

Keynote Remarks of Commissioner Geoffrey Starks

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Thank you, Blair, for inviting me to speak with you all today. As we prepare to celebrate Thanksgiving next week, it's appropriate to take stock and look to the future. With that in mind, I'd like to reflect on our nation's progress on 5G and observe a few of the related issues facing us in 2022 and beyond. Since the first mobile deployments in [2019](#), US 5G service and adoption have steadily expanded. The Commission has played a key part in that growth, and we must ensure that it continues. But we must also draw lessons from that work, so we're prepared for the days ahead.

American wireless providers are investing billions in 5G. Just last year these carriers spent \$30 billion on infrastructure, and in the last 10 years, they've [invested](#) over \$265 billion. The next year should see some of the greatest growth to date in terms of both the rollout and adoption of 5G. Our auction of spectrum in the 3.45 GHz band has reached nearly \$22 billion in proceeds and is now the third largest spectrum auction in FCC history. We should turn to the 2.5 GHz band once the 3.45 GHz auction is complete.

Coupled with the 100-megahertz tranche of the C-band that, as we sit here, is now scheduled to begin use in January, wireless carriers will soon have access to critical mid-band spectrum that will allow them to increase their speeds, cover larger areas with less infrastructure and compete more effectively.

Meanwhile, consumers are steadily upgrading to 5G-capable devices as manufacturers debut new models and carriers offer aggressive promotions. According to 5G Americas, North America [will have](#) more than 500 million 5G connections in the next five years. One major carrier recently [announced](#) that more than one quarter of its subscribers had upgraded to a 5G-capable device.

As this audience knows, however, 5G is more than faster speeds on your smartphone. We're now seeing 5G use cases that will transform our way of life. For example, energy companies have long relied on wireless technology to manage their networks and communicate with their employees. As each year brings another round of extraordinary storms and other weather events, these companies are looking for ways to increase their efficiency while reducing carbon consumption and increasing resiliency. With its ultra-fast speeds, massive bandwidth, and low latency, 5G will help these companies seamlessly integrate new renewable energy sources, immediately address potential outages and pipeline breaks, and incorporate smart meters to reduce customer bills.

Those same qualities could also make 5G a game-changer for telehealth. Coming from a family of physicians, I've strongly supported telehealth initiatives since before I became a Commissioner. The COVID-19 pandemic has accelerated Americans' embrace of telehealth for tasks like examinations, mental health counseling, and remote patient monitoring. 5G's capabilities will further expand the opportunities for telehealth treatments. For example, at [Columbia University](#), physical therapists are using 5G technology to work remotely with patients via virtual reality. 5G's low latency and high speeds allow the therapist and patient to conduct exercises as if they're in the same room. Similar experiments are taking place in [the UK](#), where

5G technology recently allowed a clinician to perform a procedure remotely using VR equipment and zero-latency video streaming.

5G also has tremendous potential to help with our supply chain. Ports and warehouses already use wireless technologies to connect their devices and monitor their operations, but 5G's capacity is exponentially greater. While 4G allows communications between up to 4,000 devices per square kilometer, 5G will allow communications between up to [1 million](#) devices in the same area. When you combine this capacity with edge computing, the possible efficiency gains are enormous.

Private 5G wireless networks will be able to connect thousands of IoT devices, manage inventory, and operate robots at fulfillment centers and docks so products can get to customers as fast as possible. In the [Port of Barcelona](#), operators and pilots are already using 5G networks paired with artificial intelligence and edge computing to manage the flow of 9,000 ships each year.

These are exciting developments, but our experience with COVID-19 has underscored that access to high-speed broadband services like 5G affects our access to employment, education, healthcare, and more. These services can either create new opportunities to draw us together or divide us further if service isn't available to everyone. Americans of color remain particularly likely to lack a home broadband connection. Pew [data](#) released this Summer shows that 29 percent of Black adults and 35 percent of Latinx adults do not have a home broadband connection. A recent Joint Center [study](#) found that this problem is even worse in the Black Rural South, with nearly [40 percent](#) of Black Americans reporting that they lack home broadband service.

Some of this digital divide is due to a lack of available service, but many urban residents lack broadband because they simply cannot afford it. Others, particularly seniors, may not subscribe because they aren't sure they need it or understand how to use it. To address these issues, we need to do three things:

- [#1: Fund broadband infrastructure buildout](#). The Bipartisan Infrastructure deal presents a once-in-a-generation opportunity to connect millions of Americans without access to broadband service. But the FCC also needs to generate accurate broadband maps and data, so the money gets to the right locations. And we need to ensure that our own programs, including the second phase of the Rural Digital Opportunity Fund and the 5G Fund, reflect current needs and are administered properly.
- [#2: Increase broadband affordability](#). Congress has already passed important programs to help Americans with their broadband bills and connect schools and libraries. The infrastructure deal continues the funding for the affordable broadband program, and I'm committed to ensuring that every qualified American learns about the program and has an opportunity to apply.
- [#3: Increase digital skills](#): According to a recent Pew [study](#), [30 percent](#) of Americans say that they either need someone to help set up a connected device or have little or no confidence to use a computer or other device online. This applies particularly to our senior citizens. The Commission needs to work with libraries and community organizations to build confidence and skills among these folks, so they feel confident using the Internet.

