REMARKS OF
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Good morning. It is a pleasure to meet with so many of you, from so many regions of the world, to discuss an issue that is so essential to our shared prosperity—and that is Broadband for All. It is also my sincere pleasure to address you in person this year, in conference settings that are comfortable and familiar, but feel more like a privilege than they ever did before.

Let me begin by saying that it is a tremendously exciting time to be a broadband advocate. Accelerated by the pandemic, the world's digital transformation has shown no signs of stopping. Case in point—the past few years proved virtual care as a trusted alternative, establishing telemedicine for widespread acceptance and scale. In the United States, 46 percent of consumers now rely on telehealth visits in some capacity, compared to just 11 percent in 2019. The pandemic also taught us how remote learning works and how it can work better, cementing a greater role for online education and skills training to bridge knowledge gaps. It forced businesses, large and small, to digitize out of sheer necessity, creating the infrastructure for workers and consumers to lead more of their lives online. The pandemic also pushed governments to migrate to the internet economy more quickly, making online access to essential services—like vaccine appointments and unemployment assistance—a practical new default.

And let's not forget that 5G networks continue to be deployed successfully, with transformative use cases taking shape along nearly every industry vertical. We're also seeing massive amounts of private and public capital pouring into our communities to modernize and expand our telecommunications infrastructure. So from the personal to the governmental to the networks, greater connectivity is driving greater opportunity—in the United States, here in Europe, and in virtually every other part of the world.

These developments should be celebrated, and I share the excitement that many of you feel. But, sometimes, this level of excitement, no matter how well deserved, can tempt us to mistake our achievements for ultimate success. We cannot afford to do that with broadband. With broadband, no matter how much we manage to achieve along the way, we will not be truly successful unless every person has the same opportunity to participate in our connected future, and unless

we build that future responsibly, sustainably, and with our climate in mind. That is what I want to talk to you about today.

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We must start by connecting the unconnected. In February 2019, an estimated 27 percent of American adults lacked a home broadband connection. That already staggering number masked even deeper inequalities, with 37 percent of rural Americans and 44 percent of low-income Americans finding themselves without connectivity. This was an ominous backdrop for a global health crisis. In March 2020, just days after the World Health Organization declared a global pandemic, I published an op-ed in the New York Times warning that "the coming weeks" would "lay bare the already-cruel reality of the digital divide." I noted that "tens of millions of Americans cannot access or cannot afford the home broadband connections they need to telework, access medical information, and help young people learn when school is closed." About eighteen months later, before this same group last June, I spoke about how "the lack of broadband access replicated and reinforced existing systems of inequality," ultimately resulting in low-income Americans being significantly less likely to have a home broadband connection than their counterparts, and thus even more likely to find themselves left behind economically, educationally, medically, and more.

We needed change.

In the United States, we responded in kind—with a once-in-a-generation commitment to not just build new networks, but also help people afford and ultimately adopt broadband into their lives.

Let's start with building. Last November, Congress enacted the bipartisan Infrastructure Investment and Jobs Act to rebuild and modernize the American economy. Among other things, the Act directed more than $42 billion to building new networks that expand broadband. Qualifying service must be fast and high-quality—as I cautioned this group last year, 25 megabits down and 3 megabits up "just won't cut it" in the Internet of tomorrow. The new law recognizes this, requiring minimum 100/20 speeds for funded broadband projects.

In case you couldn't tell, I'm excited—thrilled—about the massive scale of infrastructure deployment the United States. But let me be plain. Building alone is not enough, because having a network nearby matters very little to people who

struggle to afford to pay for quality access. This is the case for an estimated 48 million American households today. During the pandemic's peak, Congress and the Commission chipped away at this problem with the $3.2 billion Emergency Broadband Benefit program, which provided low-income families with a discount on broadband as a form of temporary COVID-19 relief. We also established an emergency $7.17 billion facility to fund devices and connectivity for students, teachers, library patrons, and staff forced to work and learn off campus. Last year, when speaking before you, I expressed my hope for a long-term affordability solution. In November, Congress and the Biden Administration heeded the call, setting aside just over $14 billion for the "Affordable Connectivity Program," or "ACP."

