REMARKS OF FCC CHAIRMAN AJIT PAI
AT MOBILE WORLD CONGRESS AMERICAS

SAN FRANCISCO, CA

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Thank you, Meredith, for that introduction and for your thoughtful remarks. For years, I've been trying to meet the high standard Meredith set as my immediate predecessor at the FCC. And now, I'll try to meet the high standard she set onstage this morning. A tall order, indeed.

I'm excited to be part of the first keynote session for the first-ever Mobile World Congress Americas, and it's an honor to share the marquee, not only with my friend Meredith, but with Mats and Carlos.

Ordinarily, I would transition here with a quip about the competing iPhone event. But these are not ordinary times.

Over the past two weeks, the United States has been hit by a pair of unprecedented storms. Hurricane Harvey dumped a staggering 33 trillion gallons of rain on Houston and the surrounding area. And Hurricane Irma's winds have left a path a destruction across the Caribbean and Florida. The damage to people's homes and communities has been devastating. The loss of lives has been worse.

The FCC has a role to play in the federal government's disaster response efforts. We work closely with the Department of Homeland Security, the Federal Emergency Management Agency, state public safety officials, and private communications providers. We monitor the status of communications networks in affected areas, thanks in part to our incredible staffers on the ground. We provide information, data, and support to first responders and others wherever possible to assist with recovery and restoration efforts. And when the need arises, we act quickly to ensure that first responders on the ground can quickly get access to the spectrum they need to communicate.

It will be a long time before we'll be able to calculate the total amount of damage inflicted by Harvey and Irma. But we already know one thing: it would have been a lot worse if it weren't for wireless communications.

In the case of Harvey, the one bit of good news is that wireless networks were much more resilient than in some previous disasters. About 5% of cell sites were down, as opposed to 25% for Hurricane Sandy. That wireless connectivity was literally a lifeline for many. In the initial phase of Harvey, Houston's main 911 emergency response center received more than 96,000 calls, many of which were from wireless phones. Many of the more than 11,000 people rescued by the Coast Guard were found because of wireless calls. That includes one 14-year-old girl who was saved after telling Siri, "Call the Coast Guard." People also used their smartphones to access social media platforms like Facebook and Twitter to summon help and keep tabs on their family, friends, and neighbors.

Last week, I visited Houston. I saw first-hand some of the damage that was done by Harvey, the heroic efforts to quickly restore communications, and the challenges that remain. When the rain was still coming down and the water was still rising, technicians braved the elements to fix service disruptions as quickly as possible. Now, reports so far indicate that communications services in the path of Hurricane Irma have not fared as well due to staggering winds. But we're grateful for the hard work people are doing to keep wireless networks up and running for as many people as possible.

At shows like this, we tend to focus on the next big invention, the breakthrough that is going to change everything. But the past two weeks remind us that for public safety purposes alone, wireless communications during times of emergency are critical. I would like to extend my heartfelt thanks to

everyone here whose company or organization has contributed to the recovery from these storms and to your industry as a whole for making us safer.

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One of the perks of speaking early during a conference is that you get to make the observations about timely subjects before anyone else. Of course, one can also set the bar low. We'll see how I do.

The iPhone 8 is being rolled out moments from now just a few miles from here. But to me, the more notable coincidence of timing and location is that it was 10 years ago, in this very building complex, that Steve Jobs debuted the very first iPhone.

It's become conventional wisdom that the iPhone changed everything. The fact that Apple's ad campaign was "This changes everything" might have had something to do with that. And there is no question that the iPhone was a watershed for wireless communications. But if you dig deeper, you see that the revolution that was launched in 2007 was about more than just one phone.

Yes, the iPhone leapfrogged everything on the market when it came to design and user interface. But it had two major shortcomings. First, it was really expensive. Second, and more important in my view, it didn't run on 3G networks. During the iPhone's legendary rollout, Steve Jobs said, "The killer app is making calls." In retrospect, the iPhone of 2007 seems to have been everywhere. But the reality is that the first edition sold 6.1 million in its first year. For context, in 2007, about that number of people purchased tickets in the United States to see the film "Because I Said So," starring Diane Keaton and Mandy Moore. (For the record, I bought neither.)

In many ways, the iPhone really became "The iPhone*"* in 2008. That's when it featured 3G connectivity. Only then could you get GPS and turn-by-turn navigation. Only then could you unleash the App Store. And sales more than tripled.

3G not only turbocharged the smartphone; it became the gateway to the Internet for hundreds of millions around the globe. Back in 2007, barely 1 billion people worldwide were online. Today, about half the world's population is connected—about 3.5 billion people—and 3G has been essential to expanding Internet access in the developing world.

