REMARKS OF
COMMISSIONER GEOFFREY STARKS
AT THE OPEN TECHNOLOGY INSTITUTE EVENT, "LEO SATELLITE CONSTELLATIONS: WHY SMART SHARING RULES MATTER IN SPACE"
OCTOBER 25, 2022

Good morning, everyone, and thank you, Michael, for the introduction. To New America and the Open Technology Institute, thank you for organizing this event and inviting me here today. And to my colleague Commissioner Simington, it's a privilege to share the stage with you.

Now, if you've been listening to me the past few years, you'll know just how thrilled I am to live in a golden era of commercial space. I've been awed by the progress we've seen from NASA and its commercial partnerships—which have unlocked private-sector achievement at an absolutely frenetic pace. Reusable launch vehicles are not just here, they're reaching for serious lift capacity. Commercial human spaceflight isn't around the corner—several companies are doing it today, and it's about much more than just tourism. Just this past month, we saw the sixth commercial crewed flight shuttle astronauts up to the ISS. Days later, the fifth flight splashed down safely after a successful 170 days in orbit.

The satellite industry has made enormous progress, too, and it's hardly unrelated. Satellites have become smaller, lighter, and more cost-effective to build—and build quickly—thanks to innovation in modularity, component design, and the manufacturing process. At the same time, we've seen growth in launch opportunities at a dramatically lower cost per launch, with an expansive menu of rideshares, tugs, and dedicated flights that work for large and small payloads alike. We're also continuing to see progress on the ground segment, toward terminals that are smaller, more efficient—hopefully cheaper—and in some cases, even interoperable. Collectively, these trends are opening new possibilities for everything from niche missions to large constellations. They're pulling down entry barriers left and right, giving way to a vibrant ecosystem of services that rely on space-based connectivity.

As a Commissioner focused so deeply on the digital divide, I'm especially thrilled about what a golden era in commercial space could mean for broadband. New satellite broadband systems promise more choice and better performance for many Americans, including those who live, work, and travel in some the toughest-to-serve places. They can even improve the reach of terrestrial broadband networks, through satellite backhaul and, perhaps one day soon, base stations flying in low-Earth orbit. Importantly, these systems are also improving the resilience—and agility—of our broadband infrastructure. They're empowering first responders, survivors, and governments to ad-hoc more powerful and more secure networks more quickly, sometimes mere moments after disaster strikes.

All of this progress is exciting to witness. Now, I'm optimistic that our success in space will only continue to build, even if we see some turbulence along the way. But for that to happen, we can't take a dynamic space economy for granted. We need to do our part to keep the momentum going, and to enable sustained innovation of the kind we've seen to date. That is what I would like to talk to you about today.

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Making space innovation sustainable is a multidimensional problem. But it begins with focusing on competition as a pillar of our strategy in space—including our strategy on spectrum access.

It's almost hard to believe. Nearly six years have passed since our first Ka/Ku processing round for new NGSO systems. Let's take stock, briefly, of what has happened since. The FCC moved quickly. Within just a few weeks after the application window closed, we proposed new rules to accommodate as many NGSO new entrants as possible.

Spectrum sharing, of course, was the key focus of that proceeding. In 2017, we moved to new rules, including a default spectrum-splitting procedure that would facilitate sharing among systems licensed in the same processing round. The basic concept behind the procedure—segmenting the band during in-line events to encourage private coordination—was not unfamiliar. In fact, it dated back to a previous Commission decision circa 2002.

The default rule showed progress, but it hardly settled the matter. Private coordination among NGSO systems remains a work in progress. At the same time, more NGSO systems applied for the same spectrum, prompting another processing round. Not just in Ka/Ku, but in the V-band as well—where we're also on round number two. The music didn't stop there, either. We've continued to see even more applications, plus announcements of planned systems that, one day, may take their own run at Ka/Ku and or the V-band too.

Now, I like to be cautious when making predictions about outer space. But when you look at our history, this much becomes clear. The days of holding a processing round and expecting the outcome to survive decades, with just some minor tweaks—mostly to account for systems that drop out—well, those days are probably over. There's too much interest from new operators who want in, and existing operators are evolving to new technology generations much more quickly.

Don't get me wrong—this is a very good place to be. But it also raises difficult questions about spectrum rights. Putting aside the question of how systems authorized in one processing round should protect each other, what level of protection do they owe other systems that came first? How do you define that protection level and measure compliance with it? How long should that protection last? In the long run, what balance will advance the public interest the most—and result in the most robust, innovative, and competitive set of satellite services across all operators? At what level of specificity does government need to decide these issues, if the goal is to encourage private agreement?

