

LIFTOFF: UNLEASHING INNOVATION IN SATELLITE COMMUNICATIONS TECHNOLOGIES

HEARING
BEFORE THE
SUBCOMMITTEE ON COMMUNICATIONS AND
TECHNOLOGY
OF THE
COMMITTEE ON ENERGY AND
COMMERCE
HOUSE OF REPRESENTATIVES
ONE HUNDRED EIGHTEENTH CONGRESS

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FRANK PALLONE, Jr., New Jersey *(ex*

officio)

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LIFTOFF: UNLEASHING INNOVATION IN SATELLITE COMMUNICATIONS TECHNOLOGIES

WEDNESDAY, FEBRUARY 8, 2023

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:30 a.m., in room 2232, Rayburn House Office Building, Hon. Robert E. Latta (chairman of the subcommittee) presiding.

Members present: Representatives Latta, Bilirakis, Walberg, Carter, Dunn, Curtis, Joyce, Weber, Allen, Balderson, Fulcher, Pfluger, Harshbarger, Cammack, Obernolte, Rodgers (ex officio), Matsui (subcommittee ranking member), Clarke, Veasey, Soto, Eshoo, Cardenas, Craig, Fletcher, Dingell, Kuster, Kelly, and Pallone (ex officio).

Also present: Representatives Johnson and Schrier.

Staff present: Sarah Burke, Deputy Staff Director; Michael Cameron, Professional Staff Member, Consumer Protection and Commerce; Nate Hodson, Staff Director; Tara Hupman, Chief Counsel; Noah Jackson, Clerk, Communications and Technology; John Lin, Senior Counsel, Communications and Technology; Sean Kelly, Press Secretary; Peter Kielty, General Counsel; Emily King, Member Services Director; Tim Kurth, Chief Counsel, Consumer Protection and Commerce; Giulia Leganski, Professional Staff Member, Communications and Technology; Kate O'Connor, Chief Counsel, Communications and Technology; Michael Taggart, Policy Director; Evan Viau, Professional Staff Member, Communications and Technology; Jennifer Epperson, Minority Chief Counsel, Communications and Technology; Waverly Gordon, Minority Deputy Staff Director and General Counsel; Tiffany Guarascio, Minority Staff Director; Dan Miller, Minority Professional Staff Member; Elysa Montfort, Minority Press Secretary; Joe Orlando, Minority Senior Policy Analyst; Greg Pugh, Minority Staff Assistant; Caroline Rinker, Minority Press Assistant; Michael Scurato, Minority FCC Detailee; and Johanna Thomas, Minority Counsel.

Mr. Latta. Good morning, and I'd like to call the Subcommittee on Communications and Technology to order. And the Chair now recognizes himself for 5 minutes for an opening statement.

OPENING STATEMENT OF HON. ROBERT E. LATTA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OHIO

Thank you to our witnesses for agreeing to appear in person to provide your expertise on five pieces of bipartisan legislation and

discussion drafts that aim to promote U.S. leadership in satellite communications technology. Last week, the subcommittee held a hearing to discuss the state of the satellite marketplace in the United States. That hearing provided insight into the challenges and opportunities in the rapidly changing satellite marketplace.

Today, we will hear from a different slate of witnesses representing a wide range of the satellite industry and how the legislative text being considered would impact the current regulatory landscape. The five pieces of legislation include the gentlelady from Washington, the chair of the full committee, and the gentleman from New Jersey, the ranking member, their Satellite and Telecommunications Streaming Act. This legislation would codify a statutory framework and streamline the Federal Communication Commission's satellite licensing process by clarifying what information the FCC should consider in an application and put shot clocks on how much time the FCC has to complete its review and grant a license.

Next, we will discuss the Secure Space Act led by the ranking member, the gentleman from New Jersey, and the gentlelady from Washington, the full committee chair, which would prohibit the FCC from granting authorization for a satellite service to operate in the United States if such satellite service poses a national security risk. This bill—bipartisan work on this committee to secure our Nation's communications networks in the ground by now looking to secure our services in space.

Next we will have the gentleman from Ohio and the gentlelady from Washington's ALERT Parity Act, which would establish a process for the FCC to ensure that satellite technology can be used to ensure access to wireless and emergency alerts and 911 service remain uninterrupted during times of emergency. Then we will have the gentlemen from—both from Florida—legislation on the Launch Communications Act, which would help streamline the process for approving access to wireless frequencies or commercial space launches and reentries. Many times, the process requires approval by both the FCC and the National Communications and Information Telecommunications and Information Administration, which would result in delay. This legislation would help improve that process.

And last but not least, we will discuss the Precision Agriculture Satellite Connectivity Act, which is led by myself and the gentlelady from Illinois. This legislation will require the FCC to look at its current satellite rules to determine if rule changes can be made to promote precision agriculture.

Despite the billions of dollars that have been made available for broadband deployment over the last 2 years, it is clear that traveling in my district that too many Americans still lack access to the internet. Republicans have long called for technology neutrality and next-generation satellite network provide broadband speeds and latency that rivals other forms of broadband service. Farmers and ranchers across America increasingly rely on technology, improved efficiency and yields by also minimizing cost.

In the 21st century, that technology must be connected to the internet for its benefits to be totally realized. Gathering, processing, ensuring data in real time can help farmers and ranchers

make better decisions. While many farmers and ranchers have made progress getting access to fixed and wireless terrestrial networks over time, we heard at our hearing last week that satellite technology played a key role. In some cases, satellite technology can connect directly to equipment or sensors in the field, and in other cases satellite technology provides back-hall to wireless towers nearby.

I am excited to be considering these five pieces of bipartisan legislation today, and thank you again to our witness being with us today and look forward to the discussion.

[The prepared statement of Mr. Latta follows:]

**Opening Statement of Chair Robert E. Latta
Subcommittee on Communications and Technology
“Liftoff: Unleashing Innovation in Satellite Communications
Technologies.”
February 8, 2023**

Good morning! Thank you to our witnesses for agreeing to appear in person to provide your expertise on five pieces of bipartisan legislation and discussion drafts that aim to promote U.S. leadership in satellite communications technology.

Last week, this subcommittee held a hearing to discuss the state of the satellite marketplace in the United States. That hearing provided insight into the challenges and opportunities of the rapidly changing satellite marketplace. Today, we will hear from a different slate of witnesses representing a wide range of the satellite industry and how the legislative text being considered would impact the current regulatory landscape.

The five pieces of legislation include:

Chair Rodgers' **Satellite and Telecommunications Streamlining Act**, co-led by Ranking Member Pallone. This legislation would codify a statutory framework and streamline the Federal Communications Commission's satellite licensing process by clarifying what information the FCC should consider in an application, and put shot clocks on how much time the FCC has to complete its review and grant a license.

Next, we will discuss **the Secure Space Act**, led by Ranking Member Pallone and Chair Rodgers, which would prohibit the FCC from granting an authorization for a satellite service to operate in the United States if such satellite service poses a national security risk. This builds on the bipartisan work of this committee to secure our nation's communications networks on the ground by now looking to secure our services in space.

Next, we have Representative Johnson and Representative Schrier's **ALERT Parity Act**, which would establish a process for the FCC to ensure that satellite technology can be used to ensure access to wireless emergency alerts and 9-1-1 service remain uninterrupted during times of an emergency.

Then we have Representative Soto and Representative Dunn's **Launch Communications Act**, which would help streamline the process for approving access to wireless frequencies for commercial space launches and re-entries. Many times, this process requires approval by both the FCC and the National Telecommunications and Information Administration, which can result in delay. This legislation would help improve that process.

And last but not least, we will discuss the **Precision Agriculture Satellite Connectivity Act**, led by myself and the gentlelady from Illinois'

second district, Representative Kelly. This legislation would require the FCC to look at its current satellite rules to determine if rule changes can be made to promote precision agriculture.

Despite the billions of dollars that have been made available for broadband deployment over the last few years, it is clear from traveling my district that too many Americans still lack access to the Internet. Republicans have long called for technology neutrality, and next-generation satellite networks provide broadband at speeds and latency that rivals other forms of broadband service.

Farmers and ranchers across America increasingly rely on technology to improve efficiency and yields while also minimizing costs. In the 21st century, that technology must be connected to the Internet for its benefits to be fully realized. Gathering, processing, and sharing data in real time can help farmers and ranchers make better decisions.

While many farms and ranches have made progress getting access to terrestrial fixed and wireless networks over time, we heard at our hearing last week that satellite technology can play a key role. In some cases, satellite technology can connect directly to equipment or sensors in the field, and in other cases satellite technology can provide backhaul to wireless towers nearby.

I am excited to be considering these 5 pieces of bipartisan legislation today. Thank you again to our witnesses for testifying, and I look forward to the discussion.

Mr. LATTI. At this time the Chair now recognizes the subcommittee ranking member from California for 5 minutes for an opening statement.

OPENING STATEMENT OF HON. DORIS O. MATSUI, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Ms. MATSUI. Thank you, Mr. Chairman, and I thank the witnesses for being here today. I am glad that we are building on the progress of our first hearing with another bipartisan discussion today. The bills before us hold the potential to boost innovation, cut the red tape, and increase security in the satellite ecosystem. Having the perspective of both government agencies and industry standards will give us a holistic perspective. It will help inform these bills as they move through the committee process.

As both the FCC and Congress move forward on updates for the satellite licensing process, hearings like this will give us a chance to harmonize these efforts. It is important that this committee and the FCC are working hand-in-glove to advance complementary rather than conflicting policies.

The five bills before us today are bipartisan and cover a wide swath of issues crucial to the satellite marketplace.

Chairwoman McMorris Rodgers' and Ranking Member Pallone's SAT Streamlining Act would modernize an often onerous licensing and market access process at the FCC. Specifically, the bill would require a reasonable shot clock that would create a more responsive process at the FCC. It would also require the FCC to issue rules to promote tech-neutral rules of the road in space.

While this is still a discussion draft, I look forward to working toward a consensus bipartisan introduction. As ongoing feedback with the FCC and industry is considered, I know we're on the right track.

And as I mentioned at last week's hearing, I'm glad to see progress on the Secure Space Act. As an original cosponsor of the rip-and-replace bill, I know this is a national security and economic imperative. The FCC has been doing great work keeping the covered entity list current, and I'm excited to have an opportunity to discuss that work.

We also have legislation on today's agenda that would make changes to the way some emergency alerts are handled. As a member of the California delegation, I know the stakes for this information is literally life and death. During emergencies like wildfires, these alerts need to be accurate and timely, no exceptions. It's important to get policy in this space right, and I'm looking forward to additional conversations on this bill.

We're also going to discuss the LAUNCHES Act from Representatives Soto and Dunn. As it stands now, companies looking to conduct a commercial space launch must navigate a complex process of overlapping Federal interests seeking access to spectrum. And rather than coordinating multiple launches at once, this process can only be done on an individual basis, causing delays. The LAUNCHES Act would require the FCC to continue its work streamlining this process. This would create more predictability for both Federal and private organizations.

And finally, we have a chance to discuss the Precision Agriculture Satellite Connectivity Act from Chairman Latta and Congresswoman Kelly, which would require the FCC to report to Congress on opportunities to update its satellite rules to promote precision agriculture. My new district is home to a rich tradition of agriculture with family farms that have been passed down through generations. These small communities are desperate for connectivity and modern farming tools to stay prosperous.

On the government side, the FCC and NTIA are already taking crucial steps to advance U.S. leadership. I'd like to note that in January 2021, I urged then-President-elect Biden to develop a unified process to spectrum management and to consider updating the memorandum of understanding between the FCC and NTIA. Thanks to the hard work of the two agencies before us today, that suggestion has come to fruition. I'm excited to hear more about how that new MOU can support better coordination on satellite regulations. We have a lot to discuss, and I'm eager to get started.

With that, I yield back the remainder of my time.

[The prepared statement of Ms. Matsui follows:]

Committee on Energy and Commerce

**Opening Statement as Prepared for Delivery
of**

Subcommittee on Communications & Technology Ranking Member Doris Matsui

Hearing on “Liftoff: Unleashing Innovation in Satellite Communications Technologies.”

February 8, 2023

Thank you, Chairman Latta.

I’m glad that we’re building on the progress of our first hearing with another bipartisan discussion today.

The bills before us hold the potential to boost innovation, cut red tape, and increase security in the satellite ecosystem.

Having the perspective of both government agencies and industry representatives will give us a wholistic perspective that will help inform these bills as they move through the committee process.

As both the FCC and Congress move forward on updates to the satellite licensing process, hearings like this give us a chance to harmonize these efforts. It’s important that this Committee and the FCC are working hand-in-glove to advance complimentary rather than conflicting policy.

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And, rather than coordinating multiple launches at once, this process can only be done on an individual basis, causing delays.

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And finally, we've got a chance to discuss the Precision Agriculture Satellite Connectivity Act from Chairman Latta and Congresswoman Kelly which would require the FCC to report to Congress on opportunities to update its satellite rules to promote precision agriculture.

My new district is home to a rich tradition of agriculture with family farms that have been passed down through generations. These small communities are desperate for connectivity and modern farming tools to stay prosperous.

Bipartisan bills like this that reinforce the partnership between the FCC and Congress show we're serious about addressing the connectivity problems that plague farms across this country.

I'm glad to have witnesses from the government and industry before us today to discuss implementation and real-world implications of these bills.

On the government side, the FCC and NTIA have already taken crucial steps to advance U.S. leadership. I'd like to note that in January 2021 I urged then President-elect Biden to develop a unified approach to spectrum management and to consider updating the Memorandum of Understanding between the FCC and NTIA.

Thanks to the hard work of the two agencies before us today, that suggestion has come to fruition. I'm excited to hear more about how that new MOU can support better coordination on satellite regulations.

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We'll also hear from some of the most innovative companies in the satellite industry --- with applications that can expand connectivity in unserved places, increase consumer choice, and support our efforts to combat the climate crisis.

We have a lot to discuss and I'm eager to get started.

With that, I yield back the remainder of my time.

Mr. Latta. Thank you very much. The gentlelady yields back, and at this time the Chair recognizes the gentlelady from Washington, the chair of the full committee, for 5 minutes.

**OPENING STATEMENT OF HON. CATHY McMORRIS RODGERS,
A REPRESENTATIVE IN CONGRESS FROM THE STATE OF
WASHINGTON**

Mrs. Rodgers. Good morning, and thank you, Mr. Chairman. Today we will discuss solutions to unleash innovation in the satellite communications marketplace. Last week, we heard from witnesses about how satellite systems will play a role in closing the digital divide, how they will connect Americans in times of disaster and emergencies, and how they will enable the technologies of the future to beat China. Technologies like precision agriculture, which is valuable for farmers in Eastern Washington working to improve their yields and lower their costs. Streamlining the Federal regulations to enable technology that helps put food on the table is why efforts like the Satellite and Telecommunications Streamlining Act are so important.

We also heard from witnesses about the threat that China and others pose to our economic and national security if we do not take action. These hearings could not be more timely. With the Chinese Communist Party illegally launching a balloon over the continental United States and spying on American assets and citizens, this experience was a frightening reminder of the need to secure our networks from the Chinese Communist Party, both networks on the ground and satellite communications. China will stop at nothing to undermine American values, steal American data and use that information to advance its authoritarian agenda around the world. We cannot let that happen.

I'm pleased to have the witnesses before us who can speak to the five bipartisan bills we're considering to encourage investment, innovation and competition in the satellite communications industry to solidify America's dominance in this sector. Last Congress, I introduced with—with then the chairman, Frank Pallone, the Satellite and Telecommunications Streamlining Act. Today we are considering that language as a discussion draft as we continue to work with industry and government stakeholders to make sure that we get it right. This is the first major legislative effort since 2000 to update our laws and regulations related to how satellite systems are licensed in the United States.

This legislation would reform the Federal Communications Commission's process to grant satellite licenses, establish a statutory framework that directs the FCC to act swiftly to approve satellite license applications, and incentivize operators to be responsible stewards of space and spectrum in the global marketplace.

We heard repeatedly at last week's hearing about the need for our government to move quickly to stay relevant. In order for U.S. companies to compete globally, they must move first. They must be incentivized to design their systems to better serve the unconnected, whether in America or in developing countries that the Chinese Communist Party seeks to dominate. I thank Ranking Member Pallone for working with me on this legislation.

We are also reviewing Ranking Member Pallone's Secure Space Act, a bill that I'm proud to colead. This bill builds on Energy and Commerce Committee's leadership to make sure untrusted equipment and software is removed from American communications networks.

In 2020, President Trump signed the Secure and Trusted Communications Network Act, which prohibits Federal subsidies from being used for untrusted equipment and authorizes a grant program at the FCC for carriers to remove that equipment from their networks. The grant program is short by 3 billion, and we are working with our colleagues across Congress to fund that shortfall as soon as possible.

With Chinese flying reconnaissance balloons over our land, the timing could not be more urgent. Additionally, last year Congress passed the Secure Equipment Act to close a loophole that allowed vulnerable equipment to remain in our networks regardless of whether it was federally funded or not.

The Secure Space Act would expand this work by applying similar requirements to our satellite communications technologies. By prohibiting the FCC from granting authorization for satellite services that pose a national security risk, we will not allow risky businesses to serve the United States.

Now is the time to act, to plow the hard ground necessary to legislate. I'm pleased to see Members across the subcommittee working in a bipartisan manner to lead on solutions to solve some of our toughest challenges, including how America can lead and win the future with satellite technologies that improve people's lives. I look forward to hearing from the witnesses.

[The prepared statement of Mrs. Rodgers follows:]

**Opening Statement of Chair Cathy McMorris Rodgers
Subcommittee on Communications and Technology
“Liftoff: Unleashing Innovation in Satellite Communications
Technologies.”
February 8, 2023**

(As Prepared for Delivery)

Good morning, and thank you, Mr. Chairman.

U.S. Leadership

Today, we will discuss solutions to unleash innovation in the satellite communications marketplace.

Last week, we heard from witnesses about how satellite systems will play a role in closing the digital divide...

...how they will connect Americans in times of disaster and emergencies...

...and how they will enable the technologies of the future to beat China.

Technologies like precision agriculture, which is valuable for farmers in Eastern Washington working to improve their yields and lower their costs.

Streamlining federal regulations to enable technology that helps put food on the table is why efforts like my Satellite and Telecommunication's Streamlining Act are so important.

We also heard from witnesses about the threat that China and others pose to our economic and national security if we do not take action.

These hearings could not be more timely...

...with the Chinese Communist Party illegally launching a balloon over the continental United States...

...and spying on American assets and citizens.

This experience was a frightening reminder of the need to secure our networks from the Chinese Communist Party, both terrestrially and in satellite communications.

China will stop at nothing to undermine American values...

...steal American data...

...and use that information to advance its authoritarian agenda around the world.

We cannot let that happen. I am pleased to have the witnesses before us who can speak to the five bipartisan bills we are considering to encourage investment...

...innovation, and competition in the satellite communications industry...

...to solidify America's dominance in this sector.

Satellite and Telecommunications Streamlining Act

Last Congress, I introduced the Satellite and Telecommunications Streamlining Act with Ranking Member Pallone.

Today, we are considering that language as a discussion draft as we continue to work with industry and government stakeholders to make sure we get it right.

This is the first major legislative effort since 2000 to update our laws and regulations related to how satellite systems are licensed in the United States.

My legislation would reform the Federal Communications Commission's process to grant satellite licenses...

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In order for U.S. companies to compete globally, they must move first.

They must be incentivized to design their systems to better serve the unconnected: whether in America, or in developing countries that the Chinese Communist Party seeks to dominate.

Thank you, Ranking Member Pallone, for working with me on this legislation.

Secure Space Act

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This bill builds on the Energy and Commerce Committee's leadership to make sure untrusted equipment

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In 2020, President Trump signed the Secure and Trusted Communications Networks Act, which prohibits federal subsidies from being used for untrusted equipment...

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That grant program is short by \$3 billion, and we are working with our colleagues across Congress to fund that shortfall as soon as possible.

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...regardless of whether it was federally funded or not.

The Secure Space Act would expand this work by applying similar requirements to our satellite communications technologies.

By prohibiting the FCC from granting authorization for satellite services that pose a national security risk, we will not allow risky businesses to serve the United States.

Closing

Now is the time to act and plow the hard ground on this Committee.

I am pleased to see members across the subcommittee working in a bipartisan manner to lead on solutions to solve some of our toughest challenges, including how America can lead and win the future with satellite technologies that improves people's lives.

I look forward to hearing from the witnesses and I yield back.

Mr. Latta. Thank you. The gentlelady yields back. And at this time, the Chair now recognizes the ranking member of the full committee, the gentleman from New Jersey, for 5 minutes.

OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. Pallone. Thank you, Chairman Latta. I'm going to sound like Chairwoman Rodgers with my opening statement today, so please forgive me, but I think it just shows that we are very bipartisan in addressing the next frontier of the commercial space industry. And the stakes could not be higher for the American satellite marketplace. Just this last week, we witnessed the Chinese Government's balloon flying high above American airspace. This incident demonstrated the urgency for us to explore every method possible to protect our Nation from these and other aerial threats and prevent our foreign adversaries from using our skies for their surveillance missions. And satellites have a role to play in achieving these objectives. And the legislation we are discussing today would help ensure that our satellite marketplace remains competitive, nimble, and protected from untrusted actors.

Today's legislation will also allow satellites to play a greater role in helping first responders in the public when natural disasters and other emergencies strike. Better earth imaging will also help us monitor and track some of the most urgent global issues like the worsening climate crisis.

So first I appreciate that we're considering H.R. 675, the Secure Space Act, bipartisan legislation that I reintroduced with Chairwoman Rodgers last week. This bill would extend the Secure and Trusted Communications Network Act Framework to the U.S. licensing of nongeostationary orbit satellites to protect the public from untrusted entities and foreign adversaries. As innovations flourish, we must protect the satellite marketplace and its role in the supply chain from threats by nontrusted actors. We can't risk our satellite networks facing the same challenges as our other communications networks here and globally.

We'll also be discussing the Satellite and Telecommunications Streamlining Act, a bipartisan discussion draft that Chairwoman Rodgers and I introduced last year. The legislation would streamline the satellite licensing process at the FCC for certain satellite applications. This bill would strengthen the competitiveness of the United States satellite industry, which is imperative, given other countries, including our foreign adversaries, are making aggressive moves to dominate the industry.

There is no question that the U.S. must remain a market leader in this sector. Failure to do so risks our Nation falling behind our counterparts across the globe, including China, in producing cutting-edge consumer innovations and fortifying our public safety and national security capabilities.

We're also considering H.R. 682, the Launch Communications Act, a bipartisan bill reintroduced last week by Representatives Soto and Dunn. This bill would enhance the ability of entities to launch rockets from the U.S. by streamlining the FCC's process for authorizing access to spectrums for commercial space launches and

space reentries. It would also encourage continued competitiveness and growth in the American commercial space industry.

Then we have the Precision Agriculture Satellite Connectivity Act, a bipartisan discussion draft from Subcommittee Chair Latta and Representative Kelly. That would encourage advancement in the innovation of precision agriculture. This bill requires the FCC to review its rules related to certain satellite services to develop recommendations to promote precision agriculture and report these findings to Congress.

And finally, there's the Advanced, Local Emergency Response Telecommunications, or ALERT, Parity Act. This is, again, a bipartisan discussion draft from Representatives Johnson and Schrier that will also—that would also introduce—or they introduced last Congress. And it would allow satellite communication providers to access spectrum in temporary situations so that local customers can retain access to 911 and other lifesaving services where service is not available. This could be in circumstances where the area is remote, where the area is experiencing certain outages caused by natural disasters. And with this bill, Americans would not have to worry about being able to reach first responders and loved ones in an emergency.

So every bill or discussion draft we are considering today is bipartisan, and we look forward to hearing feedback from these witnesses and other stakeholders.

I'm determined to continue working with Chairwoman Rodgers and Chairman Latta, Ranking Member Matsui, and other members of the committee so that we can make sure the United States leads the rest of the world in the satellite communications industry. And time is certainly of the essence.

So I welcome our panelists, look forward to hearing from them. It's also nice to see that a familiar face will be before us today, David Goldman, but I don't see David. Where is he? Is he here? No? He is not here yet. He served as the subcommittee Democratic chief counsel for 7 years, and I thank him in advance for being here, when he arrives.

With that, Mr. Chairman, I yield back the balance of my time.
[The prepared statement of Mr. Pallone follows:]

Committee on Energy and Commerce

**Opening Statement as Prepared for Delivery
of
Ranking Member Frank Pallone, Jr.**

***Communications and Technology Subcommittee Hearing on “Liftoff: Unleashing Innovation
in Satellite Communications Technologies.”***

February 8, 2023

I am pleased to again be discussing bipartisan steps this Committee can take to advance the next frontier of the commercial space industry.

The stakes could not be higher for the American satellite marketplace. Just this last week we all witnessed the Chinese government’s balloon flying high above American airspace. This incident demonstrated the urgency for us to explore every method possible to protect our nation from these and other aerial threats and prevent our foreign adversaries from using our skies for their surveillance missions.

Satellites have a role to play in achieving these objectives and the legislation we are discussing today will help ensure that our satellite marketplace remains competitive, nimble and protected from untrusted actors. Today’s legislation will also allow satellites to play a greater role in helping first responders and the public when natural disasters and other emergencies strike. Better earth imaging will also help us monitor and track some of the most urgent global issues like the worsening climate crisis.

First, I appreciate that we are considering H.R. 675, the Secure Space Act, bipartisan legislation that I reintroduced with Chair Rodgers last week. This bill would extend the Secure and Trusted Communications Network Act framework to the U.S. licensing of non-geostationary orbit satellites to protect the public from untrusted entities and foreign adversaries. As innovations flourish, we must protect the satellite marketplace and its relevant supply chains from threats by non-trusted actors. We cannot risk our satellite networks facing the same challenges as our other communications networks, here and globally.

We will also be discussing the Satellite and Telecommunications Streamlining Act, a bipartisan discussion draft that Chair Rodgers and I introduced last year. The legislation would streamline the satellite licensing process at the Federal Communications Commission (FCC) for certain satellite applications. This legislation will strengthen the competitiveness of the United States’ satellite industry, which is imperative given other countries, including our foreign adversaries, are making aggressive moves to dominate the industry.

There is no question that the United States must remain a market leader in this sector. Failure to do so risks our nation falling behind our counterparts across the globe, including

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China, in producing cutting-edge consumer innovations and fortifying our public safety and national security capabilities.

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The Precision Agriculture Satellite Connectivity Act, a bipartisan discussion draft from subcommittee Chair Latta and Representative Kelly would encourage advancement and innovation of precision agriculture. This legislation requires the FCC to review its rules related to certain satellite services to develop recommendations to promote precision agriculture and report its findings to Congress.

Finally, the Advanced, Local Emergency Response Telecommunications (ALERT) Parity Act, is a bipartisan discussion draft from Representatives Johnson and Schrier that was also introduced last Congress. It would allow satellite communications providers to access spectrum in temporary situations so that mobile customers can retain access to 911 and other lifesaving services where service is not available. This could be in circumstances where the area is remote, or where the area is experiencing service outages caused by natural disasters. With this legislation, Americans would not have to worry about being able to reach first responders and loved ones in an emergency.

Every bill and discussion draft we are considering today is bipartisan and we look forward to hearing feedback from these witnesses and other stakeholders. I am determined to continue working with Chairs Rodgers and Latta, Ranking Member Matsui, and other members of this Committee so that we can make sure the United States leads the rest of world in the satellite communications industry. Time is certainly of the essence.

I welcome our panelists and look forward to hearing from them. It is also nice to see that a familiar face will be before us today— David Goldman who served as this Subcommittee's Democratic Chief Counsel for several years. David, thanks in advance for being here today. And I yield back the balance of my time.

Mr. Latta. We'll give—we'll let him know he had a glowing report, very accurate. But the gentleman yields back, and we have now concluded with the Member opening statements.

The Chair would like to remind Members that, pursuant to committee rules, all Members' opening statements will be made part of the record. We'd also like to again thank our witnesses for being with us today to testify before the subcommittee. Today's witnesses will have 5 minutes to provide an opening statement, which will be followed by a round of questions from the Members. At the conclusion of the first panel, the subcommittee will briefly recess so we can prepare for the second panel of witnesses. The second panel will begin promptly thereafter.

Our first witness panel for today's hearing will include Mr. Bill Richardson, the deputy associate general counsel for agenda review for the Federal Communications Commission, and Mr. Charles Glass, chief of the International Spectrum Policy Division of the National Telecommunications and Information Administration.

And just to mention—again, familiarize everyone with the lights. You have 5 minutes. It will be green. At 1 minute, you will have yellow. And then time is up, is it red, so finish up your statement at that time. We appreciate it.

I also want to make mention: You will see Members on both sides going up and out of here today because we also have two committees, Oversight and Health, meeting together downstairs. And so we'll have two—these two hearings running at the same time, so I apologize for people having to get up and down, but we have that going on today.

And so with that, Mr. Richardson, you are recognized for 5 minutes for your opening statement.

STATEMENTS OF WILLIAM R. RICHARDSON, DEPUTY ASSOCIATE GENERAL COUNSEL, FEDERAL COMMUNICATIONS COMMISSION; AND CHARLES GLASS, CHIEF, INTERNATIONAL SPECTRUM POLICY DIVISION, NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION, DEPARTMENT OF COMMERCE

STATEMENT OF WILLIAM R. RICHARDSON

Mr. Richardson. Chairman Latta and Ranking Member Matsui, Vice Chairman Carter, Chair McMorris Rodgers, Ranking Member Pallone, and members of the subcommittee, thank you for the opportunity to be here with you today. Your consideration of these five bills will address a number of critical issues facing the Commission and a rapidly expanding satellite industry, and we welcome the opportunity to work closely with you in these efforts.

The Commission's role in the licensing and regulation of satellite communications systems began over 60 years ago, including the launch of the first communications satellite to orbit the Earth. As you heard last week, there is widespread recognition that the satellite licensing process today needs updating in light of the growing number and complexity of satellite applications and the increased potential of the satellite sector for broadband coverage, emergency services, and U.S. competitiveness in a global marketplace.

Acknowledging the work of Chair McMorris Rodgers and Ranking Member Pallone, FCC Chairwoman Rosenworcel has agreed that the new Space Age needs new rules. The Commission has already taken a number of steps in recent years to modernize this process. To start, it has increased by 38 percent the size of its satellite staff to help speed up its work. Another critical action the Commission has recently taken is an initiative to modernize the FCC by establishing a Space Bureau, which is designed to prioritize attention to the growing needs of the satellite industry.

In addressing these bills, I would note that the FCC has provided technical assistance on several of them, and we welcome the opportunity to continue to engage with your offices in that process.

First, the Secure Space Act of 2022. This bill would bar the Commission from granting licenses or market access petitions for non-geostationary orbit satellite systems held or controlled by certain entities. It is similar in concept, as you've heard, to the Secure Equipment Act of 2021, which barred the Commission from issuing equipment authorizations of certain equipment that would pose an unacceptable risk to the national security of the United States or security and safety of United States persons. In implementing this bill, we would expect to draw heavily on the experience we had in implementing that legislation last November.

Second, the SAT Streamlining Act of 2022. In considering this bill last week, industry witnesses recognized the need to balance concerns that incumbent satellite and terrestrial licensees may have about potential interference from new entrants with a need to support growth of and competition in this rapidly changing industry in three ways: streamline processes, adequate availability of spectrum, and effective processes for sharing spectrum where, as is increasingly the case, exclusive spectrum is no longer available. As I note in my written testimony, the Commission has taken or is actively considering steps that align with many of these goals, including through pending rulemakings.

Third, the Launch Communications Act would focus not on satellite service but on the spectrum needed for launch and reentry of satellites. In 2021, recognizing that need in the face of an expanding commercial space launch industry, the Commission completed action to allocate the 2200 to 2290 megahertz band for this purpose on a secondary basis. At that time, it also proposed licensing and service rules for use of this band and sought comment on use of additional bands for these purposes, including some of those referred to in this bill. We welcome the Launch Communications Act's support for this proceeding.

Finally, the other two bills in draft that you are considering today would direct the FCC to address important priorities as well, promoting precision agriculture through satellite delivery in consultation with the existing task force established by the Commission and USDA and facilitating service to areas that are unserved by terrestrial providers or temporarily unserved because of natural disasters or power outages.

Thank you for inviting me to participate in today's hearing, and I look forward to assisting the subcommittee in considering these bills. I'd be happy to answer your questions.

[The prepared statement of Mr. Richardson follows:]

**Statement of William R. Richardson, Jr.
Deputy Associate General Counsel
Federal Communications Commission**

**Before the Subcommittee on Communications and Technology
Committee on Energy and Commerce
U.S. House of Representatives**

**Liftoff: Unleashing Innovation in Satellite Communications Technologies
February 8, 2023**

INTRODUCTION

Thank you for the opportunity to appear before you today. Since 2016, I have been Deputy Associate General Counsel at the FCC. Your consideration of these five bills today involves issues that have been addressed by a wide range of operating bureaus and offices within the Commission: the International, Wireless, and Public Safety Bureaus, and the Office of Engineering and Technology. I supervise lawyers in the Office of General Counsel that work closely with each of these different bureaus and offices within the Commission. I began work in OGC in 2012, following 30 years in private law practice representing clients before the Commission.

I appreciate the chance to participate with the Subcommittee and our partners at NTIA to address the Commission's role in the important topics addressed by these bills. The views expressed in my statement are my own, and not those of the Commission. Additionally, my appearance before the Subcommittee is limited to providing an overview of the current state of the law and Commission proceedings pertinent to your consideration of these bills, and technical drafting assistance, but not to opine on any possible or proposed policy or legislative changes.

The Commission's role in the licensing and regulation of satellite communications systems began over 60 years ago, including the launch of the first communications satellite to orbit the earth.¹ As early as 1970, the Commission determined to exercise its authority over radio spectrum under the Communications Act of 1934 to begin authorizing domestic satellites operated by commercial entities.² As noted below, since that time the Commission has regularly explored ways of modernizing and streamlining such regulation to account for the changes in the satellite industry.

The Commission has provided the Subcommittee with technical assistance on a number of these bills, and we would be happy to follow up with you on any further questions you may have about them. Today I will concentrate on three of them: (1) H.R. 9464, preventing satellite service by those providing certain communications services or equipment who have already been determined by Congress or specified Executive Branch agencies to pose unacceptable national security risks; (2) H.R. 9463, streamlining satellite application processing in light of today's changing satellite marketplace; and (3) the draft Launch Communications Act, the focus of which is to complete FCC proceedings providing access to spectrum for space launches and reentries and expedite the processing of applications for use of such spectrum.

The other two draft bills you are considering today address important priorities as well: promoting precision agriculture through satellite delivery, in consultation with the existing Task Force established by the Commission and the Department of Agriculture, and facilitating service

¹ See Remarks of Chairwoman Jessica Rosenworcel, The Global Aerospace Summit, 2022 WL 489107 (Sept. 14, 2022).

² See *Establishment of Domestic-Satellite Facilities by Nongovernmental Entities*, Report and Order, 22 F.C.C.2d 86 app. C (1970) (memorandum on legal issues).

to areas that are unserved by terrestrial providers or temporarily unserved because of natural disasters or power outages.

SECURE SPACE ACT OF 2022 (H.R. 9464)

This bill would amend the Secure and Trusted Communications Networks Act of 2019 to bar the Commission from granting licenses or market access petitions for non-geostationary orbit (NGSO) satellite systems held or controlled by any entity or affiliate that produces or provides certain “covered” communications equipment or service as defined in that Act.

This bill is similar in concept to the Secure Equipment Act of 2021, which barred the Commission from reviewing or approving any application for equipment authorization of “covered” equipment. The “covered” equipment or (in this case) service refers to certain communications equipment or service that has been determined to “pos[e] an unacceptable risk to the national security of the United States or the security and safety of United States persons.” Examples include telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any of their subsidiaries or affiliates).

The Secure Equipment Act directed the Commission to adopt rules to implement that Act, which it did last November. Unlike that Act, the Secure Space Act does not include such a specific grant of rulemaking authority to the Commission, which could facilitate implementation of the Act.

SAT STREAMLINING ACT of 2022 (H.R. 9463)

This bill is designed to inform the continuing efforts of the Commission to streamline the process for review and action on certain satellite license applications and modifications and renewals thereof.

As industry witnesses testified before the Subcommittee last week, there is widespread recognition that this process needs updating in light of the growing number and complexity of satellite applications, particularly for nongeostationary (NGSO) systems, and the increased importance of the satellite sector for broadband coverage, emergency services, and U.S. competitiveness in a global marketplace.³ Acknowledging the work of the authors of H.R. 9463, FCC Chairwoman Rosenworcel has agreed that “the new space age needs new rules.”⁴

As noted below, the Commission has already taken a number of steps in recent years in efforts to modernize this process. Many of these are similar to those reflected in this bill. To start, the Commission has increased by 38% the size of its Satellite Division staff to help speed up its work.⁵ Another critical action the Commission has recently taken is an initiative to modernize the FCC by establishing a Space Bureau, which is designed to prioritize attention to the needs of the satellite industry in these respects, and to focus Commission resources on those needs. At the same time, this proposed reorganization will highlight (through creation of a separate Office of International Affairs) the equally critical nature of U.S. participation in the ITU and other

³ For a recent summary of the changes in the satellite industry, see *Communications Marketplace Report*, FCC 22-103, paras. 174-211 (released Dec. 30, 2022).

⁴ *Expediting Initial Processing of Satellite and Earth Station Applications*, Notice of Proposed Rulemaking, FCC 22-95 (released Dec. 22, 2022) (“*Expediting Initial Processing*”) (separate statement).

⁵ *Space Innovation*, Notice of Inquiry, FCC 22-66 (released Aug. 8, 2022) (statement of Chairwoman Rosenworcel).

international fora in that global marketplace, which make decisions about spectrum allocation and management affecting U.S. satellite competitors.⁶

H.R. 9463 would amend Title III of the Communications Act of 1934. That title confers the Commission with authority to manage use of radio spectrum by non-federal entities. As the Supreme Court noted 80 years ago, Title III affords the Commission a “dynamic” and “comprehensive mandate to ‘encourage the larger and more effective use of radio in the public interest,’” given “a field of enterprise the dominant characteristic of which was the rapid pace of its unfolding.”⁷ As this Subcommittee recognized at last week’s hearing, nowhere is that characteristic more true today than in the satellite industry.

At the same time, we share jurisdiction with NTIA, which Congress delegated with authority over federal use of spectrum.⁸ We also continue to work closely with NASA, the FAA, and other federal agencies as they develop policies affecting commercial deployments in space.

In considering H.R. 9463, last week industry witnesses recognized the need to balance concerns that incumbent satellite and terrestrial licensees may have about potential interference from new entrants, with the need to support growth of and competition in this rapidly changing industry through streamlined processes, adequate availability of spectrum, and effective processes for sharing spectrum where (as is increasingly the case) exclusive spectrum is no longer available. The Communications Act itself reflects this balance in many ways.

⁶ *Establishment of the Space Bureau and the Office of International Affairs*, FCC 23-1 (released Jan. 9, 2023). This order will become effective upon appropriate clearance under the Consolidated Appropriations Act, 2022.

⁷ *National Broadcasting Co. v. United States*, 319 U.S. 190, 219 (1943), quoting 47 U.S.C. § 303(g).

⁸ See 47 U.S.C. § 305.

It states, for example, that it “shall be the policy of the United States to encourage the provision of new technologies and services to the public.” It also provides the Commission with a mandate to “make available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex, a rapid efficient Nation-wide, and world-wide wire and radio communications service with adequate facilities at reasonable charges,” for the purposes of “national defense” as well as “promoting safety of life and property through the use of wire and radio communication.”⁹

Equally important in considering application processing is the role of public participation in that process, embodied in Section 309 of the Communications Act. Section 309(b) requires that, for classes of stations that the Commission may prescribe, applications may not be granted until 30 days following “issuance of public notice by the Commission of the acceptance for filing of such application or of any substantial amendment thereof.” This public notice then triggers a deadline for the filing of petitions to deny the application by any party in interest.¹⁰ Part 25 of the Commission’s rules (referred to in H.R. 9463) incorporates this process.¹¹ This statutory and regulatory regime, which is common to many other services subject to Commission regulation, is designed to ensure that parties file complete applications that can form the basis of informed review by the Commission and interested parties.

This regime is particularly critical to one of the fundamental missions of the Commission under Section 303(f) of the Communications Act: to make (and enforce) regulations “as it may deem

⁹ 47 U.S.C. §§ 151, 157(a).

¹⁰ 47 U.S.C. §§ 309(b), 309(d).

¹¹ 47 C.F.R. §§ 25.150 *et seq.*

necessary to prevent interference between stations.”¹² Industry witnesses at last week’s hearing recognized the need to balance the value of expedited satellite application processing against this spectrum management obligation. Particularly given the complexity of satellite designs and the growing numbers of satellites, and the increasing need for Commission licensees to share spectrum given the growing numbers of competing uses for it, this task often requires the Commission to devote considerable effort – and time -- to resolving interference disputes between incumbent satellite (or terrestrial) licensees and new satellite applicants.

In doing so, the Commission sometimes needs to rely on its well established statutory authority to follow up to obtain additional information specific to a particular situation.¹³ This is no different than how the Commission proceeds with broadcast, wireless, wireline, or other applications, and is a useful tool when used carefully so as not to unduly burden the applicant. Commission staff are mindful of those burdens, and carefully weigh them in determining whether such additional information will enable them to process the application more quickly. Satellite applications are among the most complex the Commission works on, and flexibility to seek additional information when needed is a valuable tool.

The Commission’s goal, like that of this bill, is to design the administration of this process as efficiently as possible while protecting the interference and other concerns of interested parties. As noted above, the Commission has for some time been exploring improvements in its

¹² 47 U.S.C. § 303(f).

¹³ See 47 C.F.R. § 25.111(a).

application process that would reflect these competing goals. These began as early as 1991.¹⁴ They later included efforts at standardizing application forms.¹⁵

However, the rapidly changing nature and importance of satellite technology, coupled with the enormous increase in the number of satellites and earth-based facilities for which applicants are seeking Commission approval, have led the Commission to redouble its efforts. I want to focus on two such actions, both referred to by witnesses at last week's hearing.

First, in December 2021, the Commission sought comment on how to promote sharing among NGSO fixed-satellite service (FSS) licensees in order better to facilitate deployment and promote competition, while addressing the complex question of how best to ensure against harmful interference. This proceeding is examining both licensees within the same processing round, and those in different processing rounds. It has specifically invited comment on two issues you heard about at last week's hearing, and that are addressed in H.R. 9463. One is about how to measure harmful interference. The Commission has sought comment on various alternative, specific criteria for this. Another is to explore the contours of good faith negotiation among those sharing spectrum, including a proposal for confidential sharing of data such as beam locations. These issues are complex. I am by no means an engineer, but since I began practicing communications law I have found myself on different sides of the elusive question of what constitutes harmful interference in any particular situation.

¹⁴ See, e.g., *Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacing and to Revise Application Processing Procedures for Satellite Communications Services*, First Report and Order, 6 FCC Rcd 2806 (1991); *Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures*, Report and Order, 11 FCC Rcd 21581 (1996).

¹⁵ See *Amendment of the Commission's Space Station Licensing Rules and Policies*, Third Report and Order, 18 FCC Rcd 15306 (2003).

Second, in December 2022 the Commission sought comment on ways that it could avoid delays in getting applications accepted for filing. Among these proposals are to simplify application forms to avoid inadvertent errors or inconsistencies in applications, and adding specificity on the criteria necessary for applications to be deemed acceptable for filing. The Commission also raised again the question of using “shot clocks” for action on applications once the comment period on them has closed.¹⁶ For the reasons stated above, the Commission has proposed that such “shot clocks” run from the date that applications have been determined to be complete, rather than from the date they have been filed. The Commission also sought comment on relaxing the application of the limits on multiple applications for NGSO licenses.

Comments from industry and other interested members of the public on these most recent application processing proposals are due by March 3; reply comments, by April 3. We look forward to reviewing these recommendations, while working in tandem with your Subcommittee with the goal of further improving and streamlining the satellite application licensing process.

LAUNCH COMMUNICATIONS ACT

The Launch Communications Act would focus not on satellite service, but on the spectrum needed for launch and reentry of satellites. In 2021, recognizing that need in the face of an expanding commercial space launch industry, the Commission completed action to allocate the 2200-2290 MHz band for this purpose on a secondary basis. At that time, it also proposed licensing and service rules for use of this band, and also sought comment on use of additional

¹⁶ *Expediting Initial Processing*, FCC 22-95, para. 19.

bands for these purposes, including some of those referred to in this bill.¹⁷ We welcome the Launch Communications Act's support for this proceeding. We very much appreciate the Subcommittee's recognition of the need for adequate spectrum given the increased frequency of these critical launches.

CONCLUSION

Thank you for inviting me to participate in today's hearing. I look forward to assisting the Subcommittee in considering these five bills, and would be happy to answer your questions.

¹⁷ *Allocation of Spectrum for Non-Federal Space Launch Operations*, Report and Order and Further Notice of Proposed Rulemaking, 36 FCC Rcd 7764 (2021) (FCC 21-44).

Mr. LATTA. Thank you very much.
Mr. Glass, you are recognized for 5 minutes.

STATEMENT OF CHARLES GLASS

Mr. GLASS. Good morning, Chairman Latta, Chairwoman Rodgers, Ranking Member Pallone, Ranking Member Matsui, and members of the subcommittee. On behalf of Assistant Secretary Alan Davidson, thank you for the opportunity to testify about the National Telecommunications and Information Administration's work on satellite issues.

My name is Charles Glass. I serve as the chief of the International Spectrum Policy Division in NTIA's Office of Spectrum Management and have been in this role for the last 8 years. NTIA has several responsibilities with respect to how to—our Nation utilizes spectrum resources, including those used by space-based systems such as satellites.

First, NTIA is the principal advisor to the President on telecommunication issues, including those involving radiofrequency spectrum. Second, we directly manage the use of spectrum by Federal agencies, as I will describe more fully momentarily. In addition, NTIA maintains a research and testing lab, the Institute for Telecommunications Sciences in Boulder, Colorado, which provides critical theoretical and real-world knowledge on spectrum engineering.

NTIA is, of course, part of the Department of Commerce. So we strive to ensure that spectrum resources are maximized for the growth and vitality of our Nation's economy. One of the Department's key strategic goals is to advance U.S. leadership in the global commercial space industry. Several other parts of the Department are also actively engaged in this effort.

NTIA, through the Department of Commerce, works to ensure that sufficient spectrum is accessible for U.S. companies to pioneer and lead in their global space-based industries. As NTIA is well aware, space is one of the areas where a strong, mutually beneficial relationship exists between the Federal Government and American industry. NTIA works with the Federal agencies to ensure that their vital mission supporting national security, weather forecasting, space exploration, radio astronomy and a host of other important Federal equities are fully supported and protected while balancing the need for increased spectrum access for commercial activities.

For satellite systems, this is accomplished through domestic efforts in concert with the FCC in its rulemaking and licensing efforts, which are coordinated with NTIA under a memorandum of understanding between our agencies. Internationally, NTIA leads, files and coordinates Federal satellite authorizations and registrations while working with the FCC to ensure maximum access to spectrum for commercial activities. NTIA is also committed to protecting critical infrastructure, including satellites, from malignant actors that pose a threat to our security.

Now for an overview of our spectrum management operations. For Federal systems, OSM has a process for reviewing and certifying the spectrum supportability for our proposed system. We also

have a separate but related process for assigning specific frequencies to each Federal system.

As a result of these efforts, we process roughly 200 certifications for Federal agencies every year and make nearly 100,000 frequency assignments to the agencies. NTIA also is responsible for coordinating Federal satellite filings internationally to ensure protection of our existing satellite systems.

The international filing process is conducted in coordination with the FCC, which transmits all satellite filings to the International Telecommunication Union. NTIA also leads international delegations in bilateral discussions with foreign administrations for coordination of our Federal satellite systems with new foreign satellite systems. The ITU publishes a quarterly report of satellite systems being registered, and NTIA works with the Federal agencies to identify any foreign systems with which coordination will be required.

We have an equally important role in connection with the coordination of nonfederal systems that either share spectrum with Federal systems or operate using nearby frequencies. Our goal in these cases is to balance protecting critical Federal operations, promoting spectrum efficiency, and supporting commercial development.

OSM coordinates either directly with the FCC or, at times, with the system proponents themselves. We also work closely with the FCC through our longstanding interagency processes. Notably, NTIA and FCC recently agreed to an update of the MOU that is enhancing our coordination in a number of important ways.

NTIA has an important role in preparing for each World Radiocommunications Conference, which takes place typically every 4 years. NTIA coordinates and reconciles Federal views and proposals with the FCC and the U.S. Department of State to ultimately develop U.S. views and proposals that account for all U.S. spectrum stakeholders.

Thank you for the opportunity to testify today. I look forward to answering any questions you may have regarding NTIA's work on satellite matters.