So I think that the better way to think about the past decade is to say that both the iPhone and 3G changed everything. Innovation in devices combined with innovation in networks started the mobile revolution. They set off a chain reaction that has led to an enormous surge of consumer demand, network investment, and new products and services.

Today, we find ourselves nearing another possible hinge moment. We've seen remarkable progress, but it feels like we're still waiting for another huge breakthrough. Well, 5G could well be what we're waiting for. Going from 2G to 3G was the mobile equivalent of switching from dial-up to broadband. Similarly, the transition from 4G to 5G promises to be more than just incremental change—we could see dramatic improvements in network speed, capacity, and responsiveness that will make the impossible possible. One analysis by CTIA suggests that 5G could create three million jobs and over $500 billion in additional GDP growth over seven years in the United States.

Our challenge is to seize that opportunity. So: what's our plan?

Before talking about where we're going at the FCC, it's think it's useful to talk about where the U.S. mobile marketplace is—its strengths and weaknesses.

Just last week, the FCC circulated the 20th Mobile Wireless Competition Report. Consistent with Congress's instructions, the report analyzes whether effective competition exists in the marketplace for mobile wireless services. In case you haven't read it yet, there's a lot of good news.

For example, consumer demand continues to rise. Mobile subscriptions were up 5% last year to about 400 million, which puts the mobile penetration rate at 121%. That's right—there are now more mobile subscriptions in our country than people!

Roughly 80% of mobile subscribers use smartphones. The average subscriber uses 4 GB of data a month, up 34% from a year ago. And in the past year, U.S. consumers also benefitted from a dramatic expansion in options of nationwide wireless plans offering unlimited data.

Prices are falling, too: The cost per MB of data has dropped from $1.37 in 2007 to less than half a cent in 2016. And wireless speeds are up. The mean LTE download speed increased over 60% in 2016, rising to 23.5 Mbps.

With data showing consumer choice, demand, and usage going up, service quality getting better, and prices going down, we have clear indicators that the marketplace is effectively competitive.

But that doesn't mean that there aren't challenges.

Wireless service in rural areas still lags the national averages. Only 55% of rural Americans can choose from four LTE providers. And about 3% of U.S. road miles and 20% of square miles have no coverage at all.

I personally experienced this last week while driving from Houston to Austin. The personal impact of the "no service" display in that case was trivial: I wasn't able to bid against my friends on Drew Brees as my quarterback in a fantasy football auction.

But the wireless aspect of the rural digital divide has serious costs for many people. I think of my visit to the Rosebud Sioux Reservation in South Dakota, where I heard the story of an elderly woman who was found dead in her home, clutching her cellphone. She was in distress and dialed 911 a total of 38 times, but the calls never went through. There just wasn't wireless coverage.

Bottom line: the mobile marketplace is healthy, but we've got work to do to close the digital divide and boost network investment, which go hand in hand. And we need to tackle these issues with an eye toward revving the virtuous cycle of faster, better networks that unleash new innovations that drive additional consumer demand.

The FCC has embraced these goals. Here's what we're doing, starting with the digital divide.

On the wireless side, the most significant step we've taken this year is aiming to bring mobile broadband to millions of Americans with what we call Mobility Fund Phase II. This is a $4.53 billion fund that takes money previously used to subsidize areas that already have 4G LTE service and devotes it to bringing 4G LTE service to rural Americans who don't have it today. And we're spending that money over the next decade in an efficient, fiscally responsible way by using a competitive reverse auction to allocate these funds to private providers.

The program I've just described involves government funding. But private network investment is by far more substantial and important. That's why the most concerning emerging issue we are seeing is that investment in wireless networks was down significantly in 2016. According to the UBS Wireless 411 report, in fact, investment was down 9%, a huge drop outside of a recession. This is even more ominous as we move from 4G to 5G. Network architecture in the future will be much denser, with hundreds of thousands, if not millions, of closely packed small cells. And much more fiber will have to be installed for backhaul. These networks won't come cheap.

I believe that the FCC's most powerful tool for expanding digital opportunity is setting rules that maximize private investment in high-speed networks. For the plain reality is that the more difficult government makes the business case for deployment, the less likely it is that broadband providers, big and small, will invest the billions of dollars needed to connect consumers. Too often, unnecessary rules make it more expensive to construct these networks than it needs to be.

I think you know where I'm going next. In our *Restoring Internet Freedom* proceeding, the FCC is currently examining whether we should change our Internet regulations in order to encourage greater deployment and investment and bring digital opportunity to more Americans. CTIA has weighed in to express your concerns that the current rules hinder network investment. We are analyzing these and other comments—and there's a lot of them—as we move toward a decision.

