. This was especially true in some airwaves that had been designated for industrial, scientific, and medical uses. The services we imagined would develop in these bands never quite did—in part, because under FCC rules they had to contend with interference from some widely used devices, like microwave ovens.

In fact, so little was happening in this spectrum, these airwaves were known as "garbage bands." Conventional wisdom is that they were junk. They were scraps of spectrum where the demand for wireless licenses would just be limited.

Or so we thought. Because this is where the story takes an interesting turn. The FCC decided to think differently. We decided we could do more than just dismiss these bands as junk. We decided to abandon the traditional practice of providing licenses to single operators to control in specific bands for specific purposes. And to do this we decided to ask technical experts for some creative ideas.

Once we got started, the questions multiplied—fast. Why should the FCC dictate what technologies should use these underused frequencies? What if innovators could just do anything they want if they abide by some basic technical parameters? And what if we gave the public access to these airwaves? That would mean that instead of thinking of spectrum like a license or a lease we would think about it like a highway, where if you simply comply with the rules of the road you can do things and go places.

In FCC circles this was edgy stuff. It was a move away from command and control spectrum policy. It was a different way to think about interference and optimizing the airwaves. It was radical.

To their credit, my predecessors at the FCC not only asked the right questions—they took action. As a result, three decades ago the FCC designated its first significant swaths of unlicensed spectrum for public use in these so-called "garbage bands."

This is the spectrum where Wi-Fi was born. In time, with the development of the 802.11 standard, we turned this wireless junk into gold. Because today, our lives are not just dependent on wireless connectivity, they are deeply dependent on unlicensed spectrum—and Wi-Fi is an enormous part of that.

Wi-Fi is how we get online. More than half of us have used public Wi-Fi—and more than 60 percent of us rely on Wi-Fi at home.

Wi-Fi is how our wireless carriers help manage their networks. In fact, today nearly one-half of all wireless data connections are offloaded onto unlicensed spectrum. So it may not be intuitive, but unlicensed spectrum helps manage the flow of traffic on licensed airwaves.

Wi-Fi is how we foster innovation. That's because the low barriers to entry for unlicensed airwaves make them perfect sandboxes for experimentation. This is where we tinker. It is where we can explore new ideas for Internet-enabled connectivity—at low cost.

Wi-Fi is also a boon to the economy. The economic impact of unlicensed spectrum has been estimated at more than $140 billion annually—and it's only going to grow.

This is good stuff. We need to keep it coming. We need to make Wi-Fi a priority in spectrum policy. It needs to move from the back bench to policy prime time.

So here are three ideas to make it happen.

First, let's commit to finding more spectrum for Wi-Fi and unlicensed activity. This is technical—but also important. We have to find more places in our airwaves for unlicensed services like Wi-Fi. We are using more Wi-Fi than ever before, and this use is only going to grow. In fact, with so much data traffic offloaded on Wi-Fi, wireless carriers are currently exploring even more new ways to use unlicensed spectrum to manage data traffic like LTE-U. The standards development process for LTE-U is ongoing, and we need to be mindful of its impact on unlicensed spectrum use.

The bottom line is: Thanks to the iron laws of physics, we are not making more spectrum. So we need to be more creative and find more places for Wi-Fi to flourish.

Today, most Wi-Fi makes its home in the 2.4 GHz band. But this is getting crowded. It's a band where the Wi-Fi everyone here uses is packed in with Bluetooth, wireless speakers, and video game consoles. Today we also have some parts of the 5 GHz band for Wi-Fi, and this helps lighten the load. In fact, right here at the Austin Convention Center, the 5 GHz band is the spectrum SXSW recommends for higher speeds.

Last year, the FCC freed up another 100 megahertz of spectrum in the 5 GHz band for unlicensed use. In effect, we doubled the capacity for Wi-Fi in this band—and that's a good thing.

This year, the FCC is poised to develop a creative licensing scheme in the 3.5 GHz band. It will allow airwaves not in use by government or commercial entities to be available for unlicensed purposes. This is a different way to think about licensing by creating an unlicensed reserve. It's exciting.

