

## Competition in the Low Earth Orbit Satellite Industry (Part 2)

### Introduction

00:01 – 00:15

*Tom Romanoff - Director of the Technology Project, Bipartisan Policy Center*

Hello again and thank you for joining us for part two of this video series on competition in the low earth orbiting satellite space where we continue to hear from some of the top experts on how government can spur competition in the industry.

### What considerations will the FCC need to take as the number of satellites in orbit increase?

00:29 – 2:12

*Harold Feld - Senior Vice President, Public Knowledge*

The important considerations for the FCC are, number one, how to manage this, what is a limited resource, the amount of space that's available in orbit, when we do not have international treaties that govern this. One of the things about geostationary satellites is we have an international treaty going back to the 1970s where every country has a certain number of slots for those orbits. They're allocated through the International Telecommunications Union. Countries work with each other. And you know, as a country, how many satellites you can authorize at least for U.S. launch based on the number of slots that are available. We don't have an international treaty system that governs the number of slots available. So there are two concerns for the FCC. One is how do you divide up the space above the United States so that you can have multiple functioning services with sufficient capacity to deliver the kind of service that people need and expect? And how do you address the concerns of other countries and, ourselves, deal with other countries, that are getting into the launch business? We care about the satellites over the United States, but those satellites are in orbit. They pass over other countries as well and take up space potentially in their sky. Their service satellites pass over our country. Some of them may offer service in the United States, but again, we have American companies that want to get up there. And if the space is full then space is full.

2:13 – 3:06

*Whitney Lohmeyer - Assistant Professor of Engineering, Olin College*

The FCC has already started thinking about orbital debris mitigation. I would say sustainability from the space perspective, as well as from the limited resource of spectrum, are a couple of the primary considerations the FCC will need to continue to think about. We fortunately have not had in this country any major issues in orbital debris in the last few years since the rise of these LEO constellations, really, which I would say has actually been ten years. Onweb filed for their first filing internationally in 2012. And the FCC is doing its part and ensuring that orbital debris is mitigated. And we have to come together as an industry and put forth some standards and practices to make sure that continues.

## Are there international considerations that the FCC needs to consider?

03:12 – 04:37

*Mindel De La Torre - Chief Regulatory and International Strategy Officer, Omnispace*

I think that the United States and the FCC, as sort of the implementing regulatory agency of the ITU, International Telecommunications Radio Regulations, which is a treaty, we need to be working within those parameters. And if we don't like the parameters that are there and we see that changes need to be made, then we can make those proposals to a World Radio Communications Conference. And there's one coming up this year. But you have to basically get your agenda in for the for the next year, for the next world conference, which will be in 2027 after this one. So, you know, I think that one of the things that the ITU - that the FCC needs to be thinking about is what ITU rules are there. And they also need to think that that these NGSO systems are, by their nature, global. They're not just one country. So you know, you have some GSOs that only provide service to the United States and Canada because of the footprint for those GEOs. But NGSOs are, by their by their nature, global. And so having an international harmonized spectrum allocations, I think, is really important to work and so the U.S. is going to have to work with its international partners to maintain that harmonization to the greatest extent that they can.

## What are the immediate next steps for the FCC to promote competition?

4:41 – 5:25

*Julie Zoller - Head of Global Regulatory Affairs, Project Kuiper at Amazon*

Stand up the space bureau, achieve a good outcome at the ITU's World Radio Conference that takes place at the end of 2023, where a number of issues affecting non-geostationary systems are on the agenda. Address the policy issues that are currently in front of the Commission that approach competition. In particular, make the 17 gigahertz spectrum available to NGSOs and updating the rules for sharing between non-geostationary systems, known as the 25.261 proceeding.