But it's important not to look at that proceeding in isolation. Instead, it is just one part of a comprehensive review of how to encourage the construction and expansion of next-generation networks.

We've heard loud and clear from you how state, local, and Tribal processes affect the speed and cost of infrastructure deployment. This past spring, we suggested ways to streamline those processes. We're also exploring pole attachment reforms to make it easier for broadband providers to attach the wires and wireless equipment necessary for next-generation networks.

Beyond these proposals, the FCC has also established a Broadband Deployment Advisory Committee. The members of the BDAC and its working groups are working hard to find deployment-friendly reforms that can deliver better, faster, and cheaper networks to the American people. I'm looking forward to hearing their first set of recommendations this fall.

Of course, you can't talk about unlocking the possibilities of wireless without talking about unleashing spectrum.

One of the game-changers for 5G is that new technologies have made it possible to use millimeter-wave bands for broadband. But we know that opening up spectrum for 5G isn't just about millimeter-wave. We need to free up all kinds of spectrum—low-, mid-, and high-band—for both licensed and unlicensed use. Here's a sketch of where we are on each.

On low-band spectrum, we've completed the first-ever incentive auction. And we're well into granting wireless licenses in the 600 MHz band. In fact, approximately 90% of applications have already been granted. One major operator has already started deploying service in this band, with a path to 5G. But to fully repurpose this spectrum for wireless, the FCC and industry must work together to ensure a smooth post-auction transition.

That transition has begun, and we're currently reviewing the individual cost estimates eligible for reimbursement from the broadcaster relocation fund authorized by Congress. It appears from initial estimates that the $1.75 billion fund won't cover eligible costs. Accordingly, Congress is examining ways to prevent stations from paying out of pocket while also ensuring that 600 MHz winners are able to use that spectrum promptly. I share these goals and remain committed to working with you, with broadcasters, and with Congress to achieve them.

Now, to mid-band spectrum. We adopted new sharing tools in the 3.5 GHz band to make 150 MHz of spectrum available for mobile broadband. This spectrum traditionally has been used for military radars and non-federal fixed satellite service. Commissioner O'Rielly is leading a review of our rules for that band to ensure they are designed to maximize investment. And one month ago, we began to evaluate spectrum bands between 3.7 and 24 GHz, with a focus on new licensed access to the C band and new unlicensed access in the upper 6 GHz band. We also want to know how existing rules can be modified to promote additional access to these "middle" bands.

We're moving on high-band spectrum, too. Last summer, our *Spectrum Frontiers Order* opened up nearly 11 GHz of spectrum in the bands above 24 GHz for mobile use. But it also left many questions unanswered. Here, we continue to move full speed ahead so that operators have a clear path to launching 5G and other innovative millimeter-wave services in the United States. That means continued pursuit of the three bands we identified in that order—28 GHz, 37 GHz, and 39 GHz. It also means opening up additional bands for flexible, commercial use. That's why, by the end of the year, I intend to present to my fellow Commissioners an order that would make available more high-band spectrum for commercial

use. Our goals are clear: to make sure the U.S. continues to lead in 5G and to enable wireless consumers to benefit from these technologies sooner rather than later.

One last policy note. Until now, I've talked almost entirely about fostering all the good things about wireless communications. But we also need to step up our game to combat one bad thing: unwanted and unlawful robocalls. This is the number one source of complaints to the FCC, and I've made cracking down on robocalls my number one consumer protection priority. In March, the Commission proposed to give voice providers greater leeway to block many "spoofed" calls—specifically, calls that purport to be from unassigned or invalid phone numbers. In addition, we're exploring how to set up a reliable system for authenticating phone calls, which would help to crack down on malicious robocallers who hide their true phone number to evade call-blocking tools and dupe consumers.

The wireless industry has made strides in attacking this problem. But we still need your help. Specifically, I'm asking you to engage deeply in our effort to create a call authentication system—a sort of digital fingerprint for every phone call. This would give consumers meaningful relief from robocalls and the FCC an enormous boost in addressing this top priority.

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A decade ago, Steve Jobs stood in this building complex and charted a new course for the wireless industry. You responded by proving that he wasn't the only wireless visionary. Many of you designed and deployed networks that enabled a revolution. Others designed devices and applications that raised the bar. And all of you have kept pushing toward what's next.

We gather at yet another moment of possibility for technological breakthroughs that will spur prosperity, expand opportunity, and improve our standard of living. Let's meet this moment and chart a new course together.