

**REMARKS OF FCC CHAIRMAN AJIT PAI
AT THE INFORMATION TECHNOLOGY AND INNOVATION FOUNDATION**

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Thank you to Doug Brake and the Information Technology and Innovation Foundation for hosting us. And thanks to everyone for taking the time to join us during one of the most eventful weeks I can remember. You had the Iowa Caucuses on Monday. The State of the Union was on Tuesday. The Oscars are this coming Sunday. And yes, the world's greatest deliberative body handed down a long-awaited verdict. That's right. Punxsutawney Phil didn't see his shadow, so spring is coming early.

Of course, for me, a long, long suffering Kansas City Chiefs fan, the main event had to be the Super Bowl. I don't want to say that the Chiefs' comeback win was the highlight of my Chairmanship, because I think that does a disservice to the hard-working staff of the FCC who have worked so tirelessly and have accomplished so much over the past three-plus years. But it ranks up there. Plus, no wardrobe malfunctions . . . which I appreciated.

The Super Bowl is not just the biggest sporting event of the year, it's the biggest event of the year for advertising—a time for companies to promote the next big thing. One marketing effort, in particular, caught my eye. That was all the hype about how this was the first Super Bowl featuring 5G—the next generation of wireless connectivity. What does a 5G Super Bowl mean? Well, if you've ever been to a sporting event with thousands of people, you know how frustrating it can be to do something as simple as opening an app to check the stats for the game in front of you. If you had a 5G-enabled phone at this year's Super Bowl, you could not only watch the game on your phone, you could see five simultaneous streams at once, and toggle back and forth to pick your favorite camera angle.

This fuss around 5G and the Super Bowl is a notable indicator that in 2020, 5G will rapidly continue the transition from concept to reality. Last year, multiple carriers lit up 5G service in the United States, reaching dozens of cities, with one carrier now covering most of our nation's population with 5G. In 2020, 5G service will expand, and we should see a substantial increase in the availability of smartphones and other devices that will allow Americans to take advantage of 5G's capabilities.

Zooming out from the micro to the macro perspective, many believe that 5G will be a huge boost for our economy. One study pegs 5G's potential at three million new jobs, \$275 billion in private investment, and \$500 billion in new economic growth. You can quibble with the numbers, but there is no question that 5G networks will be an important platform for innovation and investment in the coming years, as were 4G LTE and the mobile app economy it enabled, starting over a decade ago.

That explains why countries around the world are jockeying for global leadership in 5G. Whoever sets the pace globally will become the frontrunner in the development of the 5G ecosystem and attract the investment, talent, and innovation that come with that status. And I want the past to be prologue: I want America's success in 5G to match our leadership in 4G.

That's why the FCC has been pursuing a strategy to Facilitate America's Superiority in 5G Technology. The 5G FAST plan includes three key components: freeing up spectrum, promoting wireless infrastructure, and modernizing regulations to encourage fiber deployment.

Evidence abounds that our plan is working. In 2018, the number of wireless small cells deployed in the United States more than quadrupled, from 13,000 to more than 60,000. 2018 was also a record-setting year for fiber deployment in the United States, with buildout to nearly six million additional homes—until that record was broken in 2019, with deployment to over seven million such locations.

I rarely pass on an opportunity to talk about the actions we've taken to boost fiber and wireless infrastructure deployment. But I'm not here today to talk about our initiatives in the physical world. I'm here to talk about the third, invisible component of our 5G FAST plan—freeing up spectrum.

We're taking an aggressive, all-of-the-above approach here: we're freeing up high-, mid-, and low-band spectrum for 5G. And here too, there's plenty of good news to report.

High-band spectrum enables ultra-high-speed, gigabit-plus wireless connectivity. And we've been fairly active on this front, to say the least.

Last year, the FCC successfully concluded our nation's first two auctions of millimeter-wave spectrum for 5G services, in the 28 GHz and 24 GHz bands, respectively. One week ago, we concluded bidding in the first phase of an auction of the upper 37 GHz, 39 GHz, and 47 GHz spectrum bands. All told, we are making available almost five gigahertz of high-band spectrum for commercial use. To put that in perspective, that is more spectrum than is currently used for terrestrial mobile broadband by all wireless service providers in the United States combined.