[The prepared statement of Mr. Glass follows:]

Written Testimony of

Charles Glass
Chief, International Spectrum Policy Division
Office of Spectrum Management
National Telecommunications and Information Administration
U.S. Department of Commerce

Before the House Committee on Energy and Commerce
Subcommittee on Communications and Technology

“Liftoff: Unleashing Innovation in Satellite Communications Technology”

February 8, 2023

Good morning Chairman Latta, Chairwoman Rodgers, Ranking Member Matsui, Ranking Member Pallone, and members of the Subcommittee. On behalf of Assistant Secretary Alan Davidson, thank you for the opportunity to testify about the National Telecommunications and Information Administration’s (NTIA) work on satellite issues. My name is Charles Glass. I serve as the Chief of the International Spectrum Policy Division in NTIA’s Office of Spectrum Management (OSM) and have been in that role for the past eight years. After briefly highlighting NTIA and Department of Commerce space interests, I am going to provide some background on NTIA’s spectrum management role and then discuss some specifics of how we do our job.

NTIA has several roles with respect to how our nation utilizes spectrum resources, including those used by space-based systems such as satellites. First, NTIA is the principal advisor to the President on telecommunications and information policies. Second, we directly manage the use of spectrum by federal agencies. In addition, NTIA maintains a research and testing lab, the Institute for Telecommunication Sciences, in Boulder, Colorado, which provides critical theoretical and real-world knowledge on spectrum engineering.

NTIA is, of course, part of the Department of Commerce, so we strive to ensure that spectrum resources are maximized for the growth and vitality of our nation’s economy. One of the Department’s key strategic goals is to advance U.S. leadership in the global commercial space industry. Several other parts of the Commerce Department also are actively engaged in this effort.

The space economy is a strong growth sector of the U.S. economy. The Administration views space as a source of American innovation, opportunity, leadership, and strength and has made it a priority to foster a policy and regulatory environment that enables a competitive and burgeoning U.S. commercial space sector. NTIA is committed to supporting this growth through improving our own federal processes and, in coordination with the Federal Communications Commission (FCC), to support space commerce.

NTIA works to ensure that sufficient spectrum is accessible for U.S. companies to pioneer and lead in their global space-based industries. As NTIA is well aware, space is an area where there is a strong mutually beneficial relationship between the federal government and American industry.

NTIA works with federal agencies to support their growing spectrum access requirements for their vital national security, weather forecasting, space exploration, radio astronomy, and other missions, while balancing the need for increased spectrum access for commercial activities. For satellite systems this is accomplished through domestic efforts in concert with the FCC in their rulemaking and licensing efforts which are coordinated with NTIA under our Memorandum of Understanding. Internationally, NTIA leads, files, and coordinates federal satellite authorizations and registrations while working with the FCC to ensure maximum access to spectrum for commercial activities.

NTIA is also committed to protecting critical infrastructure, including satellites, from malignant actors that pose a threat to our security. NTIA supports the Department in its role of enhancing cybersecurity awareness and protections, maintaining public safety, and supporting economic and national security.

Now for an overview of our spectrum management operations.

For federal systems, OSM has a process for reviewing and certifying the spectrum supportability for a proposed system. This certification process typically has a number of stages, from conceptual through operational, as these systems take years to design and build and the relevant parameters may change over time. We also have a separate but related process for assigning specific frequencies to each federal system. All of this is spelled out in the Manual of Regulations and Procedures for Federal Radio Frequency Management (NTIA Manual), usually referred to as the "Redbook" within the spectrum management community. As a result of these efforts, we process roughly two hundred certifications for federal agencies every year and make nearly one hundred thousand frequency assignments to the agencies.

NTIA also is responsible for coordinating federal satellite filings internationally and with foreign administrations to ensure protection of our existing satellite systems. The international filing process is conducted in coordination with the FCC which transmits all satellite filings to the International Telecommunication Union (ITU). NTIA also leads U.S. engagement in bilateral discussions with foreign administrations for coordination of our federal satellite systems with new foreign satellite systems. The ITU publishes a quarterly report of satellite systems being registered, and NTIA works with the federal agencies to identify any foreign systems with which coordination will be required.

We have an equally important role in connection with the coordination of non-federal systems that either share spectrum with federal systems or operate using nearby frequencies that may receive interference from what's called "out-of-band" emissions. Our goal in these cases is to balance protecting critical federal operations, promoting spectrum efficiency, and supporting commercial development. OSM coordinates either directly with the FCC or, at times, with the system proponents themselves. We also work closely with the FCC through our longstanding

interagency processes. Notably, NTIA and the FCC recently agreed to an updated Memorandum of Understanding that is enhancing our coordination in a number of important ways.

NTIA has an important role in preparing for each World Radiocommunication Conference (WRC) which takes place typically every four years. The WRC is an international forum for world agreement on the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits. The next WRC is scheduled for later this year in Dubai. NTIA has an Interdepartmental Radio Advisory Committee (IRAC) subcommittee dedicated to development of federal views and proposals for each WRC agenda item. Each of these agenda items is tied to specific studies for introduction of new technologies or review of current regulations to improve them. NTIA strives to ensure that there is a balance between protection of existing operations and introduction of new technologies that will further spur economic growth and support federal missions. NTIA coordinates and reconciles federal views and proposals with the FCC and the U.S. Department of State to ultimately develop U.S. views and proposals that account for all U.S. spectrum stakeholders.

Thank you for the opportunity to testify today. I look forward to answering any questions you may have regarding NTIA's work on satellite issues.

Mr. LATTI. And thank you very much, Mr. Glass, for your testimony today. And we will now move into the question-and-answers portion of the hearing. I will begin the questioning and recognize myself for 5 minutes.

Mr. Richardson, the FCC has led the Precision Agriculture Connectivity Task Force for nearly 5 years. While this task force has included some discussion about satellite technology, most of this recommendation do not address the role satellites can play in providing broadband or Earth observation services. Does the FCC have any plans to reexamine its rules governing satellite services to see if there are any changes that could promote precision agriculture?

Mr. RICHARDSON. Thank you for the question, Mr. Chairman. Precision agriculture is recognized, I think, by the Commission as a way that satellites technology can contribute in the future to improving the work of farmers and ranchers. The task force that you are referring to is one that has recently issued four working group reports. And these working groups, appointed by the Commission and the USDA, have included a broad range of experts from the satellite industry as well.

These are interim reports. They are—my understanding is that they are on the way to being developed into a final report, which the FCC will be looking at in terms of recommendations for any changes to our rules that could facilitate use of satellite to deliver precision agriculture.

Mr. LATTI. I just want to make sure. Is there a timeline that you are looking at trying to have those reports in by?

Mr. RICHARDSON. I am not sure when the Commission is expected to act on that, but I could check back.

Mr. LATTI. I appreciate that. Thank you. Mr. Richardson, when processing rounds were first established by the FCC 20 years ago, there was no way to predict there would be the number of systems authorized and launched today. However, the processing round system stipulates that after a lead application is put on public notice, other prospective satellite operators only have a limited window to submit an application. But I appreciate the Commission's efforts to reorganize its international bureau into a—into a Space Bureau of Office of International Affairs.

Do you agree that the process around framework takes too long regardless of the staff resources?

Mr. RICHARDSON. The question of revisiting the Commission's processes is an excellent one, and it's one the Commission has teed up in a pending rulemaking, several pending rulemakings, actually. These processing issues are something that commenters are due to be filing with the Commission, their recommendations for change, March 3rd for comments, April 3rd for reply comments. And we are looking forward to getting their ideas about the processing round and other issues that we flag for comment.

Mr. LATTI. Thank you. And not to be picking on you a little more, but the ALERT Parity Act on today's hearing would require the FCC to issue rules that establish a process for satellite operators to provide wireless emergency alerts and 911 service using terrestrial spectrum. The Warren Act provides the FCC authority to

ensure that the provision of these lifesaving services are technically feasible and reliable.

While I recognize that the current secondary market has produced many partnerships, has the FCC evaluated what changes, if any, under law would be needed to ensure that the WEA alerts and 911 service provided by satellite operators receive the same treatment as—

Mr. RICHARDSON. I think the ALERT Parity Act is—recognizes the importance of using satellite where feasible to fill in the gaps, if you will, for critical 911 and alert services. As you know, section 1 of the Communications Act identifies as one of the key priorities for the Commission the promotion of public safety.

We have, as you say, been—recently received applications for some very interesting partnerships to provide services between satellite and terrestrial that essentially broken down some of the stovepipes, if you will, that we've had in the past. And these are being looked at by our technical experts, our public safety experts and our licensing experts to see what kinds of issues they may pose.

And I think those are directly relevant to the same issues that you're looking at in this bill. I think that it is an intriguing new way to promote these emergency services in areas that don't currently have them, which is a very important priority.

Mr. LATTA. Thank you very much. And I will yield back the balance of my time and recognize the gentlelady from California, the ranking member, for 5 minutes.

Ms. MATSUI. Thank you, Mr. Chairman. As an original cosponsor of the rip-and-replace bill, which required the FCC to establish the covered list, I'm glad to see these restrictions being implemented in other industries. However, for this list to have teeth, it's imperative that the FCC constantly be evaluated and updated. Mr. Richardson, can you describe the FCC's process for updating the covered list and how to keep it current in rapidly evolving satellite marketplace?

Mr. RICHARDSON. Thank you for the question. This is something we've been looking at with our Federal partners. And to step back, it's important to stress that, under the Secure Networks Act, the determinations of whether particular services by particular entities pose an unacceptable risk to national security and therefore get put on the covered list come from other Federal agencies and—or under the National Defense Authorization Act passed by Congress.

So what we first do is we look to what the Federal agencies have done. If they have put a covered service on the list, then we have a process through public notice system to implement that covered list—

Ms. MATSUI. Thank you. Two years ago, I wrote then-President-elect Biden, urging him to develop an administration spectrum strategy that is persistent, concerted, and effective. Mr. Glass, can you describe the NTIA's role in—spectrum management generally and the implications in—for the satellite ecosystem.

Mr. GLASS. Thank you very much, Ranking Member Matsui. Coordination of individual applications typically is not time-consuming and is handled through precoordination per NTIA's MOU with the FCC. The cases that take most time for technical analysis

involve either exceptions to the existing rules or actual rulemakings where new rules are being created or old rules are being modified. In those cases, it can take additional time for all stakeholders, including NTIA and Federal agencies, that have important equities to agree on the data and the methodology for analyzing the impact of proposed FCC actions.

Once FCC publishes notice of its proposed actions, at that point in the process such issues generally are addressed through the FCC's public proceeding, and NTIA may submit information to the FCC for the record on behalf of the Executive branch. Beyond that, in terms of any policy implications, I'm not in a position to comment, but our staff can follow up with your staff as required.

Ms. MATSUI. Certainly will. Thank you very much. NTIA is responsible for coordinating the Federal Government's participation in the International Telecommunications Union's World Radiocommunication Conferences. With WRC 23 coming up later this year, we have an excellent opportunity to continue U.S. leadership. Mr. Glass, what steps is NTIA taking to prepare, and what are the implications for U.S. leadership in the international satellite ecosystem at the WRC?

Mr. GLASS. Thank you for that question. NTIA is working closely with the FCC and State Department as well as the Federal agencies and commercial stakeholders to prepare for WRC 23. On the Federal side, which NTIA manages, Federal agencies have proposed a number of proposals, and NTIA is working to get those reconciled as U.S. proposals. At the same time, the FCC is running its process with nonfederal stakeholders. And we coordinate that effort very carefully to ensure that we have strong U.S. proposals going forward to the WRC.

Ms. MATSUI. OK. Thank you. The FCC has several proceedings before it with implications for the satellite ecosystem, including the 12 gigahertz proceeding. The docket on this proceeding shows that there is much for the FCC to consider, and I hope it will continue to follow the science as it considers feedback. Mr. Richardson, I know it is difficult to discuss an open proceeding, but can you provide a brief update on the timeline here?

Mr. RICHARDSON. I went—I would like, if I could, to get back to you on the timeline for that. I can say that the question of harmful interference between terrestrial and satellite, which is the key issue in that proceeding, as in many FCC proceedings, is one that, as you indicate, has generated very complex technical engineering studies on both sides. And the Commission technical experts are working their way through the competing analyses there, and we are working as fast as we can on that.

Ms. MATSUI. OK. Keep me updated. Thank you very much, and I yield back the balance of my time.

Mr. LATTA. Thank you very much. The gentlelady yields back. The Chair will informally pass on the ranking member of the full committee until he returns from downstairs. We will now recognize the gentleman from Florida's 12th District for 5 minutes.

Mr. BILIRAKIS. Thank you, Mr. Chairman. I appreciate it very much. Last week, I chaired a hearing in the Subcommittee on Innovation, Data and Commerce on the threats we face if China was to lead on emerging technologies. I'd like to continue that discus-

sion, if I may. Mr. Richardson, have Chinese-based NGSOs applied for U.S. market access, and are there different review processes in place for foreign-based operators, especially for those countries that are adversaries, as opposed to U.S.-based businesses?

Mr. RICHARDSON. These are very good questions. I can say that we have not received any market access requests from Chinese NGSOs if that is—that is your question. A few years ago, a U.S. company did request approval for Earth station support to a Chinese-owned company. Those applications were never granted and were ultimately withdrawn last year.

In terms of market access and national security issues, the Commission has the ability on its own motion to refer applications for market access through Earth station applications to the Executive branch group of the committee formally known as Team Telecom for its expert views and recommendations on key national security law enforcement, trade policy, and foreign policy issues. And we generally take our lead from those on their recommendations.

Mr. BILIRAKIS. Thank you. I have another question for you. As you know, we are in the process of removing Chinese equipment from our terrestrial networks through rip-and-replace. But we cannot renew the Huawei debacle. I'm sure you agree. Once the satellite is launched, there is no retrofit. During the—does the FCC review the origin of satellite parts from China or other adversaries when approving or denying an application for NGSO? So in other words, you can speak to other adversaries as well, including Russia, of course.

If not, does the FCC have the authority to either include that factor in their review or ban component parts from companies that are deemed national security threats?

Mr. RICHARDSON. I will begin by talking about the issue of component parts, which the Commission has looked at in the context of its implementation last year of the Secure Equipment Act that's been discussed this morning. This is a complex question that the Commission teed up in a notice of proposed rulemaking some time ago about whether the Commission can and should regulate equipment with respect to component parts. And it ended up seeking further comment on that last November, so we are looking at the comments to see when they come in about the practical impact of that, how we would identify component parts, how we would assess their threat to national security.

But again, I would circle back to our general authority would extend these parts, but we would look in the context of applications to our friends in the Federal—our Federal partners to get their expert guidance on the extent of the threat to national security, these component parts.

Mr. BILIRAKIS. Very good. Anybody like my time? I'll yield back.

Mr. LATTA. Well, thank you. The gentleman yields back the balance of his time, and the Chair will informally pass on the ranking member of the full committee's questions until he returns from downstairs. But we'll now recognize the gentleman from Texas' 33rd District for 5 minutes.

Mr. VEASEY. Mr. Chairman, thank you very much.

Mr. Richardson, I wanted to ask you. The Satellite and Telecommunications Streamlining Act would stream on FCC's satellite

licensing process for satellite applications. I understand and support the need to streamline this process. The FCC, the satellite industries, and consumers could certainly all benefit.

How would this bill specifically ensure that any changes made to the satellite components of a renewing applicant are brought quickly to the attention of the Satellite Division's staff in order to speed up that work?

Mr. RICHARDSON. I think the—first I should say that this is a great question that the Commission itself has been looking into in its own rulemaking sort of in parallel with this bill as to how we can simplify our application process, avoid the back-and-forth with the applicant that sometimes creates delays, and how we can establish a regulatory certainty for applicants by making clearer what the requirements would be in terms of performance criteria, for example. That's one of the issues that we are addressing in our rulemaking and is also addressed in this bill.

If we can establish the ground rules, if you will, going forward for applicants, it will be easier and more expeditious for them to proceed with—for us to proceed with processing the applications.

Mr. VEASEY. Thank you very much. The subcommittee also recognizes the need for output spectrum, given the increased deployment of satellites that provide critical services to Americans. As new technologies are developed and deployed on the field, what additional best practices should Congress consider that would facilitate the FCC's Satellite Division's ability to adjust constant changes happening in the satellite industry?

Mr. RICHARDSON. I think we at the Commission recognize, as we have over the years, that we always have to keep up with very dynamic changes in our industries that we regulate. And satellite today is one of the biggest and best examples of that. I think we have proceeded, as I said, to increase our staff to develop—that are develop—that are working on these applications. And we are very excited to be implementing a reorganization to have a Space Bureau that's devoted to the needs of the satellite industry so that we can address those needs more expeditiously.

Mr. VEASEY. What is the FCC doing specifically to, you know, attract young engineers, people that have come out of college, particularly if they go into the private sector and they make more money? What are you guys doing to make the job more attractive to them working in the satellite—

Mr. RICHARDSON. That is a very good question. I'm not directly involved in that. I'd be happy to get back to you with what we are doing to do that, but I think there was a Washington Post article today generally by Max Stier of the Partnership for Public Service who is talk—who identifies this as a broader issue for the Federal Government in terms of increasing the attractiveness of the Federal workforce for younger people coming out of school.

Mr. VEASEY. Thank you very much. Mr. Glass, the bills under consideration today align with the updated memorandum of understanding on radiofrequency spectrum—between the FCC and the NTIA. Do you feel that they—that there is coordination there?

Mr. GLASS. Thank you for that question. Yes. We do believe that we have a robust process for coordination under the memorandum of understanding. We had a target to—for improvements and addi-

tions to that MOU. We reaffirm and emphasize the respective roles of the FCC and NTIA as the agencies responsible for managing spectrum use in the United States.

It ensures improved and effective communications between the agencies. It emphasizes importance of evidence-based spectrum policymaking, engineering collaboration and reliance on data analyses and engineering best practices. It promotes effective long-range planning at the agency principal and staff levels. It enhances processes for coordination of proposed spectrum actions. It commits to best efforts to identify potential issues as early as possible, and it articulates an isolation path between the agencies where necessary.

Mr. VEASEY. Thank you very much. I appreciate that. Mr. Chairman, I yield back.

Mr. LATA. Thank you very much. The gentleman yields back the balance of his time. The Chair now recognizes the gentlelady from Washington, the chair of the full committee, for 5 minutes. Thank you.

Mrs. RODGERS. Thank you, Mr. Chairman. Mr. Richardson, I—just before I begin my questions, I notice in your testimony that your testimony is, quote, “limited to providing an overview of the ... state of the law and Commission proceedings” and to, quote, “technical drafting assistance, but not to opine on any possible or proposed policy or legislative changes.” However, your testimony also states mine and Ranking Member Pallone’s SAT Streamlining Act is, quote, “designed to inform the continuing efforts of the Commission.” Do you consider opining on the purpose of goals of legislation in your testimony is—to be technical drafting assistance?

Mr. RICHARDSON. We are happy to provide technical drafting assistance and to work with the committee, subcommittee, in developing the bill, and my point was to try to demonstrate that we at the Commission are engaged in a similar initiative and have—are looking forward to ideas from industry and the public about how to do that in our proceeding and would like to work with you to make sure that you’re aware of those recommendations and that input as well.

Mrs. RODGERS. OK. Because I do want to get to the state of play as it relates to the Commission proceedings. In other words, the United States Supreme Court decision last fall, *EPA v. West Virginia*, the Court cautioned that major agency actions must be rooted in clear statutory direction, that as the complexity of these licensing applications increases, so does the likelihood that the FCC’s actions could be challenged in court. Would having a specific grant of statutory authority help the FCC defend its actions in court on satellite rules?

Mr. RICHARDSON. It’s a very topical question for many agencies. I think, in our case, I would say always from an Office of General Counsel perspective, the more authority that Congress grants us, specific or general, the better. But as I’ve said in my testimony, it was about 80 years ago, the U.S. Supreme Court made clear in the NBC case that, with respect to title III of the Communications Act—that is managing radio spectrum—the Commission has very broad authority for the reasons very relevant to this proceeding, that, quote, “dynamic nature” of the industries that we regulate.

So we believe that we have adequate authority under title III to regulate and license satellite transmission of radiocommunications. But we, as I say, always welcome additional authority.

Mrs. RODGERS. OK. And I'll just also quote from the EPA decision just within the—all the Members here. It says, "Something more than a merely plausible textual basis for the agency actions necessary," the agency instead must point to, quote, "clear congressional authorization"—it's going to be ongoing discussion.

As you know, my Satellite and Telecommunication Streamlining Act would establish a statutory framework, providing the FCC direction on satellite licensing. And while it's important to act quickly on applications, it's also necessary to balance speed with providing a stable spectrum environment that encourages investment. This legislation would establish performance objectives and make it clear to applicants that—what information needs to be submitted with an application in order to make the timely decision.

Giving—given the FCC's December proposed rule on statutory application processing, do you think such regulatory framework would help speed up the satellite licensing process?

Mr. RICHARDSON. That's a very good question, and I think that we are hopeful that with the recommendations we get, we can finalize some processes that make it clearer what is required in the original application to avoid, as I said earlier, the sometimes back-and-forth with the applicant that chews up time. And if we can establish regulatory certainty around the ground rules for performance criteria, which is something that your bill specifically calls for our rulemaking to do, I think that would be very, very helpful and—

Mrs. RODGERS. Thank you. Very quickly here at the end, the World Radiocommunications Conference takes place later this year. Certainly this is going to impact satellite operators. Would both of you speak briefly to what the administration's priorities are on the agenda?

Mr. RICHARDSON. I would like, Madam Chair, if I could, to take that back. I'm not really prepared to—

Mrs. RODGERS. OK.

Mr. RICHARDSON [continuing]. To answer that one.

[The information follows:]

Chair McMorris Rodgers

What are the Administration's priorities at the WRC?

As participants on the United States delegation to the upcoming WRC, the FCC is supportive of the ITU's core mission of promoting connectivity, broadband access, and fostering a flexible international regulatory framework for an evolving telecommunications ecosystem.

Since the WRC-23 agenda was defined at the previous WRC in 2019, FCC staff has been engaged in the four-year ITU preparatory study cycle for WRC-23, fostering opportunities for new satellite and terrestrial operations, participating in sharing studies to ensure compatibility of various spectrum access technologies.

Domestically, the FCC collaborates with the public and private sector to develop priorities in line with the FCC's own domestic initiatives. The FCC also collaborates with our partners at the federal level to ensure that the access to new spectrum bands considers vital U.S. interests in science, safety and national security.

The FCC's engagement to WRC-23 is focused on three core themes: (1) promoting and harmonizing FCC's recent domestic actions, (2) supporting the emerging space economy and (3) establishing strategies to meet the increas-

ing demands for next generation wireless technologies. Below, we identify some important WRC-23 agenda items that fall into these themes.

- One key item for the FCC is an agenda item (AI 1.2) to identify additional mid-band spectrum for International Mobile Telecommunications (IMT) mobile 5G use on a primary basis. This agenda item covers the following frequency bands: 3,300–3,400 MHz, 3,600–3,800 MHz, 6,425–7,025 MHz, 7,025–7.125 MHz and 10.0–10.5 GHz. The FCC is working to ensure the actions on these bands are consistent with domestic priorities and decisions. For example, in the 6,425–7,025 MHz band, we are working to make sure there is no change to the Radio Regulations that could undermine unlicensed use of the spectrum.
- The FCC is also supportive of an agenda item (AI 1.19) that is considering a new primary allocation in the space-to-Earth to the Fixed-Satellite-Service in the 17.3–17.7 GHz band in the region in which the United States is included. Last year, the FCC adopted rules for this type of operation. The allocation will allow satellite operators additional spectrum for broadband services.
- Another key agenda item is one which would identify frequency bands for earth stations in motion or ESIMs that are communicating with non-geostationary orbit satellites (NGSO) (AI 1.16). The frequency bands that are currently under study are: bands 17.7–18.6 GHz, 18.8–19.3 GHz and 19.7–20.2 GHz (space-to-Earth) and 27.5–29.1 GHz and 29.5–30 GHz (Earth-to-space). ESIMs will provide broadband connectivity via satellite to aircraft and ships.
- Another key agenda item for the FCC is one that seeks to create a regulatory framework to permit the operation of space-to-space links between satellites, or inter-satellite-links, in specific frequency bands (AI 1.17). Creating a defined regulatory framework, including a spectrum allocation for this service, would allow for innovation and efficiency as some satellite operators are looking at the use of spectrum and optical resources to relay data back to earth using geostationary satellite orbit (GSO) and NGSO satellites in space rather than using earth stations, reducing cost and enhancing efficiency.
- Another important priority for the FCC is an agenda item (AI 7) that has studied possible changes to certain satellite regulatory provisions involving the coordination and notification of satellite networks currently in the ITU Radio Regulations. These include certain milestone and “bring into use” dates.
- Another key agenda item is associated with regulatory actions to support the modernization of the Global Maritime Distress and Safety System (GMDSS) (AI 1.11). GMDSS is a world-wide maritime safety and distress systems used by vessels and coast station to respond to distress calls at sea. The key issue on this item is the inclusion of new satellite networks into the GMDSS, in this case a new Chinese satellite (Beidou). There are many regulatory and technical concerns with allowing the Chinese entry into the GMDSS. There are also other broader policy concerns from the perspective of security by allowing a Chinese satellite to interoperate in the GMDSS.

Mrs. RODGERS. Mr. Glass?

Mr. GLASS. Thank you, Madam Chairwoman. I’m also not in a position to comment on that, but our staff can work with your staff to describe that. Thank you.

Mrs. RODGERS. Thank you. Thank you both for being there. I yield back.

Mr. LATTA. Thank you. The gentlelady yields back. The Chair now recognizes the gentleman from Florida’s Ninth District for 5 minutes.

Mr. SOTO. Thank you, Chairman, and appreciate both your support, our ranking member’s and of course my fellow Floridian, Dr. Dunn, on this great bill we’re hearing today, the LAUNCH Communications Act. From our back yard in Kissimmee, back in Central Florida, we had quite the display of rockets coming up. It’s something that makes our region very special, being the district right next to Cape Canaveral. And we have seen full view of the

busiest space—in the world over there with NASA recently launching Artemis, SpaceX, ULA, Blue Origin, and so many more on making sure we continue to be the top nation in space flight in the world.

2022, we saw 57 orbital class rockets, a record. But wait, 2023 is no slouch either. Eighty-seven launches set for this year, another record. And who knows? We might see a hundred by 2024 on—and FCC licenses for each of these launches is—it's a cumbersome bureaucracy. It's one that has been there because there hasn't been enough direction by Congress.

We know we need to cut the red tape to boost space innovation. And I appreciate the FCC's efforts on moving forward in response to us filing this bill now 3 years—3 terms in a row, efforts to utilize the 2200 to 2290 band of spectrum is a good promise. I know our witnesses have talked about that already. The LAUNCH Communications Act will ensure that they finish the job and have statutory framework to ensure that it can't go back and forth based upon who is on the FCC. We need to secure spectrum specifically and permanently for spaceflight.

Mr. Richardson, thank you for being there. Can you speak more about the Commission's role in facilitating the launch of satellites and of commercial space launches as we continue to increase—what actions do you think the Commission can continue to build upon or take from regulatory approach that will create more certainty for a lot of these launches?

Mr. RICHARDSON. Well, thank you for your focus on this important question. I think we are recognizing that with the growth of the satellite industry comes a growth of the satellite launch industry, which is also, as you say, from your own back yard, very visible. I think the things that we can do in addition to having allocated that additional spectrum is to—and we very much appreciate your interest in that proceeding in bringing it to close. The things we can do, I think, are one, we've asked questions about are there other bands that we might be able to also use for this purpose. And the second is finalizing our proposals for service and licensing rules for this so that we have the system in place to take advantage of the new allocations.

In the past, my understanding has been that this has been somewhat cumbersome because we had to go through a so-called special temporary authorization or STA process because there was no spectrum allocated for this purpose. And so we're on our way toward a new regulatory environment, and again, appreciate your interest in that proceeding.

Mr. SOTO. I believe we are nearing 2 years now. Also this rule-making and effort at the FCC—is that a long-time or is that sort of par for the course? How would you describe the progress we've made so far?

Mr. RICHARDSON. Well, I've been practicing before the Commission and now at the Commission for over 40 years. And I think there is a wide variety of timeframes for Commission proceedings. But I think we understand the priority that needs to be placed on this proceeding.

Mr. SOTO. Well, we appreciate the FCC being responsive even to our efforts as we are still working on passing this bill into law.

The—can you talk a little bit about what happens when you miss a launch window because you can't get a license in time, and the effects it could have on America's space competitiveness?

Mr. RICHARDSON. I'd like to take that back if I could. I am not familiar with the situation that you posed.

Mr. SOTO. Well, allow me to, for the edification of the committee, discuss with them a little bit. You know, if you don't get that license on time or we have various weather obstacles that prevent launches, you are constantly having to apply again and again and again. It could be over three to four to five attempts in the—in the midst of one effort to launch a rocket. So we really want to make sure this is nimble, because weather can be unpredictable. The FCC licensing should be more so. Thank you for your testimony, and Mr. Chairman, I yield back.

Mr. CARTER [presiding]. The gentleman yields. The Chair now recognizes the gentleman from Michigan, Mr. Walberg, for 5 minutes.

Mr. WALBERG. Thank you, Mr. Chairman, and thanks to the witnesses for being here.

Mr. Glass, as part of the administration's national spectrum strategy or otherwise, is the NTIA considering the needs of commercial space operators to access spectrum, and are there ways NTIA can accelerate access to spectrum for commercial launches, especially whenever agency approval is required?

Mr. GLASS. Thank you, Congressman. With respect to our efforts, we coordinate very carefully with the FCC. But your question gets into policy issues that I'm not able to comment on. So if you like, our staff can get back with your staff to fully explore that.

Mr. WALBERG. I'd appreciate that. Only ask questions that we hope we can get an answer for. So, Mr. Richardson, the SAT Streaming Act would establish shot clocks, so to speak, for the FCC to grant or deny certain applications, modifications, or renewals. If enacted, the SAT Streamlining Act, would the FCC be able to meet these timeframes? And if not, why not?

Mr. RICHARDSON. That again is a question that the Commission has teed up in its rulemaking that's in parallel with these bills asking for industry and the public to comment on the nature of the shot clocks and the time periods. So that's under review, and we don't have the comments yet from various perspectives of industry and the public for what the appropriate time period would be.

I think another point I'd like to raise about the shot clocks—and I—is in my written testimony, is that the way the FCC processes applications—and this is not unique to satellite—is that we first have a time period for accepting for filing the applications, which then sets the time clock for comments. And then the question about the second shot clock is, how long after we get the comments do we need to have to act?

And I just wanted to make a point that shot clocks generally would be best framed, I think, from the point of view of acceptance for filing in terms of—rather than from when it comes in the door. One of the things we are trying to do is identify ways to streamline the process so it's clearer what needs to be in the application when it comes in the door, and that's one of the problems.

But I just wanted to focus on that acceptance-for-filing piece as an important part of the puzzle.

Mr. WALBERG. Well, I appreciate that. I think our—some of our biggest concerns that come through our local offices—and I can only imagine we're talking about the rapid expansion of satellites and telecommunications that it is frustrating to have the goal in mind, and the bureaucracy holds it up. So I certainly get what you are saying about making sure that we know how to approach the application. But timeliness is extremely important.

Mr. RICHARDSON. We completely agree with that, and we are looking to expedite this process, as I mentioned, not just through these rulemakings that, again, have much in common with this bill. But also, we've increased the staff for processing these applications. And NGSO applications are often technically very complex. We've got more staff, 38 percent more staff, in the Satellite Division to handle them now. And we have, as I said, focused our priority on this emerging satellite industry and its importance by creating a bureau that's designed to focus on their needs. We hear what you are saying.

Mr. WALBERG. I wish you all good speed.

Mr. RICHARDSON. Thank you.

Mr. WALBERG. Coming from Michigan, we like speed. Let me—let me follow up that. Can you describe the differences in the roles of International Telecommunications Union and the FCC in regulating satellite communication systems?

Mr. RICHARDSON. My focus has been on FCC regulations. So I will be happy to take back the question about the ITU. But basically the FCC rules for satellite, which is obviously a global service in many respects, have to be consistent with the rules of the ITU. And so applicants generally need both an ITU and an FCC authorization. But the ITU piece, I'm not personally involved in, and I'd be happy to give you more information about that piece.

Mr. WALBERG. I appreciate that. Thank you. I yield back.

Mr. CARTER. The gentleman yields back. The Chair now recognizes the gentleman from California, Mr. Cárdenas, for 5 minutes.

Mr. CÁRDENAS. Thank you very much, Mr. Chairman. Appreciate this opportunity. The chairman looks more like a pharmacist right now. Are those bags full? Anyway—during last week's Communication and Technology Subcommittee hearing, also on the subject of satellites, we heard from stakeholders on important positive roles satellites play in our everyday lives, and it affects all of our lives.

And in the United States of America, I think we are fortunate as Americans that we are probably touched more by satellite in our country than most countries around the world because we are more developed and we have an economy that depends so much on it. Today we continue discussing the importance of ensuring we have a rigorous process in place to maintain U.S. leadership and satellite communication technologies and to promote competition in American satellite marketplace.

Mr. Richardson, how will the FCC's Space Bureau and the legislation we are considering today promote a competitive and innovative satellite marketplace?

Mr. RICHARDSON. I think the focus of both is to identify ways that we can promote deployment of satellites in this country and make us more competitive in that global marketplace.

Mr. CÁRDENAS. And how is the FCC collaborating with other agencies to help improve harmonization in space policy matters?

Mr. RICHARDSON. By “harmonization,” do you mean internationally or—well, that is something that is part of the work process, I think, to make sure that our allocations and international allocations sync up. And we are very delighted that the ITU’s new Secretary General, someone with a long experience in this field at the ITU and, previous to that, working at NTIA. So we look forward to that coordination.

Mr. CÁRDENAS. So when it comes to the United States, how would you describe our position when it comes to satellites past, present, and going forward when it comes to being a leader and/or collaborator internationally?

Mr. RICHARDSON. Well, we very much believe that the United States should lead the way in satellite global marketplace.

Mr. CÁRDENAS. Are we seeing that way at the moment?

Mr. RICHARDSON. We have some very strong competitors.

Mr. CÁRDENAS. Who would that be?

Mr. RICHARDSON. Well, a number of them, you heard from last week, and some more and I think you are going to be hearing from this week right after this panel, but—and there’s a variety of segments in the satellite industry that are described in the communications marketplace report that I cited in my written testimony, which has a lot of information about who these players are and what their market share is and things like that. So I would commend that to you as an excellent summary but would happy—be happy to answer any other questions you might have about where we stack up, if you will, if that’s your question, in the global marketplace.

Mr. CÁRDENAS. Because it’s my understanding that the projections are that—about 5,500 satellites in space. And as soon as 2030, it might be past 55,000 or more potentially.

Mr. RICHARDSON. Yes. I think that’s a direct result of the tremendous success of the NGSO satellites, which require many, many more satellites than the GSO systems. And that’s where I gather there is a projected boom. And that’s one of the many challenges for regulators in terms of addressing the higher volume that we can expect and have seen in the last few years.

Mr. CÁRDENAS. So what role would Congress have to play when it comes to keeping up with that pace? Would you need to see a much more complex staffing regimen within the FCC in order to keep up with that pace?

Mr. RICHARDSON. Well, we have increased our staffing already by 38 percent.

Mr. CÁRDENAS. So you don’t need any more help? You have all the staff—

Mr. RICHARDSON. I would never say that.

Mr. CÁRDENAS. OK. You better not!

Mr. RICHARDSON. And I think you heard last—I think you heard last week from industry witnesses about the staffing question, both numbers and expertise.

Mr. CÁRDENAS. Yes.

Mr. RICHARDSON. It's a very—it's a very complicated—particularly engineering satellite is very complicated.

Mr. CÁRDENAS. And how does it—how does it feel right now when it comes to having domestic staff training and potential experts coming into possibly being future staffers at the FCC with the right expertise when it comes to organically people who grew up here who went to college here, et cetera?

Mr. RICHARDSON. Again, I would like to take that back with the—to give you an answer from the people who are focused more on the—on the recruitment angle. I think that's your question.

Mr. CÁRDENAS. I'd love to hear from them. Thank you so much, Mr. Chairman. I yield back.

Mr. LATTI [presiding]. Thank you. The gentleman yields back. And this time, the Chair recognizes the vice chair of the subcommittee, the gentleman from Georgia's First District for 5 minutes.

Mr. CARTER. Thank you, Mr. Chairman, and thank both of you for being here. We appreciate it. This is extremely important and very educational for those of us who are not quite as up as other people are on this particular subject. You know, I think that all of us would agree on both sides of the aisle that regulations and red tape are hindering innovation and, a lot of times, inhibit our global competitiveness.

So we have to be very careful about that. And there is probably no better example than the satellite marketplace. While we watch our adversaries like China and Russia, we have got to ensure that the Federal Government is not holding innovators back. I truly believe and have always said that the greatest innovators in the world are right here in the United States of America, and I believe that. But we've got to help them.

And one way we can help them is not to hold them back and to get out of their way. So I want to thank the chairman for bringing this important topic to our attention because it is important. I want to start with you, Mr. Richardson, and ask you. Tell me about processing rounds. What is that system? When was it implemented, and what was —why was it implemented? What was the need for that?

Mr. RICHARDSON. That's a good question about processing rounds because that's a focus of much of the commentary on this streamlining of the process. For GSO satellites, as I recall, the Commission established a first-come, first-served system for NGSO satellites or NGSO-like satellites. It uses a processing round. And if you are in the same processing round, you have the same priority. If you are not in the same processing round, you have secondary priority.

Mr. CARTER. When was that set up? Was that years ago, or was that just recent?

Mr. RICHARDSON. It's not recent. I would have to—I would like to get back to you on the exact date for that. There is a—there was a proceeding that established the processing rounds. I'm happy to give you that information.

Mr. CARTER. Does it still function today like it was intended to originally? Do you know?

Mr. RICHARDSON. Well, one of the questions I think that's been teed up in Commission proceedings is whether, in light of the differences within GSO and the rapid changes in the industry, should we revisit the way we conduct our processing, including processing rounds.

Mr. CARTER. OK. Let me ask you this: Do you feel like the workforce at the Commission is well equipped to handle the volume and the complexities of applications?

Mr. RICHARDSON. That was the subject of last week's hearing, that I think the industry felt that we needed more support. And I think I'm not authorized to ask you for additional support, so I won't do that.

Mr. CARTER. And I understand that and—but let me tell you I'm not interested in throwing money at it. Tell me how we can make it more efficient.

Mr. RICHARDSON. Well, I think there were good points made last week about, as you say, the complexity of satellite engineering, which is a key part of the processing. And, as you know, there are disputes between incumbents and new entrants about whether there is potential interference and how they share spectrum. We are trying to develop rules around that to make that a clearer process that has regulatory certainty attached to it.

But it does need experts. And I certainly recognize the point that the more difficult it is to attract skilled experts to replace the ones that are moving, you know, toward retirement, the better it is for us.

Mr. CARTER. OK. Mr. Glass, let me ask you: Can you explain the procedures in place to measure interference and protect Federal systems when commercial users need access to spectrum for launches?

Mr. GLASS. Thank you for that question. Yes. At NTIA, we coordinate very carefully with the Federal agencies through our interagency process to make sure that we understand what their issues are with any potential interference. We coordinate, then, with the FCC to make sure that we as the U.S. make a smart decision going forward that ensures efficiency and would allow us to maximize the use by spectrum operators.

Mr. CARTER. How do you resolve disputes?

Mr. GLASS. We have a dispute resolution process that is in our new MOU that would allow us to address any issues there.

Mr. CARTER. OK. I will stay with you, Mr. Glass. Last year, the FCC and NTIA established a Spectrum Coordination Initiative. Has this initiative improved issues related to spectrum sharing?

Mr. GLASS. I think that was worked into our memorandum of understanding with the FCC, and it has improved our coordination with them. And I think that it will continue to allow us to improve the process.

Mr. CARTER. Do you agree with that, Mr. Glass? Or excuse me. Mr. Richardson.

Mr. RICHARDSON. Yes, I would. I think that the—under the MOU, we've made increasing efforts to coordinate better with NTIA and its Federal agencies.

Mr. CARTER. OK, good. Thanks, Mr. Chairman. I yield back.

Mr. LATTI. Thank you. The gentleman yields back. The Chair now recognizes the gentlelady from Texas, Seventh District for 5 minutes.

Mrs. FLETCHER. Thank you so much, Chairman Latta and Ranking Member Matsui for organizing today's hearing so that we can continue on last week's important discussion on satellites. And, as I noted in my questions last week, there are so many areas of importance for our communities that we are talking about here and such great potential.

I want to follow up on the questions that Mr. Carter was just asking and Chairwoman McMorris Rodgers asked a little bit earlier about some of the challenges and the changing environment and the growing workload associated with the current satellite licensing demands. But I know that the SAT Streamlining Act includes a number of proposals to amend the Communications Act to better reflect those changes. So could you just elaborate, Mr. Richardson, a little bit on the reforms that are included in the bill in addition to some of the staffing issues that we've been talking about and some of the retention issues?

Can you just talk about any of the other reforms that are included in the bill that you think would have a positive impact at the FCC?

Mr. RICHARDSON. It's a very good question, the details of the bill and how they might relate to our pending rulemaking, which tracks it in many respects. I think the key issues that the bill identifies are the need to have a rulemaking to clarify what the performance criteria are for satellites so that applicants know what to expect. It has a process for expediting on applications for minor modifications that shouldn't take a whole lot of time. I think it would allow us to establish a process that would avoid the back-and-forth about parts of the application if the applicant maybe didn't realize they needed to be put in there, but we can be clearer about what's required. And it—I think those are the key things. But there are issues, for example, like letting those in the satellite industry know what are the ground rules for sharing, what are the ground rules for harmful interference, which, in my experience, I'm not an engineer, but I know it's—it's a very, very complicated question, particularly in the satellite field.

And what we've done is we've proposed in this rulemaking some very specific proposed alternatives for people to comment on about how to measure interference. And again, once we get those ground rules squared away, the hope is that the application process, again, with the—coupled with the priority of additional staffing and in a new bureau that's focused directly on this, we'll be able to address the challenge.

But I have to say that it is a—it is a—everyone recognizes that the volume of these applications and the numbers of satellites up there are increasing very, very dramatically.

Mrs. FLETCHER. Well, thank you very much for that. With the time I have left, I want to switch gears a little bit with a question for both of you to touch on something that we haven't touched on as much today at this hearing, but I know in prior Congresses we've touched on the Science, Space and Technology Committee a little bit. And it's important to our discussion here as well. So Mr.

Richardson and Mr. Glass, could you both just talk a little bit about how the FCC and NTIA can do more to help improve space sustainability and reduce orbital debris in lower orbit.

Mr. RICHARDSON. I'm—

Mrs. FLETCHER. Should I start with Mr. Glass?

Mr. GLASS. Thank you for that question. With respect to orbital debris, that gets outside of the spectrum issues that I'm able to answer. However, we would be more than glad to get back with your staff with that answer.

Mrs. FLETCHER. OK. Thanks.

Mr. RICHARDSON. From the FCC's perspective, we have another proceeding that's been pending, asking questions about how to resolve some of the questions about orbital debris. We did, last year, address one specific aspect of it, which is the amount of time that it—after a mission is over that a satellite needs to be decommissioned, deorbited. And that is a significant issue because I think there are now 4,800 or more satellites up there. And the industry, I think, agrees that this is a potential issue for collisions, avoidance maneuverability, explosions. And so what we've done is we have established a rule that requires that for—orbiting satellites of 5 years.

Mrs. FLETCHER. Thank you so much for that. I see that I've gone over my time, and I thank you, Mr. Chairman, and yield back.

Mr. LATTA. The gentlelady yields back. The Chair now recognizes the gentleman from Florida's Second District for 5 minutes.

Mr. DUNN. Thank you very much, Mr. Chairman. Closing the digital divide is encouraging innovation in satellite communications, outstanding priority for me personally and for this committee. Satellite operators can help provide broadband across the country and, in fact, around the world. The ability to maintain internet access during and after natural disasters is also vitally important as we discovered after Hurricane Michael in my home district.

And so I want to thank the chairman for organizing this hearing and highlight the bipartisan legislation we are discussing today. This is also—one of the bills is also a LAUNCH Communications Act, which I reintroduced with my esteemed colleague from Florida, Darren Soto. The LAUNCH Communications Act streamlines some of the bureaucratic elements of the launch process, making it easier for private companies to obtain authorizations for temporary use of necessary spectrum. And I look forward to working with Congressman Soto and members of the committee to get this bill passed this session. We need to ensure that the regulatory processes, in fact, support innovation and don't hamper that or get in the way.

Mr. Richardson, the FCC's policies guiding the licensing process for the special temporary authorizations were designed decades ago. Do you think they still meet the needs of a U.S. commercial launch market where we're launching, on average, two times a week?

Mr. RICHARDSON. It's a very good question. I think that this bill brings needed focus to the changes in the satellite launch industry. As the satellite industry has grown, the satellite launch needs have grown. We need—we need to do better. And I think we began that

with that allocation of additional spectrum to permit applications that avoid the special temporary authority.

Mr. DUNN. Obviously, we'd like to standardize the process so everybody knows what they're going to be using ahead of time. And this, by the way, is what, you know, the various launch companies—satellite veterans, what they will ask of us is to come in and get involved here.

So 2013, the FCC began proceedings to reallocate spectrum specifically for launches, commercial launches, and create a streamlined process, a whole process here. So I understand the NTIA—you said you support this effort on requiring the FCC, I believe, earlier today. So this goal, however, remains pending. It is 10 years later. Wouldn't it be beneficial to get these things through?

Mr. RICHARDSON. We have a proceeding designed to do that, to establish the service rules and the licensing rules now that we have the spectrum, so that's the next step.

Mr. DUNN. Yes. Mr. Glass, you previously confirmed your NTIA support for these processes. Can you comment on how bundling licenses might be beneficial, if you think it would be beneficial. So that's the launch, the unorbited, and the decommissioned spectrum.

Mr. GLASS. Thank you, Congressman, for that question. Unfortunately, that's outside my area of expertise specifically. I'm more oriented on the process with respect to registration, coordination, et cetera, of satellites. I had—can, however, make sure that we get back to your staff with an answer.

Mr. DUNN. So I actually—maybe Mr. Richardson can answer that question. Bundling of licenses for spectrum. So for the whole—I mean, the launch, the orbit—on-orbit missions and decommissioning.

Mr. RICHARDSON. If I understand your question, it's about improving and accelerating the process for granting applications.

Mr. DUNN. You bundle the license. You give out all of those license all at once. You don't have to go back and ask for another license to—different license to communicate with a satellite and another one to deorbit it.

Mr. RICHARDSON. I don't know whether that's raised under our proposals or not. Could I get back to you on—

Mr. DUNN. Yes, so, you know, that's—as we've talked about streamlining here today, this seems like an obvious way to streamline that process, give everybody some surity.

With that, I yield back my time. Thank you very much, Mr. Chair.

Mr. LATTA. The gentleman yields back. The Chair now recognizes the gentleman from New Jersey, the ranking member of the full committee, for 5 minutes.

Mr. PALLONE. Thank you, Chairman Latta. I appreciate having the FCC and NTIA here to provide feedback on these bipartisan bills. With respect to the Secure Space Act, I'm interested in hearing more about how we can ensure that space infrastructure doesn't create the same national security vulnerabilities to our U.S. communications like we've seen out of some of our other infrastructure and networks. So let me ask Mr. Richardson: How would the Secure Space Act ensure the security of U.S. satellite marketplace?

Mr. RICHARDSON. Thank you for the question. This is an area where we have first looked at use of universal service funding and protected that against the rip-and-replace program I'm referring to. And then we—last year, we completed proceeding pursuant to Congress' mandate to deal with equipment authorizations. And this bill would focus on satellite—NGSO satellites is the way it's drafted, as I understand it. And I think we would apply much the same regime, which requires a finding that a service is a specific kind of communications equipment or service.

And then a determination by a designated Executive branch agency that the production or provision of that service is—poses unacceptable risk to the national security of the United States or U.S. persons. And then, under this bill, the Commission, much like the secure networks, the Secure Equipment Act Bill—Act, would put these on a covered list and bar us from granting applications to those persons or their affiliates.

Mr. PALLONE. So, I mean, the Commission's authority to oversee and regulate communication systems of all types is clear. But the SAT Streamlining Act aims to enshrine that authority more explicitly in the—can you just explain maybe better the value in codifying the FCC authority over the satellite market as the discussion draft proposes?

Mr. RICHARDSON. It's a good question about the law in this area. I think it would—as I've said in my written testimony, it's well established under title III of the Communications Act of 1934—really the Radio Act of 1927—that with respect to radio spectrum management the Commission has a plenary rule in making sure that those who are licensed serve the public interest. So we think we have established authority, but it's always helpful to have a confirmation and additional statute of the direction you think we should be going.

Mr. PALLONE. Mr. Glass, I'm pleased to see the progress being made by NTIA to reclaim its role in coordinating Federal spectrum users and to restore order to spectrum management operations. But what does NTIA's coordination with the FCC look like with respect to the satellite industry?

Mr. GLASS. Thank you for that question. That is handled through our—the revision of our MOU we—that we have with the FCC. And it allows us to promote effective long-range planning at the agency, principal, and staff levels to make sure that we maximize access to spectrum for satellite operators. We coordinate very carefully on the special temporary authorizations, quite often directly with the operators in precoordination to allow us to be able to facilitate that process as quickly as possible.

Mr. PALLONE. Thanks a lot. Thank you, Mr. Chairman. I yield back.

Mr. LATTA. Thank you very much. The gentleman yields back the balance of his time, and at this time the Chair recognizes the gentleman from Utah's Third District for 5 minutes.