ACP reduces internet costs for eligible households by up to $30 each month (and up to $75 in Tribal lands). That amount is proving sufficient to unleash free, quality internet across the country. As the White House announced last month at an event in the Rose Garden, internet service providers covering 80% of the U.S. population now offer high-speed plans at zero cost with ACP eligibility. This is no small feat, and my hope and expectation is that more providers, covering even more Americans, will unroll similar plans soon.

It is worth emphasizing just how much ACP moves the ball forward. It expands eligibility to cover more families in need, provides more stable and lasting support, and it marshals more service providers to participate in solving the affordability problem. It also benefits from unprecedented levels of funding for outreach and inclusion, with an eye toward maximizing enrollment equitably and in all communities.

Now, in case you couldn't tell, I'm thrilled about ACP, too. But, again, let me be plain. While we have done much, there is much more to do. Making the program actually work is a combination of ensuring awareness, developing trust, and executing on enrollment. And to be sure, this is some of the toughest work in the business. As of last week, 12.5 million American households had signed up for ACP. Yet almost three times that many remain eligible but unenrolled, and there is no single solution for closing the gap.

To start, we must meet these vulnerable households where they are. Data can help us identify who is signing up and who is not, and where in the application process they are being left behind if at all. From my perspective, the ACP data shows unusually low enrollment for households receiving federal public housing assistance, even though these households are automatically eligible for the subsidy

due to their participation in a qualifying federal program. This is an area where we can and must make up ground, and I've been working on a Pilot Program to expand ACP participation in these households. If we can help a family secure housing, we should be able to help them secure an internet connection as well. *Your Home – Your Internet*—and our collective step forward toward broadband for all.

But take note. This work is truly grassroots level in the United States, and I expect the same is true in your countries. From boardrooms to community organizations, from the federal level to the local level—we need to be thinking about ways to support it. For my part, I've been working with housing authority leaders who have been standing on the front lines of this issue. Last month, I visited Nickerson Gardens in Los Angeles, the largest public housing community west of the Mississippi River. I spoke with housing authority staff who were trying to get more people signed up, and with Ms. Chica, the President of the building's Resident Advisory Council, who was a fierce advocate leading the charge in getting her neighbors online. I followed it up with a trip to Casa Adelante, a new affordable housing development in San Francisco, and then a visit with the Oakland Housing Authority on the connectivity needs of the nearly 17,000 units there. Based on these conversations along with feedback from other communities across America, we're already preparing ways to improve the Pilot Program: making the application easier to complete; developing better inter-governmental coordination; using clearer language; and providing more opportunities for assistance during the sign-up process.

My work on the ground has also led me to push for greater investment in local efforts to build digital skills. The Bipartisan Infrastructure Law provides a significant head start by allocating $2.75 billion in grant funding to promote digital equity and inclusion. According to a recent study, 36 percent of lower-income adults in the United States have low digital skills. They can't sign-up online to get online, and they need help figuring out how to use broadband to improve their day-to-day lives. In some U.S. communities, tech-savvy, community-focused individuals, often young people, are stepping up to help solve this problem—we often call them "digital navigators." These are neighbors helping neighbors get online, send their first email, and experience the relief of seeing a doctor without leaving their house. They are the boots on the ground in the broadband for all movement, and we need more of them to bridge the digital divide.

Let me close on this topic with an appeal. Whether you're a regulator or in the industry, or somewhere else in the ecosystem, I urge you to find ways to

support this work, amplify it, replicate its success, and learn from the barriers those on the front lines are facing. This is the type of work that will win a more equitable future, and this is the type of work that will expand the size of our connected markets worldwide. If we are serious about bringing broadband to everybody, we must keep these efforts at the absolute front of mind.

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There is another prerequisite for claiming success in the broadband for all movement. And that is building a vibrant, innovative, and inclusive connected future that is also environmentally sustainable.

So far, big picture, the information and communications technology sector has kept a lid on its share of global greenhouse gas emissions, with estimates hovering around 2 to 4 percent. But today, I hope to convince you that our role in combating climate change is disproportionately large. On climate, I envision an ICT sector that punches well above its weight—and that has orders of magnitude more positive impact than its current share of global emissions might let on.

I see at least four bold paths to drive impact here. Let me briefly touch on each.