05:26 – 06:26

*Whitney Lohmeyer - Assistant Professor of Engineering, Olin College*

The immediate next steps for the FCC to promote competition are to continue focusing its efforts on establishing its Space Bureau, which was recently under the Chairwoman Rosenworcel's direction, created. And in so doing this will focus a group of engineers, policymakers, lawyers at the FCC, focus their attention on space, specifically. Right now, it's the International Bureau, which has a broader range of responsibilities. So continuing to establish this, continuing to review the existing rulemaking so the NPRMs on NGSO sharing how these systems will exist and promote competition and innovation. And I think under that Space Bureau entity, continuing to think about orbital debris and space sustainability.

06:27 – 07:42

*Mindel De La Torre - Chief Regulatory and International Strategy Officer, Omnispace*

Well, let's just say that establishing the Space Bureau, I think, is a great immediate next step as it basically elevates the satellite industry to the same level of regulatory protection that the terrestrial industry has, as well as the broadcasting industry, you know, at the FCC, so that everyone basically has a voice, an equal voice. And it shows that the FCC is really recognizing those achievements in the space economy now, which when I was there, it was just starting again. But it was pretty I would say static when in, from 2000, well from 2000 and whatever, and I think people thought, oh, it's the end of the satellite industry? No more. Now everybody's sort of saying, oh my gosh, we really, this is a growing industry. And, you know, the possibilities are just enormous. So I think that

having that ability to, and resources are super important, obviously, to be able to license means that there's going to be more competition out there. So I think that the FCC has always been a leader in in the space area, but now it's going to have an even better opportunity.

07:43 – 08:46

*Harold Feld - Senior Vice President, Public Knowledge*

The FCC needs to resolve a number of its pending rulemaking provisions. Those rulemaking deal with the sharing of satellite spectrum by competing satellite systems. Right now, there is a first come, first serve method that's very bad for competition. The FCC needs to standardize the way in which it will allocate the available slots, the positions for these satellites. The FCC needs to monitor standards to enhance interoperability so that satellite companies can roam potentially on each other's systems the same way that on terrestrial, mobile, wireless services we encourage competition by having roaming so that when one provider lacks capacity they can continue to compete in the area.

8:47 – 9:29

*Mike O'Rielly- Strategic Advisor & Advocate, MPOrielly*

The commission has an open proceeding to try and modernize its regulatory approach on both for the GEOs and the NGSOs. And they're working through that. There's a couple of issues that are that are pertinent to the focus. In particular, for LEOs you have to figure out how much interference protection do you provide for those that are the incumbents or those that were in the first round of applicants versus the second round? How do you deal with different rounds? And then within a round, how do you deal with different competing protections? And that's what the commission is kind of tackling and it gets into the issue of throughput and what are the issues for interference that are so critical going forward?

### What are some relevant issues pertaining to the spectrum?

9:34 – 10:26

*Julie Zoller - Head of Global Regulatory Affairs, Project Kuiper at Amazon*

I mentioned earlier the non-geostationary sharing rulemaking. There are three important steps the Commission should take to promote competition among non-GSO systems in this rulemaking. Establish a permissible interference metric to govern spectrum sharing between earlier and later license systems, require operators to share information so that they can identify real potential for interference, and then sunset priority rights for earlier license systems after six years. The record shows that adoption of these measures is timely and there's no need to wait for further rulemaking.

### Where do you see the LEOs industry in five years?

10:31 – 11:00

*Mike O'Rielly- Strategic Advisor & Advocate, MPOrielly*

That's a tough one. But to be honest, I tend to see two to three big players, well-capitalized, successful in the marketplace. We've had many more applications. Some have matured and some have failed. And I suspect that we'll see some consolidation at some point. But I think two or three is probably a realistic expectation of what we could see from this, from number of LEOs that can survive in the marketplace. We'll see; the consumers will decide that. But I think that that's probably likelihood.

11:01 – 11:31

*Whitney Lohmeyer - Assistant Professor of Engineering, Olin College*

In five years, I'm optimistic that the LEO industry will continue to exist, for one, and we'll be going direct to cell phone. So right now StarLink, Oneweb are actually transmitting down to antenna on the ground that we call a user terminal. This is common across these systems, just due to the power that's required to transmit up to these satellites thousands of kilometers away. In five years, I said I'd like to see it go direct to cell phone and offer broadband connectivity.