Mr. CURTIS. Thank you, Mr. Chairman. I thank the witnesses. Mr. Glass, I'd like to highlight some of your efforts and the efforts of others internationally on the international spectrum policy. Particularly, I understand after 5 years of Chinese leadership, the ITU, we've been successful in getting our candidate in General—

Secretary General Doreen Bogden-Martin—I think I pronounced that correctly—who was competing against a former Russian candidate, right, who worked for Huawei, clearly very important to the U.S. interest.

And I find this very interesting. I worked—I had a bill called the TAIPEI Act that passed on 2020, and its whole point was to make sure that Taiwan was relevant in these international organizations, and it really—the point of the bill was to do exactly what you’ve done here, is to make sure we have good leadership overseas. So can you tell us a little bit about your work there and why this is so important for the United States.

Mr. GLASS. Thank you for that question. So the election of our candidate as the new Secretary General of the ITU was a huge step in our continuing leadership. The U.S. should strive to continue to fill leadership roles throughout the radiocommunication sector of the ITU, which is responsible for satellite registration and coordination, and we should continue to lead in the development of agenda items at WRCs and sharing studies for those agenda items to ensure long-term U.S. leadership for satellite communications technology.

The U.S. has a long history of leading on satellite issues, and I believe we’ll continue to be on the forefront of needed changes for satellite regulations and adoption of technologies in the ITU.

Mr. CURTIS. Can you give us a sense why this matters? If we don’t do this, what could go wrong? If we are not leading internationally, tell us why this matters.

Mr. GLASS. Leadership in any technology is always important, but you are getting into policy areas that are beyond my purview to comment on, so we can get back with you with a more thorough answer.

Mr. CURTIS. OK. That’s fine. And you mentioned this briefly in your remarks, but besides the selection, what would you like to see the United States do to exert influence internationally?

Mr. GLASS. As I said, Congressman, I think that we need to continue to fill leadership roles throughout the radiocommunication sector of the ITU and to make sure that we are leading and putting forward advanced technologies into WRC agenda items and to continue our leadership in those studies.

Mr. CURTIS. Well, thank you to both of you. More just a comment, and that is just how critically important your success in my—is in my district has some specific geographic challenges, and satellite offers some solutions for it. And we are all hampered by—it’s been discussed quite at length today updated government regulations and bureaucracies. And we feel that deeply in our district, so I’d like to thank you for your work and wish you all success. Thank you. Mr. Chair, I yield my time.

Mr. LATTA. Thank you very much. The gentleman yields back the balance of his time. At this time, the Chair recognizes the gentlelady from New York for 5 minutes.

Ms. CLARKE. Thank you very much, Mr. Chairman. I thank our ranking member for convening today’s hearing, and I thank our witnesses for joining us today. Advances in satellite communication technology represent another major step towards bridging the digital divide and unleashing the full potential of our Nation, from

connecting those in hard-to-reach rural and Tribal lands serving as a backstop for access in emergency services like 911 and providing a secure communications channel for those fighting oppressive regimes around the world. The satellite industry is already playing a critical role at home and abroad.

As the pace of advancement continues and satellite operators and wireless carriers begin pairing up to integrate their networks and eliminate coverage gaps, we need to ensure that Congress establishes a regulatory landscape conducive to fostering these kinds of innovations while balancing the spectrum needs of the Federal Government. We also need to ensure that the FCC can keep up with the pace of licensing applications it is receiving both today and into the future.

So my first question is directed to both of our panelists. The FCC recently announced its adoption of Chairwoman Rosenworcel's plan to establish a new Space Bureau. How can this new bureau and other recent FCC action related to satellite licensing work to foster further innovation and keep us competitive globally? And let's start with you, Mr. Richardson.

Mr. RICHARDSON. Thank you for the question. We are very excited to have this proposed reorganization, which is subject to approval by the appropriators. But I think the key is not only the increased staffing that we've already had, the 38 percent that I mentioned before, but also the focus of this new bureau will be devoted to the satellite industry because we recognize that this is an extremely important industry. Its importance is growing for all of the reasons that you identified.

Ms. CLARKE. Mr. Glass?

Mr. GLASS. Thank you. So our coordination with the FCC is handled through our memorandum of understanding. I don't think that will be directly impacted by the new bureau, but we, of course, look forward to working with them and continuing our close collaboration.

Ms. CLARKE. Very well. Mr. Richardson, there seems to be a widespread agreement that updating the FCC satellite licensing process is necessary for increased global broadband coverage. Considering that the Satellite and Technologic—excuse me—Telecommunications Streamlining Act will codify the FCC's authority to grant licenses for GSO and NGSO satellite services, could you tell us how this authority would expedite broadband coverage in the U.S., and what kind of resources or support you think would be necessary for the FCC to carry out the mandates of this bill effectively?

Mr. RICHARDSON. It's a very good question about a very important challenge. I think that the Commission and the authors of this bill are proceeding in tandem to try to identify ways that we can simplify the application process and expedite it that way to establish regulatory certainty about the kinds of policies that we'll be governing, the processing of the applications. And then we do recognize that, as the number of these applications increases, particularly we're talking about NGSO applications. We need to be positioned to be able to field those on a prompt basis. And I think that the witnesses last week identified the need for our capabilities to be such that we can do that both on in terms of how many engi-

neers and others we have but also the experience needed to handle these things.

Ms. CLARKE. Very well. I've only got seconds left, so I'm going to yield back and thank you very much, gentlemen, for your expertise.

Mr. LATTA. Thank you very much. The gentlelady yields back, and the Chair now recognizes the gentleman from Pennsylvania's 13th District for 5 minutes.

Mr. JOYCE. Thank you, Chairman Latta, and Ranking Member Matsui for hosting today's hearings. And thank you for the witnesses. Mr. Richardson, as we have seen this past week, adversaries continue to test the resolve and grit of the United States. You mentioned in your testimony that the Secure Space Act would prevent certain covered equipment which includes Huawei and ZTE from being granted licenses or market assets petitions from non-geostationary orbit. Can you talk more about some of the work that the Commission is doing to prevent our adversaries from gaining a foothold in this critical infrastructure?

Mr. RICHARDSON. It's a very topical question and a—

Mr. JOYCE. Indeed.

Mr. RICHARDSON [continuing]. Very important one. I think the Commission has been devoted in a number of different ways to identifying national security threats to our communications infrastructure. One is—and forgive me if I'm misunderstanding your question, but began with a rip-and-replace program and moved, directed by Congress, in the Secure Equipment Act to bar Huawei and others from being authorized to use the Commission process to permit the distribution of their equipment of certain kinds in the United States.

We have also recently taken action to revoke international common carrier authorizations from three Chinese Government-owned companies. And we have, in all of these efforts—and if this bill were enacted in this area with satellite, we would be working very closely with our Federal partners, the expert national security agencies, which provide us with recommendations and advice about the nature of the threats and how it relates to the particular equipment involved.

Mr. JOYCE. Mr. Glass, can you talk more about how intergovernmental coordination can create a friendlier regulatory environment for the satellite industry?

Mr. GLASS. Thank you very much for that question. Yes. We endeavor always to work in a collegial manner with our partners both at the FCC and in the private industry to ensure that we maximize the access to the spectrum while at the same time making sure that we take care of concerns with the Federal agencies in our interagency coordination process. We believe that this is a robust process and allows us to work in a very efficient manner with them.

Mr. JOYCE. How can Congress better assist with encouraging more intergovernmental coordination between NGIA and the FCC for nongovernment use of Federal spectrum bands?

Mr. GLASS. Thank you for that question, but that gets into policy areas I'm not able to comment on. But my staff can get back with your staff to answer that.

Mr. JOYCE. Thank you. I appreciate that. Mr. Richardson, would you feel comfortable in commenting on that?

Mr. RICHARDSON. I think I would just say that the revised MOU, I think, is a demonstration of the fact that the FCC and NTIA recognize the importance of working well together. And from my perspective, it's been working very well.

Mr. JOYCE. Thank you both. Mr. Glass, I would appreciate the followup answer to that question. And Mr. Chairman, I yield the remainder of my time.

Mr. LATTA. Thank you. The gentleman yields back, and the Chair now recognizes the gentlelady from California's 18th District for 5 minutes.

Ms. ESHOO. Sixteenth District.

Mr. LATTA. I'm sorry.

Ms. ESHOO. Think of Sweet 16.

Mr. LATTA. Sixteen. Well, there you go. Sweet 16. I'll remember that now.

Ms. ESHOO. OK. Thank you, Mr. Chairman, for this legislative hearing, and thank you to the witnesses. Mr. Richardson, during last week's hearing of this subcommittee, we heard a lot from industry about the delays in various applications by satellite companies. Some of the bills we are considering today are trying to address those concerns.

You mentioned in your written testimony that the FCC recognizes the new space-age needs of the new rules and that it's taken a number of steps to modernize its processes regarding satellites. What are those steps that FCC is taking, and how are they actually going to modernize the process?

And as a followup, does the FCC need any new authorities to help modernize the process?

Mr. RICHARDSON. Thank you for the question. I was——

Ms. ESHOO. You're welcome.

Mr. RICHARDSON. I was quoting from the chairwoman about the new space-age needs, new rules, which is a demonstration, I think, that the Commission unanimously recognizes that we are in a new era with satellite, particularly NGSO satellites. And we need to look at ways to streamline things. So we very much appreciate the efforts of this subcommittee.

Ms. ESHOO. But what are the steps?

Mr. RICHARDSON. The steps would be——

Ms. ESHOO. I know the rest.

Mr. RICHARDSON. OK.

Ms. ESHOO. I know the rest, but what are the steps?

Mr. RICHARDSON. The steps would be to simplify the application process so that we don't have miscommunication with the applicant about what the FCC needs, establish the ground rules for things like how to measure interference, how to permit sharing, because in many of these bands there isn't exclusive spectrum. They all need to share it. These are things that the Commission has teed up for industry and public comment, so we are—we need to address those.

Ms. ESHOO. I think we're going to—at this subcommittee, need to track that because it's important. Otherwise, it sounds good on

paper but doesn't really effectuate where we—on land and what we want to accomplish.

In your written testimony, you pointed out that the Secure Space Act does not include a specific grant of rulemaking authority to the FCC to implement it. Now, the FCC recently adopted rules regarding my Secure Equipment Act, which prevented the FCC from issuing licenses to telecommunication companies that pose a national security risk to our country, like Huawei and CTE. We are obviously not very fond—how important is that rulemaking authority to the success of the policy, and what can the FCC do or not do if you don't have it?

Mr. RICHARDSON. I'm glad you asked that question. I think that I want to emphasize that we don't—as I think I've indicated before, we don't—we have broad authority already under title III of the Communications Act. It's a matter of an administrative convenience, I think, if we had rulemaking authority as we did under the Secure Equipment Act. It's not necessary.

Ms. ESHOO. So you have what you need?

Mr. RICHARDSON. We do.

Ms. ESHOO. Good. Excellent. You've mentioned the MOU several times since I came into the hearing room. What exactly is in it? What's new that's in it?

Mr. GLASS. Thank you. So with the existing success of the MOU, the framework was targeted for improvements and additions. It reaffirms and emphasizes respective roles of the FCC and NTIA as the agencies responsible for managing spectrum in the U.S.

Ms. ESHOO. Sir, I don't know what you are talking about. You need to break it down into something that's understandable. You are reading something, but it doesn't make sense to me.

Mr. GLASS. I—

Ms. ESHOO. What's new that's in it?

Mr. GLASS. We have improved processes for coordination to allow us to better communicate with the FCC and—

Ms. ESHOO. But what is that? What does that mean?

Mr. GLASS. I will have to get back with your staff on an answer for that.

Ms. ESHOO. But is it speaking a better language? I mean, what is it? We are all for getting along with each other, but this is something that—it seems to me it's something beyond what you just said. At least I hope it is, because that doesn't—that kind of sounds like—law. I don't know. I don't understand it. Maybe others do. I don't.

Mr. RICHARDSON. One thing I think—

Ms. ESHOO. Maybe the MOU is important.

Mr. RICHARDSON. We agree. I think one thing, as I recall, that it does is it focuses on making sure that each party has adequate time to review the proposals for use of spectrum by the other party.

Ms. ESHOO. Can you get back to me on this—

Mr. RICHARDSON. Yes.

Ms. ESHOO [continuing]. Here? Thank you. Yield back.

Mr. LATTA. Thank you. The gentlelady yields back, and the Chair now recognizes the gentleman from Texas' 14th for 5 minutes.

Mr. WEBER. Think of it as sweet 14. Anyway—two can play that game.

Mr. LATTA. You are making fun of me.

Mr. WEBER. Oh, no, no. It's all—it's all good. It's all good. Texas is the sweet spot of the United States, if you all can't tell that I'm a Texan.

Mr. Glass, I want to go to you. In your description of your all's roles, you have, one, you're a principal advisor to the POTUS, the President of the United States, number two, you manage Federal frequency of spectrum, and you have a key goal, and that is to advance U.S. leadership. Witnessing the recent balloon foray across United States of America and things of that nature, it really brings up an interesting question to me. You manage the spectrum. FCC manages the spectrum. Is that right, Mr. Richardson?

Mr. RICHARDSON. For nonfederal users.

Mr. WEBER. For nonfederal users. And that's exactly my point here, is that you talk about things. There is an—actually a table here, and you all probably don't know the frequency numbers about VHF being 30 to 300 megahertz and the UHF being 300 to a thousand megahertz. Are you all that technical about it?

Mr. GLASS. I understand that.

Mr. WEBER. You understand that?

Mr. RICHARDSON. Yes.

Mr. WEBER. OK. Well, what megahertz would you rather apply for? I'm just messing with you. That's OK. The point I'm making is this. But you have the International Telecommunication Union which we—you say we discussed our guy elected to. But you've got bad actors out there. You've got China, and you've got a whole bunch of them that would rather do things and radio—against our best interests. In radio frequencies, power wattage means a lot when you're—when you're broadcasting your signals.

You all follow me? The amount of wattage that you use. What is to prevent China from overbroadcasting us in wattage on any of these frequencies? Mr. Glass, I'll start with you.

Mr. GLASS. Thank you for that question. Unfortunately, you are getting into policy issues with respect to that that I'm unable to comment on, and we would have to get back with you on an answer on that.

Mr. WEBER. Is you all's—you manage Federal agency spectrum, so surely a Federal agency that would be in harm's way where a foreign country could overpower their frequency—surely that would fall within your purview?

Mr. GLASS. We have a process for identifying and trying to address interference both domestically and internationally. That process is very detailed, and that is something that we could get back with you on.

Mr. WEBER. Is that something that's handled by the No Such Agency, NSA?

Mr. GLASS. I would not know to be able to answer that question.

Mr. WEBER. OK. Mr. Richardson, you—

Mr. RICHARDSON. With respect to commercial spectrum, there is a staff at the FCC that monitors use of frequencies. I mean, broadcasting, for example, they couldn't make it from China to here. It wouldn't—it wouldn't work. You are talking about satellite?

Mr. WEBER. Well, it depends on the positioning of the satellite.

Mr. RICHARDSON. Yes. You are talking about satellite.

Mr. WEBER. Correct.

Mr. RICHARDSON. That—we monitor the use of spectrum in the United States and obviously do——

Mr. WEBER. So let me——

Mr. RICHARDSON [continuing]. Refer to some of these other—those other agencies you mentioned.

Mr. WEBER. If I can interrupt. Company ABC Telecommunications, whoever that is, suddenly somebody is dispossessing their signal so that they can no longer use that signal because they are overriding them with the higher wattage available to displace that signal. Do they come to you, or do they come to Mr. Glass?

Mr. RICHARDSON. Well, I can give you an example when I was in private practice. We had a problem in the Los Angeles—our client, ABC, was being overrun by a station from Mexico. We came to the FCC and they addressed the problem with their Mexican counterparts.

Mr. WEBER. And so Mexican is a friendly—Mexico is a friendly country. So that would fly in that instance. It probably wouldn't fly to an unfriendly nation?

Mr. RICHARDSON. I don't know that that situation has ever occurred, but I——

Mr. WEBER. It's going to occur. You are going to have our enemies try to displace our capability of satellite signals.

Mr. RICHARDSON. I think if I could get back to you on the ways that we might address that problem——

Mr. WEBER. If you don't mind, that would be great. I'll just reserve that. You all get—reach back out to our office. Mr. Chairman, thank you, and I yield back.

Mr. LATTI. Thank you. The gentleman yields back the balance of his time, and the Chair now recognizes the gentleman from Georgia's 12th District for 5 minutes.

Mr. ALLEN. You got that correct. Thank you, Chair Latta. Thank our witnesses for being here today. Yes. This is a critical time in our Nation's communication systems, a lot of high-tech advancements that we—that we talked about today. You know, Congress is trying to keep up with innovation across all areas of technology. Of course, you know, China is—you know, we are in constant competition there and for Federal agencies like the ones before us today have got to be nimble enough to address the multitude of needs. And we certainly have our work cut out for us in Congress. That's where I've been so pleased with the rate at which the committee has begun its work here over this past 3 weeks. Energy and Commerce Committee participated in six hearings, two roundtables, six briefings and one markup, with another markup scheduled for tomorrow. So we are—we are out of the gate very quickly. And that's why the American people send us here.

Mr. Richardson, let's talk about the Secure Space Act. Does your agency ever receive applications from the types of entities which this bill has jurisdiction over?

Mr. RICHARDSON. Not to my knowledge.

Mr. ALLEN. OK. And——

Mr. RICHARDSON. Oh, you are talking about satellite applications?

Mr. ALLEN. Yes.

Mr. RICHARDSON. Yes. Not to my knowledge.

Mr. ALLEN. And what would be the impact if one of those applications was somehow prohibited?

Mr. RICHARDSON. Well, I guess the question the bill addresses is the potential threat to national security from having equipment of that type in a position to communicate over U.S. territory. And that would be a problem that I think, as is currently the case, these kinds of applications would be ones that—for satellite services, just like for international common carrier services or cable landing licenses, all of these kinds of applications, we would be in a position to refer them under our established policy since 1977—1997, excuse me—to refer them to Team Telecom for their recommendations about national security, law enforcement, foreign policy, and trade policy concerns. And we have—the example I mentioned before of Chinese Government-owned international 214 applications for common carrier service in the United States, which were revoked, the—our Federal partners provided key recommendations on those.

Mr. ALLEN. Good. Thank you. This is a question for both of you. Obviously, I'm in a—well, a big part of my district is rural. And of course we had issues with both broadband. Of course, we use a lot of that in agriculture. And what initiatives do you see that we need to implement to make sure that we get satellite coverage, what we need as far as technology to rural areas in this country?

Mr. RICHARDSON. Well, I can start. I think the draft bill on precision agriculture is an important indication of the importance of satellite to addressing those particular needs of farmers and ranchers. And as I mentioned earlier, we have commissioned together with USDA a task force that has come up with some recommendations for how to make use of spectrum, including satellite, in deploying for these precision agriculture purposes.

And that's one. I think the other is the promise of satellite broadband to cover areas that it makes no economic sense for terrestrial folks to cover. And then the other very intriguing idea of one of the other bills is, can we use satellite to fill in in areas where, because of disasters or other reasons, whether in rural areas or not, we need a better ability to communicate with 911 or send out emergency alerts. And that's a very interesting combination of terrestrial and satellite, if you will.

Mr. ALLEN. Mr. Glass, I apologize. I'm out of time, so I have to yield back.

Mr. LATTA. Thank you. The gentleman yields back, and the Chair now recognizes the gentleman from Ohio's 12th District for 5 minutes.

Mr. BALDERSON. Thank you, Mr. Chairman, my fellow Ohioan. Thank you both for being here today. And I'd like to first go with Mr. Richardson. Satellites and cellular presents a great opportunity to fill in coverage gaps across the Nation. In rural Ohio, in Appalachia specifically, these coverage gaps are more pronounced and have a profound impact on the ability of my constituents to connect with their friends, family, and coworkers.

My question: Mr. Richardson, can you briefly explain the process satellite companies need to go through to receive authorization

from the FCC to use satellite technologies to provide cellular services?

Mr. RICHARDSON. By "cellular services," you mean fill-in service where—

Mr. BALDERSON. Yes.

Mr. RICHARDSON [continuing]. Where there is no cellular terrestrial service?

Mr. BALDERSON. Yes, sir.

Mr. RICHARDSON. This is something that, as I said, is a new concept that our technical experts are looking at in the context of a couple of applications that have been filed to do just this. And they do raise some technical issues about the way those could be coordinated, and we are looking at that right now.

Mr. BALDERSON. OK. You mentioned in your testimony that the Commission has already taken several steps to modernize the application approval process. Can you elaborate on that and expand on what the SAT Streamlining Act would do to complement those efforts?

Mr. RICHARDSON. Sure. That's a good question. And I—when I said we have taken several steps, the Commission takes steps first by issuing notices of proposed rulemaking because the law requires that. And the purpose of that is to make sure that we are informed by the industry and members of the interested public about what the right steps would be. So we've teed up steps that are very similar to the steps in this bill. They are how can we make the application forms simpler? Can we do that by establishing ground rules for what kinds of measures we take for harmful interference and sharing of spectrum? Can we address other issues or we'll agree is an example of them that, right now, applicants receive their grants of applications conditioned on the outcome of orbital debris proceedings.

So those are the steps, I think, that would help. And again, we agreed with the subcommittee's draft bill that these are things that would help promote more expedited satellite service, and that's why we're—we launched these various rulemakings to kind of bring them home to do that kind of thing.

Mr. BALDERSON. OK.

Mr. RICHARDSON. I should say, too, that—I think I said in my written testimony this is—when I was in private practice, I loved getting my applications granted as quickly as possible. And the Commission generally helped me out with that. But the process for public participation is one that ensures that we balance the need for expedition with ensuring that our main mission—one of our main missions that we don't pose any harmful interference to other licensees or potential licensees. And so we have to balance those two together.

Mr. BALDERSON. OK. Thank you. My last question: What technical considerations, be it spectrum or usage of other issues, does the Commission consider when deciding whether to authorize satellite to cellular service, and would it be helpful for Congress to spell out what technical considerations the Commission should be considering?

Mr. RICHARDSON. I think this comes up in the ALERT Parity Bill before you. And I believe that it would make sense for our technical

experts in the public safety field—because this deals with 911 and EAS in the engineering field because of the potential, you know, coordination needs and in the licensing field because the question is, you know, how do you issue licenses to do this—that they would be happy to give you some technical assistance in some of the issues that these new forms of—these partnerships, you know, pose.

Mr. BALDERSON. OK. Thank you very much. Mr. Chairman, I yield back.

Mr. LATTI. Thank you. The gentleman yields back the balance of his time. The Chair now recognizes the gentleman from Texas' 11th District for 5 minutes.

Mr. PFLUGER. Thank you, Mr. Chairman, and I'd like to thank the witnesses for being here to discuss some of these. I know a lot of questions have been asked. And there's, you know, a lot of details discussed. I kind of want to go more broadly. And I'll open it up to both of you here.

When it comes to the policies that we have, how we are competing with, let's say, China? Let's call this, I think, what it is. And the policies we have on issuing the appropriate permits and licenses to do—you know, my district, we've got a lot of agriculture. Very interested in the precision agriculture when it comes to the cotton industry, being able to utilize technology that exists, you know, whether it's the planting or the fertilization or any of the other—any of the other new things that are going to be available.

But also more broadly, when it comes to national security issues that we have of communications and how we get through this process at the speed of relevancy, what are the major hang-ups for speed of relevancy right now? We'll just—if you guys can give me a minute each, and then we can go to the next question.

Mr. RICHARDSON. OK. What I think on the precision agriculture, the work of our task force is referred to in the bill, and we appreciate the support for bringing that to closure. I think it was one of the comments we heard earlier. On the national security issues, I think we do need to maintain our position in the global economy with our satellite industry to make sure that it's as streamlined as possible. And that's what we are working to do.

Mr. PFLUGER. Mr. Glass?

Mr. GLASS. So we work very carefully through our coordination process to ensure we continue our leadership and development of advanced technologies. But beyond that, I think your question gets into policy issues that I'm unable to answer, and we would have to get back with you—

Mr. PFLUGER. I mean, do you have an opinion on—

Mr. GLASS. I do not have an opinion.

Mr. PFLUGER. You know, let's consider a couple of things. And let me just, you know, open back up. I mean, where in the energy space when it comes to production of energy do we need to be focused, and do we need to be looking at these capabilities to enhance the production, to enhance, you know, the overall efficiencies?

I mean, where can we go in the energy industry to use satellite technology to help, you know, whether it's accomplishing all the goals that we went to accomplish with taking care of our Earth and

making sure that we have efficient energy specifically in the Permian Basin for the production of oil and gas. Can you talk to that?

Mr. GLASS. Thank you. That, unfortunately, is outside my area of expertise, so I would be unable to give you an answer today. But, however, our staff can get back with you on an answer.

Mr. RICHARDSON. I think you are identifying one of the important potential uses of satellite, which is to cover broad swaths of territory in identifying things that the energy industry can use. I think there are specific kinds of licenses that have been issued by the FCC for that purpose, and I'd be happy to get back to you about the uses of the satellite spectrum to facilitate the work in the industry.

Mr. PFLUGER. Mr. Glass, let's talk about the nonfederal use of spectrum bands. You know, we are talking about the increasing leadership in the private sector, the dual-use technologies. Do you believe NTIA and other Federal agencies need to enhance their relationships with the private sector?

Mr. GLASS. Thank you very much for that question. We are always striving to enhance our communication and our ability to coordinate with both the FCC and private industry to increase efficiencies and to be able to maximize spectrum use by commercial sector.

Mr. PFLUGER. Do you think we are doing enough?

Mr. GLASS. I—

Mr. PFLUGER. Are we operating at the speed of relevancy on those relationships with the private sector?

Mr. GLASS. Thank you for that. We are always striving to improve because there is always room for improvement.

Mr. PFLUGER. Mr. Richardson, any thoughts on that?

Mr. RICHARDSON. On the ability of the private industry to work with the Federal Government agencies, is that—is that—

Mr. PFLUGER. That's right.

Mr. RICHARDSON [continuing]. The question? I—obviously, the FCC promotes those relationships. And I would concur that I think we have done a pretty good job of making sure that Federal Government users and commercial users can meet eye to eye.

Mr. PFLUGER. OK. We have some questions we'll submit afterwards, I yield back.

Mr. LATTA. Thank you. The gentleman yields back, and the Chair now recognizes the gentlelady from Florida's Third District for 5 minutes.

Mrs. CAMMACK. Thank you, Mr. Chairman. Thank you to our two witnesses for this first panel for appearing before—I'll just follow up on my colleague from the great State of Texas, his commentary about striving to improve. Mr. Glass, you said we are, quote, "always striving to improve." By what metrics are you tracking that type of progress?

Mr. GLASS. Thank you for that question. I am not aware of specific metrics for tracking that. We are, however, through our MOU with the FCC constantly looking to improve our processes and communication, improving our processes in being able to facilitate access to spectrum by the commercial sector. And that is done in the MOU that we currently have by setting specific timelines for communication of all parties so that we can streamline that process.

Mrs. CAMMACK. So without specific metrics, the only tangible way that you can measure progress is by communication timelines?

Mr. GLASS. I am unaware of any specific metrics. There may be—and we can get back to your office with that answer.

Mrs. CAMMACK. OK. That would be very, very helpful.

Mr. Richardson, how should changes like the improvements in the Streaming Act be developed to ensure that the FCC can maintain a flexible position not only to address the issues that are within the licensing space today but also those in the future without impeding innovation within the industry? And I'm sure you have some personal expertise that you can speak to before your time here—FCC.

Mr. RICHARDSON. Well, I think the history of regulation at the FCC, if you follow a timeline, has been to be increasingly aware and addressing the question of is—when is regulation needed, and when is it not needed? I think that's something that's always at the forefront and people may have disagreements about.

Mrs. CAMMACK. Not in Washington!

Mr. RICHARDSON. Right. But I think the Commission is well-attuned, again, through its rulemaking processes because it hears a lot about this from all sides about how much regulation is too much and how much is too little.

Mrs. CAMMACK. So in your personal capacity as someone who worked to help expedite applications et cetera—

Mr. RICHARDSON. Oh.

Mrs. CAMMACK [continuing]. What regulatory burdens are at this point in time unnecessary that we in this body should address to potentially take off the books.

Mr. RICHARDSON. I can't identify particular regulations. I think one of the things that we've been working on with respect to satellite applications and this bill also addresses is, are there ways that we can simplify our forms. From my experience example is, when I first started private practice in 1977—I'm ashamed to say it was a long time ago—we had renewal applications that were like this. [Indicates thick document.] And they were reduced to a postcard.

And that was in broadcasting. It was a little different. This is more complicated. So the technical showings, engineering showings for satellite applications on Schedule S, I think it is, are more fulsome. But one of the things we strive for is sort of a can we simplify them so that we—the processors can say, "Yes, got that, yes, got that," you know, and move on down. And that's one of the goals of this rulemaking.

Mrs. CAMMACK. Do you think that the current legislation addresses ways that the FCC and satellite companies can coordinate on the technological advancements that are being made? Is there an element that we need to address that can help facilitate those changes in rapidly changing environments?

Mr. RICHARDSON. Well, it does. This legislation does address those, as do our rulemaking proposals, because they try to hit all of the subjects as well. In other words, how do we make the application simpler, avoid confusion? How do we establish ground rules in advance for interference and sharing? How does the processing round system work? These are things that both these bills address

and the FCC addresses. And we are—this is a rulemaking that just went out in December. So the comments from industry and the public on how best to do this are due—comments March 3rd, reply comments April 3rd. So we are looking forward to seeing whether we can get recommendations and suggestions that we can finalize into new rules for the new space age, you know?

Mrs. CAMMACK. I appreciate it. My time is expired. I yield, Mr. Chair.

Mr. LATTI. Thank you. The gentlelady's time has expired, and the Chair now recognizes the gentleman from California's 23rd District for 5 minutes.

Mr. OBERNOLTE. Thank you, Mr. Chair. Thank you to both our witnesses. I have enjoyed the hearing. Mr. Richardson, you had highlighted in your testimony you need to develop effective processes for the sharing of spectrum. And you mentioned that it's particularly important that the satellite spectrum that is not dedicated to one user that is intended to be shared with new, different users. I know that you've had some experience in your career with the question of what constitutes harmful interference and how that can be mitigated. Can you talk a bit more about that?

Mr. RICHARDSON. Yes. It's a very good question that has eluded me for many years as to what—because the challenge about harmful interference is it depends on the context. Depends on what spectrum you are using, how far away it is geographically, how far away it is in spectrum terms. Is it adjacent? Is it cochannel? That kind of thing. And the path—and in satellite, I am not an engineer, so all I know is it's extremely complicated, and I always relied on the engineering professionals to sign the applications.

So I'm a little bit at loss to talk about the nature of harmful interference. But we have a definition in our rules of harmful interference. And it's—I think, one of the benefits of this pending rulemaking is that it lays out there in the satellite context specific alternative ways of measuring it. And we haven't decided which is the best way. We are seeking comment on that. But it's an effort, I think, to get to your question, which is what exactly is harmful interference in this particular context.

Mr. OBERNOLTE. Sure. So—and I know you mentioned to Congressman Carter in his question that you were developing guidelines on the issue. Let me ask a followup question about that. With this interesting situation there, the established companies are developing more and more sophisticated methods of eliminating interference. So this creates a reverse incentive when we sit down at the negotiating table to figure out what interference is considered harmful that the new entrants, the lack of this more sophisticated technology might have a different standard for what constitutes harmful interference, a lower standard than the companies that do have better technology for limiting interference.

So how can we level the playing field when we are dealing with such complicated issues as that?

Mr. RICHARDSON. I would like, if I can, to ask our engineers about that question and get back to you.

Mr. OBERNOLTE. OK. But you understand the point, though, right? It's—when a company says, "You are interfering with me" and the other company says, "Well, your technology just isn't good

enough. You should be able to eliminate that interference,” you know, that’s a tough issue for the government to deal with.

Mr. RICHARDSON. Right. It’s a good question. I would like to get back to you on—

Mr. OBERNOLTE. OK.

Mr. RICHARDSON [continuing]. On that.

Mr. OBERNOLTE. We look—

Mr. RICHARDSON. Yes.

Mr. OBERNOLTE [continuing]. Forward to that. Mr. Glass, I know that the NTIA has done some work on this, and we have a laboratory for telecommunication science in Boulder that actually is dedicated to, among other things, measuring interfering and not identifying what exactly constitutes harmful interference. Can you talk a little bit about the virtual laboratory and where NTIA is on that subject?

Mr. GLASS. Thank you very much for that question. Yes. We do believe that it’s important to address that issue up front rather than after the fact. So we have processes in place specifically through our memorandum of understanding with the FCC, which now emphasizes the importance of evidence-based spectrum policy-making, the engineering collaboration to go behind and make sure that we are addressing the systems which have a reliance on data, the analyses and the engineering best practices to make sure that we address any potential interference before it occurs.

Mr. OBERNOLTE. Yes. It would be interesting, actually, to go down and take a tour of that lab. I’m sure I’d be interested in—scare up some other participants here. So NTIA has the often conflicting goals of, at the same time, trying to protect spectrum from the people who paid for access to it. And then also the mission of encouraging competition in the sector when the spectrum is shared, can you talk a little bit about how those two ideas are intentioned and how the NTIA navigates promoting those two—those two conflicting goals simultaneously?

Mr. GLASS. Thank you. I’m not sure that the two goals are conflicting. We work to make sure that we maximize efficiency of the Federal use. We work very carefully with the FCC and industry to maximize their access to that spectrum. We are currently working on an enduring pipeline to enable spectrum access for commercial systems. And it is good best practices to make sure that that efficiency enables us to operate in an environment where there is no interference.

Mr. OBERNOLTE. How do you navigate the international complexities of the—I mean, obviously we’re just one country, and although we try to be the leader in this space, we have to convince other countries to adopt our way of thinking. Can you talk about the way that that task is—complicates—those rules?

Mr. GLASS. Well, it gets back to having U.S. leadership on satellite systems in—internationally. And as long as we maintain that, we are able to follow the standard practices of registration coordination in bringing into use of satellites, which would put us in a priority position to other players and enable them to coordinate with us rather than us coordinating with them on such use.

Mr. OBERNOLTE. Sure. And what are the things that might—that might jeopardize our leadership in this space?

Mr. GLASS. I would not be able to comment specifically on that issue. That's something I would have to get back to your office on.

Mr. OBERNOLTE. I look forward to it. Thank you very much to both of you. I would yield back.

Mr. LATTA. Thank you. The gentleman yields back. The Chair now recognizes the gentleman from Ohio's Sixth District for 5 minutes.

Mr. JOHNSON. Thank you, Mr. Chairman, and I really appreciate the opportunity to waive on today to talk about this really very important issue. I'm proud to be sponsoring the ALERT Parity Act with my colleague Kim Schrier. As you've heard, this bill would require the FCC to issue rules within 18 months of enactment to establish an application process granted and in seeking to provide wireless emergency alerts to 911 service in unserved areas. I have got a lot of those unserved areas. It also requires the FCC to establish service rules whereby providers of emergency connectivity service may access spectrum held by a licensee so long as it does not cause interference to the licensee.

And we just heard from my colleague, Mr. Obernolte, that interference is a—is a really problematic thing too. We have got to get to the bottom of that. But first and foremost, enabling 911 calls and texts and emergency alerts in remote and unserved areas is not only common sense. It's a lifesaving necessity.

Every person deserves access to emergency assistance, period, no matter where they live in the United States. As you know, this bill is very narrow in scope. It would only enable emergency service providers to connect to individuals' phones where there is no cellular service, either due to an outage or because there is not a mobile carrier providing service in that area. To many of us, it's frustrating if we lose cell service temporarily. It's unfathomable for the many to understand that there remains in America remote areas that still lack reliable cellular service, as there is now technology that will enable distressed Ohioans in rural Appalachia lacking mobile cell service to reach emergency assistance. I believe we have a responsibility to make it happen to ensure American innovation can serve our communities that are otherwise not connected. Thank you, Chairman Latta, for including my discussion draft in today's legislative hearing, and thank you to our witnesses for your insight on all these very important satellite communications bills.

So Mr. Richardson, I'm going to go to you first. As I mentioned, one of the intended requirements in my legislation, the ALERT Parity Act, is that emergency service providers may only use spectrum if it does not cause interference for your licensee of that spectrum—for the licensee of that spectrum. In your opinion, what kind of coordination will be required to ensure noninterference?

Mr. RICHARDSON. That's a very good question, and I think I should start out by saying that the Commission very much shares your goal of ensuring that everybody everywhere has access to 911 emergency alerts, that kind of thing. I think that—and that—and that satellite can be a major contributor to this. To respond to your question about coordination and interference, these are some questions that our engineers are looking at now with respect to some specific proposals that we have. But I should note that the proposals we have right now—

Mr. JOHNSON. Well, I'm a computer scientist myself, and it seems to me that this is a matter of the engineers that are overseeing the various technologies sit around the table. They are probably the right ones to figure this out among the different agencies and among the different licensees and users.

Mr. RICHARDSON. Right. Generally, the FCC, in terms of frequency coordination, very much relies on the different users to try to coordinate their use of spectrum. And one way that that's being done in this set of applications we have before us now is through a kind of partnership between one terrestrial and one—so that they are working in tandem with each other.

Mr. JOHNSON. The point I was trying to make there is probably not political appointees and bureaucrats that are sitting around the table that don't understand the technology that need to coordinate and collaborate on the interference issue.

Let me ask you another question: Does the FCC have the personnel and technical resources necessary to handle an increase in satellite licenses?

Mr. RICHARDSON. We have recently increased by 38 percent the staff. I think we can always do better with more staff. I'm not here to—I'm not here—authorized to ask you for that, so—

Mr. JOHNSON. In some cases, more is always better, but I don't—I don't know that that's the case in the government work. So—

Mr. RICHARDSON. Well, one of the—

Mr. JOHNSON. Yes or no? Do you have enough people to handle increased licenses or not?

Mr. RICHARDSON. I don't know the answer to that.

Mr. JOHNSON. Can you get it back to—

Mr. RICHARDSON. Yes, sir.

Mr. JOHNSON. OK. Thank you very much.

Mr. RICHARDSON. Could I—could I just—

Mr. JOHNSON. I yield back. Thanks for having us. It's up to the chairman if he'll indulge.

Mr. LATTA. Go right ahead, please.

Mr. RICHARDSON. Thank you. I just wanted to ask—answer one thing which was—which referred to last week and by some of the questions this week. It's not just a matter of how many, but the expertise of the satellite engineers is very important.

Mr. JOHNSON. Oh, absolutely. Yes. Thank you. I yield back, Mr. Chairman.

Mr. LATTA. Thank you. The gentleman yields back the balance of the time. Well, seeing no other Members wishing to ask questions of this panel, again, I want to thank our witnesses for being with us today. Without objection, the committee—subcommittee will now briefly recess to switch out the latest panels, for the second panel. So the subcommittee will stand in recess.

[Recess.]

Mr. LATTA. The Subcommittee on Communications and Technology will come to order, and again, I'd like to first thank all of our witnesses for being with us today, and again, I just want to explain we have two subcommittees jointly meeting downstairs, and some Members will be coming back up again here in a very short period of time. But I really appreciate you all coming up today to testify and for your patience on the second panel.

And as we've heard from before that we have—you each have 5 minutes for questions—or for your opening statement, which will then be followed by questions. And so our second witness panel for today's hearing will include Mr. Dave Goldman, senior director of satellite policy at SpaceX; Mr. Peter Davidson, vice president of global government affairs and policy at Intelsat; Ms. Whitney Lohmeyer, professor of engineering at Olin College of engineering; Ms. Danielle Piñeres, vice president of regulatory affairs and compliance at Planet Labs.

And at this time, Mr. Goldman, you are recognized for 5 minutes. And again—but before—I'll just explain the lights again. You'll see that it will be green. One minute, it goes yellow. And then it will start flashing red at 5 minutes.

So Ms. Lohmeyer, you are recognized for 5 minutes, and thanks again for your testimony.

STATEMENTS OF WHITNEY Q. LOHMEYER, Ph.D., PROFESSOR OF ENGINEERING, OLIN COLLEGE OF ENGINEERING; PETER DAVIDSON, VICE PRESIDENT OF GLOBAL GOVERNMENT AFFAIRS & POLICY, INTELSAT; DAVID GOLDMAN, SENIOR DIRECTOR, SATELLITE POLICY, SPACEX; AND DANIELLE PIÑERES, VICE PRESIDENT OF REGULATORY AFFAIRS & COMPLIANCE, PLANET LABS

STATEMENT OF WHITNEY O. LOHMEYER, Ph.D.

Dr. LOHMEYER. Thank you, Chairman Latta, Ranking Member Matsui, and distinguished members of the committee. I am Whitney Lohmeyer, and I hope that sharing my experiences in the satellite industry will help Congress better define clear rules and policies for spectrum. I hope that these rules will also foster innovation, maintain U.S. leadership, and safeguard the people in this Nation.

While pursuing my Ph.D. at MIT, I was hired as one first Web—I was hired as one of One Web's first employees. I served on the U.S. delegation to the ITU's World Radio Conference in 2015. I traveled to Shanghai to coordinate our spectrum with Chinese operators, and I coauthored One Web's U.S. market access application, which initiated the first FCC processing round of the last 6 or 7 years.

Later, I joined the faculty at Olin College, where I direct Olin Satellite and Spectrum Technology and Policy Group, OSSTP, and I am a PI on NSF's \$25 million Spectrum Act's research center. In a consulting hat, I have drafted and managed eight full Part 25 FCC commercial licenses and also more than 10 experimental licenses.

The FCC adopted processing rounds in 2003 to authorize systems more efficiently. Today's FCC inherited this framework that unfortunately incentivizes or can incentivize systems to file prematurely and to overfile.

So an operator can modify its authorization as long as the interference environment is not increased from what it initially proposed. Operators are starting to file for every orbit that they could conceive of launching in order to ensure flexibility with the intent to decrease the number of satellites down the road. This has re-

sulted in applications of thousands of satellites per network that are challenging for the Commission to validate and impossible—nearly impossible, I'd say—to assess interference.

My research group, OSSTP, found that it took an average of 2 years for the FCC to authorize first processing round applicants, which increased to 3 years in the second round. In the May 2020 round, less than a third have received authorization. And in this last round, all remain under review. When a round is initiated, applicants have 4 months to file, creating a scramble, especially for those who have not fully defined their systems. They are unable to submit full, complete orbital debris or interference showings, which leads to back-and-forth inquiries at the FCC and delays authorization. OSSTP petitioned the FCC, which aligned with the SAT Streaming Act we're talking about today to mandate a 1-year shot clock for NGSO applications, which would offer regulatory certainty, particularly given the Commission's milestones in surety bond requirements.

Systems have to launch and operate half of their constellation within 6 years of grant and their full constellation within 9. They are also required to post a \$5 million surety bond within 30 days of grant. This is particularly challenging for companies like startups, and they are struggling to plan for the financial and technical buildouts of their system.

A mandated shot clock would provide clarity and reduce perceived risks for investors. And applicants could, of course, seek waivers should 1 year not be appropriate. NGSOs also include services beyond FSS and MSS which may first come to mind. These services offer weather monitoring and Earth imaging, navigation and orbit—in-orbit servicing. They can be critical in times of emergency as well as in natural disasters and can be deployed for precision farming. And another important stakeholder is launch vehicle suppliers, who have established an impressive weekly launch cadence. All of these stakeholders have spectrum needs and need a seat at the table when we consider the regulations at hand. I applaud the FCC under Chairwoman Rosenworcel for establishing the Space Bureau, and I hope that Congress will provide the SEC with adequate resources, including funding to expeditiously and support—expeditiously grant—I'm sorry—expeditiously support this new bureau.

The increasingly long wait times for authorizations and the lack of clarity in the licensing process is concerning to our vibrant investor community and is causing our talented ecosystem of entrepreneurs that our Nation has intentionally grown to consider filing and operating overseas. This wave of investment in energy and the satellite sector is awe inspiring, and we must ensure the SEC is not a bottleneck in this historic period of time. It's encouraging to see the committee's attention on our complicated and dynamic industry, and I look forward to answering your questions.

[The prepared statement of Dr. Lohmeyer follows:]

Testimony of Whitney Q. Lohmeyer

Faculty, Olin College of Engineering;

Director, Olin Satellite + Spectrum Technology & Policy (OSSTP) Group;

Principal Investigator and Coexistence Research Working Group Lead, NSF SpectrumX Center;

Research Affiliate, MIT Department of Aeronautics and Astronautics; and

Technical and Regulatory Consultant and Advisor to the Satellite Industry

Before the United State House of Representatives

Energy and Commerce Committee

Subcommittee on Communications and Technology

Hearing entitled

Liftoff: Unleashing Innovation in Satellite Communications Technologies

February 8, 2023

Thank you, Chairwoman Rodgers, Ranking Member Pallone, Subcommittee Chairman Latta, Ranking Member Matsui, and Members of the Subcommittee. I am Whitney Q. Lohmeyer, and I am an engineering professor, technical and regulatory consultant, and strategic advisor in the satellite communications industry. I hope that sharing my experiences through the lens of these three roles will help the Committee ensure that U.S. spectrum licensing and management policies are clearly defined, provide regulatory certainty, promote innovation while protecting incumbent networks, encourage competition and investment, maintain American leadership in this sector, and safeguard the security of the American people.

I joined this industry in 2011, as a National Science Foundation (NSF) Graduate Research Fellow at the Massachusetts Institute of Technology (MIT) in the Department of Aeronautics and Astronautics under Prof. Kerri Cahoy. We partnered with multiple geostationary (GEO or GSO) satellite communications companies for my PhD research, and one day, the Chief Scientist of Inmarsat asked our team, "What would it take to transmit data from someone's cell phone to one of our GEO satellites?" Back then, a bulky power supply multiple times the size of a cell phone was required to ensure the signal could travel 35,678 km above the Earth. There also wasn't a way for cellular and satellite systems to communicate. With industry's recent focus on NGSO systems, which generally orbit at less than 2,000 km, and the Third Generation Partnership Project's (3GPP) inclusion of non-terrestrial networks into today's cellular standards, the technologies required to connect a cell phone to a satellite that in 2011 were only available in the future now exist.

Announcements of partnerships like Starlink and T-Mobile to expand coverage in rural areas, the birth of direct-to-device companies like Lynk and Skylo, and the launch of more than 4,300 Starlink and OneWeb NGSO satellites, make it clear we are in a moment of unprecedented growth. It is encouraging to see the Committee's attention on our complicated and dynamic industry this early in the process, as the lives of Americans depend on satellite technology and services.

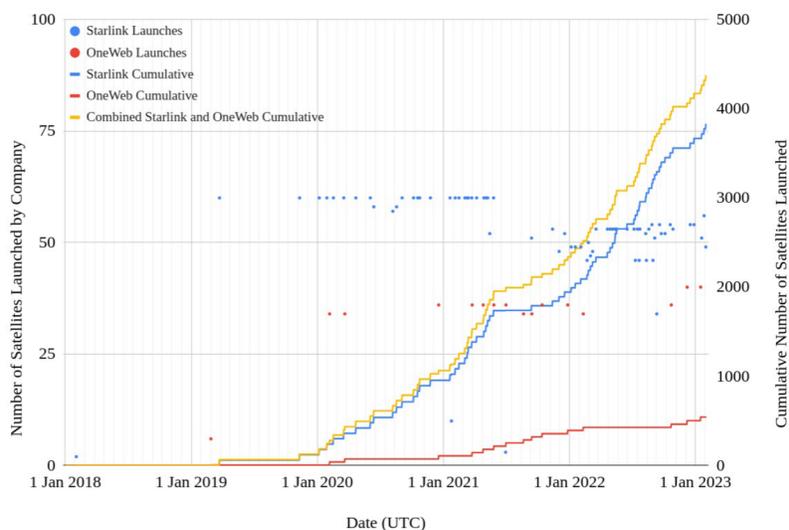


Figure 1. Number of OneWeb and Starlink Satellites Launched on a Per Company and Cumulative Basis

While at MIT, I met Greg Wyler, the founder of the O3b satellite communications network. His mission was to connect schools and healthcare centers in rural areas throughout the world with satellite broadband, and he hired me as one of the first employees on his latest project, which would become OneWeb. As a Satellite Communications and Regulatory Engineer, I worked closely with Qualcomm on the integration of their chipsets into the OneWeb user terminal, which is the hardware that is located on a customer's premise (e.g., the roof of a home or on a farm), and connects a user's device (e.g., cell phone or computer) to a satellite.

In 2015, I served on the U.S. Delegation to the International Telecommunication Union's (ITU) World Radio Conference (WRC-2015) and to Working Party 4A: Efficient Orbit/Spectrum Utilization. During the WRC-15 cycle, agenda items related to satellite broadband and rural connectivity were less of a focus for the United States. After the WRC, I traveled to Shanghai to coordinate our NGSO Fixed Satellite Service (FSS) network with Chinese operators. I represented OneWeb at the FCC on NGSO FSS

matters and I was a member of the team that drafted and submitted OneWeb's U.S. Market Access application to the FCC in 2016.

Two years later, I accepted an academic position as Engineering Faculty at Olin College,¹ an impact-driven undergraduate institution at which faculty and students work closely on today's most challenging technology and policy issues. There, I direct the Olin Satellite + Spectrum Technology & Policy (OSSTP) Research Group,² which consists of a diverse set of twenty-five researchers³ – more than 50% of whom identify as female or under-represented minorities.