First, we must continue to find ways to do more while using less, and that begins with the way we use spectrum.

At the FCC, our mantra on spectrum has always been efficiency, efficiency, efficiency. As we optimize for the efficient use of spectrum, we need to squeeze the most out of a finite resource while at the same time building networks that draw less power. Bandwidth efficiency and energy efficiency are both must-haves if we want to manage spectrum in the public interest.

We're off to a strong start with 5G. We know that through beamforming, micro-sleep, and other power-saving techniques, migrating to 5G can drive a 10-fold reduction in the amount of energy required to transmit a given amount of data—even as it also packs more users, more data, and more throughput into each unit of bandwidth. This is the type of jump in efficiency that can make wireless innovation both cost and climate sustainable, and we must continue to reach for it as traffic demand picks up.

In doing so, we also need to consider the network as whole, and that includes user devices. It is not lost on me that billions upon billions more FCC-authorized devices are going to hit the U.S. market in the coming decade. Like many of you, I welcome the IoT revolution and believe in the economic—and environmental—promise that it holds. But with the sheer volume of production, use, and disposal in the pipeline, it is incumbent on all of us to make sure these devices are conscientiously deployed.

It is also not lost on me that any day now, and perhaps in a matter of hours, the United States Supreme Court will issue a decision that is relevant here. The case involves a particular, formerly proposed action governing carbon emissions by an agency in the United States, the Environmental Protection Agency, but the Court's ruling *could* alter the larger legal landscape of federal efforts to address climate change, and even our core understanding of administrative law. Now, I don't evaluate legal opinions sight unseen, but the point to be made here is that much of the law and substance here is still developing, and likely will be for some time to come.

Second, we need to realize our full potential to help other sectors consume less, too.

The promise here is enormous. As I mentioned, we're about to embark on a once-in-a-generation improvement to our roads, bridges, rail, and grid in the United States thanks to the bipartisan Infrastructure Investment and Jobs Act. That gives us an historic opportunity to leverage connectivity for smart infrastructure. We're also entering an era where we can collect, communicate, and analyze massive quantities of data to improve decision-making in real-time. Everything from traffic flow to energy transmission to orders of operation on the factory floor can benefit from data-driven efficiencies that were previously impossible.

For example, the Bipartisan Infrastructure Law includes $500 million in awards to support the ongoing efforts by smart cities to use wireless IoT sensors to reduce emissions and energy usage. I often use my hometown of Kansas City as a case study, where we're already harnessing wireless and AI to reduce traffic congestion. Energy companies themselves are using smart grids and smart meters to monitor usage and route energy based on real-time demand—and perhaps more critically, to bring renewable generation online at the right time. The Bipartisan Infrastructure Law supercharges these efforts, too, with $3 billion supporting a smart grid investment matching program.

But the use cases that we need to develop, deploy, and scale go well beyond smart infrastructure. In rural America, farmers are using wireless to support precision agriculture, which can reduce pesticide usage and water consumption while still increasing yield. Food distribution centers are using sensors to improve cooling efficiency in warehouses, with substantial reductions in their energy consumption. Carmakers are using connected cameras and sensors to improve quality assurance, manage inventory, and more, all of which will help them achieve higher levels of output with lower levels of energy consumption.

And these are just some examples. Accenture, a U.S. consultancy, recently estimated that 5G use cases will contribute to the abatement of approximately 330 million metric tons of CO_2 by 2025. If that degree of conservation comes to pass, it would account for a full 20 percent of the total reduction needed for the U.S. to reach its 2030 emissions targets. 20 percent. All from a sector that accounts for just 2 to 4 percent of total emissions. That is the very definition of punching above our weight. If we build out the environmental benefits along with the economic benefits of 5G, we can go a long way to lifting the world out of the climate crisis.

Third, industry-led initiatives must continue to play a significant role, from progressing towards reducing or eliminating the carbon emissions associated with their operations, to increasing renewable energy and minimizing electronic waste.

Many corners of the industry are already moving to respond to the climate change challenge. In 2019, I worked with Verizon on a first-of-its-kind commitment to make its 5G operations and related supply chain carbon neutral by 2025. Since then, all of the major wireless carriers committed to achieving carbon-neutral operations by 2035. In fact, T-Mobile had already sourced 100 percent of its electricity from renewables by the end of 2021.