We have a pending NPRM exploring these questions, and our work on it continues. I wanted to share some additional guidance on how I think we can sustain a competitive environment.

First, if we want to attract the investment required to launch, maintain, and upgrade a satellite network, then the satellite spectrum we assign must remain investment-grade. So while satellite spectrum rights can and should be shared, they also need to remain sufficiently stable and secure for companies to build out their systems.

Second, we must aspire to more than just a few NGSO broadband systems in orbit. Satellite consumers deserve choice, and choice is the only way to drive sustained innovation. Choice becomes especially critical for users that depend uniquely on these constellations—users for whom other systems, terrestrial or GEO, just can't substitute. Mobility users, government users, and users in chronically underserved areas could be a part of this story, and we should keep our eye on them as we move forward.

Finally, we must keep looking for ways to promote spectral efficiency in satellite—which is something I emphasized when we adopted the NPRM.

Systems that don't use spectrum efficiently burden the operations of those systems that do. They also can complicate, or even foreclose, new entry—and make the problem of encouraging new competitors, while also preserving spectrum access for existing ones, much more difficult to solve.

But spectral efficiency isn't just about ensuring that systems are good sharers. It's also about evaluating interference accurately, and defining it reasonably, when figuring out <u>how</u> to share. Coordinating around actual interference, and not paper interference, leads to more users being served, with better service, in the same amount of spectrum. The closer we can come to modeling actual results, the better off we'll all be.

I urge industry to explore the full realm of possible here. Because when you begin to unpack real-world impacts, the effect of spectral efficiency on competition and innovation becomes crystal clear. When a system must coordinate around another system that isn't built to tolerate interference—or around protection criteria that overestimates when service impacts occur—the result could be less service, slower service, or no service in key areas. Even at a density of just 100 people per square mile, it doesn't take much for overconservative assumptions to affect the services available to millions of Americans.

These constraints undermine the business case for satellite broadband and could discourage some competitors from building at all. They'll view the bands as too saturated and move on—and that's bad for competition. Other competitors may find ways to compensate for the inefficiency, but their efforts will come at a cost. They may decide to launch more satellites, for example, which adds time, money, and risk. That could lead to millions of Americans waiting longer for competitive service—and delayed entry is a competition issue. It also could raise consumer costs—which is the quintessential competition issue. It could even lead to more debris risk—which is also a compelling issue. So, in my mind, spectral efficiency is about much more than just fairness. It's about sustaining as much innovation as we possibly can using a scarce resource like spectrum.

I'll leave you with one last thought about efficiency. From dynamic databases, to tiered access models, to random access protocols, we've consistently leveraged innovation to help us cram as much usage into shared terrestrial bands as possible. We should be equally forward-thinking when it comes to satellite. The scenarios are no doubt different, and the solutions will be, too. But space is getting crowded. We can't shy away from new ways of doing things, even if it takes some work to get there. And I know that the satellite industry, which has been sharing spectrum for years, will be up to the task when the time comes.

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Let me close by observing that spectrum isn't the only scarce resource that we need to allocate wisely. If we want to sustain space innovation over the long haul, we also need to be judicious in how we use our orbits.

Now, I don't need to remind this group that orbital debris is a problem. But what I would emphasize is this: we cannot maintain a low-barrier environment in space unless we manage debris risks successfully, and the impacts of unmanaged debris risk on the space economy could be felt much sooner than we think.

Just for a moment, let's put aside what are clearly worst-case scenarios, like a chain reaction of collisions making LEO virtually unusable. Well before anything approaching that occurs, I'm concerned that debris proliferation will make it much tougher, and much more expensive, to fly a mission in space. The financial risks posed by debris will become more material, and that could affect the availability and price of investment. At the same time, conjunctions will grow even more frequent—including actionable ones that require costly maneuvers. That, in turn, will require operators to devote more human, financial, technological, and operational resources into risk management, raising the cost profile of planned missions.

In combination, these impacts could resurrect some of the entry barriers that we've seen knocked down over the past 10 years, resulting in less competition, less innovation, and an overall less dynamic space economy. And remember: each collision or debris-generating event releases thousands of large objects, and countless more lethal but non-trackable ones. It may not take very many of them to upend the status quo.

I made this same point last September when we adopted a new rule requiring post-mission disposal in LEO in less than five years. I'm glad we took that step, and look forward to the next phase of our debris mitigation efforts. We must stay ahead of the problem.

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Thank you, again, for your time today, and enjoy the rest of the program.