In addition to my role in academia, I have advised more than thirty entities (satellite companies, academic institutions, and investors) on technical and regulatory strategy, as well as the valuation of spectrum. I have drafted and shepherded, or am currently shepherding, the submission of eight full commercial Part 25 FCC applications to the International Bureau and more than ten Experimental License applications to the FCC's Office of Engineering & Technology.

FCC NGSO Processing Round Approach

The submission of OneWeb's 2016 U.S. Market Access application initiated the first of four NGSO FSS Processing Rounds to date. When the FCC adopted its Processing Round regime in 2003, it did so with the aim of authorizing systems efficiently. It was unlikely that the Commission anticipated the launch and operation of more than one constellation, yet now the Commission has received submissions from more than twenty distinct applicants for a total of more than 70,000 satellites.⁴ While this is a clear indication that the U.S. market is one that many want to serve, issues of the Processing Round frameworks incentivize systems to file prematurely and over file due to the nature of modifications.

¹ See Olin College of Engineering, <https://www.olin.edu/>

² See Olin Satellite + Spectrum Technology & Policy (OSSTP) Group, <https://www.osstp.org/>

³ See OSSTP Team, <https://www.osstp.org/our-team>

⁴ See A. Kriezis and W. Q. Lohmeyer, U.S. Market Access Authorization Timeline Analysis for Megaconstellation Networks, OSSTP (Apr, 2022), <https://www.osstp.org/fcc-analysis>

The ITU accepts modifications to existing filings as long as the proposed changes do not increase the interference environment of the system. To ensure flexibility and a decrease in the interference environment, operators include all potential combinations of orbits they might deploy in their applications. This has resulted in applications of tens of thousands of satellites per network, making it challenging to assess the actual likelihood for interference between NGSOs and into other systems.

In April of 2022, Argyris Kriezis -- then an Olin College senior and Olin Satellite + Spectrum Technology & Policy (OSSTP) Researcher, now AeroAstro PhD Candidate at Stanford and NSF SpectrumX Research Fellow -- and I published an analysis of the NGSO FSS Processing Rounds applications, summarizing their system parameters and the time it took to receive an FCC authorization. On average, it took the Commission 2.0 years (ranging from 1.0 - 3.8 years) in the first Round and 2.9 years (ranging from 1.3 - 4.1 years) in the second Round.⁵ Of the applicants in these two Rounds, OneWeb, Starlink, and Kepler have started launching their systems.

Less than one-third of applications in the third Round (May 2020: Ku-/Ka-band) have received a First Action, and all of the fourth Round (November 2021: V-band) applicants are still under review. Part of this delay could stem from applicants filing prematurely. When Processing Rounds are initiated, applicants have a brief window to file. If this period occurs before an applicant has secured a satellite manufacturer or reached Critical Design Review (CDR), then they will likely not be able to submit full orbital debris and interference showings, causing additional delays in the licensing process.

Furthermore, half of these Processing Rounds took place during the COVID-19 pandemic when the FCC was significantly understaffed. Despite working with limited engineering and legal resources, members of the International Bureau had the herculean task of authorizing the most dynamic and complex satellite systems in history, handling contentious modification requests while simultaneously issuing

⁵ *See id.*

Proposed Rulemakings on Orbital Debris Mitigation⁶ and NGSO Sharing and Licensing policies⁷. They were understandably overloaded; however, delays are compounding.

The Role of OSSTP and SpectrumX in the Advancement of Satellite Spectrum Policy

Since its founding in 2019, OSSTP researchers have worked with satellite industry mentors to apply data analytics and modeling tools to develop technology and influence policy. The ultimate goal of our Group is to aid in the creation of a safe and sustainable space environment in which many spectrum-users coexist for years to come, all while educating the next generation of policy makers and technologists through apprenticeship-styled learning experiences. OSSTP has written software to analyze aspects of every satellite application, NGSO or GSO, available in the FCC's filing database, and has validated the interference compliance and orbital debris mitigation strategies of a subset of these networks. We have also dedicated ourselves to building accessible educational materials for K-12 and undergraduate students with the aim of igniting their curiosity in space and satellite communications.

OSSTP is funded by the National Science Foundation⁸ and the Amateur Radio Digital Communications (ARDC)⁹. SpectrumX, initiated by a five-year \$25M NSF Center Grant, brings together radio spectrum stakeholders from twenty-seven universities, a federal research facility, and corporate partners to conduct strategic spectrum research and workforce development projects.¹⁰ The SpectrumX

⁶ See *Mitigation of Orbital Debris in the New Space Age*, IB Docket Nos. 18-313, 02-54, Notice of Proposed Rulemaking, 33 FCC Rcd 11352 (2018). See also *Orbital Debris in the New Space Age*, IB Docket No. 18-313, Report and Order and Further Notice of Proposed Rulemaking.

⁷ See *Revising Spectrum Sharing Rules for Non-Geostationary Orbit, Fixed-Satellite Service Systems, Systems; Revision of Section 25.261 of the Commission's Rules to Increase Certainty in Spectrum Sharing Obligations Among Non-Geostationary Orbit Fixed-Satellite Service Systems*, Order and Notice of Proposed Rulemaking, FCC 21-123 (2021)

⁸ See National Science Foundation (NSF) Award Number 2132700 - Spectrum Innovation Initiative Center: SpectrumX - An NSF Spectrum Innovation Center; See NSF Award 2037732 - Spectrum Innovation Initiative Planning: Olin Satellite Innovation Initiative Center (OSIIC); see also NSF Award 1936665 - Collaborative Research: Cubesat Ideas Lab: Space Weather Atmospheric Reconfigurable Multiscale Experiment (SWARM-Ex)

⁹ See Amateur Radio Digital Communications (ARDC), <https://www.ardc.net/>

¹⁰ See SpectrumX, <https://www.spectrumx.org/>

vision is to become a trusted resource within the spectrum ecosystem, offering innovative policy and technical contributions through inclusive education and research activities.

Congressional engagement with SpectrumX members on pressing policy decisions and support of undergraduate STEM research programs like OSSTP is imperative for maintaining and improving U.S. leadership in technology and public policy.

Mandatory Shotclocks on FCC Satellite Applications

In November 2022, Argyris Kriezis and I, along with Olin College junior and OSSTP Researcher Kaitlyn Fleming, submitted a Petition for Rulemaking to the FCC requesting the consideration of a one-year shotclock on NGSO applications.¹¹ Clearly defined, mandatory shotclocks would offer regulatory certainty and technical and financial clarity, given the milestone and surety bond requirements codified in 25.164¹² and 25.165¹³ of the Commission's Rules, respectively.

The FCC's milestones require the launch and operation of half of an applicants authorized network within six years of a license grant and their full network within nine years. These requirements importantly promote the buildout of systems while aim to prevent spectrum warehousing. The Commission's bond regulations require NGSO applicants post a \$5M escalating surety bond thirty days after grant. As noted in our Petition, the size of this \$5M bond may seem minimal compared to the billions of dollars of investments some broadband networks require. However, securing the funds, scheduling the payment, and potentially having the bond linger for up to five years can be taxing for NGSO startups. Having a mandated shotclock would provide a clear projection of surety bond payments.

In addition to the bond requirements, there are also application and operating fees. Under Chairwoman Rosenworcel, the Commission has considered the affordability of the licensing process and

¹¹ See Whitney Q. Lohmeyer et al., Petition for Rulemaking, Revising License Determination Rules for NGSO License Applications (filed Nov. 10, 2022), available at <https://www.fcc.gov/ecfs/document/1110237682587/1>.

¹² See 47 C.F.R. § 25.164 (2021)

¹³ See 47 C.F.R. § 25.165 (2021)

deserves credit for decreasing NGSO FSS application fees from nearly half a million dollars (\$471,575) to \$15,050. Unfortunately, this decrease took place after the last processing round, and some participants haven't received reimbursements for the ~\$450,000 required at filing over a year later.

With increasingly long authorization processing time, applicants, particularly startups, are struggling with the resulting regulatory uncertainty that impacts their financial and technical system buildout. A mandatory shotclock would give certainty to the schedule of fees and project timeline to meet bond and milestone requirements. Additionally, applicants could seek waivers for circumstances when a one-year shotclock is not appropriate for their system, as efficiency in processing must give way to the need to ensure interference-free communications services. Lastly, if Congress mandates shotclocks, it is imperative that it equips the Commission with the necessary technical and legal expertise and resources to avoid the risk of an unfunded mandate.

Redefining Satellite Communications to Include Services Beyond FSS and MSS

It is also important for Congress to understand that commercial NGSO applicants include services beyond the FSS and Mobile Satellite Service (MSS). The Earth Exploration Satellite Service (EESS) is critical for emergency response during natural disasters like wildfires and hurricanes and could be deployed for precision agriculture. The EESS consists of companies like Planet,¹⁴ which provides daily satellite data to help us understand the physical world and take action, as well as Tomorrow.io,¹⁵ which plans to expand its weather forecasting platform via its Weather Monitoring Constellation to reach customers beyond the U.S. Air Force, JetBlue, Ford, Uber and National Grid.

More recently, our industry has grown to include the rise of companies like Xona Space Systems,¹⁶ a talented group of entrepreneurs and engineers out of Stanford University, answering the call of the White House in addressing our nation's need for the next generation of precise and protected

¹⁴ See Planet, <https://www.planet.com/>

¹⁵ See Tomorrow.io, <https://www.tomorrow.io/>

¹⁶ See Xona Space Systems, <https://www.xonaspace.com/>

Global Navigation Satellite Services (GNSS). Noting that these GNSS services could be used to further the development of autonomous vehicles and farming equipment.¹⁷ In keeping with the whole of the government emphasis on space situational awareness,¹⁸ startup True Anomaly¹⁹ exemplifies how the In-space Servicing, Assembly, and Manufacturing (ISAM) market is designing systems to perform rendezvous proximity operations (RPO).

These talented teams of entrepreneurs and veterans are just a few of the players that rely on satellite communications spectrum in orbit to provide crucial services that contribute to the leadership and security of our nation, and they therefore must have a seat at the table when we consider the regulations that govern satellite communications systems.

The Allocation of Spectrum to Support Satellite Communications: Launch and Telemetry

As we buildout constellations of thousands of satellites to provide affordable broadband to our rural populations, and as we offer other services like EESS, GNSS and ISAM, demand for launch has

¹⁷ See U.S. Department of Homeland Security in partnership with the National Coordination Office for Space-Based Positioning, Navigation and Timing, *Homeland Security Infrastructure Protection Plan: Critical Infrastructure Security and Resilience*, Washington, DC: Department of Homeland Security, 2014 available at <https://www.gps.gov/multimedia/presentations/2014/11/ICG/dhs.pdf>; See The White House, *National Space Policy of the United States Of America*, Washington, DC, 2020, available at <https://trumpwhitehouse.archives.gov/wp-content/uploads/2020/12/National-Space-Policy.pdf>; See the Department of Transportation, *Complementary PNT and GPS Backup Technologies Demonstration Report*, Cambridge, MA: U.S. Department of Transportation, 2021, available at <https://www.transportation.gov/administrations/assistant-secretary-research-and-technology/complementary-pnt-and-gps-backup>; see also Cybersecurity and Infrastructure Security Agency, *Report on Positioning, Navigation, and Timing (PNT) Backup and Complementary Capabilities to Global Positioning System (GPS)*, Washington, DC: U.S. Department of Homeland Security, 2020, available at <https://www.cisa.gov/publication/pnt-backup-report>

¹⁸ See Notice, FCC, FCC Opens Proceeding On Servicing, Assembly and Manufacturing In Space (Aug 8, 2022), <https://www.fcc.gov/document/fcc-opens-proceeding-servicing-assembly-manufacturing-space-0>; See *In-space Servicing Assembly and Manufacturing and National Strategy*, Office of the President of the United State (April 2022), <https://www.whitehouse.gov/wp-content/uploads/2022/04/04-2022-ISAM-National-Strategy-Final.pdf>; see also *Notice of In-space Authorization and Supervision Policy Listening Sessions; Request for Comments*, National Space Council, Executive Office of the President (EOP), (Pub. Oct. 17, 2022), <https://www.federalregister.gov/documents/2022/10/17/2022-22413/notice-of-in-space-authorization-and-supervision-policy-listening-sessions-request-for-comments> (“National Space Council Listening Session”).

¹⁹ See True Anomaly, <https://www.trueanomaly.space/>

soared to an all-time high. Our launch industry has answered the call of this market dynamic by strengthening the reusability of their vehicles and establishing an impressive launch cadence. Now, it is critical that these vehicles are able to obtain FCC authorization and coordinate the use of shared frequencies near-automatically. A secondary allocation for commercial space launches and commercial reentries could offer more regulatory certainty, promote innovation and competition, and aid in streamlining the authorization process for launch vehicle suppliers.

The satellite industry is experiencing a similar, and concerning, lack of allocation for satellite telemetry (space-to-Earth) particularly in the S-band that is forcing filers to potentially operate and deploy aspects of their network outside of the United States. Considering 2200 - 2290 MHz, which is utilized internationally for telemetry, and is one of the three bands targeted for commercial launch and commercial reentry, would proactively address our nation's urgent lack of S-band spectrum for telemetry.

Conclusion

In closing, I applaud the bipartisan FCC, under Chairwoman Rosenworcel, for proposing to create the Space Bureau and for hiring more personnel to focus efforts on rapidly addressing licensing applications and issues facing the satellite industry.²⁰ The submission and grant of an FCC license application is a significant and meaningful milestone for companies that potential investors value. The increasingly long wait-times for NGSO FSS authorizations and the lack of clarity in the licensing process is concerning to our vibrant investor community and is causing the talented ecosystem of entrepreneurs that our nation has intentionally grown and attracted to consider filing off-shores through overseas administrations. The Committee's and Commission's continued focus on the satellite communications industry can counter this risk and maintain U.S. leadership in this sector.

I hope Congress will ensure the FCC has adequate resources including funding to expeditiously establish and support this new Bureau. The wave of investment and energy in these satellite constellations

²⁰ See Press Release, FCC, Chairwoman Rosenworcel Proposes Space Bureau (Nov 3, 2022), <https://www.fcc.gov/document/chairwoman-rosenworcel-proposes-space-bureau>

is awe-inspiring, and we must ensure the FCC is not a bottleneck for U.S. approval in this historic period. Thank you again to the committee for focusing on satellite policy – I look forward to your questions and appreciate the opportunity to share my experience.

Mr. LATTI. Thank you very much for your testimony, and Mr. Davidson, you are recognized for 5 minutes.

STATEMENT OF PETER DAVIDSON

Mr. DAVIDSON. Great. Well, Chairman Latta and Ranking Member Matsui, thank you so much. And other distinguished members of the committee here today. Mr. Joyce. Thank you so much for inviting me to testify here today. I want to start by applauding the subcommittee for focusing the first two hearings of this Congress on the space sector. These are timely hearings reflecting the urgency of rationalizing the legal and regulatory frameworks given the blazing speed of technological development in the space industry.

I am proud to be testifying before this subcommittee today representing a company that's played a pivotal role in the space industry for over five decades. Our rich history starts with President John F. Kennedy signing the 1962 Communication Satellite Act creating Intelsat. In 1965, we launched the Early Bird Satellite, the first commercial satellite in the world. And we broadcast Neil Young—Neil Young, we did broadcast the Beatles—and we broadcast Neil Armstrong walking on the moon.

And then more recently, in 2020 we completed the first in-orbit successful life extension of a satellite. Intelsat has led innovation in the space industry and has been a good steward of the space environment for over 50 years, and we continue to be at the forefront of satellite technology today. So part of our responsibility as an industry leader is to promote investment in innovation while ensuring space sustainability. While about 4,000 satellites have been launched in the last 10 years, there are estimates that almost quadruple that number will be launched in the next decade. And I think we even heard higher numbers today to that.

So it's—so threading the needle between investment, innovation, and space sustainability is perhaps the most critical task facing U.S. and international policymakers today. Intelsat applauds the Energy and Commerce Committee members and the staff for initiating policy discussions on streamlining the FCC application process, equitable access to spectrum, advancing space sustainability, and ensuring rural connectivity and emergency communications. And in particular, we support the SAT Act goals of modernizing the processing round system, expediting the FCC application process, addressing sustainability by incorporating specific orbital debris measures, and setting clear guidelines for technical compatibility among the various satellite systems.

These changes will promote competition and innovation in space. As the SAT Act moves through the legislative process, Intelsat believe it's important to ensure that the legislation will encourage industrywide competition, investment in innovation and not put a finger on the scale for any one business model. We believe all the orbits will be increasingly—be working together in integrated networks to deliver products and services, so U.S. and international policies should support the health of all orbits. We also support the implementation of information-sharing guidelines among stakeholders as an important aspect of space sustainability in an increasingly crowded environment.

While it is not directly addressed in the bills being considered today, you heard last week about the importance of spectrum to the satellite industry. Spectrum is the foundation of the space economy. The continued erosion of spectrum allocated to satellite services will significantly impede the ability of the U.S. to lead in this sector. We need to reverse this trend.

Advances in information technology and communications continue to spur economic growth around the world, but they also highlight a growing access disparity between the haves and the have-nots. As many of you have seen in your districts, there is a significant divide between well-connected urban centers and off-the-grid rural areas. Satellite is the only technology today that can provide truly global coverage.

At Intelsat, our 56 satellites cover 99 percent of the Earth's populated regions. If we are going to connect consumers in hard-to-reach areas, we need to adopt smart regulatory policies and streamline access for satellite operators, allocate spectrum efficiently, and manage space resources wisely.

I have addressed Intelsat's support for the goals of the other four bills in written testimony, and I look forward to discussing these in the question-and-answer segment. But in conclusion, I'd like to reiterate four points. Number one, continued access to spectrum with regulatory certainty is the cornerstone for a vibrant U.S. space economy. Number two, space sustainability is fundamental to ensuring the continued growth of the space economy. Number three, maximizing the efficient use of spectrum in space can only be achieved through a regulatory framework that requires transparency and information-sharing among industry operators. And number four, satellites are an excellent solution for broadband connectivity in hard-to-serve areas and in disaster preparedness and response.

Thank you very much.

[The prepared statement of Mr. Davidson follows:]



**Statement by Peter Davidson, Vice President of Global Government Affairs & Policy,
IntelSat**

**before the United States House of Representatives Energy and Commerce Committee
Subcommittee on Communications and Technology**

**Legislative Hearing: "Liftoff: Unleashing Innovation in Satellite Communications
Technologies."**

February 8th, 2023

Written Testimony

Chairwoman Rodgers, Ranking Member Pallone, Subcommittee Chairman Latta, Ranking Member Matsui, and distinguished members of the Subcommittee, thank you for inviting me to testify before you today. I am Peter Davidson, Vice President of Global Government Affairs and Policy at Intelsat.

I would like to thank you all for having me here to speak today about a critical foundation for education, health care, agriculture, entertainment – that is, ubiquitous communication access. I applaud the Subcommittee for focusing the first two hearings of this Congress on the importance of the space commerce sector. Specifically, today, our focus is on how to advance efficiency, investment, and innovation in the satellite sector. The title of this hearing, "Liftoff: Unleashing Innovation in Satellite Communications Technologies", recognizes that we are entering into the new space race that will determine how this technological innovation will translate into Americans' everyday lives.

I am proud to be testifying before this Committee representing a company that has played a pivotal role in the space and satellite industry. Our rich history originates from congressional action with President John F. Kennedy's signing of the Communications Satellite Act of 1962. Our DNA as an intergovernmental organization has, from the very beginning, been based upon service to mankind through collaboration and technological innovation. In 1965, we launched Early Bird, the world's first commercial communications satellite, which gave birth to the era of "live via satellite." In 1967 we carried the first-ever live international video broadcast when the Beatles, The Rolling Stones, and others around the world performed, "All You Need Is Love". In 1969 during the peak of the last space race, we broadcast the Moon landing and Neil Armstrong's historic walk. We took over 4 billion people to the Sydney Olympics in 2000. We continued our long list of "firsts" in 2020 when we and Northrup Grumman pioneered satellite life extension technology by successfully docking the mission extension vehicle with an active orbiting satellite with no service disruption. Intelsat has advanced the space industry through a

litany of historic milestones and achievements, and we continue to be at the forefront of satellite technology. We have been good stewards of the space environment for over half a decade and want to help preserve the space environment for generations to come.

Part of our responsibility as an industry leader is to enhance the space environment through the combined power of investment and innovation while ensuring the sustainability of that environment by augmenting the security and resiliency of the greater space ecosystem. As you well know, we are experiencing a time of unprecedented growth as satellites have demonstrated that they are able to revolutionize solutions to our everyday lives. While about 4,000 satellites have been launched in the last decade, it is estimated that this figure will more than quadruple in the next decade.

Intelsat applauds the Energy & Commerce Committee for taking timely action on these critical issues. Things like streamlining the Federal Communications Commission (FCC) application process, equitable access to spectrum, advancing space sustainability, and ensuring emergency communications while promoting U.S. leadership in international policy making bodies will all be critical in advancing the benefits of space commerce to Americans and people around the world.

We would like to thank the Committee Members and staff for their hard work over the past several months on the Satellite and Telecommunications Streamlining Act, or the SAT Act. These efforts have been quite timely given the intense activity in the space industry and ongoing regulatory proceedings. We at Intelsat support the goals of:

- Eliminating the processing round system.
- Expediting the FCC application process.
- Addressing sustainability by incorporating specific orbital debris measures.

- Setting clear guidelines for technical compatibility among the various satellite systems.

These changes will promote competition and innovation in space, ultimately to the benefit of American consumers, businesses, and advancing U.S. leadership in the space economy. As the SAT Act moves through the legislative process, Intelsat believes it is important to ensure that the legislation will encourage competition, investment and innovation rather than putting a finger on the scale for one business model or another. Intelsat is committed to the health and prosperity of all orbits, and with the proper legal and regulatory frameworks, this should not be difficult to achieve. Throughout our history we have primarily been a Geostationary Earth Orbit (GEO) provider (today Intelsat has 56 of our own satellites, and maintain and operate another 20 for others), but we are exploring opportunities in the Medium Earth Orbit (MEO) and have important partnerships with Low Earth Orbit (LEO) providers. We believe all of these orbits will increasingly be working together in integrated networks to deliver products and services, so U.S. and international policies should support the health of all orbits. Intelsat believes that all orbits should be treated fairly, and that regulation should be directed toward the highest areas of risk. For example, today we are seeing a rush to the LEO orbit, so when dealing with issues such as orbital debris, policy makers should first direct their attention to where the problems are most likely to arise, especially by implementing information sharing guidelines among stakeholders.

The LAUNCHES Act is another example of how Congress is looking to streamline the application process by eliminating unnecessary barriers that hamper the ability of private companies to obtain spectrum licenses required to launch rockets from the United States. Streamlining the application process will promote an essential part of our ever-evolving space economy. This will not only encourage competition, but by lowering costs and increasing launch availability, will also promote our goal of bridging the digital divide by providing connectivity to hard-to-reach and unconnected areas.

Advances in information technology and communications continue to spur economic growth around the world, but they also highlight a growing access disparity between the haves and have-nots. As many of you see in the districts you represent, there is a significant divide between the well-connected urban centers and off-the-grid rural areas. Closing this gap requires ubiquitous, broadband connectivity. But connecting these areas is no easy task. If we're going to enhance communications opportunities for consumers in these regions of the country, we need to streamline access for satellite operators to serve them adequately.

This is where advances in satellite technology can – and should – play a crucial role. Satellite is the only technology today that can provide truly global coverage (at Intelsat, our satellites cover 99% of the earth's populated regions). The perceptions of satellite as a cumbersome, costly alternative do not reflect today's dynamic sector that is transforming the communications landscape. We also applaud the Committee's consideration of the ALERT Parity Act, which requires the FCC to establish rules that enable the provision of emergency connectivity service in remote areas. Everyone deserves to have access to emergency services no matter where they live. For decades, Intelsat has been supporting emergency communications in natural disasters areas all over the world. We also support the Precision Agriculture Connectivity Act's goal of providing connectivity to hard-to-reach rural areas. Of course, much of the agricultural production in the U.S. takes place in very rural areas, some of which do not have access to terrestrial service. Precision agriculture will be necessary for efficient production and ecologically smart farming, and satellites can provide a solution. This bill, along with the upcoming farm bill can significantly advance this important initiative.

Finally, I would like to highlight the Committee's goal of promoting the United States' leadership in space. The Secure Space Act is yet another example of how important satellite supply chain sustainability is, especially during these uncertain times. The intense global competition in space means protecting and promoting U.S. satellite operations will be an

important foundation for continuing and accelerating the innovations we see today in our industry. As was correctly pointed out during the hearing last week, our competitors are actively building up their emerging technologies and capabilities. As a leading provider of connectivity for U.S. national security through our Intelsat General unit, we believe now is the time to address this threat.

As the satellite industry rapidly evolves technologically, standards and regulatory frameworks have not kept pace. We applaud the Committee and the Subcommittee for turning its attention to help educate and lead that effort on the global stage. Fortunately, there have been some hopeful signs on this front. Recently, Doreen Bogdan-Martin was elected as the Secretary General of the ITU. The Secretary General will bring her decades of experience to help lead the ITU, particularly in this critical year leading up to the World Radio Conference in November. Moreover, regulators around the world – as evidenced by the recent Plenipotentiary Conference in Bucharest – have shown a renewed interest in promoting the space sector and in examining space sustainability policies. The unsuitability of existing regulatory frameworks jeopardizes the great potential of the satellite industry to serve society. With Doreen Bogdan Martin at the helm of the ITU and the attention of this Committee and the U.S. Government, we'll have a great opportunity to use our historic role in space to harness a vibrant and sustainable future.

While it is not directly addressed by the bills being considered today, you heard last week about the importance of spectrum to the satellite industry. Spectrum is the foundation of the space economy. The continued erosion of spectrum allocated to satellite services for decades now will significantly impede the ability of the U.S. to lead in this critical sector. This is why we are looking forward to working with you on these initiatives as we enter into the 118th Congress.

In conclusion, we would like to reiterate four points:

1. Continued access to spectrum, with regulatory certainty, is the cornerstone for a vibrant U.S. space economy.
2. Space sustainability is fundamental to ensuring the continued growth in the space economy. A responsible and measured approach to utilizing space is key to ensuring that space remains viable for all orbits, LEO, MEO and GEO. And through collaboration, much like we do currently via our business partnerships within and across orbits, we can come up with a mutually beneficial solution through legislation, such as the SAT Act.
3. Maximizing the efficient use of spectrum and space can only be achieved through a regulatory framework that requires transparency and information sharing among industry operators.
4. Satellites are an excellent solution for disaster preparedness and broadband connectivity in hard to serve areas, including agricultural areas.

We at Intelsat will continue to be good stewards of space. We will continue to be strong proponents of collaboration, transparency, innovation, investment, and sustainability in space. The bills being considered today demonstrate that Congress will play a leading role in developing the right balance of policies – in the U.S. and around the world – to continue driving innovation and investment in the commercial space sector.

Thank you for your time and for the opportunity to speak with you today. I look forward to a robust discussion.

Mr. LATTA. Well, thank you very much for your testimony.
Mr. Goldman, you are recognized for 5 minutes.

STATEMENT OF DAVID GOLDMAN

Mr. GOLDMAN. Thank you, Chairman Latta, Ranking Member Matsui, and members of the subcommittee. Thank you for the opportunity to speak with you today about the importance of maintaining U.S. leadership in satellite communications technology. My name is David Goldman, and on behalf of my 11,000 colleagues at SpaceX, I want to thank the subcommittee for its focus on modernizing and improving the regulatory system for satellite authorizations.

I am the senior director for satellite policy at SpaceX. In this role, I serve as the lead for regulatory matters at SpaceX's global—for global—SpaceX's global satellite constellation. But prior to joining SpaceX, I had the great honor of serving as chief counsel for this subcommittee under Ranking Member Pallone.

Being back in this hearing room reminds me of all the bipartisan bills this subcommittee passed while I was here that helped ensure that more Americans are connected. I'm excited to be here once again to work with the subcommittee on another collection of important bipartisan bills. We are here at a critical moment in the global race to provide high-speed internet with low-Earth-orbit satellite networks. Doing so is needed to ensure continued U.S. leadership in space technology and telecommunications more broadly.

As the world's leading launch provider, SpaceX is proud to build, launch, and operate all of our space systems in the United States. In 2016, SpaceX filed at the FCC to become a U.S. operator of a global low-Earth-orbit satellite constellation that we had yet to name.

Since then, Starlink Generations 1 and 2 have been licensed and SpaceX has launched nearly 4,000 satellites to orbit providing high-speed, low-latency internet to every corner of the world. To get Starlink to orbit, we now launch our Falcon 9 rocket, on average, every 4 days in unmatched flight cadence. Just a few short years since being licensed, SpaceX has launched one of the largest infrastructure projects in space.

We now provide high-speed internet access to more than a million households, with thousands more added every week. We serve those in urban, suburban, rural and Tribal communities, most of whom have never had access to broadband before. Starlink has also demonstrated high value when terrestrial services are disrupted, either by natural disaster or conflict. And Starlink's capability to support emergency communications will only be enhanced with our direct-to-cell service, which will save lives by eliminating cell dead zones.

That SpaceX has moved rapidly is not incidental. SpaceX must move fast to stay ahead of foreign competition. To maintain America's lead, the Commission's processes must not create drag on U.S. technology innovation, business viability, and the deployment of critical services to consumers.

Unfortunately, the current FCC has inherited a regulatory regime designed for a previous era. I want to highlight four key areas. First, processing timelines at the FCC are unacceptably

long, resulting in multiyear delays for application approval. Importantly, the Commissioners have recognized on a bipartisan basis the need for reform. This reform is crucial. U.S.-authorized systems are at a critical risk of being outpaced by foreign licensed competitors. For example, review of Starlink's Gen 2 application took nearly 3 years. This process must be more expedient.

And forcing clear, reasonable timelines will not result in less thorough regulatory review. Rather, doing so will remove the current incentive for foreign licensed operators and latecomers to game the system by endlessly filing frivolous comments in a deliberate effort to overwhelm, mislead, and ultimately delay hard-working FCC staff.

Second, FCC regulations must be explicitly grounded in statutory authority. Otherwise, applicants are left to guess at what requirements and conditions will be imposed, creating considerable regulatory uncertainty for U.S. licensees.

Third, Congress and the FCC should reward systems that are designed to be spectrally efficient and share spectrum. Too often, the current approach rewards inefficient systems designed with yesterday's technology. At the same time, essential spectrum authorized for shared satellite use like the 12 gigahertz band must continue to be available and protected from harmful interference.

Finally, the U.S. must end its approach of providing preferential regulatory treatment to foreign licensed systems. As it stands, the FCC imposes one set of stringent rules on U.S.-authorized systems like SpaceX's Starlink and then altogether different, far less burdensome set of rules on foreign licensed systems that seek U.S. market access.

As a matter of public policy, this is upside down. The SAT Act and the other bills address—that we are considering today address many of these challenges head on. With its 1-year deadline for action, the SAT Act would add much-needed certainty for satellite licensing and improve U.S. competitiveness.

The LAUNCH Communications Act will result in more efficient handling of launch spectrum approvals. The Secure Satellite Act will protect U.S. telecommunications technology against foreign competitors like China.

Thank you again for the opportunity to testify. I welcome your questions.

[The prepared statement of Mr. Goldman follows:]

**STATEMENT OF
DAVID GOLDMAN
SENIOR DIRECTOR, SATELLITE POLICY
SPACE EXPLORATION TECHNOLOGIES CORP. (SPACEX)**

**BEFORE THE
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY
UNITED STATES HOUSE OF REPRESENTATIVES**

February 8, 2023

Chair Latta, Ranking Member Matsui, Chair McMorris Rogers, Ranking Member Pallone, and Members of the Subcommittee, SpaceX appreciates the opportunity to join this timely and important hearing on several of the Committee's satellite-related legislative initiatives.

America is once again leading the way in space. But the aging rules meant to regulate this fast-growing industry are relics from a previous era and they are putting the United States at a disadvantage globally. SpaceX therefore commends the Subcommittee for its leadership in prioritizing early in the 118th Congress reform and modernization of U.S. regulations for satellite authorization and licensing. The work this Subcommittee is doing here today is a national imperative if America is to maintain its lead in space technology against determined, state-backed enterprises in China and elsewhere. As the Subcommittee considers how to modernize the regulatory structure under which next-generation satellite systems are licensed, SpaceX encourages the Subcommittee and the rest of Congress to move quickly to ensure that regulatory processes keep pace with innovation, licensing is tied by explicit statutory authority, and regulations are applied equitably among both U.S. and foreign-licensed systems.

SpaceX appreciates the important work done every day by the Federal Communications Commission ("Commission") and its staff. Due to rapid technology advances in this sector Commission staff currently apply rules and processes designed for entirely different types of satellite networks. At the same time, the Commission has seen an influx of satellite applications not yet matched by an increase in personnel and technical resources. The Commission recently has undertaken unilateral, bipartisan actions to begin addressing some of these challenges and has, on a bipartisan basis, expressed support for legislation like the Satellite and Telecommunications Streamlining Act.

Given this strong bipartisan support, SpaceX is hopeful that procedural improvements can be implemented quickly, whether by Commission action or in legislation. Specifically, SpaceX recommends particular focus on the following areas:

- (1) *Adopt firm timelines on federal agencies, particularly the Federal Communications Commission ("Commission")*. These timelines to complete satellite system license authorizations, including specific timelines to issue applications for public comment and deadlines to complete review should be the rule, not the exception. Decisions exceeding statutory deadlines should only occur under pre-defined, extraordinary circumstances. Under the aging regulatory regime currently in place, Commission decisions for satellite authorizations take 2.5 years on average. Worse, as the industry accelerates, decisions under the current framework are slowing down.
- (2) *Bind agency decisions to explicit statutory authority*. By ensuring decisions are directly tied to statutory authority, Congress can provide regulatory certainty to companies committed to satellite system deployment that requires massive up-front capital investment.

- (3) Ensure the efficient use of spectrum. Rules should create incentives to better share spectrum and reward operators who design spectrally efficient systems, rather than protecting inefficient systems that are built on yesterday's technology.
- (4) Protect shared spectrum bands that are the backbone of next-generation satellite constellations, like the 12 GHz band. The 12 GHz band is the workhorse for next-generation satellite systems for consumer downlink. No other country in the world is threatening to pull this band out from under their next-generation satellite operators. To maintain American leadership in space, the Committee should direct the Commission to end its ongoing proceeding that would upset the careful balance safeguarding this band—which has been underway for over three years—with no change to interference rules. Otherwise, process reforms proposed by this Committee will be for naught.
- (5) Level the playing field by eliminating preferential regulatory treatment for satellite operators who elect to license in foreign jurisdictions. Satellites operate in a global market, which means operators simply need to license overseas to evade regulatory requirements imposed only on U.S. authorized systems. The current approach drives companies' operators out of the U.S. by imposing asymmetric burdens on U.S.-authorized systems, like Starlink, while creating a loophole with a far less burdensome set of rules for foreign-licensed systems that seek U.S. market access.
- (6) Invest in resources at the Commission to accelerate hiring of qualified personnel. The Commission needs more satellite engineers with specific expertise in satellite technologies who can more efficiently address the increasing workload from next-generation satellite systems.

Next-generation satellite technologies like Starlink are already bringing lifechanging capabilities to Americans across the country in the form of high-speed broadband internet, and in communities across the globe. SpaceX applauds the Subcommittee for its leadership on introducing the Satellite and Telecommunications and Streamlining Act, the LAUNCHES Act, and the other pieces of legislation under consideration today. As the Subcommittee undertakes this slate of reform initiatives, SpaceX encourages the Subcommittee to comprehensively revise the existing regulatory regime and build one designed for the future.

I. SpaceX in 2023

SpaceX was founded in 2002 with the express goal of dramatically improving the reliability, safety, and affordability of space transportation. SpaceX today is the world's largest launch services provider, having successfully launched the Falcon 9 and Falcon Heavy rockets over 200 times, including eight launches so far in 2023 alone. In 2022, SpaceX successfully conducted 61 Falcon launches, and deployed well over half of all mass launched to space worldwide.¹ In 2023, SpaceX plans to conduct 100 Falcon launches.

In addition to commercial satellite launch operations, SpaceX supports a diverse set of satellite and space customers, including NASA, the Department of Defense, and allied international governments. Under one of the most successful public-private programs ever undertaken with NASA, SpaceX supports the nation's civil space program through critical cargo resupply missions with our Dragon spacecraft to the International Space Station ("ISS"). In May 2020, in partnership with NASA, SpaceX launched the first crewed Dragon mission to the ISS, restoring U.S. human spaceflight capability. Dragon has to-date carried 30 NASA and private astronauts to space and returned them safely to Earth. SpaceX is also a certified provider to the Department of Defense ("DOD") for the National Security Space Launch program, providing assured access to space for the Nation's most critical defense and intelligence missions.

¹ Based on SpaceX analysis and BryceTech reporting through Q3 of 2022., accessed at <https://brycotech.com/reports>

Leveraging our experience in space launch system and spacecraft design, development, production, and on-orbit operations, SpaceX developed an innovative non-geostationary satellite orbit (“NGSO”) constellation—Starlink. Operating in low Earth orbit (“LEO”), SpaceX’s high-speed, low latency internet network Starlink began initial commercial service in 2020 and now serves over one million households. Starlink is licensed to operate on all seven continents, providing service to customers in more than 46 countries, as well as additional markets worldwide, and connecting communities that previously never had access to the internet. SpaceX’s Starlink is designed to reach directly to end users, and provide global broadband services at speeds, latencies, and prices on par with terrestrial alternatives available in metropolitan communities.

To achieve revolutionary reductions in launch costs and enable a high cadence of launch, SpaceX focused on making our rockets reusable. Since the first successful recovery of a Falcon first stage in December 2015, SpaceX has now successfully landed first stage rocket boosters 169 times, and re-flown our rockets 142 times, with some boosters achieving more than 15 flights. The reliability, cost efficiencies, and cadence enabled by reusability are critical to the deployment of large satellite constellations like Starlink.

In addition, SpaceX also continues development of Starship, the largest, most powerful launch system in history. Selected by NASA to land the next two American astronauts on the Moon, Starship will also enable greater capability for launching satellites and other spacecraft to orbit through full and rapid system reusability.

SpaceX maintains manufacturing and engineering facilities in Hawthorne, CA; Starlink satellite system design and manufacturing facilities in Redmond, WA; a rocket development and test Facility in McGregor, TX; and launch pads at Cape Canaveral Space Force Station, NASA Kennedy Space Center, Vandenberg Space Force Base; and production, test, and launch facilities at Starbase in South Texas. SpaceX maintains a network of more than 6,000 American suppliers and vendors in all 50 states.

II. The Arrival of Next-Generation Satellite Technologies

Satellite communications is not a new endeavor, but satellite internet has historically been hampered by high latency, limited throughput, complex and finicky equipment, and high costs. Traditional geostationary orbit (“GSO”) satellite systems operate at very high altitudes—nearly 22,000 miles from Earth’s surface—which results in high latency due to the distance the signal must travel, which typically makes this technology unsuitable for modern internet uses like streaming, video conference calls, and internet gaming. Additionally, GSO satellites have lengthy development and build cycles, are not manufactured at scale, and are designed to last for 20-25 years on orbit—timelines which do not comport with rapid technology iteration and innovation, or an efficient regulatory system.

By contrast, low Earth orbit systems, by their very design, provide much faster speeds and lower latency than GSO systems. Technology iteration cycles are much faster, indeed continuous, and per-satellite costs are substantially lower, allowing for shorter satellite lifetimes. LEO systems allow for a much-enhanced user experience due to their proximity to Earth.² While more satellites are required due to this proximity, LEO systems like SpaceX’s Starlink will always have multiple satellites in view of any given users, providing a highly resilient network connection through path redundancy. Because LEO networks are comprised of hundreds or thousands of satellites, networks are able to scale to grow with user demand, and to continuously improve throughput and quality of service. Perhaps most importantly, LEO systems can be manufactured at a scale previously unseen in the space sector, resulting in lower costs, more rapid deployment, faster technology iteration cycles, and non-linear innovation in consumer services and quality. The faster speeds, lower latencies, better reliability, and lower costs—coupled with

² Starlink, for example, operates at an altitude of approximately 200 miles.

huge unmet demand for millions of Americans who have been left out of broadband deployment—have resulted in huge demand for LEO broadband services, and a surge in investment in the sector.³ This investment is expected to continue and increase in the coming decade, with the global satellite communications market estimated to reach \$40 billion by 2030.⁴

The U.S. currently leads the world in the development, manufacture, launch, and deployment of LEO broadband services, which is directly responsible for job creation and economic growth throughout the supply chain.⁵ Moreover, U.S. leadership in LEO has paid enormous dividends domestically and globally, connecting previously unserved areas in America and around the world. But this competitive edge could be fleeting. Without quick and decisive reforms to U.S. regulatory processes, the U.S. could ultimately cede this high ground to foreign competition. As the Center for Strategic and International Studies ("CSIS") recently noted, "For U.S. companies that compete against foreign firms facing different national regulatory structures, requirements, and enforcement capabilities, comparatively stringent domestic requirements are costly and dampen U.S. firms' first-mover advantage."⁶

III. SpaceX's Starlink System

SpaceX filed an application with the FCC in November 2016 to launch and operate a next-generation satellite system to provide high-speed, low latency broadband in the United States and around the world. The FCC granted SpaceX a license nearly a year and half later in March 2018, to operate this system, and SpaceX began launching satellites as part of its Starlink network shortly thereafter in May 2019. Since this initial launch, Starlink has grown rapidly as SpaceX has raced to keep up with surging demand for connectivity in vast swaths of America and abroad, particularly to people who remained unserved, and to outpace competitive risks primarily from state-backed foreign operators. At this point, SpaceX now provides Starlink service to more than one million locations (typically households) in more than 46 countries, as well as additional markets worldwide. Of the 4,408 Starlink satellites the FCC authorized in 2018, SpaceX has already deployed well over 3,800 onboard Falcon 9, with additional launches now occurring at least every week, with a current pace of every 3.8 days for Starlink and SpaceX's other launch customers. Consistent with continuous improvement, SpaceX also received in December of last year FCC authorization for the second generation Starlink network, or "Gen 2."⁷ This new authorization enables SpaceX to launch additional, much-improved spacecraft with significantly more throughput per satellite than the first-generation system. For the end consumer, this means more bandwidth and increased reliability. For the U.S. Government, it means millions more Americans will have access to high-speed internet no matter where they live.

What this experience means on the ground is a seamless broadband connection with speeds that enable high-resolution streaming, video messaging, telehealth, remote learning and disaster response. Starlink is also authorized for mobile services, including on airplanes, RVs, and boats. Soon, low-performing airplane wi-fi will be a distant memory. With hundreds of thousands of users across the U.S., including

³ See for instance Ryan Brukardt et al., "Space: Investment shifts from GEO to LEO and now beyond", McKinsey & Company, January 27, 2022. Accessed at <https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/space-investment-shifts-from-geo-to-leo-and-now-beyond> and Washington Post, Why Low-Earth Orbit Satellites Are the New Space Race, July 10, 2020, accessed at https://www.washingtonpost.com/business/why-low-earth-orbit-satellites-are-the-new-space-race/2020/07/10/51ef1ff8-c2bb-11ea-8908-68a2b9eae9e0_story.html

⁴ Thibault Werlé et al., "LEO Satellites: A Technology to Revolutionize Global Connectivity?", Boston Consulting Group, June 1, 2021, accessed at <https://web-assets.bcg.com/b8/b6/43002b934a23a63516a1dd45ca7a/leo-satellites-a-technology-to-revolutionize-global-connectivity-final.pdf>

⁵ Laura Odell et al., "U.S. Low Earth Orbit Dominance Shifting with Gray Zone Competition", Institute for Defense Analyses, June 2021, accessed at <https://www.ida.org/-/media/feature/publications/u/us-us-low-earth-orbit-dominance-shifting-with-gray-zone-competition/d-22676.ashx>

⁶ Makena Young and Akhil Thadani, "Low Orbit, High Stakes: All-In on the LEO Broadband Competition", Center for Strategic and International Studies, December 2022, accessed at <https://www.csis.org/analysis/low-orbit-high-stakes>

⁷ *Federal Communications Commission*, IBFS File No. SAT- LOA-20200526-00055 and SAT-AMD-2-21-818-00105, released December 1, 2022.

in urban, suburban, rural, and Tribal communities, Starlink is connecting the underserved and unserved areas that terrestrial networks and legacy satellite providers have been unable or unwilling to serve. Next-generation satellite systems like SpaceX's Starlink are changing the economics of broadband deployment. With Starlink, for example, the capital cost of a network occurs at the beginning of deployment, with infrastructure principally deployed in space, eventually obtaining global coverage, or access. Unlike fiber and other terrestrial solutions, the cost of adding consumers is marginal. Additionally, with ubiquitous access, Starlink deployment to a particular end user (i.e. household) occurs in a matter of days where capacity is available—simply the time it takes for shipping to arrive at your door. Permits, project costs, the risk of stranded investments, and per-mile consumer uptake rates are not relevant for the deployment of Starlink and systems like it. And people no longer have to live with their streets being dredged up for months to get the quality broadband they deserve. In short, LEO systems—by their very nature—directly address many of the challenges associated with broadband access.

Ubiquitous Broadband Access

To highlight the profound reach of LEO systems like Starlink in addressing the otherwise intractable issue of broadband access, SpaceX offers several examples of some of the most far-flung locations where we have delivered service, and others where terrestrial telecommunications had become unavailable:

1. **Tribes and First Nations.** Starlink is reaching unserved Tribal communities, and doing so affordably relative to project costs associated with fiber build-outs. For example, the Hoh Tribe in Washington State had struggled for years to get reliable high-speed internet to their community on the Olympic Coast in Washington. SpaceX provided Starlink to the Tribe as part of the initial beta testing phase of the network. One member of the Hoh Tribe noted that "It seemed like out of nowhere, SpaceX came up and just catapulted us into the 21st century."⁸ Since that time SpaceX has provided connectivity to additional Tribal communities across the United States, including in New Mexico, where Starlink connected 150 Navajo Nation households with K-12 students who didn't have reliable access to high-speed internet before Starlink became available.⁹
2. **Rural America.** With the built-in advantage of not needing to dig or lay fiber to reach single locations, Starlink has proven a game-changing technology for rural parts of the country. SpaceX's Starlink is an ideal solution for years of underinvestment in getting broadband to rural communities, and connecting the nearly 15 million Americans from rural areas who do not have access to high-speed internet.¹⁰ Starlink has provided access to high-speed internet in places like Wise County, Virginia, where an early Starlink project will be expanded to serve 438 students in the area.¹¹ Starlink is providing critical connectivity in Eastern Kentucky as well, with an expanding program that is connecting residents to telehealth services and education services in the Appalachia region.¹²

⁸ Jon Brodtkin, "Remote tribe says SpaceX Starlink 'Catapulted' them into the 21st century", *Ars Technica*, October 12, 2020, accessed at <https://arstechnica.com/information-technology/2020/10/remote-tribe-says-spacex-starlink-catapulted-them-into-21st-century/>

⁹ See "Coconino County makes leading effort to bring Starlink to Navajo Nation students", Navajo-Hopi Observer, August 9, 2022, accessed at <https://www.nhnews.com/news/2022/aug/09/coconino-county-makes-leading-effort-bring-starlink/>

¹⁰ Laura Bedard, "How Starlink is a Reliable Internet Service for Rural America", *Successful Farming*, December 22, 2022, accessed at <https://www.agriculture.com/technology/computers/how-starlink-is-a-reliable-internet-service-for-rural-america>

¹¹ Slater Teague, "Grant will help fund Starlink expansion in Wise County", October 6, 2022, accessed at <https://www.wjhl.com/news/local/grant-will-help-fund-starlink-expansion-in-wise-county/>

¹² See "Kentucky, SDAR, and SpaceX: 30 Homes in Eastern Kentucky to Receive Starlink High-Speed Internet", accessed at <https://soar-ky.org/starlink-eastern-ky/>

3. **Alaska and Antarctica.** SpaceX completed the initial deployment of the polar shell of the Starlink constellation at the end of 2022, providing coverage to the highest-latitude regions and achieving global coverage. While additional polar deployments continue to improve capacity, Starlink is now providing service to all of Alaska, the most remote regions of Northern Canada, and even to Antarctica, where the U.S. expedition at McMurdo station has already made use of Starlink broadband in the service of their scientific endeavors.
4. **Ukraine.** Shortly after Russia launched its invasion of Ukraine, SpaceX received an urgent request from the Ukrainian government to help with providing internet connectivity through Starlink. The Starlink network has proven vital in keeping the country online since the Russian invasion. One Ukrainian platoon commander noted that "Without Starlink, we would have been losing the war already," and Ukrainian President Volodymyr Zelensky has noted how critical the network has been for the Ukrainian population.¹³
5. **Disaster Response and Recovery.** SpaceX has repeatedly deployed Starlink to areas where terrestrial telecommunications services have been disrupted by natural disasters. For example, Starlink has provided connectivity in the aftermath of wildfires- (Washington state, California, Spain), floods (Germany), volcanic eruptions (Tonga), and hurricanes (Louisiana, Florida), among others. In each case, because of Starlink's global reach, SpaceX was able to make Starlink kits available to emergency responders, often within hours, to restore critical communications services to assist in disaster response and recovery. In the future, in partnership with T-Mobile, Starlink will deploy a direct-to-cell capability, enabling users with a compatible cellphone to receive service even when they are outside the range of a cell tower. This groundbreaking capability will enable emergency communications "off the grid," and eliminate cell dead zones.