On low-band spectrum, we're repurposing spectrum in the 600 MHz band, which was long used for broadcast television, for mobile broadband. This so-called re-pack is on schedule, and carriers are already deploying 5G wireless service in the band.

I witnessed the results of these efforts for myself during a recent visit to Nevada, where I saw a T-Mobile deployment delivering over 500 Mbps connectivity using millimeter-wave spectrum and over 180 Mbps using 600 MHz spectrum, transmitted from an antenna almost a mile away. That was a glimpse of our 5G future.

So: that's high-band and low-band. We've also been focused on mid-band spectrum.

Mid-band spectrum is appealing for 5G largely because of physics: it combines good geographic coverage with good capacity.

Other countries share this view. The European Commission has issued a directive that 3.4-3.8 GHz will be the first primary band for 5G in the European Union. Last year, Japan awarded licenses in the 3.6-4.1 GHz band for 5G. And this past August, Australia initiated a plan for fixed and mobile broadband use in the 3.7-4.2 GHz band.

At the FCC, we're determined to lead the world in pushing out mid-band spectrum for 5G, just as we have led with respect to high- and low-band spectrum.

That's why, back in 2017, immediately after I became Chairman, we took stock of where things stood on mid-band spectrum. Unfortunately, the cupboard was virtually bare. There was an incomplete 3.5 GHz initiative that was unlikely to lead to commercial 5G deployments, given problematic rules adopted during the prior Administration. Other than that, the agency had nothing—nothing at all—on the shelf. So just months after I took office, the Commission unanimously adopted a Notice of Inquiry, kickstarting the conversation about potential use of mid-band spectrum, and how our rules could be modified to promote additional access to these airwaves.

Since then, we have systematically identified mid-band airwaves that were being underused and set plans to put these airwaves to work for the American people.

In July 2019, the Commission adopted flexible new rules for the 2.5 GHz band. This is our nation's single largest band of contiguous spectrum below 3 GHz, and it's well-suited for 5G deployment. Earlier this week, we opened a Tribal Priority Window so that Tribal Nations in rural America have early access to 2.5 GHz spectrum. And we intend to auction any remaining spectrum shortly after this window closes. In the end, this spectrum will yield about 200 megahertz for 5G and other wireless services.

We also targeted the 3.5 GHz band. As I mentioned earlier, the rules for this band had not been optimized for the benefit of American consumers. But with the leadership of Commissioner O'Rielly,

we've designed new rules to promote 5G deployment. We're currently on track to auction 70 megahertz of priority access licenses in the 3.5 GHz band this June.

And that's not all. We're targeting new commercial access to the 4.9 GHz band—50 megahertz of prime spectrum that's significantly underused. And we've also proposed some important steps to start clearing incumbents from the 3.3-3.55 GHz band, with an eye to new 5G opportunities there as Congress envisioned in the MOBILE NOW Act.

That's just on the cellular side of the ledger. We've also proposed to make more mid-band spectrum available for unlicensed use in the 5.9 GHz and 6 GHz bands. With the advent of Wi-Fi 6, the 160-megahertz-wide channels we're aiming to make available would deliver gigabit connectivity wirelessly and form a powerful 1-2 punch of licensed 5G and unlicensed Wi-Fi innovation.

So when it comes to spectrum, we're on the right track and producing results. Indeed, just last month, a study projected that by the end of this year, as many as three-quarters of the world's 5G subscriptions would be found in just two countries: the United States and South Korea. That's 5G fast.

But now is not the time to slow down. We must and we will continue to take bold and aggressive action to make more mid-band spectrum available for the commercial marketplace and promote American leadership in 5G.

And along those lines, I'm pleased to make a major announcement. Minutes ago, I shared with my fellow Commissioners our most significant proposal yet to repurpose mid-band airwaves for next-generation wireless services. Specifically, I have shared draft rules that would repurpose 280 megahertz of airwaves in the so-called C-band for 5G. The C-band is a 500 megahertz swath of spectrum from 3.7 GHz to 4.2 GHz. It's mostly used by fixed-satellite companies to beam content to video and audio broadcasters, cable systems, and other content distributors.

From the many meetings I've had to the many submissions I've read to even the many tweets I've seen, this has been one of the most complicated and contentious proceedings during my Chairmanship. So I'd like to take some time this afternoon to walk through some of the details of my proposal, and to explain how I arrived at my decision.