Device makers, chipmakers, equipment manufacturers, and cloud service providers have also joined the cause, with commitments to reduce or completely offset their own carbon emissions. Some have gone beyond carbon neutrality and are aiming for net-zero, or even carbon negative, operations with their commitments. And I highlight that Ericsson is targeting net zero in its own operations by 2030 and across its entire value chain by 2040.

Keep on pushing—and consider this part of the on-going dialogue between us. Let me know how things are working, or not. Because if companies make little effort to address the externalities of their own emissions, then they punish competitors who are doing the right thing. That's not just unfair—it also

undermines the collective efforts of the rest of us. And if left unchecked, it could unravel incentives for responsible action market-wide, at a time when we need more—not less—focus on this issue.

Fourth, we must collectively do our part to mitigate climate change's harmful effects at the network level. Robust, resilient networks that are there when we need them are a great start. With the weather patterns we're seeing, we should invest in networks that can stand up to the climate challenge, and that will keep us connected—and safe—in the wake of storms, floods, wildfires, and other disasters.

How will we judge success here? A few thoughts. As with the digital divide, our focus must shift to the work that is still left undone. Now, some have suggested that if you take the ICT sector's total emissions, and offset them by the reductions that connectivity-driven efficiencies will enable, then you will get to a place where the math says that we have little left to do. I want to push back on that thinking, which doesn't hold up for a few reasons.

Even if we hold ICT emissions constant, the sector's proportional share of global emissions will increase dramatically as other sectors ratchet down their emissions to meet their own 2030 and 2050 targets. That means the ICT sector will lose the argument that it has been doing its fair share in due course—unless it substantially reduces its own carbon emissions. Now that is just simple math, and we'll get ahead of it if we're smart.

Further, we should not assume that ICT emissions will remain anything close to constant. We need to be forward-looking in our climate commitment, and sharp rises in consumption are on the horizon. A huge component of the ICT footprint comes from manufacturing user devices. Yet, as I mentioned, the number of connected devices is expected to multiply dramatically in the coming years and could reach 150 billion by the end of the decade. The network itself will become much denser, with more equipment operating in more places to provide next-generation levels of performance. Data center emissions are also poised to increase as the shift to cloud-native applications continues, and as AI and other computation-heavy technologies become even more commonplace. And while 5G may be a vastly more efficient technology on a per-bit basis, total bits will soar as new networks take off, an outcome that we have seen with every generational advancement in wireless technology.

So what can we do? Well, to start, we should be as aggressive as possible with our climate commitments, and we should be as comprehensive as possible in

our effort to comply with them. We should treat as much of the value chain as within our control when we calculate our emissions to make sure we incentivize cleaner behavior across the board. We should recognize ICT for the dynamic sector that it is and assume that efficiency will drive more usage in our calculations—an assumption that is no different from betting on our own success.

We also need to focus on e-waste to reduce emissions not just from disposal, but from the production phase as well. With so much of the ICT footprint attributable to embodied emissions—and an explosion of low-cost IoT on the horizon—we should find ways to keep devices in the commerce stream for as long as they are useful, so that we can amortize all the work—and emissions—invested in their production over a longer lifetime.

On all of these issues, we'll continue to work with you at the FCC. We've been hard at work already unleashing more spectrum to make efficiency-driven 5G use cases possible. We've also focused on some of the more intricate details in our spectrum decisions. Just a few weeks ago, for example, we began an inquiry to bring more wireless connectivity to offshore ships, sensors, and platforms, to support clean energy solutions like wind power generation. In 2020, we worked to realign spectrum eyed for smart grid deployments in the 900 MHz band. We've also opened a comprehensive and wide-ranging proceeding on network resiliency, with an eye toward maintaining equal access to communications in an era of more frequent—and more severe—climate-based events.

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We have come a long way since last June, and there is every reason to be excited about our shared outlook for tomorrow. With broadband ready to take off, though, we have no time to lose in connecting the millions of households that remain at risk of being left behind. We also must raise our ambitions as we work toward an ICT sector that leads the way on sustainability. I thank you for the opportunity to speak with you today, and I look forward to working together on these important issues.