Space Safety and Sustainability

With Starlink, SpaceX is leading the world in responsible space operations that ensure continued and sustainable orbital access, as well as mitigate impacts on optical and radio astronomy. As the first private company to have taken astronauts to the International Space Station ("ISS"), as well as the first and only company to launch an all-civilian crew into orbit, SpaceX is deeply committed to maintaining a sustainable orbital environment, and protecting astronauts in orbit as well as the uninvolved public on the ground. SpaceX has demonstrated this commitment through action. Notably, SpaceX uniquely includes sustainability as a critical design element for its satellite operations, ensuring that no debris remains in space longer than five years should a satellite become non-maneuverable.¹⁴ Additionally, SpaceX's space safety approach includes, but is not limited to:

- **Design and build reliability.** SpaceX satellites are designed and built with high reliability, with reliability around 99% after the deployment of nearly 4,000 satellites.
- **Operations below 600 km.** SpaceX has chosen to operate at an altitude below 600 km, since this altitude is essentially "self-healing," meaning that objects will decay out of orbit due to atmospheric drag within a short period of time in rare off-nominal scenarios, eliminating the risk of persistent orbital debris. By contrast, several other commercial satellite constellations are designed to operate above 1,000 km, where it will take hundreds to thousands of years for spacecraft to naturally deorbit if they fail on orbit.¹⁵

¹³ As quoted in "Ukraine Leans on Elon Musk's Starlink in Fight Against Russia", *Wall Street Journal*, July 16, 2022 <https://www.wsj.com/articles/ukraine-leans-on-elon-musks-starlink-in-fight-against-russia-11657963804> and "Volodymyr Zelensky on War, Technology, and the Future of Ukraine", *WIRED*, June 2, 2022. Available at: <https://www.wired.com/story/volodymyr-zelensky-g-and-a-ukraine-war-technology/>

¹⁴ The non-maneuverable rate is trending towards 0% with Starlink satellites.

¹⁵ Here, the 2021 National Science Foundation JASON report on *The Impacts of Large Constellations of Satellites* ("the JASON report") found that : " [d]ue to the impacts on ground-based astronomy and concerns about debris generation and longevity, JASON's highest priority recommendation is to eliminate or highly regulate large satellite constellations in orbits higher than

- **Deployment into an extremely low insertion orbit below 300 km.** At this low altitude, any SpaceX satellites that do not pass initial system checkouts are quickly deorbited actively, or by atmospheric drag.
- **Radical transparency and data sharing with the U.S. Government and other satellite owners/operators to ensure full space situational awareness.** SpaceX openly shares high-fidelity future position and velocity prediction data for all SpaceX spacecraft. SpaceX was the first operator to share both ephemeris and covariance data and calls on all other operators to do so. In addition, SpaceX volunteered to publicly provide routine system "health reports" to the Commission, something no other operator has ever offered or does.
- **Advanced collision avoidance systems protect SpaceX and other satellites.** Every SpaceX satellite is equipped with an autonomous collision avoidance system that ensures it can maneuver away from any other tracked object that could approach it. SpaceX's autonomous collision avoidance system has been scrutinized by NASA's Conjunction Assessment and Risk Analysis (CARA) program, which deemed it sufficiently trustworthy to rely on it to avoid collisions with NASA spacecraft.
- **Post-mission disposal.** In nominal scenarios, SpaceX satellites are propulsively deorbited within weeks of spacecraft end of mission. This vastly exceeds the international standard of 25 years.
- **Starlink spacecraft are 100% demisable.** At end of life, SpaceX satellites are designed to vaporize upon atmospheric reentry, eliminating the risk of falling debris.
- **Best Practices.** SpaceX's approach to space safety relies on extreme transparency in operations, and SpaceX has collaborated with other operators and experts in developing an "Industry Best Practices" document that is based on operational lessons learned. SpaceX encourages all operators to implement these best practices to ensure the sustainability of the space environment.

The United States currently has the most robust orbital debris requirements in the world. As one of the few remaining U.S.-licensed systems, SpaceX adheres to and significantly exceeds these requirements, and operates with full transparency as required by U.S. regulations. SpaceX's actions stand in stark contrast to nearly every other satellite system, in every orbital regime, which have obtained license authorizations outside of the U.S. and do not comply with U.S. requirements. This forum shopping is purposeful. SpaceX wishes to emphasize that U.S. leadership on space sustainability and orbital debris prevention, mitigation, and remediation requires the U.S. Government to apply its requirements consistently across operators, irrespective of where a system is authorized, if it wishes to provide service in the U.S. market.

SpaceX has also prioritized collaboration with astronomers and scientists to mitigate the impact of Starlink on their work. After early observations showed satellites that were brighter than expected—which no one at the time anticipated—SpaceX began proactively collaborating with astronomers and the U.S. government, and dedicated engineers and resources to design and deploy mitigations and run experiments to test their efficacy. Initially, for example, SpaceX experimented with a dark paint to absorb sunlight, but when in-space experiments showed this mitigation was less effective than desired, SpaceX pivoted to development of a visor—VisorSat—to block sunlight from hitting the satellite and reflecting back to the Earth, and implemented flight configuration changes to minimize the surface area of the spacecraft from which a reflection could result—both highly effective mitigations. SpaceX continues development, with additional technologies, including a combination of dielectric mirror film (developed and made by SpaceX, and made available to other constellation operators at cost), which reflects sunlight away from the Earth, and a SpaceX-developed low-reflectivity black paint, which reduces lower specular peak by a factor of five compared to the darkest available space stable paint.

600 km." The report further stated that "SpaceX Starlink is to be strongly commended for abandoning 1200 km in favor of a constellation at 550 km. In these uncertain, initial phases this is an extremely good and wise decision."

Importantly, SpaceX proactively requested from the Commission two license modifications to reflect two different deployment phases to lower the operating altitude of the satellites, which is a crucial mitigation for astronomers and one endorsed by the American Astronomical Society to reduce impacts on astronomy, as well as improve space safety with respect to orbital debris mitigation.¹⁶ Notably, nearly every other satellite operator—most of which are licensed in foreign jurisdictions—opposed this modification for spurious reasons, delaying its approval for more than a year. This episode in anti-competitive regulatory triage by incumbent and aspirational satellite operators acutely demonstrates the problematic nature of the Commission satellite licensing process, as it opens the door for foreign interference even in circumstances when a license application is meant to *improve* safety and sustainability.

More recently, the National Science Foundation (“NSF”) and SpaceX announced an updated coordination agreement to protect astronomy and continue collaboration on mitigation practices.¹⁷ As discussed below, SpaceX called upon the Commission to impose similar conditions on other satellite operators. These include:

- filing semi-annual reports on collision avoidance maneuvers and satellite disposal, including any difficulties or failures related thereto;
- applying a new performance-based method for assessing disposal failures that accounts for both the number of failed satellites and their entire passive decay time;
- communicating and collaborating with NASA to promote space safety and sustainability; and
- taking all possible steps to assess and mitigate collision risk after receiving a conjunction warning from the 19th Space Defense Squadron or other source.

IV. Lengthy FCC Licensing Timelines and Regulatory Asymmetry

Increasing timelines for decisions. While the pace of space innovation is speeding up, the speed of regulatory decisions is too slow. This Subcommittee has the opportunity to reverse this trend to maintain American leadership in space. For example, SpaceX not only designs, builds, and launches from the United States, but is licensed by the Commission to operate the Starlink system for residential, business, and mobile uses. The high demand for Starlink in the United States is testament to the large geographic areas that have not been served by terrestrial systems or legacy satellite networks. This large market of unserved users has driven the increase in satellite license applications at the Commission in recent years. But this increase in applications—accompanied by the proliferation of competitor comments to the record—has contributed to the increased time it takes for the FCC to process applications.¹⁸ For companies seeking licenses in the United States, the average processing time now takes over two and a half years, with the trend line pointing in the wrong direction.¹⁹

Just recently, SpaceX filed the original application for our Gen 2 system in May 2020,²⁰ but the Commission was not able to put this application out for public comment until approximately 18 months later. The Commission ultimately granted SpaceX its license nearly 30 months after SpaceX filed the Gen 2 application.

¹⁶ See American Astronomical Society reply to IBFS File No. SAT-MOD-20200417-00037 (citing Constance Walker et al., *Impact of Satellite Constellations on Optical Astronomy and Recommendations Toward Mitigation*, at 3 (2020)) (stating that satellites orbiting at or below 600 km do appear brighter than satellites at higher altitudes, but they are in sunlight for less of the night, which is “one of the leading benefits to science.”)

¹⁷ See “NSF statement on NSF and SpaceX Astronomy Coordination Agreement”, January 10, 2023, accessed at <https://beta.nsf.gov/news/statement-nsf-astronomy-coordination-agreement>

¹⁸ OSSTP analysis, “U.S. Market Access Authorization Timeline Analysis for Megaconstellation Networks”, April 2022, accessed at <https://www.osstp.org/fcc-analysis>

¹⁹ *Ibid.*

²⁰ *Space Exploration Holdings, LLC*, Application for Orbital Deployment and Operating Authority for the SpaceX Gen2 NGSO Satellite System, IBFS File No. SAT-LOA-20200526-00055

These timelines create an impossible situation for American operators in the domestic and global marketplaces. The extreme demand to connect unserved Americans quickly, coupled with a rush of foreign competitors, drive U.S. licensees to begin work on these complex satellite constellations years before a license is granted. If they did not, no U.S. system would be able to compete with foreign, often state-backed competitors. As a result, U.S. operators are forced to build at risk, exposing themselves and investors to significant capital risk. Worse, each satellite license has its own unique operating conditions, meaning the operator generally is not aware of what restrictions will be placed on its system—or whether those conditions will be debilitating to their operations—until the license is issued.

Not only does this regulatory asymmetry place U.S. companies at a competitive disadvantage, it undermines the U.S. as a regulatory venue of choice, and it needlessly delays critical services to consumers. The case-by-case nature of satellite licensing in the U.S. has made it an unfortunate target for gaming by foreign competitors and late comers to the market with legions of lawyers and lobbyists. These competitors “fill the docket” at the Commission with spurious and repetitive filings in a deliberate effort to overwhelm Commission resources. Commission staff, in turn, incorrectly view themselves as bound by the Administrative Procedure Act to respond to every filing, no matter how late in the process those filings are received. Typically—and with a flamboyant lack of self-awareness—foreign-licensed operators will call for the Commission to impose conditions and requirements on U.S. operators that would not apply to them and that they could not meet themselves. As just one example, a company licensed in a foreign jurisdiction filed hundreds of pages in a SpaceX docket *8 months* after the comment cycle closed, yet the FCC felt obligated to respond to each new argument dumped on it. Every argument in that filing was eventually rejected by the FCC and later by the courts, but only after years of litigation and after Commission staff spent months sifting through pages of the frivolous claims.

Regulatory asymmetry. Meanwhile, these same operators that game the U.S. process to slow down decisions for U.S. licensees rely on a glaring loophole that exempts foreign-licensed systems from the U.S. regulations. Specifically, while the Commission defers to foreign jurisdictions to regulate their own licensees, virtually none of the countries has comparable regulatory requirements, nor the transparency associated with American public notice and comment. As a result, while many foreign jurisdictions employ protectionist regimes to support their domestic licensees, the U.S. uses an asymmetric set of rules that benefit foreign-licensed systems over U.S.-authorized systems. This legacy loophole has been a leading cause for most satellite operators to license overseas—outside the reach of U.S. oversight—while still taking advantage of the U.S. market.

To help correct this imbalance, SpaceX recently filed at the Commission seeking equitable application of the conditions that it placed on SpaceX’s Gen 2 system for all other systems serving the U.S. market. These conditions include robust space safety requirements and reports, as well as a requirement to coordinate with NSF with respect to radio and optical astronomy protections. To be very clear, SpaceX supports these conditions. Indeed, what is good for the Starlink system should also be good for other satellite constellations. Commission license conditions should be equitably applied to all systems hoping to serve the U.S. market.

SpaceX commends the Subcommittee for seizing this opportunity to update this aging framework to the modern era. Asymmetric regulatory treatment of U.S. systems, unbounded anti-competitive regulatory triage against U.S. licenses, and long delays have a cost. As noted, they introduce enormous amounts of risk for investment and innovation, especially in a sector as capital intensive as satellite communications. Many innovative companies may simply not have the wherewithal to accept these risks and delays. With technological developments happening every day, the months and years it takes to gain authorization means that other operators and foreign, often state-backed companies gain a critical advantage, especially in countries like China, as clearly articulated by the recent CSIS report. And, perhaps most importantly, consumers in critical need of broadband services are left to wait, once more.

Protecting spectrum from speculators. But any reforms to Commission processes can only succeed if the carefully-balanced spectrum rules for key spectrum bands authorized for use by next-generation satellite operators remain intact. For example, the 12 GHz band has been a U.S. success story, leading to millions of Americans relying on the band for high-speed, low latency broadband internet connectivity and satellite television. These customers are in urban, suburban, and rural areas, often in locations where no alternative service is available. Recognizing the promise of LEO systems in bridging the digital divide, the Commission authorized numerous next-generation satellite systems to use 12 GHz for their consumer downlink. In fact, following the FCC's lead, this band has become the tent pole supporting next-generation systems in China, in Europe, and around the world.

But as this Subcommittee has recently recognized in other contexts, spectrum licenses must mean something. On the basis of its licenses, satellite operators, including SpaceX, have invested and continue to invest billions of dollars in satellite systems using the 12 GHz band to deliver service. Current operators carefully share the spectrum with each other and other users today. Proposals to change the rules in this band have been met with extensive technical and engineering studies that conclusively demonstrate that any changes to the delicate balance in the band would result in widespread interference with GSO and NGSO systems, making the band effectively unusable for satellite operators and abruptly ending critical services for millions of Americans. The Commission must therefore close down a proceeding that has been ongoing for more than three years that threatens American leadership in the 12 GHz spectrum.²¹ SpaceX asks this Committee to encourage the Commission to complete its work on the lower 12 GHz band, and thanks the many bipartisan Members of this Committee who have already done so.

V. The Satellite and Telecommunications Streamlining Act, LAUNCHES Act, and Secure Space Act

Commission staff and Commissioners on a bipartisan basis have acknowledged the challenges of the outdated rules they inherited, and have taken preliminary steps to address some concerns. Both the Commission and this Committee have recognized not only the current benefits of next-generation satellite systems, but the enormous potential on the horizon. SpaceX enthusiastically supports the efforts to modernize the U.S. approach to processing satellite applications. The Commission is in the process of standing up a Space Bureau, and the reorganization should in theory help to prioritize and expedite the satellite review process. SpaceX is encouraged the Commission and this Committee agree on the need to address some of these licensing delays, and to specifically impose deadlines for satellite license reviews.

The Satellite and Telecommunications Streamlining Act is an important part of the solution to maintain U.S. leadership in the satellite communications sector. By providing regulatory certainty and introducing clear, mandatory timelimes for when the Commission must act on applications, operators will no longer be faced with an uncertain process that takes years to resolve. SpaceX has additional recommendations to further enforce these deadline requirements, including a mandatory 30-day period to notice a satellite application for public comment, as well as clear statutory language imposing strict requirements with respect to when tolling the overall timeline required in the legislation could be allowed. SpaceX also strongly supports the establishment of expedited procedures for U.S.-authorized systems.

SpaceX also supports the bill's proposed revision of the Part 25 rules to allow the FCC to examine what parts of satellite license application process can be streamlined, while allowing the Commission to defer to expert agencies on highly technical matters like orbital debris and space safety. The inclusion

²¹ Federal Communications Commission, Notice of Proposed Rulemaking, "Expanding Flexible Use of the 12.2-12.7 GHz Band", released January 15, 2021, accessed at <https://www.fcc.gov/document/fcc-seeks-comment-maximizing-efficient-use-12-ghz-band>

of timelines for major and minor modifications is also a welcome step, as is the timeline for acting on earth station applications.

The Leveraging American Understanding of Next-generation Challenges Exploring Space ("LAUNCHES") Act would modernize unwieldy current processes for licensing spectrum used during commercial space launch and reentry operations. The LAUNCHES Act would permit these activities to be licensed on a secondary basis instead of under the current Special Temporary Authorization (STA) regime, eliminating redundant and cumbersome paperwork while protecting current and future federal users in the identified bands. And, it would require the Commission to issue new regulations to streamline the approval process, including improving interagency spectrum coordination and allowing for blanket licensing for identical missions. These improvements and others contained in this important legislation would enable the U.S. to keep pace with the rapid growth of the commercial space industry, while maintaining important oversight.

The Secure Space Act would address the same security risks that threatened terrestrial communications networks that are quickly migrating to space. The importance of U.S. leadership in satellite technology cannot be overstated. Other countries are moving forward with significant investment in LEO space systems, and are clearing regulatory obstacles to allow for their state-backed networks to rapidly launch and deploy. China is aggressively pursuing a satellite constellation called "StarNet" with plans to launch approximately 13,000 satellites in the coming years.²² The European Union is also pursuing its own Secure Connectivity LEO system, as are Russia and India. Beyond the clear benefits to the U.S. government in having U.S. companies lead in LEO broadband, ceding U.S. leadership in the race to provide satellite internet globally creates significant geopolitical risks.²³ While the U.S. has blocked the installation or use of Chinese hardware for telecommunications networks domestically due to security concerns, many nations have few options when it comes to telecommunications infrastructure and must rely on whoever can provide connectivity. The Secure Space Act seeks to address some of these concerns, and in conjunction with the Satellite and Telecommunications Streamlining Act will help maintain U.S. leadership in this sector.

VI. Conclusion

Thank you again for the invitation to testify before the Committee today. SpaceX looks forward to working with the Committee to modernize the U.S. regulatory approach to satellite system authorization, leveraging next-generation technologies like Starlink to help close the digital divide, and support continued U.S. leadership in space.

²² See "China is developing plans for a 13,000-satellite megacosntellation", *Space News*, April 21, 2021, accessed at <https://spacenews.com/china-is-developing-plans-for-a-13000-satellite-communications-megaconstellation/>

²³ Makena Young and Akhil Thadani, "Low Orbit, High Stakes: All-In on the LEO Broadband Competition", Center for Strategic and International Studies, December 2022, accessed at <https://www.csis.org/analysis/low-orbit-high-stakes>

Mr. Latta. Well, thank you very much for your testimony. Ms. Piñeres, you are recognized for 5 minutes.

STATEMENT OF DANIELLE PIÑERES

Ms. Piñeres. Thank you, Chairman Latta. Thank you, Chairman Latta, Ranking Member Matsui, and members of the subcommittee. I am honored to appear before you today to discuss how Earth observation data from space can help governments and commercial companies make better decisions for life on Earth and how streamlining licensing requirements, preserving access to spectrum, and protecting the low-Earth-orbit operating environment can support space operators.

The commercial remote-sensing community is vibrant, innovative, and growing and provides data and analytics tools used by scientists, researchers, companies, communities, Federal agencies, and individuals to empower better data-informed decisions. As Congress and relevant Federal agencies collaborate on steps to enable continued growth and innovation in the commercial space sector, Planet recommends consideration of technology-neutral policies that enable innovation across a diverse range of space actors. The continued importance of spectrum to support satellite capabilities and the need for a timely and responsive licensing regime that keeps pace with technology development.

Planet is an integrated aerospace remote sensing and data analytics company whose mission is to image Earth's landmass every day in order to make global change visible, accessible, and actionable. Planet designs, builds, and operates the largest constellation of Earth-observing satellites in human history, imaging with multiple spectral bands and delivering this data within operational decision-making processes for thousands of users across sectors.

At Planet, we believe you can't fix what you can't see. Planet is able to line-scan the Earth and image the entirety of Earth's landmass every day at 3.7-meter resolution using our Dove satellite constellation of approximately 180 small sats that are about the size of a loaf of bread. Additionally, Planet's sky sat fleet of 21 satellites can be tasked to image specific portion—specific points on Earth and enables Planet to deliver 50-centimeter resolution images to customers.

Planet also leverages machine learning to transform imagery into information feeds that detect objects and track change, providing customers with deeper insights on planet imagery. Planet has a daily reported history of the planet everywhere for the past 6 years and adds new imagery on a daily basis. This growing data set offers rich historical context across the globe as well as deep imagery stacks for application development and machine-learning-based analytics. Planet's data sets complement government-operated space and ground-based sensors and dramatically improve the spatial, temporal, and spectral resolution available to decision makers and scientists for monitoring real-time changes in wildfire spread in California to recording daily changes in Arctic ice to better understanding crop production and food security around the world. Planet and its commercial satellite imagery are empowering governments, companies, and individuals with the daily data they need to address the challenges they face.

I'd like to discuss today just a few examples of how Planet data has an impact here on Earth. Agricultural customers use Planet imagery in their farm management platforms, allowing farmers to make more informed decisions around ideal investment in seed and crop protection products, when to plant, water, and harvest and scout monitoring to identify underperforming crops early in a season.

Satellite imagery provides the near-daily coverage necessary to conduct crop yield analysis, land-use change, and monitor additional impacts to farms. Norway's International Climate and Forest Initiative, or NICFI, is a pioneering program to stop global deforestation. It uses Planet data across all tropical developing countries between 30 degrees north and 30 degrees south in latitude to support the prevention of deforestation and help save the world's tropical forests.

The NASA Harvest, Food Security, and Agriculture Program utilizes Planet data to benefit global food security, agriculture, and human and environmental resiliency. They are using Planet data to monitor Ukraine's farmland, which is known as the world's breadbasket, to enable better understanding of the impacts to global food supply resulting from the Russian invasion of Ukraine. Finally, the California Forest Observatory is a data-driven forest-monitoring system that leverages Planet satellite data and artificial intelligence to map drivers of wildfire behavior across California, including vegetation fuels, weather, topography, and infrastructure.

This provides communities and decision makers the data that they need to invest in mitigation and prevention to keep communities safer. In order for Planet to continue delivering these insights to our customers and to facilitate continued innovation and U.S. leadership in the commercial space sector, we need to work together as industry and government to protect the operational environment for satellites so we can preserve access to space for future generations.

We also need reliable access to spectrum to communicate with and operate our satellites and ensure that we can download the more than 30 terabytes of data that we collect every day. And we need targeted changes to existing regulatory and licensing frameworks to streamline the approvals necessary to operate in space. We ask that the committee continue its efforts to streamline licensing requirements, preserve access to satellite spectrum, and protect the LEO operating environment to support space operators.

Planet appreciates the invitation to testify today and the subcommittee's attention on these important issues. And I look forward to your questions.

[The prepared statement of Ms. Piñeres follows:]

**DANIELLE PIÑERES
PLANET LABS PBC**

**Testimony Before the U.S. House Energy and Commerce Committee
Subcommittee on Communications and Technology Hearing
Liftoff: Unleashing Innovation in Satellite Communications Technologies
February 8, 2023, at 10:30 a.m., 2322 Rayburn House Office Building**

Chairman Latta, Ranking Member Matsui, and members of the Subcommittee, I am honored to appear before you today to discuss how Earth observation data from space can help governments and commercial companies make better decisions for life on Earth, and how streamlining licensing requirements, preserving access to spectrum, and protecting the Low Earth Orbit (LEO) operating environment can support space operators. The commercial remote sensing community is vibrant, innovative, and growing, and provides data and analytics tools used by scientists, researchers, companies, communities, federal agencies, and individuals to empower better data-informed decisions. As Congress and relevant federal agencies collaborate on steps to enable continued growth and innovation in the commercial space sector, Planet recommends consideration of technology neutral policies that enable innovation across a diverse range of space actors, the continued importance of spectrum to support satellite capabilities, and the need for a timely and responsive licensing regime that keeps pace with technology development.

I. Planet Overview

Planet is an integrated aerospace, remote sensing, and data analytics company whose mission is to image Earth's landmass every day in order to make global change visible, accessible, and actionable. Planet designs, builds, and operates the largest constellation of Earth observing satellites in human history – imaging the entire landmass of the Earth daily with

multiple spectral bands and delivering this data within operational decision-making processes for thousands of users across sectors.

At Planet, we believe, “You can’t fix what you can’t see.” With approximately 180 satellites in orbit, Planet is able to line-scan the Earth and image the entirety of Earth’s landmass every day at 3.7 meter resolution using our Dove satellite constellation. Additionally, Planet’s SkySat fleet of 21 satellites can be tasked to image specific points on Earth and enable Planet to deliver 50 centimeter resolution imagery to customers. Planet also leverages machine learning to transform imagery into information feeds that detect objects and track change, providing customers with deeper insights on Planet imagery than ever before. Planet data empowers users with a living dataset of global change, with new imagery added on a daily basis. This growing dataset offers rich historical context across the globe, as well as deep imagery stacks for application development and machine learning-based analytics. Planet has a daily recorded history of the planet everywhere for the past six years and with our Earth Data Platform, our customers are able to see change and take action.

II. Commercial Earth Observation Data Enables Better Decisions

Planet’s cloud-based, AI-enabled daily global imagery, along with data from other commercial providers, enables scientists, governments, corporations, and communities to make informed decisions. These datasets complement government-operated space and ground-based sensors, and dramatically improve the spatial, temporal, and spectral resolution available to decision makers and scientists. From monitoring real-time changes in wildfire spread in California, to recording daily changes in Arctic ice, to better understanding crop production and food security around the world, Planet and its commercial satellite imagery are empowering governments, companies, and individuals with the daily data they need to address the challenges

they face. Below are just a few examples of how Planet data has an impact here on Earth.

Agricultural customers use Planet imagery in their farm management platforms, allowing farmers to make more informed decisions around ideal investments in seed and crop protection products, when to plant, water, and harvest, and scout monitoring to identify underperforming crops early in a season. Satellite imagery provides the near-daily coverage necessary to conduct crop yield analysis, land use change, and monitor additional impacts to farms.



PlanetScope, June 22, 2021: Tazewell County, Illinois

Norway's International Climate and Forests Initiative (NICFI), a pioneering program to stop **global deforestation**, uses Planet data across all tropical developing countries between 30 degrees North and 30 degrees South in latitude to support the prevention of deforestation and help save the world's tropical forests. NICFI provides that data to the UN Food and Agriculture Organization, the Ministries of Forestry for the relevant countries, and researchers and non-

governmental organizations (NGOs). Some of the data is also made universally open as a digital public good.¹

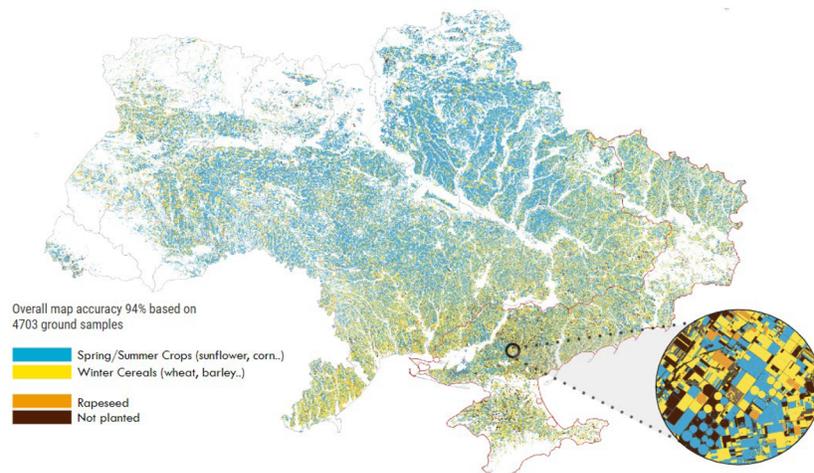


PlanetScope, January 16, 2021: Deforestation, Chiribiquete National Park, Colombia

The NASA **Harvest food security** and agriculture program utilizes Planet data to benefit global food security, agriculture, and human and environmental resiliency. They are using Planet data to monitor Ukraine’s farmland, which is known as the “world’s breadbasket,” to enable

¹ *Norway’s International Climate and Forests Initiative Satellite Data Program*, Planet Labs PBC (2023), <https://www.planet.com/nicfi>.

better understanding of the impacts to global food supply resulting from the Russian invasion of Ukraine.²



*NASA Harvest: Ukraine Crop Map 2022 (August Occupation Boundaries)*³

The **California Forest Observatory** is a data-driven forest monitoring system that leverages Planet satellite data and artificial intelligence to map drivers of wildfire behavior across California – including vegetation fuels, weather, topography, and infrastructure. This provides communities and decision makers the data they need to invest in mitigation and prevention to keep communities safer.⁴

² Adam Voiland & Mary Mitkish, *Earth Data for Informed Agricultural Decisions: Larger Wheat Harvest in Ukraine Than Expected*, NASA Harvest (Dec. 2, 2022), <https://nasaharvest.org/news/larger-wheat-harvest-ukraine-expected>.

³ Planet Labs PBC, Investor Day Presentation, at 13 (Oct. 12, 2022), [https://s29.q4cdn.com/903184914/files/doc_presentation/2022/Planet-Labs-PBC-Investor-Day-Presentation-October-2022-\(Web-Version\).pdf](https://s29.q4cdn.com/903184914/files/doc_presentation/2022/Planet-Labs-PBC-Investor-Day-Presentation-October-2022-(Web-Version).pdf).

⁴ Paris Good, *California Forest Observatory Sets New Standard for Mapping Forests and Wildfire*, Planet Labs PBC (Sept. 14, 2020), <https://www.planet.com/pulse/cfo-mapping-new-standard-wildfire>.



*California Forest Observatory*⁵

In order for Planet to continue delivering these insights to our customers and to facilitate continued innovation and U.S. leadership in the commercial space sector, we need:

- To work together as industry and government to protect the operational environment for satellites so we can preserve access to space for future generations;
- Reliable access to spectrum to communicate with and operate our satellites, and ensure we can download the more than 30 terabytes of data we collect every day; and
- Targeted changes to existing regulatory and licensing frameworks to streamline the approvals necessary to operate in space.

⁵ California Forest Observatory, <https://forestobservatory.com> (last accessed Feb. 4, 2023).

III. Industry and Government Can Collaborate to Improve Space Sustainability and Address Orbital Debris in LEO

Planet takes seriously its responsibility as a satellite operator to minimize its impact on the space environment. Planet has safely operated over 200 satellites with its current designs, and safely disposed of more than 150 satellites over the past decade. We take a variety of steps in designing and operating our fleets of satellites that help to minimize the potential for debris and maximize the sustainability of the LEO environment in which we operate.

International Efforts. There are many international initiatives underway to move toward a more sustainable LEO environment. Planet participates in the World Economic Forum's working group on Space Traffic Management and Orbital Debris, the Paris Peace Forum's Net Zero Space initiative,⁶ and also helped to beta test the Space Sustainability Rating (SSR). The SSR is an effort by World Economic Forum's Global Future Council, European Space Agency, MIT, BryceTech, University of Texas at Austin, and EPFL Space Center to develop a tool that allows operators to understand the impact of their missions on the space environment and other operators.⁷ These efforts bring attention to the issue of space sustainability and can help shape international commercially reasonable best practices for space actors.

ASAT Testing. Planet appreciates the U.S. Government's work as a whole toward ensuring safe and responsible operations in space. In particular, Planet greatly appreciates and supports the U.S. Government's leadership in committing not to conduct destructive, direct-ascent anti-satellite (ASAT) missile testing. For the last ten years, Planet has raised concerns about the impact destructive ASATs have on a healthy space ecosystem. ASATs threaten operations in LEO, jeopardize astronauts' safety, and risk destroying satellites that provide

⁶ Paris Peace Forum, *Net Zero Space*, <https://parispeaceforum.org/en/initiatives/net-zero-space>.

⁷ Space Sustainability Rating: Leading the Path Towards a More Sustainable Use of Space (2022), <https://spacesustainabilityrating.org>.

critical services to humanity. There is no such thing as a responsible kinetic ASAT. The narrow commitment by the United States to limit ASAT tests is an important first step, and Planet was pleased to see widespread support at the UN General Assembly for a resolution calling for a ban on direct-ascent ASAT weapons.⁸ Planet hopes that other nations follow the lead of the United States and also commit to the direct-ascent ASAT test ban, thereby creating over time an international behavioral norm.

Federal Communications Commission (FCC) Orbital Debris Efforts. The FCC has been active in its efforts to curb the proliferation of debris in LEO. Planet supports the 5-year deorbit rule that the Commission adopted last year⁹ as a reasonable measure to reduce the time that space objects remain in space and pose a collision risk to other operators.

With respect to remaining issues still under consideration in the FCC's orbital debris proceeding, Planet has advocated for a risk-based, technology neutral approach to maneuverability in which policymakers could set a desired target for maneuvering capability that operators could innovate to meet in a variety of ways. Critically, policymakers should consider how any new requirement will be applied. Satellite designers and manufacturers have a long development pipeline and would need significant time to adapt to any new requirement. An implementation period running to the end of an operator's license term (or 5 years from the date of any final FCC order) correctly balances the need for near-term steps to prevent debris creation with operators' reasonable investment-backed expectations. In short, any new requirements for maneuverability should state a safe operating requirement but the implementation should be up to the licensee to allow for technological innovations. Further, we recommend grandfathering of

⁸ Jeff Foust, *United Nations General Assembly Approves ASAT Test Ban Resolution*, Space News (Dec. 13, 2022), <https://spacenews.com/united-nations-general-assembly-approves-asat-test-ban-resolution>.

⁹ See generally *Space Innovation: Mitigation of Orbital Debris in the New Space Age*, Second Report and Order, IB Docket Nos. 22-271, 18-313, FCC 22-74 (rel. Sept. 30, 2022).

existing licenses and for new debris policies to be mindful of creating additional barriers for new companies to compete in this emerging market.

Space Sustainability Policy Collaboration, Harmonization, and Transparency. As Congress and the agencies continue to work with industry to address space sustainability, Planet urges close collaboration among the Office of Space Commerce (OSC), the FCC, Congress, and other interested U.S. government entities on orbital debris policy. The OSC has been charged with implementing a civilian space situational awareness capability. At the same time the FCC has adopted new regulations aimed at curbing orbital debris in LEO and is actively considering further actions. As both agencies work independently in these related areas, there is an opportunity to closely collaborate on policy developments to avoid conflicting or duplicative regulation.

As the OSC works toward implementing the new civilian space capability, Planet has encouraged the establishment of an open architecture for space-based tracking assets that will help promote transparency and sustainability. Countries have launched or are planning to launch space situational awareness (SSA) satellites. The United States should lead by making as much of its space-based tracking data open as is feasible and encouraging other allied nations to do the same. Creating an open architecture in a standard data format enables interoperability in data sets and increases the fidelity of data to improve forecasting models. Further, a virtual constellation of SSA satellites could lead to a more resilient, upgradable, and participatory space architecture and strengthen collaboration with allies toward a sustainable space environment.

IV. Access to Sufficient Wireless Spectrum Resources Is Critical to Supporting Continued Innovation in Commercial Space Services

Satellite operators rely heavily on wireless spectrum resources to send and receive important information to and from their satellites. Everything from commands to the satellite,

telemetry about the health of the satellite, to “payload downlink” for the images and data that the satellite collects, transmits wireless spectrum to and from the satellites and the ground stations on Earth. Planet and other remote sensing operators rely on and share a limited number of spectrum bands allocated for the non-Federal Earth Exploration Satellite Services (EESS). These frequencies should be maintained for EESS use.

Planet currently downlinks more than 30 terabytes of data per day; as demand grows for our services and as new capabilities come online, this number will increase. Moreover, time is often of the essence to deliver our data to the companies and governments that rely on it, including for disaster response. As a result, spectrum needs are likely to grow, not lessen, over time. Intersatellite links (ISLs) pose an important opportunity for the remote sensing industry, as they can speed the time from tasking a satellite to the time an image is delivered to a customer, as well as provide an “always on” connection with satellites that increases safety of space operations. There are efforts underway at the International Telecommunication Union to enable new frequencies for ISL use and Planet supports the use of these new technologies to improve reactivity and reduce latency.

V. Space Operators Require Prompt, Reliable, and Transparent Radio Frequency Licensing Regimes

Planet appreciates this Committee’s and the FCC’s focus on streamlining the complex and time-intensive licensing process for satellite systems. As Chairwoman Rosenworcel has noted, the FCC has before it today applications for 64,000 new satellites and saw an eight-fold increase last year in the number of applications for fixed satellite service gateways.¹⁰ But the licensing rules were built for a simpler time and in large part for different kinds of satellites, so

¹⁰ Remarks of Chairwoman Jessica Rosenworcel to the Satellite Industry Association, *Space Innovation and the FCC*, Washington, D.C. (Nov. 3, 2022), <https://www.fcc.gov/document/chairwoman-rosenworcel-remarks-satellite-industry-association>.

Planet agrees that now is the time to revisit those rules so that they can keep pace with the innovation occurring in the U.S. commercial space industry.

Space operators such as Planet need a prompt, reliable, and transparent radio frequency licensing regime in order to consistently meet commercial requirements such as launch milestones and contractual deliverables, and to reduce uncertainty. Given the increase in the number of FCC applications for space and ground stations, appropriate resources and staffing are needed to process applications in a timely manner. We appreciate the FCC Chairwoman's commitment of additional resources to the International Bureau (Bureau) to help with the huge influx of new satellite-related applications, and look forward to seeing how the creation of a standalone Space Bureau could foster close collaboration with other agencies working on space issues to improve harmonization on space policy matters. We also applaud the Commission's efforts to seek comment on appropriate approaches to streamline the satellite licensing process. The Notice of Proposed Rulemaking on Expediting Initial Processing of Satellite and Earth Station Applications (NPRM) tees up several good ideas for improving the radio frequency licensing process for satellite operators¹¹ and Planet looks forward to participating in the proceeding. We appreciate the continued collaboration of the U.S. Government and other space operators on ideas to continue to improve the licensing process.

Planet encourages continued regular communication between the FCC and NTIA on wireless spectrum issues, including with respect to satellite and ground station applications. The new Memorandum of Understanding between the FCC and NTIA represents an important step forward in active and regular collaboration between the FCC, NTIA and federal government

¹¹ *Expediting Initial Processing of Satellite and Earth Station Applications*, Notice of Proposed Rulemaking, IB Docket Nos. 22-411, 22-271, FCC 22-95 (rel. Dec. 22, 2022).

spectrum users.¹² Because spectrum coordination across government agencies is needed for most space station and Earth station applications, prompt FCC transmission of applications to NTIA is critical to allow for coordination early in the licensing process.

Planet discourages the Commission and the Committee from taking actions that could result in unnecessary dismissal of license applications. For example, dismissing applications because they contain internal inconsistencies or omissions, as the Commission raises as a possibility in the NPRM, is unlikely to achieve faster processing times. Planet appreciates the Bureau's efforts to work with satellite operators to address information gaps or inconsistencies, which can be resolved by supplemental filings without a dismissal. Similarly, shot clocks for FCC action on license applications, particularly without built-in flexibility to address challenging circumstances (such as complex spectrum coordination questions, new proposed uses not anticipated under domestic or international regulations, or incomplete information provided by the operator), could result in a larger number of dismissals. Dismissal requires an operator to restart the process, which creates additional regulatory burdens on both the operator and the Commission that should be avoided.

VI. Legislation Under Discussion

Planet appreciates the attention of this Committee to these important issues and the legislation proposed for discussion today. There are two bills in particular on which we would like to offer specific comments, given their relevance and importance to our industry.

Precision Agriculture Satellite Connectivity Act. Planet's data is widely used to support the agricultural sector and inform precision agriculture. The goal of precision agriculture is to

¹² Memorandum of Understanding Between the Federal Communications Commission and the National Telecommunications and Information Administration (Aug. 1, 2022), <https://www.fcc.gov/document/mou-between-fcc-and-ntia-spectrum-coordination>.

optimize the use of crop inputs to produce higher yields and avoid environmental degradation. Planet's near-daily, 3 meter resolution imagery makes this possible by giving farmers the best chance to obtain imagery at the time they need it to drive decision making throughout the growing season.

The draft *Precision Agriculture Satellite Connectivity Act* has an important goal to review the FCC's rules to promote precision agriculture with the Precision Ag Connectivity Task Force (Task Force). Although the Task Force has incorporated a broad approach to precision agriculture needs and included satellite imagery in some of its work, the statute creating the Task Force does not include direct consideration of the accessibility of satellite imagery to support precision agriculture. Planet would be pleased to work with the Committee to consider whether such a statutory change may be helpful to complement the review and report required under the draft legislation.

Satellite and Telecommunications Streamlining Act. As discussed above, the prompt, reliable, and transparent processing of FCC licensing applications is key to the future growth of the satellite and remote sensing industries so we can continue to deliver actionable insights to our customers. Planet appreciates the diligent efforts of Chairwoman McMorris Rodgers and Ranking Member Pallone, as well as Chairwoman Rosenworcel, to address lengthy and unpredictable license application processing times at the FCC. We also appreciate the iterative approach being taken with this legislation, with multiple discussion drafts being released and extensive feedback sought from across the satellite industry.

Planet is continuing to review the most recent draft bill released with this hearing. We do appreciate recent updates to the legislation, which include technology neutral performance objectives and procedures which may prevent unnecessary denials of applications. We hope the

Committee continues engaging with the community on the legislation to ensure reforms are achieved that provide the transparency, reliability, and timeliness envisioned by all parties.

VII. Conclusion

Space-based Earth observation data plays a key role in understanding our changing world. The commercial remote sensing community is vibrant, innovative, and growing, and provides data and analytics tools used by scientists, researchers, companies, communities, federal agencies, and individuals to empower better data-informed decisions. We ask that the Committee continue its efforts to streamline licensing requirements, preserve access to satellite spectrum, and protect the LEO operating environment to support space operators. Planet appreciates the invitation to testify today and the Subcommittee's attention on these important issues. I look forward to your questions.

Mr. LATA. And thank you very much for your testimony today, and I thank all the witnesses. And now we'll move into the questions-and-answers portion of the panel. I'll begin the questioning, I recognize myself for 5 minutes.

Mr. Goldman, low-Earth-orbit systems like Starlink have the potential to offer broadband speeds that can unlock numerous opportunities for rural America. Would you discuss some of the benefits, including the impact they could have, especially on agriculture, here in the United States?

Mr. GOLDMAN. Yes. Thank you very much for the question. I really appreciate it. I think one of the really exciting things about these new next-generation satellite systems like Starlink is they have the potential to bring urban-quality broadband speeds to rural areas. And you can bring—so you are bringing service not only to places where you are connecting them for the first time, but they are actually getting high-quality broadband at the same time, that they are not getting a second-tier internet. You don't have to compromise just because you are living in a rural area.

And so I think one of the values of your—of the legislation that the committee is considering is that what you're doing is facilitating the deployment of these constellations that brings the speed and brings these vital connections to rural areas. And you ask about precision agriculture. One of the hardest things—even assuming that everything is working right, one of the—it's most of—our government's programs for broadband right now are about households and not necessarily about getting to the last acre of farmland. It's—you are looking at densities of population and not saying we need connectivity in places where there's not necessarily people but we have important crops or other things that we are growing.

And so I think one of the things that we can—we can do is, by using satellite technology, you can bring these kinds of speeds to be able to do these vital services out to every corner of the farm.

Mr. LATA. Thank you very much. And Ms. Lohmeyer, the FCC's current structure of licensing satellite systems from processing rounds seems to have its pros and cons. As someone who has filed applications with the FCC for low-Earth orbit satellite systems, what challenges do processing rounds present to companies that want to enter the marketplace today or for existing satellite operators that want to make innovative upgrades for their systems?

Dr. LOHMEYER. So the existing challenges really—oh, thanks. The existing challenges come down to timing, market entry and how that impacts competition. So for entrants, those who are applying, like I mentioned, the processing round can force the filer to prematurely submit an authorization. And given what I will say is the fortunate fact that the FCC does have a thorough and diligent stance on orbital debris rules and orbital debris showings that can delay the authorization process.

For those who are incumbents who are either already authorized or operational, they have uncertainty when it comes to protections and interference risk from later round filers. And I will say the FCC has initiated proceedings on NGO sort of sharings looking at this, the impact, effectively, of early rounds versus later rounds and stressed, too, that what we need are rules that balance these

expectations of our incumbents, which are investment-backed, with the needs of incentivizing for innovation and competition.

Mr. LATTA. Thank you. Ms. Piñeres, Planet is a different type of satellite operator than SpaceX in that it provides Earth observation sensing capabilities. Would you please briefly explain how Planet's services are used by farmers and ranchers? And sorry, only about a minute left.

Ms. PIÑERES. Sir, I'd be delighted. So agricultural customers—agricultural customers use Planet imagery in their farm management platforms, allowing farmers to make more informed decisions. Variable rate applications optimize input and water-use efficiency to reduce overfertilization while boosting yields. Sustainable agriculture monitoring, including crop rotation, conservation tillage and cover cropping—I actually grew up on a farm myself in Idaho. But farming today is a very high-tech business. And actionable satellite data to promote precision ag fits right in with this vision for the future of farming.

Also say it's important that Planet data we offered into the farm management platforms that farmers are already using, understanding that not everyone is a geospatial analysis expert. So we are really trying to meet our customers where they are in terms of bringing them actionable satellite data.

Mr. LATTA. Well, thank you very much, and my time is just about to expire, but I have a couple more questions that I will submit to you all and for feedback on them.

At this time, my time has expired, and I yield to the gentlelady from California, the ranking member of the subcommittee, for 5 minutes.

Ms. MATSUI. Thank you very much, Mr. Chairman. Thank you very much, Mr. Chairman. Satellite systems are capable of providing service globally regardless of where they are licensed. That means companies can get access to the U.S. market through foreign regulatory body rather than through the FCC. Asymmetry in the requirements for operators seeking FCC license versus market access and space system and significant consequence for U.S. international leadership.

Mr. Goldman, I asked this question at the last hearing, but it's worth reiterating now. Yes or no, do you believe our licensing and market access requirements should incentivize U.S. operations whenever possible?

Mr. GOLDMAN. Yes, absolutely.

Ms. MATSUI. Chairwoman Rosenworcel is doing what she can with the resources she has to keep the FCC responsive to the needs of the satellite marketplace. However, it's clear that with the increase in satellite applications and potential expand—potential expand the scope proposed in these bills, the agency needs more resources to keep up. Mr. Davidson, do you have concerns U.S. leadership and increased spending—if we don't provide a commensurate increase in resources to the FCC?

Mr. DAVIDSON. Yes. Thank you, Congresswoman, for that question. I think absolutely. And I think what you heard last week and what you heard in the earlier panel today was kind of a unanimous endorsement of what you just said, that with the advances in technology today, things are becoming much more sophisticated, not

just the quantity of resources but the quality of the resources that are there. And I think the chairwoman has recognized that and in the additions that she's made there.

But I think with the pace of technology and now, with—if this legislation passes, you are going to have a broader mission given to the FCC. So absolutely they will need more resources to accomplish this.

Ms. MATSUI. Thank you. As more system operators begin to share congested spectrum bands, it will be increasingly important that satellites are spectrally efficient to allow more effective use of limited resource. Mr. Goldman, can you describe the measures that can be used to measure spectral efficiency, and how can we incentivize improvements in efficiency?

Mr. GOLDMAN. Yes. Thank you very much for the question. We—this is exactly—this is exactly the point. And Professor Lohmeyer was mentioning earlier that the processing round systems at the FCC actually can somehow—can sometimes actually disincentivize building efficient systems. Unlike—this subcommittee deals with terrestrial licenses where people get exclusive rights to certain bands. On satellite, it's completely different. Everyone has to share. And that actually can create this incentive to build the least efficient system, because it allows you to box out your competitors.

And so what I think the Satellite Streamlining Act does is it recognizes this, and it encourages—tells the FCC to look into encouraging efficiency. SpaceX has actually petitioned the FCC asking for them to pick this up exactly and start building in metrics such as how much speed are you—are you providing per square mile on the ground per person. How much speed are you providing, trying to drive an incentive towards—that you actually are rewarded for having a more efficient system as opposed to being right—right now, the current system actually rewards you for being inefficient.

Ms. MATSUI. OK. Thank you. I am interested in the deal that SpaceX has struck with T-Mobile, which would permit T-Mobile customers with off-the-shelf devices to receive Starlink signals from the outer range of the usual T-Mobile network coverage. This is exciting, and I know that other companies are trying to offer similar services.

Mr. Goldman, how is SpaceX overcoming the challenges of sharing spectrum with wireless licenses? And what role do you see for satellite to supplement terrestrial networks?

Mr. GOLDMAN. Yes, great. That's a great question. So the model that we are using is we actually—we—as you mentioned, we have a deal with T-Mobile. So we—we are actually working with the terrestrial operators rather than seeing them as the adversary and trying to battle against them. We are trying to work with them and see them as partners. And so we actually have a deal where we are going to be using T-Mobile spectrum with their permission. And essentially our satellites will operate like wireless towers in space.

So as you mentioned, just a phone off the shelf when you are in a dead zone will be able to connect with the satellites.

Ms. MATSUI. OK. I'm using my time here. So, anyway, I—I really do. I yield back the balance of my time.

Mr. LATA. Thank you. The gentlelady yields the balance of her time, and the Chair now recognizes the gentleman from Florida's 12th District for 5 minutes.