Perhaps the biggest challenge the FCC faces as we work to free up more spectrum for 5G is that almost all the airwaves are accounted for in one way or another. There's not much greenfield spectrum laying around that we can just dedicate to 5G without having to accommodate some range of existing services or licensees.

But the C-band presents an enormous opportunity if we are willing to be creative and do the hard work. That's because satellite companies don't need the entire C-band to provide the same services they are providing today. This creates an opportunity for a consumer-friendly transition. In 2017, the Commission sought to assess this opportunity in its *Notice of Inquiry* into mid-band spectrum. We specifically identified the C-band as ripe for study and asked if the rules for this band could and should be modified to support more flexible uses, including mobile broadband.

The answer from the record soon became clear: yes. And so, in July 2018, we formally launched the proceeding on the C-band that has brought us to today's announcement. We entered this process with an open mind. We sought comment on a variety of approaches for expanded flexible use in the band. Over the past year-and-a-half, we have studied many ways to repurpose some or all of the band—market-based, auction-based, and other solutions (pretty much everything other than a coin toss).

During the deliberative process, I made clear that my decision would be guided by four principles: First, we must make available a significant amount of C-band spectrum for 5G. Second, we must do so quickly. Third, we must generate revenue for the federal government. And fourth, we must ensure that the services that are currently delivered using the C-band can continue to be delivered to the American people.

With that backdrop, here are the key elements of my proposal, and why I believe they represent the best path forward in advancing these principles.

The first key decision, which I announced this past November, is that I favor holding a public auction to repurpose spectrum in the C-band for flexible use. The leading alternative was a private sale, in which the satellite companies operating in the band would sell rights to a portion of the C-band to an interested party or parties.

There are a number of reasons why a public auction is the best approach.

For starters, the FCC has a quarter-century track record of successful and transparent auctions. As of late last year, the Commission had conducted 93 spectrum auctions that generated \$116 billion in revenue for the U.S. Treasury. That doesn't include the ongoing auction of the 37 GHz, 39 GHz, and 47 GHz bands, which is wrapping up and has already attracted over \$7.5 billion in bids. And we show our work, so to speak. You can go to the auctions website right now and see the number of qualified bidders, the number of licenses available, the gross proceeds, and much more information.

With this proven record of success, with this demonstrable transparency, a public auction is the best bet to ensure fairness. A trusted, well-established process will be more attractive to prospective bidders, which means more participation and, ultimately, more money raised for the Treasury. Conversely, bidders would be less likely to participate in an untested private auction, one that was described in our record as "fiendishly complex." And if you don't think testing out a new system for the first time in a high-profile proceeding can lead to major headaches, the Iowa Democratic Party would like to have a word with you.

Not only have public auctions proven to be an effective tool for repurposing spectrum fairly, we've shown that they can do so quickly. The Commission already has the necessary pieces in place, including the auction software development infrastructure, and under my proposal, we would get the auction started by the end of 2020. In fact, I can share with you the specific date on which the C-band auction would start: December 8.

One more point in favor of a public auction over a private sale is that a public auction is squarely within the Commission's legal authority. By contrast, the leading plan for a private sale would have required an unprecedented grant of authority to private entities. Remember, the satellite companies currently do not have terrestrial rights to the C-band—so essentially, what some were urging the government to do was to give them new rights just so that they could turn around and sell them. That doesn't make much sense to me, and I doubt that I'm alone.

Once we decided to go with a public auction, the next big decision was how much spectrum should be made available for flexible use. Put differently, if one of your guiding principles is freeing up a significant amount of spectrum for 5G and another is to protect the services currently being delivered in the C-band, how do you divvy up the band?

Some broadcasters and cable operators initially argued that we should only clear 100 megahertz of spectrum to protect programming delivery. Others, like T-Mobile, Qualcomm, and U.S. Cellular, argued that all 500 megahertz should be made available for flexible use.

After a careful review of the record, I favor clearing the lower 280 megahertz of the C-band and making it available for flexible use. We would also reserve the 20 megahertz above that as a guard band and repack existing satellite operations into the upper 200 megahertz of the band. I believe this strikes the appropriate balance between making a large amount of spectrum available for 5G and preserving sufficient spectrum for incumbent uses.