Next year, even bigger opportunities are underway for unlicensed spectrum. We are going to redistribute spectrum in the 600 MHz band. That's a part of the airwaves that is used for television today. The signals go far—further than the reach of any Wi-Fi services we have today. But we are going to do something neat. We are going to mix television and wireless services in this band. Between these services we will have guard bands—guard bands that are open for Wi-Fi use.

So that's a lot of effort by the FCC to reserve spaces in the sky for Wi-Fi. Still, I think we can do more. We need to take a look at the upper portion of the 5 GHz band where 75 megahertz of spectrum is located at 5850 to 5925 MHz. Don't let the numbers intimidate you. All you need to know is that this band is close to other parts of the 5 GHz band that are already used for Wi-Fi. That means it would be smart to clear the way for more Wi-Fi in this spectrum. But back in 1999 this band was allocated for a car and roadside safety project. This project is known as Dedicated Short Range Communications Service. While it has been slowly developing over the last decade and a half, the demand for Wi-Fi and devices using unlicensed spectrum has exploded. At the same time, technologies to mitigate interference concerns have improved. So I think it is time to explore how to have more Wi-Fi in the upper 5 GHz band—and I think we can do so without causing harmful interference to safety efforts.

Second, let's take a fresh look at how Congress values our airwaves. Traditionally, the legislative process has overlooked the value of unlicensed spectrum and favored licensed spectrum. This is not because of some rancorous partisan divide. It's not because of some unsavory battle between industries. No, it's because when the non-partisan staff at the Congressional Budget Office do their job, they assign value to spectrum when it is licensed and sold at auction. So bills that direct the FCC to sell licensed spectrum get high grades, while legislation that creates more spectrum for Wi-Fi gets low marks.

This accounting method is outdated. Because it fails to take into account the more than $140 billion in economic activity unlicensed spectrum creates each year. That economic activity can grow—if we find a new way to put Wi-Fi on the books. So I think it is time to develop a multiplier that accounts for the billions of dollars of activity that new unlicensed spectrum can generate in the economy. I think numbers like this would help Congress think differently about the value of unlicensed spectrum.

But more than just accounting, if we want to ensure that our spectrum policy reflects the best economic value for Americans, every time we identify spectrum to auction for licensed use, we should identify spectrum for unlicensed use. Call it a cut for Wi-Fi—or the Wi-Fi digital dividend. This was the exactly approach taken with the guard bands in our upcoming 600 MHz auction—and it could be a model for the future. And if we use this model, every time we hold a spectrum auction we will not only generate revenue for the United States Treasury, we will give back to the American public by putting more spectrum into the unlicensed economy.

So changing how Congress accounts for airwaves and finding ways to cut a Wi-Fi digital dividend into new spectrum auctions can help us keep the right balance of licensed and unlicensed spectrum. These changes are thoroughly wonkish—but they could be the ticket to bigger and bolder Wi-Fi opportunities in the future.

Third—and finally—let's make clear that we will not tolerate malicious or willful interference with Wi-Fi. This is already the law under the Communications Act. However, last year a bunch of hotels banded together and filed a petition with the FCC. They asked the agency to bless their ability to block hotel guests from using their own Wi-Fi connections under the guise of network security concerns. There are other ways to address legitimate security concerns—but this is a bad idea.

We've all been hotel guests. I'm sure some of you here are staying at a hotel right now. So you know Wi-Fi is the difference between working in the comfort and privacy of your own room and being relegated to the business center. It's the difference between seamlessly getting your work done at a conference and getting saddled with special fees and charges just to connect.

We got a little noisy on this one in Washington. In response, the hotel industry recently withdrew this petition. That's a victory for hotel guests and a gain for Wi-Fi connectivity. I hope it is also a lesson for other premises operators. Because blocking Wi-Fi connections while simultaneously charging high fees to connect is a bad idea.

That's because Wi-Fi gives us choices, keeps us connected, and keeps us creative. That's true for the school district in Coachella, the city managers of Porto, and underground musicians in New York. It's true for all of us, too. Because that band of renegade engineers at the FCC that long ago rewrote the playbook on spectrum policy saw into the future. And with their playbook we can head faster into a world where the Internet grows less visible because it becomes a part of everything we do. Reserving more of our airwaves for unlicensed use is going to make our economy stronger and our world more innovative, exciting, and fun.

It's time to supersize Wi-Fi.

Thank you.