Mr. BILIRAKIS. Thank you, Mr. Chairman. I appreciate it. In a global market for NGSO systems, if the U.S. regulatory burden for approvals and launches are too burdensome, a company could theoretically launch elsewhere and retroactively apply for market access. This would equate to other countries benefiting from satellite technologies while we sit in a regulatory quagmire. Mr. Goldman, question for you. In your written testimony, you stated the U.S. approval timeline is, on average, 2½ years. How does the U.S. regulatory burdens for satellite approvals compare to foreign countries', and have you launched outside of the United States or at least considered it due to more friendly regulatory environments?

Mr. GOLDMAN. Thank you so much for the question. So I guess to start out with, we are—SpaceX is proudly a U.S. company. We build, launch and operate all of our systems within the United States, and we are completely licensed within the United States. But that's actually why—specifically why we are so concerned about making sure that the U.S. regulatory process keeps up with the innovation because it is true, as Ranking Member Matsui was mentioning, the nature of satellites is that you can license anywhere in the world and still be able to operate in the lucrative U.S. market.

And we have seen that. We have seen that happening. More and more satellite operators go and license overseas and then come back. And they basically escape U.S. oversight of their operations but still are able to take advantage of the U.S. market. So I think we think that one of the key—the key steps to take that's addressed in the Satellite Streamlining Act is if you can shorten the timeline to be able to do these approvals. The other thing that the U.S. does that no one else does is it's completely transparent. So it is actually—to answer your question about does anyone else take this long, it is hard to know because other countries kind of do it behind closed doors and in the U.S. you can see it.

I can tell you our—we are now operating in 46 countries, 59 total markets. We have not run into those problems in other places when we are operating in other countries. So I think the Satellite Streamlining Act would do a great deal to try to bring back and incentivize people back to licensing in the United States again.

Mr. BILIRAKIS. Sounds good. Ms. Lohmeyer, do you have anything to add? I know you had some testimony with regard to this issue.

Dr. LOHMEYER. In particular, folks filing administrations overseas and then obtaining market access here?

Mr. BILIRAKIS. Correct.

Dr. LOHMEYER. I think I would primarily just echo what Mr. Goldman said. The primary reasons folks go overseas is the perceived onerous nature—onerous nature of the FCC's process, like we described, the public nature as well. And I think as the FCC also conducts complete overview of the technical and legal narratives that are required to be submitted before submitting the ITU filing, which establishes international priority, whereas other

nations have a less diligent process. There's pros and cons to that, so—

Mr. BILIRAKIS. OK. Thank you. Next question is for Mr. Goldman. You also discuss in your written testimony the Starlink capabilities that allow for a satellite to provide services to areas devastated by natural disaster. I've seen hurricanes, being from the State of Florida, from time to time leave residents stranded both physically and from outside communication. How long does it take to reposition a satellite to provide coverage to a disaster zone, and how do you complete that task without disrupting service to other populations? I specifically recall, Representative Dean, that that happened, absolutely. Representative Dunn. Yes. I guess that was Hurricane Michael, right?

Mr. DUNN. Yes.

Mr. BILIRAKIS. Yes. So if you could answer that question, I appreciate it very much.

Mr. GOLDMAN. No. I appreciate that. And I actually—I myself, I grew up in Tampa, so I saw hurricanes and saw exactly what they did. We actually—last year, we started working with State of Florida government. And when hurricanes came in last year during hurricane season, we were able to deploy basically overnight. We don't need any additional ground infrastructure to be able to bring in our service. And our satellites are everywhere already. They are already spread. We don't have to move the satellites.

So essentially, as soon as we get the call, we can move in with our equipment and be able to bring service to people immediately, which is what we did last year during this—during the hurricane season.

Mr. DAVIDSON. Could I add just one thought to that, Congressman? That is, for example, in Tonga, we were the first into Tonga when the disaster happened there last year. So we are able to set up our—carry a backpack with our satellite equipment on it on a commercial plane, land in Tonga. We were there for a week or two before anybody else could come and set up comms there. So satellite, as David is saying, is a very nimble way to get into those areas quickly. And you can preposition equipment so that, you know, areas that are prone to disasters can have that equipment ready to go.

Mr. BILIRAKIS. Very good. I yield back the balance of my time. Thank you, Mr. Chairman.

Mr. LATTA. Well, thank you. The gentleman yields back. The Chair now recognizes the gentleman from California's 29th District for 5 minutes.

Mr. CÁRDENAS. Thank you very much, Chairman Latta and Ranking Member Matsui, for having this very, very important hearing. For decades, satellites have been used for GPS communications and remote sensing. In 2022, the GAO found that there are almost 5,500 active satellites in orbit. And one estimate predicts that they may launch an additional 58,000 satellites by 2030. Satellite technologies provide more opportunities to advance critical research in health, agriculture, energy, and more. Ms. Piñeres (sic), in your testimony, you mention the work that Planet does to capture daily images of Earth to show how the planet is changing and to help us make better decisions.

In California, we are experiencing more extreme weather, hotter temperatures, longer and more severe drought, worsening wildfires, and dangerous flash flooding. We are not just seeing this in California, but we are seeing this all over the country and all over the world.

How does Planet's satellite imagery reveal drought indicators and aid in drought response across the world?

Ms. PIÑERES. Thank you for the question. Measuring the impact of drought is critical for evaluating its severity and monitoring its change in identifying vulnerable areas. Planet's data allows users to record, process, and analyze water resources and land cover changes on the ground over time at a high spatial and temporal resolution. Planet's analytics products called planetary variables include a soil moisture content variable, which can measure the volume of water contained in soil at a 5-centimeter depth. And these products pair Planet's daily data with other public data sets to provide actionable insights.

And I would just add, too, that in response to questions regarding, you know, other types of extreme weather, hurricanes and disaster response, Planet's data can also provide kind of critical situational awareness in those—at those times for building damage assessment and also for evacuation paths.

Mr. CÁRDENAS. And on how—could you elaborate on how access to sufficient wireless spectrum is critical to the work and data that you provide?

Ms. PIÑERES. Yes. Thank you for the question. We rely on wireless spectrum in order to communicate with our satellites, to command the satellites, and, critically, to download the more than 30 terabytes of data that we—that we downlink every day. So wireless spectrum is critical for our operations, for the work that we do and to provide data to our customers. We are also really interested in new types of spectrum technologies, for instance, intersatellite links that can connect satellites in space to speak to each other.

One of the challenges in the Earth observation sector is we operate a little bit differently than other satellite operators. We only communicate when we're within view of a ground station. So it limits our downlinking opportunities by how many ground stations we have. So intersatellite links can provide both better reactivity in terms of sending commands to the satellite about where to image and also better downlinking capabilities to get images faster to customers, particularly in disaster situations.

Mr. CÁRDENAS. Thank you. I'm just amazed at the projection of numbers: 5,500 satellites today to possibly an additional 58,000 or more in the very near future. Are we going to be sending up bumper cars instead of satellites or a combination thereof? How fast are the satellites moving, and does congestion concern anybody?

Mr. DAVIDSON. Yes. Congressman, I addressed in my opening statement this exact issue. So I think it's the health of the orbits and particularly the LEO orbit that could limit the ability for, you know, innovative new products to be launched. So it's going to be a crowded environment.

So part of the licensing process needs to be an understanding of where this—where these new satellites are being deployed, how they are managed, how they—how we can understand where they

are. Are operators communicating with each other? In the GEO orbit, it's a very, I would say, collegial orbit. All the operators talk with each other. When something happens, we help each other out. So it's—you know, there is a lot of information sharing. The LEO orbit, as you mentioned, is going to become very crowded.

So what I refer to as the bucket of space sustainability issues, so tracking, disclosure, you know, transparency, maneuverability of can you move your satellites around an orbital debris, managing orbital debris, all part of the space sustainability bucket that's going to be critical for the future of the industry.

Mr. CÁRDENAS. Yes, please.

Dr. LOHMEYER. The inclusion of technologies like standard fixtures on board satellites are incredibly important as well as in-orbit servicing. One Web, back in 2015 was even—or 20, yes, 2015 was even working on creating some of these devices.

Mr. CÁRDENAS. But people can launch satellites anywhere on Earth. They bring the capability. They get the information, you know, from somebody's lands. Is the United States the standard bearer, or who is the standard bearer today, and who should we—who should be the standard bearer going forward?

Dr. LOHMEYER. I think the United States is definitely a leader in these technologies with NASA and FCC as well as private sector.

Mr. DAVIDSON. And I would also just note that the U.S. has a huge market. It's a huge addressable commercial market. So people who want to do business here need to comply with our—with the standards of the United States.

Mr. CÁRDENAS. Thank you very much. Thank you.

Mr. LATTA. Thank you very much. The gentleman's time has expired and yields back. The Chair now recognizes the gentlelady from Washington, the chair of the full Committee of Energy and Commerce, for 5 minutes.

Mrs. RODGERS. Thank you, Mr. Chairman. Mr. Goldman, I want to start with you and just thank you for testifying on behalf of SpaceX and your effort—your efforts to offer rules, satellite connectivity and provide launch services to other companies. At our hearing last week, we heard a lot about the importance of spectrum and spectrum access for satellite services. My SAT Streamlining Act would provide direction to the FCC on how to incentivize satellite operators to reduce spectrum efficiently. As we are considering ways to streamline and clarify the FCC's rules to encourage upgrades and new interest into the marketplace, what principles should we consider when trying to strike the right balance in providing adequate protection from interference and also encouraging innovation?

Mr. GOLDMAN. Thank you so much for the question, and thank you for having us today. I think you are putting your finger exactly on the biggest issue that we have in satellite right now is how do we, in a shared spectrum environment—how do we give enough certainty to licensees that when you get your license—these systems cost tens of billions of dollars to build—how do you get—how do you have enough certainty that your license is going to—is going to actually mean something to you going forward while you spend these billions of dollars?

At the same time, because it's a shared environment, you don't want to cut off having new entrants enter. And so how do you do both things at the same time, which is a very, very difficult balance. And I compliment you and your staff for taking this on in the—in the SAT Streamlining bill, of trying to strike that balance. It really is—I think that you're—you are addressing it correctly, which is you are thinking exactly about the—how do you make sure that these licenses will continue to have value at the same time that you're encouraging the efficiencies and encouraging people to build in the technology that does cost more to be able to share the spectrum better.

So I think that's the key, and I think that's exactly what your bill is getting at.

Mrs. RODGERS. Thank you. Mr. Davidson, Intelsat is also accompanied with storied American history, starting over 50 years ago in the government-owned system. Today you are at the forefront of innovation and working to integrate multiple orbits and multiple spectrum bands into one integrated system. This discussion draft would grandfather certain systems' use of spectrum as the FCC sets out the new roadmap for spectrum use going forward. Would you also address the balance on the need to streamline the process or protecting billions of dollars in investment made by satellite operators under the current rules?

Mr. DAVIDSON. Great question, and I would concur with David in his assessment of this threading the needle. I think this really is the critical issue your committee and policymakers are going to have to address, which is dealing with the fact that there is a lot of investment up there in space right now and that there were—there was commitments made of billions of dollars.

The same time, we want to encourage innovation and investment and new entrants. So really, finding that—you know, threading the needle in that regard is going to—is going to really be critical. I'm not going to necessarily draw a line on the grandfathering where you should or should not do that. I would just say, from a principal perspective, you've got to find the right balance between protecting investment and encouraging new investment. And I would say the spectral efficiency, we are in complete agreement on that as well. There are old systems that need to be phased out that are, you know, potentially nearing end of life that are extremely inefficient systems. And we are building cutting-edge efficiencies into all of our—we have—we have many new satellites in product—in production right now.

Our software-defined satellites are going to be the most efficient satellites that GEO has ever produced.

Mrs. RODGERS. Thank you.

Ms. Lohmeyer, you are an aerospace engineer with years of experience advising satellite operators as NGSO systems are getting larger and more satellites are launched into orbit. It will be important that these systems are designed with flexibility to maneuver and deorbit safely. What role should the FCC have to ensure satellite systems' license will be good stewards in space?

Dr. LOHMEYER. The FCC should serve as the authority on the front end to make sure that these operators are good stewards, require compliance using NASA's debris assessment software tool. It

should also continue to regulate and codify rules that are built from NASA's standards and interface with NASA—comply, if you will—with ODMSP in a holistic, not piecemeal approach, so not a single reg but look at the scenario as a whole and then interface with agencies, NASA and Office of Space Commerce more—more closely to coordinate those different efforts. Thank you.

Mrs. RODGERS. Thank you. Thank you, everyone. I yield back.

Mr. LATTA. Thank you. The gentlelady yields back. The gentleman from Florida is recognized for 5 minutes.

Mr. SOTO. Thank you, Mr. Chairman. In our last panel, we talked a lot about my back yard in Kissimmee, where we get to see the full magnificence of America's busiest spaceport, the world's busiest spaceport in Cape Canaveral with NASA, SpaceX, ULA, Blue Origin, and more, and the increasing number of launches, 57 in 2022. We have, 2023, 87, which is set to be another record. But I think a lot of people don't realize how many of those are from SpaceX: 31 in 2021, 61 in 2022. They are reusable, economically efficient.

So, Mr. Goldman, first, thanks for your company's commitment to Central Florida. I guess my first question is how many—how many launches do you have on tap for 2023?

Mr. GOLDMAN. I think we have roughly about 100 on the manifest. Right now, we are going about every 4 days so far this year.

Mr. SOTO. So that's a lot of flights. So how helpful would the LAUNCH Communications Act be in increasing and helping your busy launch schedule by streamlining FCC licenses?

Mr. GOLDMAN. Oh. Thank you so much for that question, and thank you for that legislation. It really is putting its finger on a very, very important issue. As you know, the authorization process for commercial launches was built a long time ago. In fact, it was not built. It just kind of happened. And so we now—right now, for every single launch, we have to go to the FCC to get special temporary authority for every single launch, sometimes multiple authorities for a 41 launch, depending on what's going on.

The process at the FCC, there isn't much of one. It's—you go to the FCC. You fill out their form, they reach out to NTIA, they reach out to the other agencies. And then it all is kind of manual and then comes back. When you are launching every four days—and that's just us, this process is just—it's on the verge of breaking. And so I think your bill recognizes that and puts in effective measures to try to address this and be able to make sure that the Space Coast remains the Space Coast going forward.

Mr. SOTO. And we appreciate Dr. Dunn's help on this in a good bipartisan bill. Central Florida has a lot of advantages in space flight. We are closer to the equator—the fuel. We have the Atlantic in front of you just in case something goes wrong. And the talent there—but the weather is not always cooperative, right? So you want to give the committee a sense of how often you may have to go to one to two to three launch windows just in the—one of these flights?

Mr. GOLDMAN. Oh, it happens all the time. And especially when you start getting into hurricane season and things get very, very unpredictable. It really kind of depends on the launch. Some of our launches, when we are launching our Starlink satellites, we have

a lot more flexibility. But when you are launching astronauts, everything needs to be absolutely perfect.

And so you really need to have that certainty. And, again, as your bill recognizes, you can't always just keep going back and forth with the government and asking, "Is this time OK?" "Is this time OK?" "Is this time OK?" You need to be able to coordinate more in real time to make sure that, especially these life-carrying missions are secure, that they are predictable, and that we have everything in place before the launch goes.

Mr. SOTO. So when we see a schedule of 87 launches for 2023 for the Cape, you could have a real pileup, right, of launches running into each other datewise if you have bad weather for an extended period of time. So how would—how would that figure into why it's so critical that we get this right?

Mr. GOLDMAN. Yes, absolutely. Again, it's going back and forth with the government agencies. It just becomes—at some point, you hit the breaking point. It just becomes not viable. And you will—you are going to start having launches that get delayed not because there is anything wrong with the launch, but the paperwork hasn't been processed in time.

And so what your—what your bill does is it clears out that problem, and it makes sure that when the launch is ready to go, when the technology is ready to go, that we can go.

Mr. SOTO. As we look to American space dominance and see the Chinese increasing their space launches and Russians being not only our partners but our main competition on these, how important is it for us to maintain our space dominance to really get everything just right so we can beat a schedule?

Mr. GOLDMAN. Oh, it's absolutely critical. As you recognize, there is—foreign powers around the world are—they are looking at the United States with envy. They recognize the United States has taken the lead in space. And you are seeing a lot of state-backed actors who are trying to build competitors to what the U.S. has. And what we need to do is make sure that our regulatory systems keeps us in the lead.

Mr. SOTO. Thank you so much. Committee, this is something our Nation is getting right, but we do have work to do to keep our place as the world's dominant space power. I yield back.

Mr. LATTA. Thank you. The gentleman yields back. The Chair now recognizes the gentleman from Michigan's Fifth District for 5 minutes.

Mr. WALBERG. Thank you, Mr. Chairman, and thanks to the panel.

Ms. Piñeres, precision agriculture has revolutionized food production all across the Nation, really all across the world. But I'm worried that farmers in rural Southern Michigan, my district, won't be able to harness this technology due to lack of connection. This is something different than simply broadband in their homes. What are the benefits that satellites could have on precision agriculture, and more specifically, has the FCC taken a comprehensive look at what rules may need to be updated to advance the use of satellite technology for this purpose?

Ms. PINERES. Thank you very much for the question. So, as I mentioned in my prior testimony, Planet's data is—it can be very

important in sort of a different approach to precision agriculture than the broadband connectivity that Starlink provides. So it's—what we're providing is the imagery that can be downloaded into existing farm management platforms to help farmers visualize the crops, what kind of—how the crops are developing, whether they need more fertilizer, whether they need more water. And we are—Planet's satellites deliver the kind of daily cadence that farmers need in order to be able to monitor precision agriculture needs over time.

To your question about the Commission, Congress created not so long ago—or instructed the FCC to create a precision agriculture task force that would look at broadband connectivity for precision agriculture. That statute, however, doesn't really acknowledge the importance of Earth observation data for precision agriculture. And so we welcome the Precision Ag Act under consideration here today. And, you know, I think that's one way—it references Earth observation satellite data. So that's one way we can work with the FCC to sort of expand what the Precision Ag Task Force is working on to look not just to broadband connectivity but also the role that Earth observation can play.

Mr. WALBERG. Thank you. Ms. Lohmeyer, your testimony, you discussed how applicants only have a brief window for designing a system and filing—and filing with the FCC to join a process and round. What incentive does that provide for satellite operators to design efficient or responsible systems?

Dr. LOHMEYER. So it's important to note that not all systems are in this kind of scramble that I describe. There are lead applicants as well as those that follow. And so there are numerous operators who have the time to methodically think out and plan and design, procure manufacturers. And so that fits nicely with the regulatory process.

Mr. WALBERG. And then Mr. Goldman, in SpaceX's experience, how has the processing round framework affected your ability to compete against international competitors like China?

Mr. GOLDMAN. It's been a strain, to be totally frank. It's—the processing rounds work for what they are. But foreign competitors don't have the same regulatory burdens that you do when you are going through the FCC's process. I think one of the main issues has been just delays in approvals when it can take multiple years before you are approved. Again, state-backed competitors are not—not facing those same kinds of delays. And it makes it difficult for the U.S. to maintain its lead when it continuously has to go through these delayed processes.

Mr. WALBERG. Well, thank you for your testimony. Mr. Chairman, I yield back.

Mr. LATTA. Thank you. The gentleman yields back. The Chair now recognizes the gentlelady from Texas, Seventh District for 5 minutes.

Mrs. FLETCHER. Thank you, Chairman Latta. Thanks again to both you and Ranking Member Matsui for organizing today's hearings into two very informative panels, and I really want to focus on this panel on a followup on what we were discussing in our hearing last week as well, just about the great potential to deliver emergency communications before, during, and after emergencies

and natural disasters. This is something we are unfortunately all too familiar with in my home in Houston, and so we have been very focused on ways to improve communication both from government to residents and also between agencies and between first responders.

And so I want to direct my first question to Ms. Lohmeyer. Specifically, can you talk about some of the specific challenges that both governments and industry are facing when it comes to implementing and providing emergency communications using satellites?

Dr. LOHMEYER. Sure. So efficient licensing frameworks like we've been mentioning—

Mrs. FLETCHER. Mm-hmm.

Dr. LOHMEYER [continuing]. That enable multiple different types of services to be deployed, subsidies to overcome the cost of user terminals and the service. And I say "subsidies" because, when I think of emergency services, I think of kind of two different types, if you will. There is the always on, like 911, medics, fire.

Mrs. FLETCHER. Mm-hmm.

Dr. LOHMEYER. And then there is triaging these natural disasters, like FEMA come to mind.

And I think clearer rules for that first type and then even sort of lessons learned from past experiences where we have had scenarios like in 2017 in Puerto Rico. The hurricanes came in, and one anecdote that we often don't share is, in that time, Project Loon, a Google initiative to use high-altitude platforms, was quickly licensed to deploy services. The cellular infrastructure wasn't in place due to the hurricane, and so those balloons actually backhauled over O3b satellite network. So satellites not only provide these two that I mentioned. We also provide—or two being the direct-to-device and broadband. But they also serve a kind of multi-tiered infrastructure as well.

Mrs. FLETCHER. Well, and it's interesting the way you described it because I—when I'm thinking about this, I'm thinking about those moments when your existing infrastructure has stopped working and satellites coming in and being able to help fill the gap like the description—like the scenario you described in Puerto Rico. And I think that that is something that we have seen, is what happens when what you are usually relying on fails.

Certainly with satellite technology, there is a lot that people are usually losing when it comes to satellite technology as well, so I don't mean to suggest that that's not the case. But certainly we have some hard infrastructure that we use in our emergency communications and that we have unfortunately seen go out time and again. And it's in those moments of true crisis where, if there is a quickly dispatchable, deployable technology that can fill that gap, I think it's incredibly important. So I'd love to continue that conversation in this committee obviously throughout this Congress.

I also want to touch on—on kind of a related issue, but this bill that Representatives Johnson and Schrier have introduced, the ALERT Parity Act, to require the FCC to establish a process for satellite to provide these emergency services and create rules for that temporary spectrum use. And I think it will go a long way towards some of the things that we've been talking about and some of the challenges that we've seen.

But I think one of the—one of the questions from this morning, especially, is sort of focusing on the FEC—FCC portion of the process that's outlined in the bill. How else can Congress work? What else can we do here to ensure that the satellite technology is available to bolster these communications and maybe—Mr. Davidson, you look like you might have an answer, something you want to say so—first.

Mr. DAVIDSON. Well, I thank you, and thanks for the question. I just—I just add very quickly that I think the whole ecosystem, so everything we are talking about here today, contributes to the satellite industry's ability to make—to respond to these disasters. So all the stuff that we are talking about—I mean, we truly are the first responders. We are able to go in. I mentioned, I think, before you came in that we can fly commercial to a site with a—with a backpack with the satellite equipment in it.

We can be up and, you know, transponding information before anybody else. So in disasters, oftentimes, terrestrial networks go out. So we really are the ones that can get there, and then we transition to other networks. So I would say the health of the whole system, including spectrum and kind of regulatory efficiency would help in the disaster context as well.

Mrs. FLETCHER. Great. Thank you for that perspective, Mr. Goldman, anything to add?

Mr. GOLDMAN. Yes. I actually completely agree with the answers that came before me. So, as Mr. Davidson said, you are looking at a collection of really important, critical bills that really are going to be super helpful. We are able to roll out our equipment basically overnight. We can reposition it and be there before the event if we know that it's coming. And we are able to—in the past couple of years, the Starlink system has been able to help in wildfires in California and Germany.

We were able to help in Tonga, as Mr. Davidson—and so you are able to deploy this stuff immediately and bring basically urban-quality broadband to a natural disaster immediately and connect people. And as Professor Lohmeyer—it's not just for the satellite connectivity. You can also be backhauled for mobile phones as well.

Mrs. FLETCHER. OK. Well, thank you so much. I see that I once again used up my 5 minutes, because this is really interesting. So I thank all of you for your time, your testimony today. And I thank you so much, Mr. Chairman, for recognizing me and holding this hearing, and I yield back.

Mr. LATTA. Thank you very much. The gentlelady yields back. The Chair now recognizes the gentleman from Georgia's First District, the vice chair of the subcommittee, for 5 minutes.

Mr. CARTER. Thank you, Mr. Chairman. Thank each of you for being here. This obviously is extremely important, as you all know. And it is important in our country. It is important in our world. This is the future right here. I mean, the global satellite marketplace is estimated to be worth \$40 billion by 2030. And, you know, we had approximately 4,000 satellites had been launched in the last—in the last 10 years. And the next 10 years, that number is expected to quadruple. And, you know, it's just overwhelming what's happening here. So we all understand that.

I want to ask you—I'll start with you, Mister—I'll start with Mr. Goldman. Tell me how, just very briefly and succinctly, how can we balance efficiency with safety and sustainability as we legislate? Tell me what we can do.

Mr. GOLDMAN. Thank you so much for the question. Fortunately, I think the bills that you have in front of you are striking a very good balance on doing that. Your point is exactly right. In order to be able to have a robust competitive market, everybody has to be efficient. And so, by identifying that and putting that at the forefront and saying that everybody needs to use their resources, whether it's the spectrum resources or the—or orbits, your resources in space, making sure that you are as efficient as you possibly can is the only way that we are going to be able to continue this going and reach those numbers that you were talking about for the economy.

Mr. CARTER. Mr. Davidson, your opinion?

Mr. DAVIDSON. Yes. So I agree with that, and I would say also that there need to be some requirements in terms of transparency. So as you are applying for a license, you have to be—your satellite should be trackable. We need to know where they are. We need to know what the relationship with others are going to be. We need to know what the interference levels are going to be. And this can all happen prelicensing. And then we can also look at the issue of maneuverability. Do we need to be able to move satellites around in orbit to avoid interference or take other measures?

So these are all things that can be looked at the very beginning of the process. And it need not be bureaucratic or slow as long as you have the right number of engineers and scientists kind of looking at how these are going to interact with each other.

Mr. CARTER. OK. Fair enough.

Ms. PIÑERES. Could I jump in just on the maneuverability piece?

Mr. CARTER. Yes, sure. Go ahead.

Ms. PIÑERES. Thank you very much. On maneuverability, I just wanted to add that the importance of a technology-neutral approach to maneuverability. So in other words, when Congress is looking at new statutory language instructing the FCC on new orbital debris policies, allowing for companies to innovate their way to maneuverability, so mandate the desired outcome and let people innovate to get there versus mandating a specific requirement for propulsion or other kind of specific—technology-specific requirement.

I would also add just on the point of transparency I think, in addition to everything that happens at the Commission prior to launch, I think it is incredibly important for space operators in the LEO environment to be communicating with each other to avoid conjunctions. We—as Planet published our ephemeris data, which tells where our satellites are and where they are going, operators like SpaceX do as well. But not everybody does that. And I think Congress can play an important role, policymakers can play an important role in encouraging industry to come to standards and best practices around sharing that kind of information.

Mr. CARTER. Well, thank you for that. Thank you for using the word “encouraging” as opposed to “mandate.” First start—I don't like that word but—and I couldn't agree with you more about inno-

vation. We want to encourage innovation. And sometimes the best way we can do that is to get out of the way so—well, let me switch gears real quick. I represent a lot of South Georgia. You know, we like to say in Georgia there are two Georgias. There is Atlanta and everywhere else. Well, I represent everywhere else. We got a broadband problem, particularly in South Georgia and particularly with reliable broadband connectivity.

And just tell me about regulatory barriers that exist or do you feel like may exist at FCC and NTIA. Have they—have they added to the current digital divide that we—that we see how—that is due to the—due to the licensing of a satellite system, Mr. Goldman?

Mr. GOLDMAN. Thank you for the question. Yes. You know, Starlink, our broadband system, is built specifically to bring broadband to everywhere else. So we appreciate that. Yes. Unfortunately, the FCC right now is saddled with old rules that were developed decades ago, frankly. And—

Mr. CARTER. We just had them on the first panel, and, you know, that is something we were asking about.

Mr. GOLDMAN. Yes. And I think that the Commissioners, the current crop of Commissioners have all mentioned it, have all talked about the importance of updating the rules. And we really do appreciate kind of on a bipartisan basis they have been recognizing that. But it really does need—

Mr. CARTER. Are they doing it? I mean, recognizing and doing is two different things.

Mr. GOLDMAN. I—they have a number of rulemakings that they are working on right now that hopefully will get us there soon.

Mr. CARTER. Nice way of saying no. I'm sorry. I'm running out of time. Go ahead and finish up.

Mr. GOLDMAN. No. I'm sorry. That's—

Mr. CARTER. All right. All right. Well, I am out of time. And thank you, Mr. Chairman, and I yield back.

Mr. LATTI. The gentlemen's time has expired. He yields back, and the Chair now recognizes the gentlelady from Illinois' Second District for 5 minutes.

Ms. KELLY. Thank you, Mr. Chair. Thank you, Ranking Member, and—excuse my voice—to the witnesses. My district, Illinois' Second Congressional District, has a strong rural sector, with close to 2,000 farms that serve as the economic backbone of the district and, quite frankly, agriculture in the State of Illinois. Many of these farmers and producers have felt the squeeze of the pandemic's economic impacts and supply chain challenges. Nevertheless, these farmers and producers in the Second District have maintained productivity, generating corn, soybeans, wheat that continue feeding our families, fueling our cars, and help raising our livestock.

Our farmers are vital to Illinois' economy. And when I go home to my district, I regularly hear about the measures farmers want us to take in Congress to support them, notably the need for us to pass solutions to combat surging input costs and help learn from and implement successes from conservation practices.

So because of that, I was excited to hear a little at last week's hearing about how satellite services could benefit our farmers, particularly how the application for satellite services would allow

farmers to utilize GPS to control tractors and other farm equipment and utilize sensors to determine if additional water or fertilizer is needed for any crops.

For these reasons, I was proud to partner with Chair Latta in introducing the Precision Agriculture Satellite Connectivity Act, which I'm not going to go into as I'm sure you did already. But when you are last, a lot of your questions have been asked already. But I wanted to ask about last September, the White House hosted for the first time in 50 years a conference on hunger and nutrition and health. Part of the purpose of the conference was to accelerate progress and drive significant change in hunger, improve nutrition, and close the disparities around them.

Ms. Piñeres, will you provide more background on Planet's work with NASA Harvest food security and agricultural programs and in particular, how your data enables a better understanding of the impact of certain world events on global food supplies?

Ms. PIÑERES. Thank you, Congresswoman, for the question. So NASA Harvest is leveraging Planet's data or daily Planet scope imagery, which our Dove satellites produce, and combining it with other environmental, economic, and social science impact data to see what crops were growing and what crops were not growing on a field-by-field level across Ukraine. And that resulted in an August 2022 outlook that actually predicted more crops had been harvested and planted along both the Russian-occupied and Ukrainian-held territories than previously expected. And so, by monitoring agricultural fields for change, researchers can determine what stage a crop is in from space without having to go field-by-field for crop estimates.

Planet and NASA Harvest actually recently announced a new partnership last month that will build on this work regarding Ukraine and then scale it to conduct regional and global assessments. And that solution will be offered to national governments, multilateral institutions, NGOs, and other interested parties around the world.

Ms. KELLY. Thank you so much. Thank you to the witnesses.

Mr. LATTA. Well, thank you very much. The gentlelady yields back. At this time, the Chair recognizes the gentleman from Florida's Second District for 5 minutes.

Mr. DUNN. Thank you very much, Mr. Chair. So great panel. Thank you all for being here. Mr. Goldman, in your opening remarks, you—in your written statement, you highlighted some of the ways that the foreign competitors are able to game the system and get approved—to slow our companies down. These two separate standards seem so un-American to me. I wonder, is the FCC inadvertently giving an upper hand to foreign competition? Is this something that is built into the deck, or do we have to write a statute in law that says level the playing field? That just doesn't—it seems a lot—

Mr. GOLDMAN. Thank you so much for the question. The FCC doesn't need a statute to be able to level the playing field. And to just back up and clarify what I was talking about, the—for—satellites are inherently global, which means that you can apply for a license anywhere in the world. Everybody wants to then operate in the United States because we have the best market. And so—

but what the FCC's rules are currently are that, if you are licensed overseas, for the most part, they are going to trust that you are—the country that licensed you already kind of looked at the—how safe your system is, how—whether it's going to be protecting space or not. And so, for the most part, they are saying they are not going to apply the FCC's rules to those systems.

The problem is, is the U.S. is actually the most forward-leaning, has the strongest rules in the world for orbital debris. So for saying that, you are essentially—what you are doing is encouraging systems to leave the United States, go license elsewhere, and come back. And so we have actually petitioned, asking for the FCC to fix that. And I think the legislation you have in front of you will also do that as well.

Mr. DUNN. Excellent. So we heard a lot about how satellite broadband can help the digital divide—rural broadband and whatnot. The Federal Government—tens of billions of dollars—grants for rural broadband and whatnot. But to our dismay, it tends to not be tech-neutral, so technology-neutral. They tend to sort of feed the fire on that. What programs are there that—well, satellites are eligible for to help the rural broadband, and what would you like to be part—and then I'm going to ask you to answer the same question, Mr. Davidson.

Mr. GOLDMAN. Yes. That's a really good point. I know when the—when Congress passed the infrastructure law last year, it specifically called out that these programs should be technology-neutral. Unfortunately, NTIA, when they went to implement it, put in a very strong preference for fiber, as you recognize. I—we were disappointed in that. We think that it should be more performance-based metrics. If you are able to get certain speeds, if you are able to get certain latencies, the consumer doesn't care how it got there. They just want the service to be there.

And so we are hopeful that these programs going forward will be more technology-neutral. We are working with NTIA. We are talking to them. We are also talking to the States to see if there's any ways that we can work with them.

Mr. DUNN. I would love it if you'd share some—yes. That's good with the States too. But I'd love it if you'd share with us words—the wording of that kind of statute that we might pass in this committee at another time. So keep us on—on speed dial.

Mr. DAVIDSON. Yes, Congressman. So I agree with that. I agree with that statement, and there are—I don't know how many of these programs are out there, and they all have different standards. So it is very difficult to know what you are going to qualify for in the Rural Utilities Service, and the U.S. Department of Agriculture is even, I think, more fiber-centric than some of the FCC and NTIA programs. So it is kind of interesting. You have an agricultural department that has the most restrictive.

Mr. DUNN. Yes.

Mr. DAVIDSON. You know, it is—and you are not—listen, you are not going to build fiber to a tractor anytime soon. So satellite is a great alternative, and yet it is disqualified from many of the programs.

Mr. DUNN. And it is worth reminding ourselves that some of these comm competitors that we have overseas are actually government-backed programs. We are competing against—

Mr. GOLDMAN. That's exactly right.

Mr. DUNN [continuing]. Nation states, not just—Mr. Chairman, I will yield back. Thank you very much.

Mr. LATTA. Well, thank you very much. The gentleman yields back. The Chair now recognizes the gentleman from Pennsylvania for 5 minutes.

Mr. JOYCE. Thank you, Mr. Chairman. I think we can all agree that we recognize connectivity continues to be a serious issue throughout rural areas. I represent Pennsylvania's 13th Congressional District, which is a large agricultural district spanning from Gettysburg, Pennsylvania, out to Somerset County. Nearly 800,000 Pennsylvanians go without fast, reliable broadband, including almost a half a million of them living in rural communities. Now, we must work together to bridge that digital divide. And that's why you must take an all-of-the-above approach when ensuring those in rural areas have the same connection, the same speeds as those in Philadelphia and Pittsburgh.

Ms. Lohmeyer, can you talk more on how reforming FCC licensing requirements will better connect my constituents in rural Pennsylvania?

Dr. LOHMEYER. In general, I think as we lean towards more and strive towards more efficient licensing rules with clear regulations, we are going to be able to deploy systems more rapidly.

Mr. JOYCE. And with that rapid deployment, do you see that we see a fair share of that going into the rural, underserved areas?

Dr. LOHMEYER. Satellites uniquely positioned to cover ubiquitously. And so there is not actually benefit or, if you will, to focus on the cities where they are densely populated. So it is actually an ideal location for satellites to prove out that there is a business case. And—

Mr. JOYCE. And we look forward to that being proven out in the rural areas.

Ms. Piñeres, following up on my previous question about the importance of rural connectivity, you mentioned in your testimony how farmers are making more informed decisions based on the imagery from Planet. Can you talk about the work that the FCC's Precision Agriculture Task Force has done in the satellite space and realizing that food security is national security? Can you talk about how the Precision Agriculture Satellite Connectivity Act will benefit farmers in congressional districts like mine which have a large rural agricultural component?

Ms. PIÑERES. Thank you, Congressman, for the question. As I mentioned in my—in my prior testimony, the underlying statute that formed the FCC's Precision Agriculture Task Force actually does not—focuses just on broadband and does not really look at Earth observation and the importance of imagery, of satellite imagery like Planet's and the importance that it can bring to farmers in rural and remote areas.

So I welcome the Precision Agriculture Act. I think the fact that it references Earth observation imagery is very helpful. I think we'd be glad to work with the committee on some other language

potentially to change the underlying statute so that the sort of mandate of the task force is broad enough to include not just broadband but also the kind of imagery that we think can make a real difference for farmers.

Mr. JOYCE. And I think that is important that this gives us that opportunity to, as you say, make that real difference for farmers.

Mr. Chairman, thank you. I yield the rest of my time.

Mr. LATTA. Thank you very much. The gentleman yields back. The Chair now recognizes the gentleman from Texas' 14th District for 5 minutes.

Mr. WEBER. Thank you, Mr. Chairman. Ms. Lohmeyer, understanding you have a background as an aeronautical engineer, the SAT Satellite Streamlining Act would require the FCC to issue technology-neutral, objective, and measurable performance objectives for space—and orbital debris. Given your experience providing technical advice to satellite companies, I have got really two questions. It is, how should the FCC's rules look to incentivize satellite operators to be good stewards of space? And the second part of that is, how do we compare that to other countries? Are we going to be in this alone, or are we going to be subject to being disadvantaged by those rules? What say you?

Dr. LOHMEYER. So the first question, how do we incentivize our operators to be good stewards of space? I actually, from my time at One Web and from working with the operators, feel that they are on board with these rules. They want America to lead in this place and maintain the position as an example internationally.

We even have companies coming out, startups with investments that are geared towards the sustainability initiatives. And if you will repeat your second question for me—

Mr. WEBER. Well, it's going to be—let's stay on the first one just—

Dr. LOHMEYER. Sure.

Mr. WEBER [continuing]. A minute. So the SAT Streamlining Act you are saying really is not needed—pretty good actor in taking care of the debris. But if you follow that up with—how about the other countries, the other licensed satellitees, if that is the right term. Are they going to be just as good at cleaning things up and their debris?

Dr. LOHMEYER. I have not seen as diligent measures internationally.

Mr. WEBER. Are there other countries that you are aware of—this might be a question for some of you all too—that have those kinds of requirements from a—maintaining a satellite that's basically free of debris or doesn't cause debris? Are you aware of any?

Mr. DAVIDSON. Well, Congressman, I just add that I think one of the key questions here is—is the U.S. market too. So that's why I think we can provide an example for the rest of the world whether—a lot of this stuff is international. I think if you want to do business in the United States, which everyone is going to want to do, you have to meet those standards. Then I think the rest of the world will, you know, follow along and try to do that. So, you know, listen, they have to be smart. It has to be smart regulation. It shouldn't be overregulation. But it should address the issues that

will keep particularly the LEO orbit, you know, sustainable for the next, you know, next generations.

Mr. WEBER. Well, Congress never overregulates.

Mr. Goldman?

Mr. GOLDMAN. Yes. So I agree with Mr. Davidson. So the main idea here is that the U.S. is the market that everybody wants to operate in. What the Satellite Streamlining Act does that's really smart is it does two things, is it extends the U.S. orbital debris rules to anyone who wants to operate here, but it also has features in it that—that bring—once—it encourages people to come back, which there is potential for expedited processing if you are a U.S. licensee.

So you are doing two things at once: You are taking away the incentive to move out of the United States while you are actually creating an incentive to come back. And so I think that's why I think the Satellite Streamlining Act actually strikes a really nice balance to be able to address these things without overregulating.

Mr. WEBER. Let me change gears real quick. Mr. Goldman, you said earlier that the least efficient satellite companies are able to box out their competitors.

Mr. GOLDMAN. Mm-hmm.

Mr. WEBER. OK. And what would incentivize them not to have the least efficient system because they can box out their competitors?

Mr. GOLDMAN. I think if you started creating incentives and rewards within the regulation for having—we have the regulations anyway. If we have them where they benefit you for building in—for investing in more efficient technology that's better at sharing, then you can create the kind of current race to the bottom. You can turn that into a race to the top by rewarding people for doing the right thing.

Mr. WEBER. OK. And then Mr. Davidson, you said that applying for a license, your satellite needs to be trackable. Is that to say that the satellite is already launched? Are you talking about it needs to be—have a tracking—

Mr. DAVIDSON. No. In terms of your—when you are applying for a license to operate that these are some of the requirements you should have to satisfy. So you should be able to demonstrate where your satellite is going to go, that you are—you know, you are transparent in terms of the information, what the interference likelihoods are. All that should be done upfront. And that—it can—the standards can be set out very clearly, and you either qualify or you don't qualify to be given a license.

Mr. WEBER. OK. Thank you. And Mr. Chairman, I yield back.

Mr. LATTA. Thank you. The gentleman yields back the balance of his time, and the Chair now recognizes the gentleman from Georgia's 12th District for 5 minutes.

Mr. ALLEN. Thank you, Chair Latta. And I said in my opening statement before the first panel of witnesses that our committee needs to make it our highest priority to work to meet the needs of our private partners. I come to Congress from the business world, although I grew up on a tractor.

And the last time that I operated a tractor, I planted a row of peanuts 16 inches over from where the farmer had planted them last year, and I didn't touch—he said, “Don't touch a thing.”

And so with that, Ms. Piñeres, obviously, you all are involved in agriculture. That has evolved over the years. And you can kind of cover a little bit of that. But what do you see in the future? I mean, obviously farming continues. I mean, we are—we are satisfying 115 percent of our food needs with less than 2 percent of the population right now. But where do you see this thing going?

Ms. PIÑERES. Thank you. Thank you for the question. It is really exciting to see farming go high-tech, as you said, and I think Planet's imagery can play an important role in that. As I mentioned in my prior testimony, the ability for farmers to really access farm-level data and have that cadence be near-daily so they can see change in their crops over time and help decide—help them make important decisions about, you know, how much inputs they are going to need in terms of fertilizer, water, I think that's really important.

I'd also say, in addition to kind of visual imagery, I had mentioned earlier that Planet also offers a planetary variable for soil moisture content which enables farmers to see how much water is in the soil and help make decisions about water usage as well.

So I think, you know, I hope that we will see a future that Planet can play a role in a future where, you know, we are able to do more with less, less inputs, less land, and feed more people.

Mr. ALLEN. Well, farming is the largest industry in my district and the largest in our State, and we don't have much dry land farming anymore. It is, like I said, very precise. And you mentioned the moisture content of the soil and just putting just enough water. They also plant the seed with fertilizer already in it. And so it is pretty amazing.

The Starlink and—or Mr. Goldman and Mr. Davidson, do Starlink—and tell us to provide a service to farmers and ranchers, and what role does satellite technology have to play in supporting precision agriculture technologies?

Mr. GOLDMAN. Yes, absolutely. Thank you for the question. And as Mr. Davidson said, you know, we are not—we are not expecting to see fiber to the tractor anytime soon. So satellite is the solution. I can tell you, for Starlink, we have high-performing antennas that are essentially flat. And you can actually put it on a tractor and be able to get high-speed broadband all the way to a tractor anywhere to the last acre on the field.

And so we are currently—so first of all, we have farmers who are customers who are using these services already. But we are also working with a lot of farm equipment manufacturers and trying to think of new ways and new—new innovative ideas to be able to integrate high-speed broadband into the equipment that is being used already.

Mr. DAVIDSON. And Congressman, we have a slightly different business model at Intelsat than Starlink does. We have multi-orbit, multilayer with a 5G core. So that means we utilize partnerships, and we have our GEO satellites. And we have MEO and LEO partners that we integrate into the network. And we have the largest infrastructure in—terrestrial infrastructure of any satellite oper-

ator as well. So all of this stuff is—operates through from end to end 5G compatibility. So we are doing many of the same things that Starlink is with a slightly different business model that delivers that, you know—well, sometimes different services, sometimes similar services and working again with equipment manufacturers and farmers to provide the service.

So the future is very bright for this. And I think, as long as government provides the right foundation, you are going to see more progress in this area.

Mr. ALLEN. Well, food supply is going to be an international need, and certainly we need to continue to look at every way we can produce food, because we are going to be doing a lot for the rest of the world.

I only have just 24 seconds but—and you can submit this to me. I just—we learned there's a lot of satellites up there and we know that technology like in these things is changing by the hour. I mean, do some of those satellites need to come down, and we need to put new ones up there? And you can just submit that in writing rather than take committee time. I would just like to know what is the program on recycling all the stuff up there and using the best, latest technology.

With that, Chairman, I yield back.

Mr. LATA. Well, thank you. The gentleman yields back. And at this time, the Chair will recognize the gentleman from Utah for 5 minutes.

Mr. CURTIS. Thank you, Mr. Chair and Ranking Member, our witnesses. Thank you for this hearing. I want to go in a little different direction and talk about technology that it feels like we are just in the very beginning of, using satellite technology to monitor specific sources of carbon emissions. It feels like this is in its infancy, but it might be a good tool particularly overseas and narrowed down source emissions, I understand, within a square mile, which would be very helpful.

There are some hurdles. For example, there are issues with visibility through cloud cover. But potential for this technology is immense.

Danielle, I'm trying to pronounce your last name.

Ms. PIÑERES. Piñeres.

Mr. CURTIS. Piñeres. OK. Thank you. Satellite technology could be used to ensure closed societies like Russia and China are being transparent about their emissions. Can't this technology be used to ensure China is giving reliable data on their emissions and uncover possible accidents that are harmful to the environment?

Ms. PIÑERES. Thank you very much for the question. Planet is actually working to understand methane emissions. And we have plans for a new groundbreaking hyperspectral satellite constellation called Tanager. And we expect to begin launching this year. Our hyperspectral mission is designed to support the identification of methane emissions at the facility scale, so at a very small scale, along with a myriad of other applications that can improve life on Earth spanning across areas such as biodiversity, water quality, et cetera.

So we are actually undertaking this hyperspectral mission as part of the Carbon Mapper Coalition, which is a public-private

partnership with a broad-based coalition of industry and nonprofit organizations. So we are really looking forward to seeing how this hyperspectral data can complement the other satellite imagery that Planet uses but really hoping that it will be a game changer in terms of ability to identify emissions to allow governments to—governments and companies to keep tabs both on their own emissions, others' emissions, and there would be a lot more transparency around emissions and accidents going forward.

Mr. CURTIS. And keeping people accountable. I am told most of the satellites with these capabilities are government-owned. But is this technology useful in the private sector? Do you think we will see this grow?

Ms. PINERES. We do believe it is useful in the private sector. As I mentioned, we do have plans to launch a hyperspectral constellation. And so I guess we'll see. But I think Planet certainly sees value in hyperspectral data, particularly for these climate change emissions-monitoring-type applications.

Mr. CURTIS. I'm aware of one company that is using it for mining industry gas and oil, better track methane. Are there challenges that we should be aware of in Congress with getting these capabilities licensed?

Ms. PINERES. Thank you very much for the question. You know, I think one thing that is interesting about Planet and our—we have slightly different licensing needs than are—than are faced by others on the panel. For instance, we are—we are typically exempted from the processing round requirements because of the Earth observation, the Earth exploration satellite service spectrum that we use. We share our spectrum in a different way.

But nevertheless, you know, we really appreciate the committee's work on the SAT Streamlining Act and the focus on ensuring a transparent and timely licensing process that will enable us to continue to get our satellites authorized and have those authorizations in place to permit our business to go forward.

Mr. CURTIS. I have no doubt that China is also very interested in this technology. What do we need to do to stay ahead of them, and how do we—how do we make sure that we dominate in this technology?

Ms. PINERES. Yes. What a great question. There is—as you've heard from across the panel today, the U.S. is a leader in terms of regulation but also behind, right? We are doing great on orbital debris and sort of leading the way on that. But in order to have effective orbital debris policy, it can't just be the United States. We need to be working with others globally to try to make sure that everyone around the world is abiding by these orbital debris rules.

I think in addition, we—in addition to FCC regulation, we also face Earth observation regulation specific to our industry. And so we really appreciate NOAA, our regulator, streamlining the rules back in 2020 for Earth observation satellites and look forward to continuing to work with them to try to make some additional changes to try to make sure that the U.S. remains the world leader in this technology.

Mr. CURTIS. Thank you. I didn't mean to neglect the other three. Twenty seconds left if any of you have any comments on these issues.

Good. Thank you. Mr. Chairman, I'll yield my time. Thank you.
Mr. Latta. Thank you very much. The gentleman yields back, and the Chair now recognizes the gentleman from Ohio's 12th District for 5 minutes.

Mr. Balderon. Thank you, Mr. Chairman. Mr. Green or Mr. Allen just left, but I wanted to acknowledge and thank you all for being here, give my shout-out to former colleague of ours Bob Gibbs, Congressman Gibbs, who is a Starlink customer. And I had to hear all about it for 2 weeks, about how great it was. And he installed it himself, so he is quite accomplished.

But on his farm, it is very useful. And it has been a saving grace for him and his wife and his grandchildren. And I have had numerous folks from the congressional district, Kyla who works with our—Farm Bureau and just the successes that they've had.