And I'm pleased that there is a wide range of support for this position. In the U.S. Senate, both the Wicker-Thune and the Kennedy-Cantwell-Schatz bills call for making 280 megahertz of C-band spectrum available for flexible use. And the C-Band Alliance, which is largely made up of incumbent

satellite operators in the band, advanced a plan in October 2019 that would clear that amount of spectrum. They told the Commission that the upper 200 megahertz of the band would be sufficient for them to continue providing current services to their customers. So if anyone tells you that my plan would mean that millions of Americans would no longer be able to see their favorite television shows, don't believe it for a second. It's nothing but fearmongering.

The next question: How much compensation will incumbent satellite operators receive from this public auction of 280 megahertz? Let's start with the easy part. Pretty much everyone who commented to the Commission, and everyone on Capitol Hill, agrees that satellite operators' relocation costs should be covered. It will cost money for satellite companies to relocate their operations to the upper 200 megahertz of the C-band. Among other things, new satellites will need to be launched, and filters will need to be placed on earth stations. According to the record the Commission has compiled, we expect those costs will range from \$3 billion to \$5 billion. And it's only fair that every single reasonable cost should be covered. So under my draft rules, the winning bidders in the C-band auction would be required to reimburse satellite operators for their reasonable relocation costs.

Now, we get to the tougher issue. There is a widespread consensus that incumbent satellite operators should have the opportunity to receive some amount of money above and beyond their relocation costs. But that consensus breaks down as you migrate from the conceptual to the concrete.

Some believe that incumbent satellite operators should get a split of the auction proceeds. The C-Band Alliance originally proposed this. And one piece of Senate legislation would provide up to 50% of auction proceeds, with the caveat that satellite operators would have to pay for their relocation costs out of that 50%.

Others believe that satellite operators should get a set incentive payment. And under this approach, I've seen a proposal for incentive payments as low as \$1 billion in Senate legislation. I've also seen a proposal larger than the gross domestic product of Iceland.

Where do I come down? To begin with, I'm proposing what I call "accelerated relocation payments" to satellite operators if they meet deadlines for clearing C-band spectrum quickly. Specifically, satellite operators would receive these payments if they clear the lower 100 megahertz of the C-band in 46 of the top 50 Partial Economic Areas by September 2021 *and* the remaining 180 megahertz of the C-band by September 2023. That's four years and two years faster, respectively, than the September 2025 timeframe our record indicates that we might otherwise expect.

Some might ask (and I'm sure some will): Why are any accelerated relocation payments necessary? The answer is pretty simple: speed. Remember, we aren't just asking the incumbents to move their services to the upper 200 megahertz of the C-band. We want them to do that *quickly* in order to free up spectrum for 5G sooner rather than later. And this transition will be much faster if we can create powerful incentives for incumbent operators to expedite the transition. And to make sure they follow through—they would *only* be paid the full amount if in fact they did so. That is why I favor targeted accelerated relocation payments.

To be clear, I don't favor accelerated relocation payments because they are in the private interest of satellite companies. The balance sheets of private companies are not my concern. I favor accelerated relocation payments because they are in the public interest. It is in the public interest to make available the C-band for 5G deployment as quickly as possible, as part of the national priority to promote American leadership in 5G. And to get the job done quickly, we need to align the satellite companies' private interests with the public interest. That's precisely what accelerated relocation payments will do.

Now, others might ask: Why not give satellite companies a certain percentage of auction revenues? To begin with, Congress could certainly do so. But the FCC's ability to do so under current law—in particular, the Miscellaneous Receipts Act—is in serious doubt. Moreover, I think that it is

important for any payments to be tied to the speedy clearing of the band. Again, we need to make sure that incumbent satellite operators have the right incentives to get the job done and get it done quickly.

Next question: Who will be responsible for the accelerated relocation payments? Under my proposal, these payments would be made by the winning bidders in the C-band auction; they would not be made by the FCC.

And then comes the question that has perhaps been the subject of the most intense interest: How much should these accelerated relocation payments be? Before I answer that directly, let me explain how we've gone about figuring that out. Accelerated relocation payments are designed to capture the value to auction winners of satellite operators clearing spectrum quickly. Therefore, those payments shouldn't exceed the amount that wireless carriers would be willing to pay in a free-market transaction if one could solve the holdout and free-rider problems that would be inherent in any such negotiations.