*11:32 - 13:25*

*Kevin Bryan - Associate Professor, University of Toronto*

I mean, the cost of putting a satellite into space is going to be 10x lower than it is today. The number of companies that make complementary technology, so technology that helps me run launches more successfully, that helps me beta test my CubeSat or my Nanosat, my small satellite, before I put it into space, they'll be more well developed. You know, we already have companies that think of it like Amazon for space parts. These companies already exist and they're only getting better. You know, we know the history of technologies that standardize tools and standardize inputs can be really good for allowing non-specialists to enter an industry when they have knowledge in kind of related industries that are really important. So I think we're going to start to see low earth satellites being used, not just for kind of traditional sensing or telecom applications, but being used for very, very, very specific applications. I saw, for example, this week a new company announced a product where you can order a live satellite shot, high definition satellite shot of anywhere you want, I think anywhere in the U.S. is in the coverage, for \$175. So this obviously wasn't possible in the past. But now, thanks to these reductions in the cost of putting something in the space, you can get every single day a live satellite shot of, say, a build site, or a mine, or a forest you're worried about that's being cut down in Brazil or something like that -- \$175 bucks. Which is much, much cheaper than other monitoring tools we had in the past. And the use cases for very cheap low earth satellites are only going to increase. I can't even tell you what they would be because we're relying on the other seven and a half billion people on earth to, now that they have access to space, to apply their own ideas to improving technological progress and improving how we can use things up in the sky to make earth better.

*13:26 - 14:12*

*Mindel De La Torre - Chief Regulatory and International Strategy Officer, Omnispace*

Well, I see a continued momentum toward standardization of what they're calling 5G non-terrestrial networks, which is through actually a terrestrial standards body, which is known as 3GPP. And just last year they issued Release 17, which for the first time ever had a satellite component to a terrestrial standard for 5G. So this is really exciting for us and it's exciting for all the companies that are looking to do direct to device which I was explaining earlier. And so, I think that that's something that we'll be seeing and it'll probably be seeing some consolidation because right now there's just so many players out there.

*14:13 - 16:43*

*Harold Feld - Senior Vice President, Public Knowledge*

I think that we're going to see a number of these would be services consolidating or failing to get off the ground. This is an expensive business and we're still feeling our way through. So I expect that the industry will ultimately mature into a relatively small number of players. I also expect that this is not a competitor to traditional broadband service in most of the United States. This isn't going to compete with fiber, this doesn't compete with cable. I don't expect anybody in urban areas or even suburban areas or rural areas where there is build-out of systems to choose satellite over a terrestrial service provider. But there are a large number of niche cases that together accumulate into a viable business. There are, even with the billions of dollars that we are investing now in

deploying networks to rural areas, there will always be areas that are out of reach of terrestrial services. There will be a lot of people who will want satellite backup in case there are reasons why the terrestrial service goes down, such as a natural disaster. There is Natural Disaster Recovery Service where the ability to bring satellite into an area quickly and easily with relatively low power, self-contained low power for the customer unit, because you don't have to power the whole network, the network is powered from someplace else and is self-powered from the satellite, is of enormous benefit in natural disaster recovery. Finally, we are seeing in Ukraine a test of the importance of this for national security and for situations where you do not have the infrastructure established, where you need service for a variety of reasons. And finally, there is vacation, leisure, mobile service. SpaceX is already selling a service for RVs. There's a lot of these use cases that are out there which in the aggregate will create a viable satellite business even if we don't expect to see satellite competing directly with the likes of Comcast and Verizon.

16:44 - 17:13

*Julie Zoller - Head of Global Regulatory Affairs, Project Kuiper at Amazon*

I've been involved with LEO constellations since the late nineties when the international rulemaking process started, and it's incredible the acceleration that's happened over the past few years. I see LEOs as the leading edge of the space industry.

**Thank you for joining us. Stay tuned for our next video on the basics of LEO satellites.**