So thank you, Starlink, Mr. Goodman. And I will direct my questions predominantly to you today. So SpaceX recently announced a partnership with T-Mobile that would pair Starlink's satellite with T-Mobile's wireless network.

During the first panel, I discussed the importance of filling in the coverage gaps that hurt my constituents in rural and Appalachia Ohio. Excuse me. This innovation from the private sector sounds like a promising start, but we must ensure it's not thwarted by unnecessary red tape before it has a chance.

Mr. Goodman, what regulatory barriers have you run into while seeking authorization from the FCC to provide satellite-to-cellular services?

Mr. Goldman. Thank you so much for the question and for the kind words. Really do appreciate it. And so to just back up one step, we do have a deal with T-Mobile where we are going to be using their licensed spectrum. And essentially our satellites will look like a wireless tower to a phone. So when you don't—when you are in a dead spot, when you are—when you can't—when your phone can't see a normal cell tower, it will see our satellites as though it is a tower and be able to fill in those gaps.

At this point, I am happy to say we have not run into any significant regulatory problems. But it is—it is in the early time on this. We actually just had to refile an application for this yesterday. So we are—we are early in the process. I do expect where regulations struggle is when you have something that doesn't fit neatly into any of the boxes that they are used to. And this is—this is one of those things. Regulators are not used to seeing—they are not used to seeing someone asking to use satellites in cellular spectrum.

So we are going to have to work closely with the FCC to try to figure out how to smooth things out. So far, we have gotten very positive feedback from the FCC and the staff, but it is going to be a regulatory challenge.

Mr. Balderon. OK. Thank you. To follow up with that, how will the SAT Streamlining Act and the ALERT Parity Act make that process easier for you and other companies that may wish to provide cell—satellite-to-cellular service?

Mr. Goldman. Well—sorry. That's a mouthful. One of the great things about the Satellite Streamlining Act is it gives us certainty that, when we apply for a license, we know we have some idea of when we are going to get it. Right now, we have no—we put in an

application, we have no idea when it is going to come out. It is really hard to build technology when you have no idea when you are going to be able to start using it. So it really adds to that certainty, which is absolutely necessary.

On the ALERT Parity Act, it is a really interesting idea that we would really love to be able to work with you on. One of the things that it does that is a novel concept is that, in the event of an emergency, it allows you to be able to use other spectrum that is not already being used to be able to provide lifesaving services. And our equipment that we are going to be using with the T-Mobile service actually can access other spectrum bands. For example, there is mobile satellite spectrum that is not actually being heavily used right now.

And so one possibility is that under that—this act is that we might be able to access some of that spectrum in event of an emergency.

Mr. BALDERSON. OK. Thank you very much. My last question is Professor Lohmeyer. Thank you for being here, Professor. In your testimony, you touched on the SpaceX and the T-Mobile partnership. Can you outline some of the technical concerns that this partnership would need to address to move forward with deployment?

Dr. LOHMEYER. Well, one thing that was coming to mind when you were just speaking was just this history since I have been involved. In 2015 at the World Radio Conference, U.S. delegation was prioritizing terrestrial spectrum allocations. And we've seen at the FCC seaband—107, right? The shift from terrestrial allocations and targeting satellites—satellite frequencies for terrestrial use. Now we are in this paradigm where—shift where satellite services are looking at terrestrial frequencies for use.

And so going back to things that we needed, prioritizing satellite at the international and national level and the regulatory frameworks for those spectrum allocations.

Mr. BALDERSON. Thank you very much. I yield back, Mr. Chairman.

Mr. LATTI. Thank you. The gentleman yields back. The Chair now recognizes the gentlelady from Tennessee for 5 minutes.

Mrs. HARSHBARGER. Thank you, Mr. Chairman. Thank you, witnesses, for being here today. Mr. Goldman, I represent a very rural district in East Tennessee, and there's a lot of areas where laying fiber for traditional broadband is just difficult. What is the status of Starlink's deployment, and what speeds do Starlink service currently offer?

And I read where you have the Starlink project that will be expanded in Wise County, Virginia, which is, you know, the district next to me in Southwest Virginia that are going to be serving students. And I saw in Eastern Kentucky where you have expanded the program that's connecting residents to telehealth, which is going to be—telehealth is here to stay, and we are going to be able to utilize that for those residents. So what is the status of the Starlink's deployment?

Mr. GOLDMAN. Yes. Thank you so much for that question. And those are the kinds of projects that have been the most exciting things that we are working on. So I really appreciate highlighting those. And, right, in Wise County we were able to work with the

county, and we initially—we started with 40 units that we—of our user terminals to be able to connect people in Wise County. And the program went so well that we've been expanding it since then. And it really has been a great success because what we were able to do is bring high-speed broadband to people who just didn't have—not even like they had slow options. They had no options.

Mrs. HARSHBARGER. No options.

Mr. GOLDMAN. No—and so it really has been very fulfilling and exciting to see. As you mentioned, Western Kentucky, we have similar ones. The good news is that our system is everywhere already. We are seeing, on average, about 100-megabit speeds. So it's about what you—anyone would need for kind of residential use. We have enterprise services that can go faster than that. We've even seen kind of burst speeds that are at, like, 350 megabits where you can actually get even much, much higher. So—and so we are available anywhere at this point.

We do have areas where we are essentially oversubscribed in some areas. And so we have a little bit of a wait list. What we are—we are continuing to launch. We are launching every 4 days to put up more satellites. And that will give us more capacity to be able to put more people on the network, even in places where we are a little bit congested right now.

Mrs. HARSHBARGER. Yes. In addition to high-speed internet, it is my understanding that the LEO systems like Starlink can provide important complementary services or add-on capabilities for terrestrial networks as well. And I saw last year that SpaceX announced a direct-to-sale service, which is supposed to end the dead zones in a lot of distressed counties too for mobile service. Could you provide an update on the buildout of that system and talk a little bit about what Starlink is or will be able to offer to assist with other communication challenges beyond the high-speed LEO internet?

Mr. GOLDMAN. Yes. Thank you for the question. This is another one that we are really excited about. We just submitted a new application for that, actually, yesterday for that service. We are hoping to start launching those satellites, assuming FCC approval is coming this year. We are hoping to be able to start launching those antennas on our satellites as soon as this year. We are working with T-Mobile for a very rapid rollout of that once we have approval. It works with your standard phones already. So as soon as we are able to start launching enough satellites to have service, your phones will already be able to do it.

And, yes, I—to full disclosure, this isn't going to be a 5G service, but it will allow you to text and have emergency alerts and things like that. And hopefully at some point we will have voice and kind of low-speed data too.

Mrs. HARSHBARGER. Well, that is pretty sweet. I have got a little bit of time left. You know, I am reading about the Secure Space Act. And, you know, other countries are moving forward with significant investment in LEO systems. And I read here where China is aggressively—of course we know they are pursuing a satellite constellation, which is StarNet. But the statement that you have says while the U.S. has blocked the installation or use of Chinese hardware telecommunications network domestically due to security concerns, many nations have few options when it comes to tele-

communications infrastructure and must rely on whoever can provide that for them. They won't—matter if they are going to spy on them or whatever.

Are you aware of any countries who are using telecommunications from adversarial nations to the U.S.?

Mr. GOLDMAN. Well, we have seen this on the terrestrial side already, where we have seen what has happened is I think Congresswoman Eshoo was mentioned earlier with Huawei and ZTE. What they have been able to do is work with countries around the world that have no other options and bring low-cost options and get there before kind of U.S. manufacturers or anyone else would be able to deploy the equipment.

In space so far—so far, the U.S. is ahead. But we are watching over our shoulder that foreign actors—it's not just that it's foreign actors and it's foreign powers, it's they have state-backed systems so they will be able to—they will have resources that just no private actor is going to have. And so the only way that the U.S. is going to keep its lead is that we continue to innovate as quickly as possible and that the regulatory burdens don't slow us down.

Mrs. HARSHBARGER. That is a big deal. We have got to get on it. Thank you for that, and, Mr. Chairman, I yield back.

Mr. LATTI. Thank you. The gentlelady yields back. The Chair now recognizes the gentleman from Texas' 11th District for 5 minutes.

Mr. PFLUGER. Thank you, Mr. Chairman. I thank the witnesses for being here. I know it has been a long day, but we appreciate the opportunity to talk with you about these issues and really hone in on some things.

I will start with Ms. Piñeres. We talked a lot about the impact on satellite technology on precision agriculture. And I'm just kind of wondering, you know, there has been a lot of answers today already. So without being redundant, I mentioned this in the first panel that the district I represent has a lot of cotton. And, you know, it is very helpful to have the understanding of not just the soil but where the precision location of the seed is. And can you just kind of talk to me about some of the emerging technologies and where this is headed and what we should be looking at?

Ms. PIÑERES. Yes. Thank you very much for the question. So I mentioned that satellite imagery can be used for precision agriculture in order to monitor soil, moisture content in order to allow farmers to see on—on sort of a crop—a field-by-field basis on a daily basis what the crop health is looking like and where they might need more inputs to get the right output at the end of the day. And so we—we continue to offer that to farmers to try to meet them where they are. You know, they are not geospatial experts. So we offer our satellite data within the farm management platforms that farmers use today.

In addition, you know, just to move to a slightly different area, we also have a contract with NASA. And I talked about NASA Harvest earlier, but we also have a contract with NASA where researchers that are funded by any U.S. Federal civilian agency or the National Science Foundation, including their contractors and grantees, have access to our data. So I think there is something on the order of 2,000 research papers that are out there on a wide va-

riety of topics. Could be agriculture, it could be climate change, you know, Arctic monitoring, lots of different areas.

And so I think the continued availability of our data for scientific research can also lend itself to better agriculture applications in the future.

Mr. PFLUGER. How many farmers are you seeing? I mean, percentage increase. And we don't even know this. And anybody—welcome to answer this, but I mean what's the increase that we've seen over the last 10 years, say, in applications for agriculture used by producers?

Ms. PIÑERES. That's a great question, one I would have to get back to you on in terms of uptake on our data. But I would be happy to follow up.

Mr. PFLUGER. Any risk when it comes to cybersecurity for agriculture?

Ms. PIÑERES. That is a great question. We haven't talked about cybersecurity much yet on the panel today. I think all satellite operators are very conscious of cybersecurity risk. And so we all take measures to protect our networks.

Mr. PFLUGER. OK. I'll go with Ms. Lohmeyer on the next one. Just, you know, from your experience, what is keeping you up at night when it comes to the action process of authorizing and getting, you know, the—is government acting at the speed of relevancy? Are we able to get the appropriate licenses and authorizations, and is that process moving fast enough to keep up with technology?

Dr. LOHMEYER. So your first point, what is keeping me up at night when I work on these applications and just to shed light on what the experience is like. So we have got NTA wanting to file. They collect. And they collect data on their systems. They perform interference analyses. And then they have got this package that they submit into the system. That is the IBFS on the international bureau side; if it is an experimental license, it is the ELS. And they are different, and they are database driven.

And it is almost this kind of period of time where you are about to submit, there is relief after you submit, and then there is a waiting game. You wait until the FCC comes back with inquiries. And it is just in this black box. But I think we talked about earlier the system could be improved upon if there was more of a means for communicating with the FCC automatically. So say you submit a document and it just uploads to a website. But maybe there's additional features that could allow you to know the status of that document. Maybe there's questions. Maybe it is just accepted after review.

The same thing applies for coordination, which pertains to your relevancy question as we interact with international players. So the coordination process is such that sometimes you are sitting on other sides of the table from an operator. But it is actually the administration, so the FCC in the U.S. or Ofcom in the U.K., that arrange or organize these sorts of exchanges. And so you submit letters to the FCC, which then forward the letters to Ofcom or which other nation has a cofrequency use. And that admin submits letters to its operators.

So some way to really automate this process and reduce the waiting time would address relevancy.

Mr. PFLUGER. I am out of time, but I will submit a question on whether or not that hampers our competition—

Dr. LOHMEYER. Thank you.

Mr. PFLUGER [continuing]. With other countries in the world.

Mr. LATTA. Thank you very much. The gentleman yields back, and the Chair now recognizes the gentlelady from Florida for 5 minutes.

Mrs. CAMMACK. Thank you, Mr. Chairman. Thank you for our witnesses for hanging in there, your endurance. It is a very important topic. But I recognize that a lot of this is technical. Basically, at this point, all of my questions have been asked that I had prepared. So we are just going to free-ball it here. So all the witnesses—this is to you, but since I only have 4 minutes and 38 seconds, please keep your answers brief.

In the first panel, Mr. Glass from NTIA, he was speaking about coordination efforts. We are talking Commerce Department and the FCC. And I was looking back on my notes, and one thing that he had mentioned was, quote, they “were always striving to improve.” When I asked him to follow up on that about what does that mean exactly—because, you know, bureaucrats, they say that, right? What does that mean? What metric do you measure to—when you talk about improvements?

And he said that they don’t have any. So speaking from the private side, the industry side, what would be an acceptable metric, a system by which they can measure a tangible level of improvement that increases transparency for industry efficiencies within a system so that we can keep moving forward on this and gives the public, quite frankly, confidence that things are moving forward? And we can just go right down the line.

Ms. PIÑERES. Thank you very much for the question. I want to think about metrics. It is a really important issue, and I wouldn’t want to just come up with one off the top of my head. So let us circle back with you on any specific metrics. But I will say I think in terms of outputs that we see from the private-sector side and things that have been useful, the NTA, FCC MOU, the renegotiation of that, you know, we are seeing and hearing about increased communication between the FCC and NTIA. And we think that is really critical.

I would say also, as we are talking about satellite streamlining and ways to make coordination—ease the burdens of coordination, make things easier, I think early communication by the FCC to NTA of satellite applications could be very useful. Most of the satellite applications need to be coordinated with Federal operators. And so I think that looking at how early the FCC is sharing those applications at NTA may be one measure we could take a look at.

Mrs. CAMMACK. OK. Mr. Goldman?

Mr. GOLDMAN. Yes. Thank you for the question. I think looking at speeds—speed of decision making is critical. It is—when I was listening to the panel this morning, there was a lot of talk about the MOU and the increased coordination. And absolutely. This spectrum is shared not just with commercial interests but also with

Federal interests and absolutely needs to be coordinated with everyone who is there.

But the more people you add into coordination process, the more everything slows down. And so I think making sure there is a counterbalance that as we more—add more parties to the coordination discussion, we are looking at longer and longer timelines. And so being able to make sure that we keep the pressure going the other way as well, that these coordination discussions are thorough and they are complete, but they are also done in a timely way.

Mrs. CAMMACK. Thank you.

Mr. DAVIDSON. I would just add—I don't know if this is a metric or not, but it—if you look at orbital debris, kind of the regulation of orbital debris—

Mrs. CAMMACK. Mm-hmm.

Mr. DAVIDSON [continuing]. I don't know. There's maybe five agencies, maybe more than five, that are involved in some aspect of that. And the jurisdictional, you know, kind of land grabs on that—in that topic are not efficient. And so there should be some—I don't know whether it is coordination or clarification of who is in charge of what in the U.S. Government I think would be very useful to have.

Mrs. CAMMACK. I like that.

Dr. LOHMEYER. And I would just like to share that the FCC has, in fact, recently required an NTIA data form for its filers, especially experimental licenses, which effectively documents the technical parameters, power, modulation schemes, to assess interference into its network, which is a step above what was required in the past, which usually looked like a series of emails back and forth to Air Force, NOAA, and NASA, which was kind of a guessing game of who you needed to include as well, so—

Mrs. CAMMACK. OK. Thank you. I'm running short on time. So I am going to ask two questions be submitted for the record, one dealing with specific regulations that you would love to see taken off the books; second, since this is a committee on innovation in this space, some of the workforce challenges that you all are seeing in trends and how we can address on the front end.

But I am going to give my last 30 seconds to you, Mr. Goldman. My district—emergency departments and first responders are having to invest upwards of \$15 million per county—and I represent 12—in building out an updated emergency communication system. Can you touch on the work that SpaceX is doing in addressing those first responder communications and where that might be a good alternative?

Mr. GOLDMAN. Yes. We don't need the same sort of ground infrastructure to be built out. We are already there. We already have coverage. So you don't need to do that initial huge—we have kind of already done the huge investment upfront. And we can, just with the deployment of user equipment, we can come in, and we are already actually working with a lot of first responders in Florida to do that. And I am happy to work with your office to see what we can do specifically in your district.

Mrs. CAMMACK. Excellent. We are 3 minutes—seconds over.

Mr. LATTA. OK.

Mrs. CAMMACK. I yield.

Mr. LATTA. Amazing. The gentlelady's time has expired, and the Chair now recognizes the gentleman from Idaho for 5 minutes.

Mr. FULCHER. Thank you, Mr. Chairman. I, too, am going to deviate here right at the end of the hearing from the—a little bit. But what has been on my mind throughout this discussion has been the issue of security and dependability and things that pop into my mind that could disrupt service: malfunction, cyber attack, some kind of breach, obsolescence, some kind of collision. Knowing what you do about the technology and the circumstances it is operating within, what is our greatest vulnerability to security and dependability? And I will start with Ms. Lohmeyer.

Dr. LOHMEYER. Tough question. I think I would like to get back to you on the record.

Mr. FULCHER. And please do that. And I am just going to ask Mr. Davidson: security, dependability—what is our biggest fear? What should we worry about? What should our—keeps us awake at night?

Mr. DAVIDSON. Yes. So, first of all, I invite you to come out to our network operations center in Tysons Corner here in Virginia—it is just about a 16-minute drive from the Capitol—so you can watch yourself. We are flying the satellites from that office there, and you can kind of see what is going on and in that—in that setting. So some of our engineers will be able to tell you about kind of what their biggest fears are.

I do think that—I think cybersecurity is something we should be very concerned about. I mean, we have our subsidiary, IGC, does a lot of work with U.S. national security agencies and intelligence agencies. And so we build that into our network. So we feel like they are extremely secure. But there are a lot of operators around the world that don't have that kind of security with—you know, built into their systems. And as, you know, Mr. Goldman had mentioned before, you know, there aren't always the incentives to build state-of-the-art whether it be spectral efficiency or security into your equipment. So I think there are a lot of vulnerabilities in the cyber throughout the world. Not everyone is up to the same standards as the folks on this panel.

Mr. FULCHER. And if there is a problem, it's not like we can go get a technician and a man and go work on it.

Mr. DAVIDSON. Well, these satellites are up there for, you know, 20 years or so. And so we have to build them—you know, again, we spend billions of dollars. We just launched—launched or are launching—and SpaceX launches most of our satellites. So we, you know, spend billions of dollars building and launching these satellites. And so we design them very well, but that is not necessarily the standard that is held by everyone.

Mr. FULCHER. Mr. Goldman, speak to security and dependability, if you would, please.

Mr. GOLDMAN. Yes. Thank you so much for the question. Yes. We have teams of people who think about this all the time. I think that they would be very upset with me if I gave too much in a public setting, but we are happy to talk to you offline about a number of those.

But let me just—a little bit of what we do to address some of these issues. It is all—our entire system is built end-to-end in the

United States. So we manufacture our satellites in Washington. We manufacture our user equipment in California. We launch out of Florida. Everything—everything is built in the United States. I think one of the bills you actually have in front of you that is being considered at this hearing, this Secure Space Act—

Mr. FULCHER. Yes.

Mr. GOLDMAN [continuing]. Actually is a very smart bill to be getting ahead of this issue early. I was mentioning earlier we saw what happened on the terrestrial side when we didn't get ahead of that early and we saw equipment getting built into the networks that essentially built backdoors into the systems. We can't do that in space. There is no rip-and-replace in space. And so it is the fact that the—that the committee is getting ahead of this now, I think, is actually really a positive sign and I think will be very helpful into the future.

Mr. FULCHER. And you say if cyber would be towards the top, cyber attack?

Mr. GOLDMAN. Absolutely. And at least for us, we have—our system is encrypted end-to-end. We can't—we can't even see in ourselves. From the time that it touches our network to the time it leaves, it is completely encrypted.

Mr. FULCHER. OK. Thank you. Ms. Piñeres, we have got 1 minute left.

Ms. PIÑERES. Thank you for the question. I would just say I think, although our satellites face multiple threats, I think one of the beauties of some of the constellations that you are seeing in low-Earth orbit, NGSO constellations like Planet's, for instance, are Dove satellites. We have approximately 180 up in space today, and we are launching new ones regularly with SpaceX, actually. And so I think having—if just—if something happens to just one satellite, we have the redundancy in space to be able to continue to take the imagery that our customers rely on. So I think thinking about security not just in terms of cybersecurity risk or dazzling of satellites but also thinking about how constellations are designed to provide that kind of redundancy is very helpful.

Mr. FULCHER. Great. Thank you. Mr. Davidson, I intend on taking you up on that offer.

Mr. DAVIDSON. Absolutely. I will send you an invite.

Mr. FULCHER. Thank you.

Mr. DAVIDSON. Thank you.

Mr. FULCHER. I yield back, Mr. Chairman.

Mr. LATTI. Well, thank you. The Chair now recognizes the gentleman from Ohio for 5 minutes.

Mr. JOHNSON. Thank you, Mr. Chairman, and once again, thanks for allowing me to weigh in to talk about these really important issues.

Mr. Davidson, let me get right to it with you. As you noted in your testimony, Intelsat has been supporting emergency communications and natural disasters all over the world, although Intelsat has primarily been a geostationary Earth orbit provider. In your view, what type of coordination or best practices should the FCC consider including for the rulemaking required in the ALERT Parity Act enabling the provision of emergency connectivity in remote areas?

Mr. DAVIDSON. So, Congressman, thank you for the question. I recently just concluded a stint as the chair of the Crisis Connectivity Center. It is part of a World Food Program coordination for all world disaster. So what happens is whether it is terrestrial providers or satellite providers get together and figure out how to get in quickly. And, you know, oftentimes satellite is the first one to be able to get in there. So it is a really critical first responder. So your question is a really good one.

So we use our own spectrum rights that we already have when we go into areas for disaster response. So we kind of self-provision both the equipment and the use of the spectrum. So I don't know that I'm the best one to be able to advise for people who don't have that—the spectrum or the equipment, what they need, so I may defer to another panelist to answer specifically that question. But I think the intent of your—of the legislation is excellent. And I think focusing on the needs of—you know, these things pop up, you can't always plan for them. And so putting the things in place in advance, which your legislation does, I think is a good—is great policy.

Mr. JOHNSON. OK. Mr. Goldman, as I mentioned last week to Amazon about Project Kuiper, I am very excited about the possibilities of LEO satellite broadband and the integral role that it would play in bridging the urban-rural digital divide. I have actually had the opportunity to set up Starlink at your office here in DC. And I saw for myself how easy it was to set up and even did a speed test. I have got a staff member back in Ohio that is—that is using the system to connect her entire farm, loves it. While Starlink is available in some areas in Ohio, I know there are many more in our rural Appalachian district who are eagerly waiting for Starlink to become available in their communities.

How many additional satellites does SpaceX intend to launch in order to meet the great demand across the United States and globally while maintaining the promised speeds and latency for existing customers? Will you need more than the 4,408 satellites authorized by the FCC?

Mr. GOLDMAN. Yes. Thanks for the question. Yes. The FCC actually just authorized us last month, 2 months ago, for our new Gen 2 System, which is another 7,500 satellites initially. And those actually will be more capable satellites. We have already started launching into the—into those orbits that is already going to start adding new capacity to the network. And so we are going to be launching more and more capable satellites.

And we continue to innovate. It is just like innovation on the ground: You just keep doing it, you don't stop, and so the system should become more and more capable over time, and we should be able to make sure that we are really excited about the amount of demand that we see in your district, and we are excited to be able to get all those people who want the service to be able to get on as quickly as possible.

Mr. JOHNSON. OK. Continuing with you, Mr. Goldman, have there been any important takeaways for SpaceX from your experience providing vital internet service in Ukraine?

Mr. GOLDMAN. In Ukraine? Oh, yes. That is something I personally am very proud of that we were able to do. And basically the

Ukrainian Government asked us to step in and help when the Russian—Russia invaded. And within 48 hours, we had service. And we are providing service to—we are continuing to provide service to Ukrainians across the country.

Important lessons, that is a good question. I don't know. We have been learning a lot through the entire process. That is obviously a very contentious area to be providing service. What we have seen is efforts to try to jam the system, so we have had to learn how to be able to avoid jamming. It has definitely taught us a lot of lessons on how to make the system more resilient and more redundant.

Mr. JOHNSON. Well, maybe you don't want to answer this here, but just a follow-on: Are you talking to DoD and any of our special operations folks? I mean, that is a pretty compact system to be able to take anywhere.

Mr. GOLDMAN. Yes, we are, and I am happy to talk to you offline about that as well.

Mr. JOHNSON. OK, great. Thank you, Mr. Chairman. I yield back.

Mr. LATTA. Thank you. The gentleman yields back, and seeing no further Members here to ask questions, I—again, I want to thank our witnesses for being with us today. You can tell—

Mr. GOLDMAN. Thank you.

Mr. LATTA [continuing]. From the questions for last—when you started—last couple hours has been a lot of—a lot of interest. You know, a couple things that I always—I listen to and I always say is that this subcommittee, this committee, we look over the horizon 5 to 10 years, and so we always have to have your input and make sure that we are getting the right laws in the books and then followed by the right regulations.

Another thing is that we always see, the government or any agency picking winners and losers out there, because usually it is going to be the losers. So we want the best that can be out there for everyone.

So I ask unanimous consent to insert—documents included on the staff hearing documents list. Without objection, that will be ordered. And without objection, so ordered.

Pursuant to committee rules, I remind Members that they have 10 business days to submit questions for the record, and I ask that witnesses respond to the questions promptly. Members should submit their questions by the close of business on February the 23rd.

And without objection, the subcommittee is adjourned.

[Whereupon, at 3:13 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

.....
(Original Signature of Member)

118TH CONGRESS
1ST SESSION

H. R. _____

To amend the Secure and Trusted Communications Networks Act of 2019 to prohibit the Federal Communications Commission from granting a license or United States market access for a non-geostationary orbit satellite system if the license or grant of market access would be held or controlled by an entity that produces or provides any covered communications equipment or service or an affiliate of such an entity, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. PALLONE introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the Secure and Trusted Communications Networks Act of 2019 to prohibit the Federal Communications Commission from granting a license or United States market access for a non-geostationary orbit satellite system if the license or grant of market access would be held or controlled by an entity that produces or provides any covered communications equipment or service or an affiliate of such an entity, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Secure Space Act of
3 2023”.

4 **SEC. 2. PROHIBITION ON GRANT OF CERTAIN SATELLITE**
5 **LICENSES OR UNITED STATES MARKET AC-**
6 **CESS.**

7 (a) IN GENERAL.—The Secure and Trusted Commu-
8 nications Networks Act of 2019 (47 U.S.C. 1601 et seq.)
9 is amended—

10 (1) by redesignating sections 10 and 11 as sec-
11 tions 11 and 12, respectively; and

12 (2) by inserting after section 9 the following:

13 **“SEC. 10. PROHIBITION ON GRANT OF CERTAIN SATELLITE**
14 **LICENSES OR UNITED STATES MARKET AC-**
15 **CESS.**

16 “The Commission may not grant a license for, or a
17 petition for a declaratory ruling to access the United
18 States market using, a non-geostationary orbit satellite
19 system (as defined in section 25.103 of title 47, Code of
20 Federal Regulations (or any successor regulation)), if such
21 license or grant of market access would be held or con-
22 trolled by—

23 “(1) an entity that produces or provides any
24 covered communications equipment or service; or

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1 “(2) an affiliate (as defined in section 3 of the
2 Communications Act of 1934 (47 U.S.C. 153)) of an
3 entity described in paragraph (1).”.

4 (b) APPLICABILITY.—Section 10 of the Secure and
5 Trusted Communications Networks Act of 2019, as added
6 by subsection (a), shall apply with respect to the grant
7 of a license or petition on or after the date of the enact-
8 ment of this Act.

.....
(Original Signature of Member)

118TH CONGRESS
1ST SESSION

H. R. _____

To facilitate access to electromagnetic spectrum for commercial space launches
and commercial space reentries.

IN THE HOUSE OF REPRESENTATIVES

Mr. SOTO introduced the following bill; which was referred to the Committee
on _____

A BILL

To facilitate access to electromagnetic spectrum for
commercial space launches and commercial space reentries.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Launch Communica-
5 tions Act”.

6 **SEC. 2. ACCESS TO SPECTRUM FOR COMMERCIAL SPACE**

7 **LAUNCHES AND REENTRIES.**

8 (a) SERVICE RULES; ALLOCATION.—

1 (1) IN GENERAL.—Not later than 90 days after
2 the date of the enactment of this Act, the Commis-
3 sion shall—

4 (A) complete any proceeding in effect as of
5 such date of enactment related to the adoption
6 of service rules for access to the frequencies de-
7 scribed in subsection (c) for commercial space
8 launches and commercial space reentries, in-
9 cluding technical specifications, eligibility re-
10 quirements, and coordination procedures to pre-
11 serve the Nation’s defense capabilities; and

12 (B) allocate on a secondary basis such fre-
13 quencies for commercial space launches and
14 commercial space reentries.

15 (2) COORDINATION WITH NATIONAL TELE-
16 COMMUNICATIONS AND INFORMATION ADMINISTRA-
17 TION.—The coordination procedures adopted under
18 paragraph (1)(A) shall include requirements for per-
19 sons conducting commercial space launches and
20 commercial space reentries to coordinate with the
21 Assistant Secretary regarding access to the fre-
22 quencies described in subsection (c) for commercial
23 space launches and commercial space reentries.

24 (3) LIMITATION.—Access to the frequencies de-
25 scribed in subsection (c) under the service rules

1 adopted under paragraph (1)(A), and the allocation
2 of such frequencies under paragraph (1)(B), shall be
3 limited to the use of such frequencies for commercial
4 space launches and commercial space reentries.

5 (b) STREAMLINING OF PROCESS FOR GRANTING AU-
6 THORIZATIONS.—Not later than 180 days after the date
7 of the enactment of this Act, the Commission shall issue
8 new regulations to streamline the process for granting au-
9 thorizations for access to the frequencies described in sub-
10 section (e) for commercial space launches and commercial
11 space reentries so as to provide for—

12 (1) authorizations that include access to such
13 frequencies for multiple commercial space launches
14 from one or more space launch sites and multiple
15 commercial space reentries to one or more reentry
16 sites;

17 (2) authorizations that include access to mul-
18 tiple uses of such frequencies for commercial space
19 launch or commercial space reentry;

20 (3) automation of the processes of the Commis-
21 sion to review applications for authorizations for ac-
22 cess to such frequencies for commercial space
23 launches and commercial space reentries; and

24 (4) improved coordination by the Commission
25 with the Assistant Secretary (who shall coordinate

1 with the heads of such other Federal agencies as the
2 Assistant Secretary considers appropriate, which
3 may include the Secretary of Defense) to increase
4 the speed of review of applications for authorizations
5 for access to such frequencies for commercial space
6 launches and commercial space reentries.

7 (c) FREQUENCIES DESCRIBED.—The frequencies de-
8 scribed in this subsection are the following:

9 (1) The frequencies between 2025–2110 MHz,
10 2200–2290 MHz, 2360–2395 MHz, and 5650–5925
11 MHz.

12 (2) Any additional frequencies identified by the
13 Commission (in coordination with the Assistant Sec-
14 retary, in the case of potential impact to Federal
15 spectrum use) as necessary to conduct commercial
16 space launches and commercial space reentries.

17 (d) RULE OF CONSTRUCTION.—Each range of fre-
18 quencies described in this section shall be construed to be
19 inclusive of the upper and lower frequencies in the range.

20 (e) DEFINITIONS.—In this section:

21 (1) ASSISTANT SECRETARY.—The term “Assist-
22 ant Secretary” means the Assistant Secretary of
23 Commerce for Communications and Information.

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1 (2) COMMERCIAL SPACE LAUNCH.—The term
2 “commercial space launch” means a launch licensed
3 under chapter 509 of title 51, United States Code.

4 (3) COMMERCIAL SPACE REENTRY.—The term
5 “commercial space reentry” means a reentry li-
6 censed under chapter 509 of title 51, United States
7 Code.

8 (4) COMMISSION.—The term “Commission”
9 means the Federal Communications Commission.

[DISCUSSION DRAFT]

118TH CONGRESS
1ST SESSION

H. R. _____

To amend the Communications Act of 1934 to provide authority for certain licenses, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mrs. RODGERS of Washington introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the Communications Act of 1934 to provide authority for certain licenses, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Satellite And Tele-
5 communications Streamlining Act” or the “SAT Stream-
6 lining Act”.

1 **SEC. 2. AUTHORITY REGARDING CERTAIN LICENSES.**

2 (a) AMENDMENT.—Part I of title III of the Commu-
3 nications Act of 1934 (47 U.S.C. 301 et seq.) is amended
4 by adding at the end the following new section:

5 **“SEC. 346. RADIOFREQUENCY LICENSING AUTHORITY RE-
6 GARDING CERTAIN OPERATIONS.**

7 “(a) RULES.—

8 “(1) IN GENERAL.—Not later than 18 months
9 after the date of the enactment of this section, the
10 Commission shall issue rules to amend part 25, title
11 47, Code of Federal Regulations, to establish for
12 each license granted under subsection (b) or any re-
13 quest for a grant of market access granted under
14 subsection (c)—

15 “(A) in accordance with paragraph (2),
16 specific, measurable, and technology-neutral
17 performance objectives for space safety and or-
18 bital debris;

19 “(B) specific modifications (or classes of
20 modifications) to a license granted under sub-
21 section (b)(1) that warrant expedited treatment
22 under subsection (g)(2);

23 “(C) specific actions taken by a licensee of
24 a license granted under subsection (b)(1) or a
25 grantee that has been granted market access

1 under subsection (c)(1) that constitute a failure
2 to coordinate in good faith;

3 “(D) a quantifiable level of protection re-
4 quired under subsection (h)(4); and

5 “(E) the manner in which an applicant
6 shall notify the Commission of a request to sub-
7 mit a modification under subsection (g)(5).

8 “(2) CONFLICT WITH INTERAGENCY STANDARD
9 PRACTICES.—In the rules issued pursuant to para-
10 graph (1)(A), or any successor rule, the Commission
11 may not establish performance objectives that con-
12 flict with any standard practice established in the
13 Orbital Debris Mitigation Standard Practices adopt-
14 ed by the United States Government.

15 “(b) APPLICATION FOR LICENSE.—

16 “(1) NGSO DETERMINATION REQUIRED.—Not-
17 withstanding sections 4(i), 303(r), and 303(y) and
18 the authority of the Commission to require such
19 other information under section 308(b) and consider
20 such other matters under section 309(a), and except
21 as provided in paragraph (5), not later than 1 year
22 after the date on which a written application is sub-
23 mitted to the Commission, the Commission shall
24 make a determination whether to grant such appli-
25 cation for a license for—

1 “(A) a nongeostationary orbit space station
2 or space-station constellation and an earth sta-
3 tion or earth stations;

4 “(B) a nongeostationary orbit space sta-
5 tion and the blanket-licensed earth stations that
6 will operate with the nongeostationary orbit
7 space station; or

8 “(C) a nongeostationary orbit space-station
9 constellation and the blanket-licensed earth sta-
10 tions that will operate with the nongeos-
11 tationary orbit space-station constellation.

12 “(2) GSO DETERMINATION REQUIRED.—Not
13 later than 1 year after the date on which a written
14 application is submitted to the Commission and ex-
15 cept as provided in paragraph (5), the Commission
16 shall make a determination whether to grant such
17 application for a license for a geostationary orbit
18 space station or space-station constellation and earth
19 stations.

20 “(3) CONTENTS OF APPLICATION.—In addition
21 to the application requirements described in section
22 308(b), an application submitted under paragraph
23 (1) or (2) shall include the following:

1 “(A) Performance metrics with respect to
2 the frequencies and transmission power to be
3 used.

4 “(B) A description of compliance by the
5 applicant with the performance objectives and
6 actions established under subparagraph (A) of
7 subsection (a)(1) and, in the case of an applica-
8 tion submitted under paragraph (1) of this sub-
9 section, subparagraphs (C) and (D) of sub-
10 section (a)(1).

11 “(4) TERM OF INITIAL LICENSE.—The Com-
12 mission shall grant a license for a term not to exceed
13 15 years for any application granted under this sub-
14 section.

15 “(5) EXCEPTIONS.—The deadline for the deter-
16 mination required in paragraphs (1) and (2) may be
17 extended by the Commission for an application sub-
18 ject to review under section 310(d).

19 “(6) TIMELY GRANT OF CERTAIN APPLICA-
20 TIONS.—

21 “(A) GRANT OF APPLICATION RE-
22 QUIRED.—Not later than 60 days after the date
23 on which the Commission receives a written ap-
24 plication for a license described in paragraph
25 (1) that the Commission determines meets the

1 additional criteria described in subparagraph
2 (B), the Commission shall grant such applica-
3 tion.

4 “(B) CRITERIA DESCRIBED.—The addi-
5 tional criteria described in this subparagraph
6 are as follows:

7 “(i) A limit on the number of space
8 stations a constellation contains, as deter-
9 mined by the Commission.

10 “(ii) A limit on the total in-orbit life-
11 time for any individual space station, as
12 determined by the Commission.

13 “(iii) For each space station, the fol-
14 lowing:

15 “(I) A limit on the orbital alti-
16 tude at which the space station may
17 operate, as determined by the Com-
18 mission.

19 “(II) A requirement that the
20 space station has a maneuverability
21 capability and the ability to make col-
22 lision avoidance and deorbit maneu-
23 vers, as determined by the Commis-
24 sion.

7

1 “(III) A requirement that each
2 space station is identifiable by a
3 unique signal-based telemetry marker
4 that meets requirements issued by the
5 Commission.

6 “(IV) A requirement that the
7 space station releases no operational
8 debris.

9 “(V) A requirement that the
10 space station can be commanded by
11 command originating from the ground
12 to immediately cease transmissions
13 and the applicant has the capability to
14 eliminate harmful interference when
15 required by the Commission.

16 “(iv) A requirement that the operator
17 has assessed and limited the probability of
18 an accidental explosion, including an explo-
19 sion that results from the conversion of en-
20 ergy sources on board any space station
21 into energy that fragments the space sta-
22 tion.

23 “(v) A limit on the probability of a
24 collision between each space station and

1 any other large object, as determined by
2 the Commission.

3 “(vi) A requirement that each space
4 station is disposed of post-mission through
5 atmospheric re-entry and the probability of
6 human casualty from such re-entry meets
7 requirements issued by the Commission.

8 “(C) IMPLEMENTATION.—Not later than
9 60 days after the date of the enactment of this
10 subparagraph, the Commission shall—

11 “(i) issue rules to implement this
12 paragraph; or

13 “(ii) make the finding described in
14 subparagraph (D).

15 “(D) FINDING DESCRIBED.—If the Com-
16 mission finds that the rules of the Commission,
17 as of the date of the enactment of this para-
18 graph, satisfy the requirements in this para-
19 graph, the Commission shall issue a public no-
20 tice stating such finding.

21 “(e) APPLICATION FOR GRANT OF MARKET AC-
22 CESS.—

23 “(1) DETERMINATION REQUIRED.—Notwith-
24 standing sections 4(i), 303(r), and 303(y) and the
25 authority of the Commission to require such other

1 information under section 308(b) and consider such
2 other matters under section 309(a), the Commission
3 shall make a determination whether to grant a writ-
4 ten application submitted to the Commission for
5 market access within the United States for—

6 “(A) a nongeostationary orbit space station
7 or space-station constellation and an earth sta-
8 tion or earth stations;

9 “(B) a nongeostationary orbit space sta-
10 tion and the blanket-licensed earth stations that
11 will operate with the nongeostationary orbit
12 space station; or

13 “(C) a nongeostationary orbit space-station
14 constellation and the blanket-licensed earth sta-
15 tions that will operate with the nongeos-
16 tationary orbit space-station constellation.

17 “(2) CONTENTS OF APPLICATION.—In addition
18 to the application requirements described in section
19 308(b), an application submitted under this sub-
20 section shall include the following:

21 “(A) Performance metrics with respect to
22 the frequencies and transmission power to be
23 used.

24 “(B) A description of compliance by the
25 applicant with the performance objectives and

1 actions established under subparagraphs (A),
2 (C), and (D) of subsection (a)(1).

3 “(3) TERM OF INITIAL GRANT OF MARKET AC-
4 CESS.—The Commission shall grant a grant of mar-
5 ket access for a term not to exceed 15 years for any
6 application granted under this subsection.

7 “(d) EARTH STATION AUTHORIZATION.—

8 “(1) DETERMINATION REQUIRED.—Notwith-
9 standing sections 4(i), 303(r), 303(y), and 309(a)
10 and subsections (a) through (c) and (e) through (j)
11 of this section, not later than 1 year after the date
12 on which a written application is submitted to the
13 Commission, the Commission shall make a deter-
14 mination whether to grant such application for au-
15 thorization to use an earth station (including a gate-
16 way station) to receive a signal from—

17 “(A) a nongeostationary orbit satellite or
18 nongeostationary orbit satellite system; or

19 “(B) a geostationary orbit satellite or geo-
20 stationary orbit satellite system.

21 “(2) DEEMED GRANTED.—If the Commission
22 does not grant or deny a written application sub-
23 mitted under paragraph (1) within 60 days after the
24 date on which the application is submitted to the
25 Commission, except as provided in paragraph (3),

1 the application shall be deemed granted on the date
2 on which the Commission receives a written notice of
3 the failure by the applicant.

4 “(3) EXCEPTION.—The deadline for the deter-
5 mination required in paragraph (1) may be extended
6 by the Commission for an application subject to re-
7 view under section 310(d).

8 “(e) DETERMINATION OF PUBLIC INTEREST, CON-
9 VENIENCE, AND NECESSITY.—Before making a deter-
10 mination to grant an application, renewal, or modification
11 under subsection (b), (c), (d), (f), or (g) (as the case may
12 be), the Commission shall determine if the license, grant,
13 or authorization (as the case may be) serves the public
14 interest, convenience, and necessity, including—

15 “(1) in the case of a license or grant to which
16 subsection (h)(4) applies, the license or grant does
17 not exceed the quantifiable level of protection estab-
18 lished in subsection (h)(4); and

19 “(2) in the case of a license or grant that is re-
20 quired to protect radio astronomy observatories by
21 the International Telecommunication Union, the ap-
22 plication, renewal, or modification demonstrates that
23 such protection will be provided.

24 “(f) RENEWAL OF LICENSE, GRANT OF MARKET AC-
25 CESS, OR AUTHORIZATION.—

1 “(1) IN GENERAL.—Except as provided in sec-
2 tion 309(k)(2), the Commission shall grant a re-
3 newal for a license issued under subsection (b), a
4 grant of market access under subsection (c), or an
5 authorization granted under subsection (d), upon re-
6 quest by an applicant for a term not to exceed the
7 length of the initial term beginning the day after the
8 date on which the previous license, grant of market
9 access, or authorization expires, if the Commission
10 determines the requirements under subsection (e)
11 and section 309(k) have been met.

12 “(2) DEADLINE FOR DETERMINATION.—Not
13 later than 180 days after the date on which the
14 Commission receives a request for renewal of a li-
15 cense issued under subsection (b), a grant of market
16 access under subsection (c), or an authorization
17 granted under subsection (d), the Commission
18 shall—

19 “(A) grant or deny such renewal; or

20 “(B) make the determination described in
21 section 309(k)(3).

22 “(g) MODIFICATION OF LICENSE; GRANT OF MAR-
23 KET ACCESS.—

24 “(1) MAJOR MODIFICATIONS.—Except as pro-
25 vided in paragraphs (2), (3), (5), and (6), and not

1 later than 1 year after the date on which the Com-
2 mission receives a request to modify an application
3 granted under subsection (b)(1), the Commission
4 shall grant the request if the Commission determines
5 the modification meets the requirement of subsection
6 (e). The Commission may grant a request to modify
7 an application submitted under subsection (b)(2) or
8 subsection (c) if the Commission determines the
9 modification meets the requirement of subsection
10 (e).

11 “(2) EXPEDITED TREATMENT FOR MINOR
12 MODIFICATIONS.—Except as provided in paragraphs
13 (3), (5), and (6), the Commission shall grant a re-
14 quest made by an applicant to modify an application
15 granted under subsection (b)(1) not later than 90
16 days after the date on which the Commission re-
17 ceives the request to modify if—

18 “(A) the request does not exceed the quan-
19 tifiable level of protection described in sub-
20 section (h)(4); and

21 “(B) the request is limited only to modi-
22 fications, or a class of modifications, that—

23 “(i) increase transmission capacity;

24 “(ii) improve spectral efficiency, such
25 as by improving compression technologies;

1 “(iii) improve the orbital variance effi-
2 ciency of the constellation; or

3 “(iv) otherwise do not substantially
4 modify the constellation.

5 “(3) EMERGENCY MODIFICATION.—If the Com-
6 mission finds that there are extraordinary cir-
7 cumstances requiring temporary operations in the
8 public interest and that delay in the institution of
9 such temporary operations would seriously prejudice
10 the public interest, the Commission—

11 “(A) may grant a license described in sub-
12 section (b), a grant of market access described
13 in subsection (c), or an authorization described
14 in subsection (d), a modification of such license,
15 grant of market access, or authorization, or re-
16 newal of such license, grant of market access,
17 or authorization for 180 days in a manner and
18 upon the terms the Commission shall by rule
19 prescribe in the case of an emergency found by
20 the Commission involving—

21 “(i) danger to life or property; or

22 “(ii) an action that is necessary for
23 the national defense or security of the
24 United States;

1 “(B) shall include with a grant made
2 under this paragraph a statement of the rea-
3 sons of the Commission for making such grant;

4 “(C) may extend a grant made under this
5 paragraph for periods not to exceed 180 days;
6 and

7 “(D) shall give expeditious treatment to
8 any timely filed petition to deny such applica-
9 tion and to any petition for rehearing of such
10 grant filed under section 405.

11 “(4) EXCLUSION.—Paragraph (2) shall not
12 apply to a request to modify a license for—

13 “(A) the addition of an ancillary terrestrial
14 component; or

15 “(B) modifying the service offered under
16 the initial license granted under subsection (b)
17 between fixed and mobile service.

18 “(5) AUTOMATIC GRANT OF CERTAIN MODI-
19 FICATIONS.—Upon notification to the Commission,
20 the Commission may automatically grant a request
21 to modify an application granted under subsection
22 (b), (c), or (d) or a covered authorization, to replace
23 one space station (or component of such space sta-
24 tion) with a technically similar space station (or

1 component of such space station) previously ap-
2 proved by the Commission.

3 “(6) EXCEPTIONS.—The deadlines under para-
4 graphs (1) and (2) may be extended by the Commis-
5 sion for a request subject to review under section
6 310(d).

7 “(h) SHARED SPECTRUM; PROTECTION FROM HARM-
8 FUL INTERFERENCE.—

9 “(1) GRANDFATHERED TREATMENT AND SUN-
10 SET OF CERTAIN AUTHORIZATIONS.—For the dura-
11 tion of the covered period—

12 “(A) a covered authorization shall not be
13 treated as being granted under subsection
14 (b)(1) or subsection (c)(1) (as the case may be);
15 and

16 “(B) the Commission shall protect an enti-
17 ty with a covered authorization from harmful
18 interference consistent with the terms of such
19 protection afforded before the date of the enact-
20 ment of this section.

21 “(2) TRANSITIONAL RULE.—After the expira-
22 tion of the covered period, an entity with a covered
23 authorization may seek renewal for a license or
24 grant of market access under subsection (f).

1 “(3) GOOD FAITH COORDINATION OF SHARED
2 SPECTRUM.—Not later than the date on which the
3 rules issued pursuant to subsection (a) take effect,
4 a licensee of a license granted under subsection
5 (b)(1), a grantee of market access granted under
6 subsection (c)(1), or an entity with a covered author-
7 ization, in a spectrum band with service rules that
8 require such licensees or grantees to share spectrum,
9 shall make a good faith effort to coordinate the use
10 of spectrum with any other licensee or grantee au-
11 thorized in the spectrum band in which another li-
12 cense was granted under subsection (b)(1), another
13 grantee was granted under subsection (c)(1), or an-
14 other entity was granted authorization to use spec-
15 trum in such band.

16 “(4) PROTECTION FROM HARMFUL INTER-
17 FERENCE.—Not later than the date on which the
18 rules issued pursuant to subsection (a) take effect,
19 for any spectrum band in which the Commission
20 grants a license under subsection (b)(1) or a grant
21 of market access under subsection (c)(1), the Com-
22 mission shall establish a quantifiable level of protec-
23 tion that a licensee of a license granted under sub-
24 section (b)(1) or a grantee of market access granted
25 under subsection (c)(1) shall afford to any other li-

1 licensee or grantee authorized in the spectrum band
2 in which another license was granted under sub-
3 section (b)(1), another grantee was granted under
4 subsection (e)(1), or another entity was granted au-
5 thorization to use spectrum in such band.

6 “(5) CONSIDERATION REQUIRED.—When estab-
7 lishing the quantifiable level of protection described
8 in paragraph (4), the Commission shall ensure the
9 benefit to improved coordination among licensees
10 and grantees outweighs any costs associated with the
11 implementation of such protection.

12 “(6) RELATION TO ITU RADIO REGULATIONS.—
13 Nothing in this subsection shall be construed to re-
14 quire the Commission to adopt rules regarding the
15 use of spectrum that contravene a requirement by
16 the radio regulations of the International Tele-
17 communication Union.