5G is a critical part of bridging the digital divide, and every community must have access to this important service. Mid-band spectrum will be essential to achieving this goal, and since becoming a Commissioner, I've focused on making as much of this spectrum available as fast as possible. As I noted earlier, the next year should see a dramatic expansion of mid-band spectrum availability. Other spectrum bands are coming. While much work lies ahead, I am optimistic that we will be able to work with our federal partners to make additional mid-band spectrum available in the lower 3 GHz band and elsewhere. The work will not be easy, but the FCC is poised to work with this Administration to develop a national spectrum strategy that will ensure the wireless industry has the spectrum it needs to fully deploy 5G across the country, while protecting important incumbent operations from harmful interference.

As we develop that strategy, we should take stock of some of the policy issues we will have to address in the next few years regarding future spectrum auctions. The Commission must balance our goals of promoting competition, encouraging innovation, and ensuring that all Americans have access to high-quality, secure, and affordable service.

One such issue is spectrum caps. The 3.45 GHz auction rules included a 40-megahertz cap on the amount of spectrum a bidder could win in each Partial Economic Area. Once the auction is complete, the Commission will need to review how that cap affected the auction and whether to adopt similar measures in the future. More broadly, we will also need to consider the recent [Petition for Rulemaking](#) seeking establishment of a mid-band spectrum screen as well as President Biden's [Executive Order](#), which calls for the Commission to adopt auction rules that would "prevent spectrum stockpiling, warehousing of spectrum by licensees, or the creation of barriers to entry."

Auction formats are another issue. As we wrap up the 3.45 GHz auction, we will likely turn to the 2.5 GHz band next. Historically, the Commission has handled wireless auctions through a simultaneous multiple round format, where bidders compete for wireless licenses around the country over many rounds of bidding. But the Commission is also considering a single-round approach for the 2.5 GHz band. The theory is that a single-round format will level the playing field between small and larger bidders, whereas a multiple-round approach might favor bidders with greater financial resources that can shift their funds between locations as the auction proceeds. But while some small carriers support a single round approach, other small carriers prefer the traditional SMR format because it allows them greater visibility into pricing and to use their funds more efficiently.

We will also need to examine the issue of reserve prices. The Commission has a statutory obligation to ensure that our spectrum auctions raise at least 110 percent of the estimated relocation or sharing costs of any incumbent federal operations. Those costs can be significant. For example, the 3.45 GHz auction has a \$14.7 billion reserve price based on the cost of accommodating and relocating certain Department of Defense operations in the band. Both before and even during the auction, there was speculation about whether the auction would meet the reserve price. While the 3.45 GHz auction has surpassed that figure, we may face similar challenges with future proceedings, including any action regarding the lower 3 GHz band. The Commission will need to work with NTIA, DoD and other Federal stakeholders to calculate their reasonable relocation and sharing costs but we must also consider how our licensing and auction rules will affect that reserve price and the likelihood of reaching that figure.

Finally, future spectrum proceedings will need to address the issue of exclusive versus shared licensing. We've favored an exclusive licensing model in most of our mid-band spectrum proceedings. This approach has several benefits in terms of raising funds for the Treasury and allocating spectrum to well-funded licensees who want to use the spectrum for 5G as fast as possible. But it also results in most of this valuable spectrum – particularly in urban and suburban areas -- going to the largest carriers.

In addition, because we must relocate incumbent operations, exclusive licensing contributes to higher reserve prices, thereby requiring us to adopt licensing rules and auction procedures that favor those same large carriers. Spectrum sharing approaches like that in the CBRS band might result in greater licensee diversity, lower relocation costs, and spectrum efficiency, but may be more complicated to create, take more time to establish, and present a greater risk of not meeting the reserve price.

The coming year should be a momentous time for 5G and broadband expansion generally. No matter what, I will continue my focus on ensuring that FCC policies support the right service in the right locations, keeping our future needs in mind even as we seek to reach Americans where they are today. While the technologies and specific challenges are constantly changing, my core goal has remained the same since joining the Commission – every American should have access to secure, reliable, and affordable broadband service. Thank you again for inviting me today, and I look forward to the discussion.