Using that standard, I am proposing to give satellite operators the opportunity to receive accelerated relocation payments of \$9.7 billion if they meet our accelerated clearing milestones.

Now, I've been in this job long enough to realize that this proposal will receive criticism from both sides. On the one hand, satellite companies have been asking for a lot more money. But the purpose of an accelerated relocation payment is not to compensate them for the expected value of the spectrum. The purpose is to expedite the clearing of the lower portion of the band for 5G.

On the other hand, there will be those who will complain that \$9.7 billion in accelerated relocation payments is too much. They agree such a payment is necessary, but they would prefer a smaller amount—in the neighborhood of \$1 billion, for example. But that number would be far below the value to wireless companies of the accelerated clearing, and ultimately the value to American consumers of faster development of 5G. And it would not be enough to properly align the incentives of the satellite operators with our national interest of getting this C-band spectrum cleared quickly so it can be put to use for 5G.

In sum, as I see it, the Goldilocks principle applies here. Some may say \$9.7 billion is too high. Some may say it's too low. I say it's just right—if you are genuinely focused on ensuring that the prompt development of the C-band is needed for American leadership in 5G.

Having settled on what, and why, and how, and who, the last big decision we had to make was when—when to move ahead with this proposal. Some argue that the FCC should wait for Congress to legislate on the C-band. But if you believe that advancing American leadership in 5G is important, if you believe it is a priority to make 5G spectrum available quickly, and if you believe that mid-band spectrum is especially critical, waiting for Congress to act first isn't the best strategy. In fact, some might call it the absence of a strategy.

Waiting to begin the C-band auction and transition isn't in the national interest. Now, it *would* be a boon for China and other countries eager to seize a leadership role in 5G. They would be delighted to move ahead as we stood still. But delay would be bad for American consumers, for American companies, and for America, period. The longer we delay, the longer the American people will have to wait for the new services and applications and jobs that would be unlocked by 5G deployment in the C-band. And the more that our global leadership in 5G would be put at risk.

And critically, there's no need to delay. The FCC already has a strong legal foundation to take all the steps I am proposing today. Under Section 316 of the Communications Act, we have the authority to modify the licenses of C-band incumbents, which would still be able to provide the same level of service to their customers that they do today. Under Section 309, we have the authority to auction off the lower 280 megahertz of the C-band for flexible use. Under Section 303, we have the authority to set new technical rules for the lower 280 megahertz of the C-band. And under Title III and our *Emerging*

Technologies Framework precedent, which has been upheld by the D.C. Circuit, we have the authority to require winning bidders in the C-band auction to pay for the relocation of the band's incumbents.

Now, don't get me wrong. If Congress wants to direct that auction proceeds be used to address national priorities like rural broadband, it will find no bigger supporter than me. As a Commissioner back in 2016, I first proposed that Congress adopt a "rural dividend" so that 10% of auction proceeds would go toward rural broadband deployment. I am delighted so many have jumped on the bandwagon. And in this case, if the FCC approves an order on February 28, Congress could still require this year that auction proceeds be used to close the digital divide, implement Next-Generation 911, or any other similar priority.

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In three weeks, the FCC will make an important choice. Are we going to come together to advance the national interest? Are we going to take decisive action to promote American leadership in 5G? Are we going to move forward with a plan that will propel our economy and provide digital opportunity to more Americans?

Or are we going to play politics? Are we going to call for more mid-band spectrum, but then oppose a critical step toward doing that? Are we going to give a major boost to our global competitors?

I know where I stand. I favor action. I favor Facilitating America's Superiority in 5G Technology. I favor the bold, forward-thinking plan I've outlined for the C-band.

This plan meets each of the four priorities I've identified in this proceeding. It frees up a significant amount of C-band spectrum for 5G. It does so quickly. It generates revenue for the U.S. Treasury. And it protects the services that are currently delivered using this spectrum. And I would add that it is a win for innovators who want to introduce new services in the C-band. It is a win for incumbents who will be fairly compensated during this transition. And, most importantly, it is a win for the American people, who will enjoy the rollout of new 5G services.

Let's get this done. Now.