18 “(7) RULE OF CONSTRUCTION.—An entity with
19 a covered authorization shall not be required to sub-
20 mit additional information in order to retain such
21 authorization, nor shall paragraph (1) affect any ob-
22 ligation of such entity under applicable law or regu-
23 lation until the end of the covered period.

24 “(i) STATE PREEMPTION OF MARKET ENTRY;
25 RATES.—Notwithstanding any provision of law, no State

1 or local government shall have any authority to regulate
2 the entry of or the rates charged by an applicant or li-
3 censee related to a license granted under subsection (b),
4 an applicant or grantee related to a grant of market access
5 granted under subsection (e), or an applicant or entity re-
6 lated to an authorization under subsection (d), except that
7 this subsection shall not prohibit a State from regulating
8 the other terms and conditions of such licensee, grantee,
9 or entity.

10 “(j) REGULATORY RESTRAINT.—

11 “(1) LIMITATION OF INFORMATION PRO-
12 VIDED.—In addition to the requirements described
13 in section 307(c)(2), in performing any act, making
14 any rule or regulation, or issuing any order nec-
15 essary to carry out this section, the Commission—

16 “(A) shall limit the information required to
17 be furnished to the Commission;

18 “(B) shall demonstrate the Commission
19 has taken every reasonable step to limit the in-
20 formation required to be furnished to the Com-
21 mission; and

22 “(C) may not request additional informa-
23 tion regarding the performance objectives estab-
24 lished in subsection (a)(1)(A) for any case in

1 which an applicant has demonstrated compli-
2 ance with such performance objectives.

3 “(2) DEADLINE FOR PETITION DETERMINA-
4 TION.—If an applicant for a license or a licensee
5 under subsection (b) files a petition under part 1,
6 title 47, Code of Federal Regulations (or any suc-
7 cessor regulation) relating to information required to
8 be furnished to the Commission under this section,
9 the Commission shall grant or deny the petition
10 within 90 days after the date on which the petition
11 is filed.

12 “(k) DEFINITIONS.—In this section:

13 “(1) COVERED APPLICATION.— The term ‘cov-
14 ered application’ means an application for a license
15 or grant of market access to operate a system de-
16 scribed in subparagraphs (A) through (C) of sub-
17 section (b)(1) or subparagraphs (A) through (C) of
18 subsection (c)(1) in a processing round established
19 before December 31, 2022, that is pending on the
20 date of the enactment of this section.

21 “(2) COVERED AUTHORIZATION.—The term
22 ‘covered authorization’ means—

23 “(A) a license or grant of market access
24 granted by the Commission to operate a system
25 described in subparagraphs (A) through (C) of

1 subsection (b)(1) or subparagraphs (A) through
2 (C) of subsection (e)(1) in a processing round
3 established before December 31, 2022, that has
4 deployed a level of service commensurate with
5 the terms of the license or grant of market ac-
6 cess; or

7 “(B) a license or grant of market access
8 granted by Commission approval of a covered
9 application.

10 “(3) COVERED PERIOD.—The term ‘covered pe-
11 riod’ means, with respect to a covered authorization,
12 the period of time that begins on the date of the en-
13 actment of this section and ends on the earliest of—

14 “(A) the date on which the covered author-
15 ization expires;

16 “(B) the date that is 15 years after such
17 date of enactment; or

18 “(C) the date on which the Commission
19 grants a request to modify the covered author-
20 ization that would be a major modification
21 under subsection (g) if the covered authoriza-
22 tion were a license granted under subsection
23 (b)(1) or a grant of market access granted
24 under subsection (e)(1).

1 “(4) ORBITAL VARIANCE EFFICIENCY.—The
2 term ‘orbital variance efficiency’ means the mean of
3 the distance between the actual altitude of each
4 space station and the authorized altitude for each
5 space station authorized under subsection (b)(1).”.

6 (b) RELATION TO OTHER LAW AMENDMENTS.—The
7 Communications Act of 1934 (47 U.S.C. 151 et seq.) is
8 amended—

9 (1) in section 309(j)(2)—

10 (A) in the matter preceding subparagraph
11 (A), by inserting “, grants of market access,
12 authorizations,” after “licenses”;

13 (B) in subparagraph (B), by striking “;
14 or” and inserting a semicolon;

15 (C) by redesignating subparagraph (C) as
16 subparagraph (D); and

17 (D) by inserting after subparagraph (B)
18 the following new subparagraph:

19 “(C) for licenses, grants of market access,
20 or authorizations granted under section 346;
21 or”;

22 (2) in section 309(k)—

23 (A) in the heading, by striking “BROAD-
24 CAST STATION RENEWAL PROCEDURES” and

1 inserting “RENEWAL PROCEDURES FOR CER-
2 TAIN AUTHORIZATIONS”;
3 (B) in paragraph (1)—
4 (i) in the matter preceding subpara-
5 graph (A)—
6 (I) by inserting “, the licensee of
7 a license granted under section
8 346(b), the grantee of a grant of mar-
9 ket access granted under section
10 346(e), or an entity with authoriza-
11 tion granted under section 346(d),”
12 after “broadcast station”;
13 (II) by inserting “, grant, or au-
14 thorization” after “such license”;
15 (III) by striking “that station”
16 and inserting “that licensee, grantee,
17 or entity”; and
18 (IV) by inserting “, grant of
19 market access, or authorization” after
20 “its license”;
21 (ii) in subparagraph (A), by striking
22 “the station” and inserting “in the case of
23 a broadcast station, the station”;

1 (iii) by redesignating subparagraphs
2 (B) and (C) as subparagraphs (C) and
3 (D), respectively;

4 (iv) by inserting after subparagraph
5 (A) the following:

6 “(B) in the case of a licensee of a license
7 granted under section 346(b), a grantee of a
8 grant of market access granted under section
9 346(c), or an entity with authorization granted
10 under section 346(d), the licensee, grantee, or
11 entity has served the public interest, conven-
12 ience, and necessity in accordance with section
13 346(e);”;

14 (v) in subparagraph (C), as so redesi-
15 gnated, by inserting “, grantee, or entity”
16 after “licensee”; and

17 (vi) in subparagraph (D), as so redesi-
18 gnated, by inserting “, grantee, or entity”
19 after “licensee”;

20 (C) in paragraph (2), by inserting “, or the
21 licensee of a license granted under section
22 346(b), the grantee of a grant of market access
23 under section 346(c), or an entity with author-
24 ization granted under section 346(d),” after
25 “broadcast station”; and

- 1 (D) in paragraph (3)—
- 2 (i) in the matter preceding subpara-
- 3 graph (A), by striking “that a licensee”
- 4 and inserting “that a broadcast station, a
- 5 licensee of a license granted under section
- 6 346(b), a grantee of market access granted
- 7 under section 346(c), or an entity with au-
- 8 thorization granted under section 346(d)”;
- 9 (ii) in subparagraph (A), by inserting
- 10 “or 346” after “section 308”; and
- 11 (iii) in subparagraph (B), by inserting
- 12 “or under section 346 specifying the infor-
- 13 mation required by the Commission under
- 14 section 346(b)(3), section 346(e)(2), or
- 15 section 346(d)(1) (as the case may be) of
- 16 the former licensee, grantee, or entity”
- 17 after “former licensee”; and
- 18 (3) in section 310(b), by inserting “or license,
- 19 grant of market access, or authorization granted
- 20 under subsection (b), (c), or (d) of section 346”
- 21 after “radio station license”.
- 22 (e) APPLICABILITY.—The requirements in the
- 23 amendments made by this section apply with respect to
- 24 any application submitted under subsection (b), (c), or (d)
- 25 of section 346 of the Communications Act of 1934 and

1 any request for renewal or modification under such sec-
2 tion, as added by subsection (a), on or after the date of
3 the enactment of this Act.

[DISCUSSION DRAFT]

118TH CONGRESS
1ST SESSION

H. R. _____

To require the Federal Communications Commission to review certain rules of the Commission and develop recommendations for rule changes to promote precision agriculture, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. LATTA introduced the following bill; which was referred to the Committee on _____

A BILL

To require the Federal Communications Commission to review certain rules of the Commission and develop recommendations for rule changes to promote precision agriculture, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Precision Agriculture
5 Satellite Connectivity Act”.

1 **SEC. 2. PRECISION AGRICULTURE SATELLITE**
2 **CONNECTIVITY.**

3 (a) REVIEW.—The Commission, in consultation with
4 the Task Force, shall—

5 (1) review the rules of the Commission relating
6 to fixed satellite service, mobile satellite service, and
7 earth exploration satellite service to determine if
8 there are rule changes that the Commission could
9 implement under existing authority to promote pre-
10 cision agriculture; and

11 (2) if the Commission determines under para-
12 graph (1) that there are rule changes that the Com-
13 mission could implement, develop recommendations
14 for how to implement the changes.

15 (b) REPORT.—Not later than 1 year after the date
16 of the enactment of this Act, the Commission shall submit
17 to the Committee on Energy and Commerce of the House
18 of Representatives and the Committee on Commerce,
19 Science, and Transportation of the Senate a report on the
20 results of the review conducted under subsection (a), in-
21 cluding any recommendations developed under paragraph
22 (2) of such subsection.

23 (c) DEFINITIONS.—In this section:

24 (1) COMMISSION.—The term “Commission”
25 means the Federal Communications Commission.

1 (2) TASK FORCE.—The term “Task Force”
2 means the Task Force for Reviewing the
3 Connectivity and Technology Needs of Precision Ag-
4 riculture in the United States established under sec-
5 tion 12511 of the Agriculture Improvement Act of
6 2018 (Public Law 115–334).

[DISCUSSION DRAFT]118TH CONGRESS
1ST SESSION**H. R.** _____

To direct the Federal Communications Commission to issue rules for the provision of emergency connectivity service, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. JOHNSON of Ohio introduced the following bill; which was referred to the Committee on _____

A BILL

To direct the Federal Communications Commission to issue rules for the provision of emergency connectivity service, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Advanced, Local Emer-
5 gency Response Telecommunications Parity Act” or the
6 “ALERT Parity Act”.

7 **SEC. 2. EMERGENCY CONNECTIVITY SERVICE.**

8 (a) RULEMAKING REQUIRED.—

1 (1) IN GENERAL.—Not later than 18 months
2 after the date of the enactment of this Act, the
3 Commission shall issue rules for the provision of
4 emergency connectivity service under which—

5 (A) a person may submit to the Commis-
6 sion an application for approval to provide such
7 service to an area—

8 (i) that is an unserved area with re-
9 spect to either or both services described in
10 subsection (g)(5)(B); or

11 (ii) in the event that such area be-
12 comes an unserved area with respect to ei-
13 ther or both such services due to destruc-
14 tion of infrastructure, a power outage, or
15 any other reason; and

16 (B) for any period during which such ap-
17 proval is in effect and such area is an unserved
18 area, such person will receive access to electro-
19 magnetic spectrum under subsection (d) to pro-
20 vide emergency connectivity service to such
21 area.

22 (2) DEADLINE TO INITIATE RULEMAKING.—
23 The Commission shall initiate a rulemaking to issue
24 the rules required by paragraph (1) not later than
25 180 days after the date of the enactment of this Act.

1 (b) CERTIFICATIONS.—In the rules issued under sub-
2 section (a), the Commission shall require a person who
3 submits an application under such rules to provide emer-
4 gency connectivity service, in order for such application
5 to be approved, to certify to the Commission the following:

6 (1) Such person has a technical proposal de-
7 scribing how such person plans to provide such serv-
8 ice.

9 (2) Such person will not use any electro-
10 magnetic spectrum to which access is made available
11 under subsection (d) to provide any service other
12 than emergency connectivity service, unless such
13 other service is provided under a separate authoriza-
14 tion to use such spectrum held by such person.

15 (3) Such service can withstand the impact of
16 major natural disasters, such as earthquakes, hurri-
17 canes, wildfires, floods, blizzards, and tornados.

18 (4) Such person has the capability to begin pro-
19 viding such service in a rapid manner—

20 (A) in the case of an application to provide
21 emergency connectivity service to an area that
22 is an unserved area at the time at which the ap-
23 plication is submitted, after the approval of the
24 application; or

1 (B) in the case of an application to provide
2 emergency connectivity service to an area in the
3 event that such area becomes an unserved area
4 due to destruction of infrastructure, a power
5 outage, or any other reason, after such area be-
6 comes an unserved area.

7 (c) PUBLICATION OF LIST OF PROVIDERS.—The
8 Commission shall publish on the internet website of the
9 Commission a list of all providers of emergency
10 connectivity service for which an approval is in effect to
11 provide such service under the rules issued under sub-
12 section (a).

13 (d) ACCESS TO ELECTROMAGNETIC SPECTRUM.—
14 The Commission shall include in the rules issued under
15 subsection (a) service rules that make available, to a pro-
16 vider of emergency connectivity service for which an ap-
17 proval to provide such service to an unserved area is in
18 effect under the rules issued under such subsection, access
19 to electromagnetic spectrum to provide such service to
20 such area, to the extent such provider needs such access
21 to provide such service. Such service rules shall provide
22 that use of electromagnetic spectrum under such service
23 rules may not cause harmful interference to the use of
24 such spectrum by a licensee who holds a license to use
25 such spectrum.

1 (e) AREAS UNSERVED WITH RESPECT TO BOTH
2 SERVICES.—In the case of an area that is an unserved
3 area with respect to both services described in subsection
4 (g)(5)(B), the rules issued under subsection (a) shall re-
5 quire that, if a provider for which an approval to provide
6 emergency connectivity service to such area is in effect
7 under such rules chooses to provide emergency
8 connectivity service to such area, such provider shall pro-
9 vide both services described in subsection (g)(5)(B) to
10 such area.

11 (f) LIMITATION OF LIABILITY.—

12 (1) TRANSMISSION OF ALERT MESSAGES.—Sec-
13 tion 602(e)(1) of the Warning, Alert, and Response
14 Network Act (47 U.S.C. 1201(e)(1)) shall apply to
15 a provider of emergency connectivity service (includ-
16 ing its officers, directors, employees, vendors, and
17 agents) with respect to the provision of such service
18 (to the extent such service consists of the provision
19 of the service described in subsection (g)(5)(B)(i) in
20 accordance with the rules issued under subsection
21 (a), as if such provider were a provider of commer-
22 cial mobile service that transmits alert messages and
23 meets its obligations under such Act.

24 (2) PROVISION OF 9–1–1 SERVICE.—

1 (A) IN GENERAL.—Section 4 of the Wire-
2 less Communications and Public Safety Act of
3 1999 (47 U.S.C. 615a) is amended—

4 (i) in subsection (a)—

5 (I) by inserting “emergency
6 connectivity service provider,” after
7 “IP-enabled voice service provider,”;
8 and

9 (II) by inserting “emergency
10 connectivity service,” after “emer-
11 gency services,”;

12 (ii) in subsection (b)—

13 (I) by striking “IP-enabled voice
14 service or” and inserting “IP-enabled
15 voice service, emergency connectivity
16 service, or”; and

17 (II) by inserting “emergency
18 connectivity service,” after “IP-en-
19 abled voice service,”; and

20 (iii) in subsection (c), by inserting
21 “emergency connectivity service,” after
22 “IP-enabled voice service,” each place it
23 appears.

24 (B) DEFINITIONS.—Section 7 of the Wire-
25 less Communications and Public Safety Act of

1 1999 (47 U.S.C. 615b) is amended by adding
2 at the end the following:

3 “(11) EMERGENCY CONNECTIVITY SERVICE.—
4 The term ‘emergency connectivity service’ has the
5 meaning given such term in paragraph (5) of section
6 2(g) of the Advanced, Local Emergency Response
7 Telecommunications Parity Act, to the extent such
8 service consists of the provision of the service de-
9 scribed in subparagraph (B)(ii) of such paragraph.

10 “(12) EMERGENCY CONNECTIVITY SERVICE
11 PROVIDER.—The term ‘emergency connectivity serv-
12 ice provider’ means a person who provides emer-
13 gency connectivity service in accordance with the
14 rules issued under section 2(a) of the Advanced,
15 Local Emergency Response Telecommunications
16 Parity Act.”.

17 (g) DEFINITIONS.—In this section:

18 (1) ALERT MESSAGE.—The term “alert mes-
19 sage” has the meaning given such term in section
20 10.10 of title 47, Code of Federal Regulations (or
21 any successor regulation).

22 (2) COMMERCIAL MOBILE SERVICE.—The term
23 “commercial mobile service” has the meaning given
24 such term in section 332(d) of the Communications
25 Act of 1934 (47 U.S.C. 332(d)).

1 (3) COMMISSION.—The term “Commission”
2 means the Federal Communications Commission.

3 (4) COVERED DEVICE.—The term “covered de-
4 vice” means—

5 (A) a mobile device; or

6 (B) any other device that is capable of—

7 (i) receiving alert messages; and

8 (ii) providing emergency information
9 to a public safety answering point (which
10 may include enhanced 9–1–1 service).

11 (5) EMERGENCY CONNECTIVITY SERVICE.—

12 (A) IN GENERAL.—The term “emergency
13 connectivity service” means a service—

14 (i) to which covered devices are capa-
15 ble of connecting—

16 (I) without any technical capa-
17 bility specific to such service; and

18 (II) regardless of whether com-
19 mercial mobile service or any other
20 service is initialized on the device; and

21 (ii) that consists only of the provision
22 of a service described in subparagraph (B)
23 to an area that is an unserved area with
24 respect to such service, which shall include
25 the provision of both such services if such

1 area is an unserved area with respect to
2 both such services.

3 (B) SERVICES DESCRIBED.—The services
4 described in this subparagraph are the fol-
5 lowing:

6 (i) Transmitting alert messages to
7 covered devices.

8 (ii) Providing emergency information
9 from a covered device to a public safety
10 answering point (which may include en-
11 hanced 9–1–1 service).

12 (6) ENHANCED 9–1–1 SERVICE.—The term “en-
13 hanced 9–1–1 service” has the meaning given such
14 term in section 7 of the Wireless Communications
15 and Public Safety Act of 1999 (47 U.S.C. 615b).

16 (7) MOBILE DEVICE.—The term “mobile de-
17 vice” has the meaning given such term in section
18 10.10 of title 47, Code of Federal Regulations (or
19 any successor regulation).

20 (8) PUBLIC SAFETY ANSWERING POINT.—The
21 term “public safety answering point” has the mean-
22 ing given such term in section 7 of the Wireless
23 Communications and Public Safety Act of 1999 (47
24 U.S.C. 615b).

1 (9) UNSERVED AREA.—The term “unserved
2 area” means, with respect to a service described in
3 paragraph (5)(B), an area that, due to lack of infra-
4 structure, destruction of infrastructure, a power out-
5 age, or any other reason, has no provider of com-
6 mercial mobile service that is capable of providing
7 such service.



ENSURING US LEADERSHIP IN 5G

February 8, 2023

The Honorable Cathy McMorris Rodgers
U.S. House of Representatives
Chair
Committee on Energy and Commerce

The Honorable Frank Pallone
U.S. House of Representatives
Ranking Member
Committee on Energy and Commerce

The Honorable Bob Latta
U.S. House of Representatives
Chair
Subcommittee on Communications
and Technology

The Honorable Doris Matsui
U.S. House of Representatives
Ranking Member
Subcommittee on Communications
and Technology

To the Members of the House Energy and Commerce Committee:

Thank you for holding today's hearing entitled, "Liftoff: Unleashing Innovation in Satellite Communications Technologies." The 5G for 12 GHz Coalition is a collection of 37 prominent public interest groups, trade associations, and companies that are united in urging the Federal Communications Commission (FCC) to act swiftly to modernize decades-old rules and allow the critical capacity of the 12.2-12.7 GHz spectrum band to be used for 5G and fixed wireless services.

The Coalition understands that the focus of today's hearing is strictly on satellite technologies and the proposed satellite bills. Nevertheless, SpaceX has elected to raise unfounded concerns over the FCC's ongoing 12 GHz band proceeding in its testimony. SpaceX's testimony yet again does not accurately portray the opportunity of the 12 GHz band, and the Coalition believes it is necessary to set the record straight for the Committee.

First, by unlocking 500 MHz of mid-band spectrum and opening up the 12 GHz band to terrestrial services, we can narrow the digital divide for many constituencies, including for students who will be able to achieve more in the classroom, doctors and patients who will have access to critical health care services, and those living in rural areas and on tribal lands who will be able to get online.

Second, allowing the 12 GHz band to be used for terrestrial services, including 5G, not only provides more opportunities, greater competition, and consumer choice here at home, but it also allows the United States to remain a technology leader on the global stage. Though the FCC has taken positive action to bolster connectivity for consumers and open more mid-band spectrum, the United States is still losing the 5G race to China, ranking last among 13 major wireless markets. The FCC has developed a complete record that justifies opening the 12 GHz band immediately which would propel the U.S. into a global leader for available 5G mid-band spectrum, eclipsing China's spectrum deployment and helping cement America's global competitiveness. Moreover, action by the FCC now would

represent a coordinated and complementary initiative to the upcoming NTIA broadband grants.

Finally, the Coalition believes—and has proven based on sound engineering from respected experts—that sharing of the 12 GHz band between non-geostationary satellite services (NGSOs) and terrestrial wireless services is eminently possible. Indeed, the goal of this entire effort is to bring more Americans online without further delay by connecting them to next generation technologies while protecting existing services from harmful interference. It should be noted that SpaceX has access to 15,000 MHz of other spectrum (that it received at no cost) that it is authorized to use besides the 12 GHz band. SpaceX wants to monopolize the 12 GHz band and deprive the American public of greater connectivity from innovative terrestrial services. The Coalition, in contrast, believes that the 12 GHz band can and should be shared, creating a win-win-win for consumers, satellite operators, and providers that intend to use the band to deliver much-needed broadband and wireless services.

In sum, the 12 GHz band is a once in a generation opportunity to improve the lives of millions of Americans and set the country on the path to global telecommunications leadership—if we act today. We urge the Committee to encourage the FCC to move forward with its rulemaking so the United States can take advantage of this opportunity.

Sincerely,

The 5G for 12 GHz Coalition

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
REVISING LICENSE DETERMINATION) RM - _____
RULES FOR NON-GEOSTATIONARY)
(“NGSO”) LICENSE APPLICATIONS)
)
)

To: FCC Secretary

PETITION FOR RULEMAKING

Pursuant to Section 1.401 of the Commission’s rules, the Olin Satellite + Spectrum Technology & Policy (“OSSTP”) Group hereby requests that the Commission expand its ongoing efforts to 1) address staffing needs¹ and 2) review and revise non-geostationary (“NGSO”) satellite system requirements to include a clearly defined period of time within which the Commission must make a license determination on NGSO applications.

The creation of such license determination rules aligns with the goals of the bipartisan discussion draft legislation, “SAT Streaming Act of 2022” that the Republican and Democratic leaders of the House Energy and Commerce Committee circulated publicly to Congress in September 2022.² This would also serve the public interest in offering a reasonable sense of regulatory certainty and long-term technical and financial clarity, given the milestone and surety bond requirements, defined in 25.164³ and 25.165,⁴ respectively.

¹ Press Release, FCC, Chairwoman Rosenworcel Proposes Space Bureau (Nov 3, 2022), <https://www.fcc.gov/document/chairwoman-rosenworcel-proposes-space-bureau>
² See Satellite And Telecommunications Streamlining Act of 2022 – Discussion Draft Legislation, 117th Congress 2D Session, (2022) (“SAT Streamlining Act of 2022”)
³ See 47 C.F.R. § 25.164 (2021) (“Milestones”)
⁴ See 47 C.F.R. § 25.165 (2021) (“Surety Bonds”)

BACKGROUND

The OSSTP Group is funded in part through the National Science Foundation (“NSF”)’s Spectrum Innovation Center: SpectrumX⁵ and the Amateur Radio Digital Communications (ARDC) Grant, and consists of researchers and satellite industry mentors who apply data analytics and modeling tools to develop technology, and influence policy pertaining to satellite systems and spectrum. The ultimate vision of the OSSTP Group is to aid in the creation of a safe and sustainable space environment in which many spectrum-users coexist for years to come, all while educating the next generation of policymakers and technologists through apprenticeship-styled learning experiences.

The OSSTP Group stresses that the primary goals of this petition are 1) to acknowledge the level to which the International Bureau (“IB”) is overloaded and understaffed, and 2) to identify systematic issues with the NGSO filing process, requesting the Commission explore areas that will holistically streamline authorization. The OSSTP Group commends the IB for all that it has processed given the unprecedented challenges of the issues at hand and its staffing shortage. The OSSTP Group urges the Commission to continue to expeditiously allocate resources in staff count and process so that pressing issues like market access applications and rulemakings are addressed with increased efficiency.

In 2003, the Commission adopted a new regime in processing NGSO Fixed Satellite Service (“FSS”) applications incorporating Processing Rounds with the aim of authorizing such systems expeditiously and in an efficient manner.⁶ When the Processing Round regime was initiated, it was unlikely that the Commission expected that two decades later they would face a

⁵ SpectrumX, <https://www.spectrumx.org/>

⁶ See Amendment of the Commission’s Space Station Licensing Rules and Policies, 18 FCC Rcd. 10760, (2003) (“2003 Licensing Reform Order”).

complex cascade of processing rounds, each with approximately ten applicants, nor did the Commission likely expect multiple systems to launch and come to fruition. Aspects of the licensing approach need review, as the uncertainty due to the increasingly long application processing time alone threatens to undermine the efficiency, certainty, and fairness of the Processing Round licensing regime. The processing round system was crucial to the rapid growth of the NGSO satellite sector today, which has attracted billions of dollars worth of investments and has already supported the connection of more than half a million users (Starlink and SES Networks consumer and enterprise combined).⁷

An April 2022 OSSTP Group report, authored by A. Kriezis and W. Q. Lohmeyer, showed that since 2016, more than twenty distinct FSS entities have filed for a total of more than 70,000 satellites to serve the U.S. Market.⁸ Additional detail on the specific frequency ranges and operator information of each round is contained within the April 2022 OSSTP Group's Industry Report, but in summary, these applications took place across four processing rounds with the following submission dates and frequencies:

- November 15, 2016: Ku-/Ka-band⁹
- March 1, 2017: V-band¹⁰
- May 26, 2020: Ku-/Ka-band¹¹
- November 4, 2021: V-band¹²

In the 2016 Ku-/Ka-band Processing Round, it took an average of 2.0 years (ranging

⁷ Michael Sheetz, SpaceX's Starlink satellite internet surpasses 400,000 subscribers globally, CNBC, May 25, 2022, <https://www.cnbc.com/2022/05/25/spacexs-starlink-surpasses-400000-subscribers-globally.html>

⁸ See A. Kriezis and W. Q. Lohmeyer, *U.S. Market Access Authorization Timeline Analysis for Megaconstellation Networks*, OSSTP (Apr, 2022), <https://www.osstp.org/fcc-analysis> ("OSSTP Group Industry Report")

⁹ <https://docs.fcc.gov/public/attachments/DA-16-804A1.pdf>

¹⁰ <https://docs.fcc.gov/public/attachments/DA-16-1244A1.pdf>

¹¹ <https://docs.fcc.gov/public/attachments/DA-20-325A1.pdf>

¹² <https://docs.fcc.gov/public/attachments/DA-21-941A1.docx>

approximately 1.0 - 3.8 years) from the point at which an operator first submitted an FCC U.S. Market Access Application to the time at which the FCC made their First Action. In the second round (March 2017: V-band), this value increased by nearly a year to 2.9 years (ranging from 1.3 - 4.1 years).¹³ However, this analysis does not tell the whole story. Delays are cascading due to a variety of reasons including, but not limited to, IB understaffing and the parallel processing of complex rulemakings and modifications. The Commission has a major backlog of applications, processing times for modifications are increasing, and a fifth Processing Round is imminent. All of which ultimately does not align with the Commission's goals to put spectrum to use quickly.¹⁴

Furthermore, of the 2016 Ku-/Ka-band and 2017 V-band Processing Round applicants that have received authorization, three systems, Kepler, SpaceX and OneWeb, have already started launching their systems. Figure 1 depicts the individual launch events as well as the cumulative number of OneWeb and Starlink satellites already in orbit. Kepler was not included in this figure, but has launched nineteen satellites.¹⁵

¹³ OSSTP Group Industry Report

¹⁴ See Filing of Applications for New Space Stations in the Fixed-Satellite Service, 93 F.C.C.2d 1260, ¶ 11 (1983).

¹⁵ Press Release, Kepler, Kepler Communications Announces Successful Launch of 4 New GEN1 Satellites Including Test Bed for ÆTHER™ Service (Jan. 13, 2022).

<https://www.globenewswire.com/news-release/2022/01/13/2366739/0/en/Kepler-Communications-Announces-Successful-Launch-of-4-New-GEN1-Satellites-Including-Test-Bed-for-%C3%86THER-Service.html>

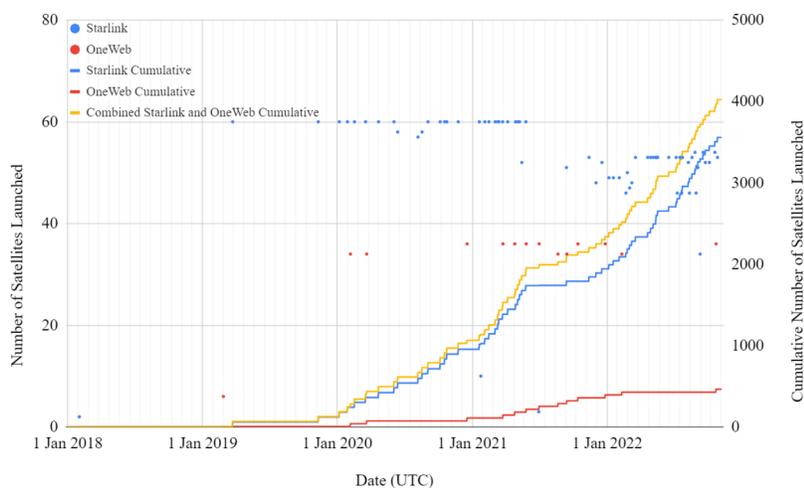


Fig. 1: Number of satellites launched by Starlink and OneWeb by launch and cumulatively

As of November 9, 2022, Starlink had deployed a total of 3,558 satellites,¹⁶ and OneWeb had deployed 464 satellites,¹⁷ totaling 4,022 satellites across the two networks. The first two Starlink satellites launched on February 2, 2018, followed by regular launches of approximately sixty satellites per launch on March 24, 2019.¹⁸ The first six OneWeb satellites launched on February 27, 2019, followed by a launch of thirty-four satellites on February 6, 2020.¹⁹

As of the date of this petition, only two of the ten 2020 Ku-/Ka-band Processing Round applications have received a First Action: one of the two applicants (Amazon Kuiper²⁰) received

¹⁶ SpaceX, <https://www.spacex.com/launches/> (“SpaceX Launches”)

¹⁷ OneWeb, <https://oneweb.net/resources/launch-programme> (“OneWeb Launches”)

¹⁸ SpaceX Launches

¹⁹ OneWeb Launches

²⁰ See Application For Satellite Space Station Authorizations, IBFS File No. SAT-LOA-20190704-00057 (Jul. 4, 2019) (“Amazon Application”).

a grant of approval and the other (EOS Defense²¹) withdrew their application. Amazon Kuiper's application²² was processed and granted in 391 days (1.07 years) while the remaining applications have remained under review for over two years. This trend of increasingly long wait times continues to hold in the most recent 2021 V-band round, in which all twelve of the submitted applications have been under review for more than a year (as of November 9, 2022).

DISCUSSION

As time progresses, one might expect the FCC's application processing time to decrease. Unfortunately, despite the Commission gaining familiarity with reviewing the FSS networks, the duration of time from application submission to FCC First Action has increased. This can potentially be attributed to the FCC's parallel efforts to address: 1) Multiple, complex rulemakings (e.g. the R&O and NPRM on "Revising Spectrum Sharing Rules for Non-Geostationary Orbit, Fixed-Satellite Service Systems", referred to as the "NGSO Sharing R&O/NPRM"²³ and the R&O and FNPRM on the "Mitigation of Orbital Debris in the New Space Age"²⁴), 2) Contentious modification requests of NGSO FSS system parameters,²⁵ as well as the depletion of staff in the FCC's International Bureau (IB).

The OSSTP Group is encouraged to see Chairwoman Rosenworcel's plan to reorganize the agency and establish a Space Bureau with a standalone Office of International Affairs, and urges the Commission to thoughtfully and expeditiously establish the new Space Bureau and

²¹ See FCC Application For Space And Earth Station: MOD or AMD, IBFS File No. SAT-MOD-20200526-00057 (May 26 2020).

²² Amazon Application

²³ See FCC Moves to Facilitate Satellite Broadband Competition, 87 FR 3481 (2022). *Systems*, 35 FCC Rcd 4156 (5), (2021) ("NGSO Sharing R&O/NPRM")

²⁴ See *FCC Updates Orbital Debris Mitigation Rules for the New Space Age*, FCC 35 FCC Rcd 4156 (5)(2020) ("Orbital Debris Mitigation Rules for the New Space Age R&O/ FNPRM")

²⁵ See Application For Satellite Space Station Authorizations, IBFS File No. SAT-LOA-20200526-00055 (May. 20, 2020) ("SpaceX Mod-2 Application").

increase staff count in a way does not contribute to additional delays in NGSO application processing.²⁶ The OSSTP Group also commends the Commission's efforts to address rulemakings and their dedication to defining policies that foster innovation, and urges the Commission to address the increased processing time of applications - as the uncertainty creates an environment that is not conducive to the large-scale investment in and deployment of spectrally efficient NGSO systems.

Due to the nature of the Processing Rounds, applicants must file a market access application within a given window, or potentially risk being considered in a later round, impacting their priority. To avoid this, network operators often file for over-designed systems, and request to submit orbital debris showings once their design has matured past key design milestones like Critical Design Review. As a result, the Commission often grants conditional licenses, requiring the licensee to file a modification that shows how it will comply with certain conditions like orbital debris rules. Currently, this means that after at least a two-year delay in license grant, the licensee could have a second multi-year delay in obtaining the modification approval required for launch.

With the current variability in NGSO FSS application processing time, it is difficult for applicants to make informed decisions around the technical buildout and financial timelines of their systems. One of the numerous financial requirements pertains to the payment schedules for the \$5M escalating surety bond required thirty days after authorization grant under 25.165.²⁷ While one might think that \$5M is minimal compared to the billions of dollars required to deploy these networks, funding, securing and scheduling this payment is not necessarily trivial for

²⁶ Press Release, FCC, Chairwoman Rosenworcel Proposes Space Bureau (Nov 3, 2022), <https://www.fcc.gov/document/chairwoman-rosenworcel-proposes-space-bureau>

²⁷ See 47 C.F.R. § 25.164 (2021)

smaller entities and startups working to enter the sector. Smaller companies must also plan for the buildout and deployment of their system, but due to the uncertainty in the licensing process, have no clear visibility into when they will be authorized to start or under what conditions their license will stipulate operations. When the license is granted, these companies must ensure their launch schedule is designed to meet the milestone requirements codified in 25.164 of the Commission's Rules. In other words, entrants are on the hook to build - nor not build - while they wait for the Commission to act.

In September 2022, the Republican and Democratic leaders of the House Energy and Commerce Committee circulated new bipartisan discussion draft legislation titled "SAT Streaming Act of 2022" to secure American leadership in Satellite Communications.²⁸ If adopted, this Bill would require the Commission amend Part 25, Title 47, Code of Federal Regulations to determine whether to grant NGSO licenses (as well as GSO licenses) and major modifications no later than one year after the date on which a written application is submitted to the Commission. This draft Bill would also require that the Commission determine the sufficiency, whether a license meets a set of additional criteria (primarily pertaining to transmission performance metrics, orbital parameters, maneuverability, debris mitigation) not later than sixty-days after which a written application is submitted to the Commission, and determine whether to grant minor modifications within ninety-days of receiving the request to modify.²⁹ The Energy and Commerce Committee stresses further that American companies are revolutionizing the communications marketplace and that we must streamline our regulatory process to usher in a new era of American innovation and investment, particularly as our economic competitors, like

²⁸ Press Release: New Bipartisan E&C Draft Legislation Will Secure American Leadership in Satellite Communications, <https://republicans-energycommerce.house.gov/news/new-bipartisan-cc-draft-legislation-will-secure-american-leadership-in-satellite-communications/> (2022) ("Energy & Commerce Committee Press Release")

²⁹ SAT Streamlining Act of 2022

China, race to dominate this industry.³⁰

At this time, there is no clear consensus across the NGSO or GSO FSS industry as to the length or general efficacy of a “shot-clock” on license determination. However, the OSSTP Group is aligned with the discussion draft legislation, and petitions the FCC to implement a default one-year “shot-clock” on the license determination for NGSO FSS systems, and to seek comment on the need for, and duration of, “shot-clocks” for FSS application sufficiency and license modifications.

The implementation of such a standards, in tandem with the recent review of NGSO Sharing³¹ and Orbital Debris Mitigation Rules,³² would revitalize the NGSO application process, alleviating stakeholders’ grievances with the current open-ended process and enabling the financing and technical deployment of NGSO systems at a more predictable pace. A default one-year “shot-clock” on NGSO U.S. Market Applications would also address the increasingly long wait times that existing and future applicants face, while also offering regulatory certainty that will better enable predictable technical development, and funding of NGSO systems.³³ Of course, applicants could seek a waiver for this rule, should license determination within one-year of application submission not be desired.

It is clear that the goals of this discussion draft legislation: to promote responsible space use, incentivize investment and innovation, and advance U.S. leadership in next-generation satellite systems align with the goals of this petition. In acting on this necessary petition to review and revise its NGSO licensing rules, the Commission can proactively effectuate Congressional intent, as passage of legislation can be uncertain and take extended periods of time.

³⁰ Energy and Commerce Committee Press Release

³¹ NGSO Sharing R&O/NPRM

³² Orbital Debris Mitigation Rules for the New Space Age R&O/ FNPRM

³³ OSSTP Group Industry Report

CONCLUSION

Historically, the Commission has found that significant delays in satellite licensing impose costs on society that are not consistent with good spectrum policy,³⁴ and has worked to address concerns with the open-ended nature of the application process, such as the establishment of the processing round licensing regime that occurred in 2003.³⁵ While the Commission aims to provide finality, certainty, and fairness to the NGSO processing round regime, the current uncertainty of application processing times has subverted this intent and does not serve the public interest.

The implementation of a one-year “shot-clock” on NGSO applications would fulfill the Commission’s goals, elegantly offer applicants technical and financial clarity - eliminating concerns related to the uncertainty of an application’s processing time - and incentivize the rapid development and deployment of these systems, allowing them to expeditiously reach underserved and unserved communities. Accordingly, the Olin Satellite + Spectrum Technology & Policy (OSSTP) Group respectfully requests that the Commission initiate a rulemaking proceeding to revise its current license determination rules for non-geostationary (“NGSO”) satellite systems, requiring determination of authorization within one year of NGSO application submission.

³⁴ See Filing of Applications for New Space Stations in the Fixed-Satellite Service, 93 F.C.C.2d 1260, ¶ 11 (1983).

³⁵ 2003 Licensing Reform Order

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Respectfully submitted,

**OLIN SATELLITE + SPECTRUM
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November 9, 2022

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Questions for the Record

Subcommittee on Communications and Technology

Hearing entitled,

“Liftoff: Unleashing Innovation in Satellite Communications Technologies”

February 8, 2023

**Mr. William Richardson, Deputy Associate General Counsel for Agenda Review, Federal
Communications Commission**

The Honorable Russ Fulcher

1. We're seeing more satellite companies offering broadband service to help close the digital divide. Will the SAT Streamlining Act expedite the licensing process so we can get these satellites up as quickly as possible to meet this need?

Response:

Space-based broadband services are critical in helping to close the digital divide and connect everyone, everywhere. The SAT Streamlining Act, in combination with other ongoing FCC initiatives to modernize the satellite licensing processes, will provide the FCC with additional tools to facilitate faster licensing times, allowing satellite operators to move forward with plans to provide broadband services that benefit American consumers. We look forward to continuing to provide technical assistance on this bill.

Streamlining and updating the satellite licensing rules and framework are a priority for the FCC. Significantly, the FCC recently released a Notice of Proposed Rulemaking (NPRM) which proposes to change the way the Commission licenses space and earth station applications to stay apace with the unprecedented number of satellite applications that have been filed over the course of the past couple of years.¹ Specifically, the NPRM seeks comment on ways to speed up the process for placing applications on public notice – the first step in building a public record. The NPRM also seeks comment on how to reduce processing timelines and other ways to streamline satellite application processing. The public comment period closes on April 5 and we look forward to reviewing the comments on our proposals and the additional ideas submitted by interested parties, and to moving quickly to final rules.

Further, as noted during the February 8 hearing, we have increased by 38% the size of the Satellite Division staff to help expedite the licensing process, including adding six new engineers. We continue to recruit and train engineering talent and look forward to further growing the engineering resources within the Commission. We have already reaped some benefits of the increase in staff, with a reduction in the earth station application backlog by more than twenty percent. In addition, in January, the Commission voted to create a new Space Bureau. The Space Bureau, once established, will prioritize attention to the needs of the satellite industry and focus Commission resources on those needs.

2. Can you discuss the differences and challenges the FCC faces in approving licenses for LEO satellite constellations versus other satellites? How can we make the process easier?

Response:

The satellite industry is growing at a record pace. Over the past two years alone, the FCC has received applications for 64,000 new satellites and hundreds of applications for new earth stations to communicate with these satellites. The applications include proposals for different

¹ *Expediting Initial Processing of Satellite and Earth Station Applications*, IB Docket Nos. 22-411 and 22-271, Notice of Proposed Rulemaking, FCC 22-95, (Dec. 21, 2022)

types of satellite systems, including non-geostationary satellite orbit systems seeking to provide internet service via large constellations in LEO, smaller constellations seeking to provide remote sensing type services, and next generation high-throughput geostationary satellite orbit (GSO) systems. As noted in the response to question 1, the FCC has several ongoing initiatives to respond to the need for a new regulatory framework in order to keep pace with new satellite technologies and proposals.

Response:

Many of these proposals are more technically complex and must be analyzed on a case-by-case basis. Further, many systems are designed to operate across frequency bands that are shared with satellite operators with different architectures, such as Federal government users. In addition, many of these satellite systems operate in frequency bands that are shared with terrestrial systems. These factors add additional layers of complexity and coordination to ensure that there is no harmful interference to other operators.

The Honorable August Pfluger

1. As space is shared jurisdiction with a host of other countries, how should Congress be thinking about developing sustainable rules and international collaborations, especially with malign actors like China and Russia who pose a threat to our national security, including in space?

Response:

This is an important issue and the FCC is working closely with the State Department and our colleagues throughout the U.S. government to make sure the United States is a leader in the various international fora where these issues are discussed, such as the International Telecommunication Union, (ITU) standards-setting bodies, and the United Nations Committee on Peaceful Use of Outer Space. Significantly, the U.S. holds several leadership positions at the ITU, including in the ITU's Radiocommunication Sector as well as the ITU's Telecommunication Development Sector. At home, the United States should be at the forefront in developing and implementing strong space sustainability rules for those wanting to provide satellite services in the United States, and therefore lead the world by example, including through sharing our regulatory best practices with other interested Administrations. For example, FCC and other U.S. government experts, advocate and share U.S. government views and policies on space sustainability with our counterparts through international training sessions in the United States Telecommunications Training Institute and other US government-led initiatives.

Questions for the Record

Subcommittee on Communications and Technology

Hearing on

“Liftoff: Unleashing Innovation in Satellite Communications Technologies”

February 8, 2023

Mr. Charles Glass, Chief, International Spectrum Policy Division, Office of Spectrum Management, National Telecommunications and Information Administration

The Honorable Russ Fulcher (R-ID)

1. Are there on the ground permitting challenges particular to satellite, particularly with Low- Earth Orbit (LEO) satellite services? If so, can you address those challenges?

RESPONSE: The National Telecommunications and Information Administration (NTIA) is not in a position to speak authoritatively regarding specific commercial satellite Earth station permitting challenges. However, where spectrum bands are shared between the federal government and commercial satellite interests there are existing coordination procedures that provide a clear process for permitting commercial Earth stations according to the particular bands being utilized.

2. Can you discuss reforms raised by industry to open more spectrum to commercial users, particularly in rural and interior areas of the country, while ensuring national security and public safety needs are being met?

RESPONSE: We very much appreciate the desire of commercial providers to respond to ever increasing consumer demand and to deliver innovative spectrum-based services. This is an exciting time for the satellite industry, and we can understand the interest in reforms. Given the nature of some of these proposals, this is primarily an issue for the Federal Communications Commission’s (FCC) consideration, as NTIA coordinates and authorizes federal satellite operations. NTIA understands the urgent needs of the satellite industry and tries to pre-coordinate use of federal spectrum to help facilitate the process. NTIA looks forward to continuing to work with the FCC and satellite industry to streamline access where possible.

The Honorable August Pfluger (R-TX)

1. As space is shared jurisdiction with a host of other countries, how should Congress be thinking about developing sustainable rules and international collaborations, especially with malign actors like China and Russia who pose a threat to our national security, including in space?

RESPONSE: Consistent with the President’s 2024 budget and pursuant to the United States Space Priorities Framework, the Biden-Harris Administration is advancing a policy and regulatory environment that enables a competitive and burgeoning U.S. commercial space sector. To create free and fair market competition internationally, the United States is working with allies and partners to update and harmonize space policies, regulations and other measures that

govern commercial activities worldwide. Even as we continue to champion U.S. technologies and businesses, the United States must cooperate with other countries and encourage an enabling environment for the sustainable and peaceful use of outer space. The United States must, therefore, continue to lead in important international fora, including the International Telecommunication Union (ITU) and UN Committee on the Peaceful Use of Outer Space (COPUOS), among others, to increase international collaboration and coordination on space issues including through transparent, expert-led dialogue. The United States must also continue to invest in research and development to ensure U.S. technologies and innovations continue to lead the world. Finally, the U.S. private sector should continue to innovate technologies and business models that conform to applicable laws and regulations and support sustainable economic development.

2. Do you have specific concerns over international cybersecurity coordination for satellite technology given the immense amount of data satellites collect?

RESPONSE: Cybersecurity is an important issue for communications networks. Currently, there is no established international body for considering cybersecurity coordination specifically for satellite technology. Therefore, satellite cybersecurity issues must be addressed through existing overall cybersecurity coordination within the United States and with our allies. For example, the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency formed the Space Systems Critical Infrastructure Working Group, which includes a mix of government and industry members, to identify and develop strategies to minimize risk to space systems, including satellites.

Question for the Record for Whitney Q. Lohmeyer following the February 8, 2023 Hearing of the House Energy and Commerce Subcommittee on Communications and Technology

March 10, 2023

Question from the Honorable Earl L. "Buddy" Carter

Have regulatory barriers at the FCC and NTIA contributed to the current digital divide due to how difficult it is to license a satellite system? Has it delayed connectivity in remote parts of the country?

The FCC's licensing system has not delayed satellite connectivity in remote parts of the country, nor has it actively contributed to the current digital divide. However, the system and lack of available spectrum for satellite operations (in UHF and S-band) has caused operators to consider filing off-shore through overseas administrations.

To elaborate, the FCC has inherited a processing round approach that has challenges given the unprecedented volume and complexity of today's satellite networks. Since 2016, more than twenty-entities have filed for more than 70,000 satellites for NGSO FSS spectrum alone¹. Chairwoman Rosenworcel proactively established the Space Bureau to address the increasingly long wait-times and lack of clarity in the current satellite licensing process. Now, it is imperative that Congress ensures the Commission's Space Bureau has adequate support and resources (staffing, data, training, equipment, etc.), so that they can methodically and intentionally define policies and license systems. Inadequate and tardy support for the Space Bureau could threaten our nation's leadership in this sector and the space situational awareness of our planet.

¹ See A. Kriezis and W. Q. Lohmeyer, U.S. Market Access Authorization Timeline Analysis for Megaconstellation Networks, OSSTP (Apr, 2022), <https://www.osstp.org/fcc-analysis>



Questions for the Record Responses

**From: Peter Davidson, Vice President of Global Government Affairs & Policy, IntelSat
before the United States House of Representatives Energy and Commerce Committee
Subcommittee on Communications and Technology**

**Re: Legislative Hearing: "Liftoff: Unleashing Innovation in Satellite Communications
Technologies."**

March 14th, 2023

Chair Cathy McMorris Rodgers

What role does U.S. spectrum policy and satellite licensing play in maintaining U.S. leadership at the international level in the space economy?

Spectrum is the foundation of the space economy. Access to adequate spectrum for satellite enables critical services for U.S. national security and commerce. It also is imperative for innovative—both on-orbit and for satellite applications such as geospatial analytics for agriculture and climate, integrated 5G communications networks, and remote healthcare and educational opportunities. Thousands of new satellites will be launched in the next few years, most of which will provide a wide array of services to customers; but continued growth in the space sector is reliant on adequate spectrum availability for operations. It is the role of the U.S. government to explore new opportunities to deploy spectrum for commercial uses and to ensure equitable access to spectrum for the space commerce sector.

There is *absolutely* a space race going on between China and the United States and its democratic allies. For the United States to continue leading in the arena of space commerce, Congress must make sure that the satellite industry has access to enough spectrum to support current and future commercial services. It is imperative for the United States to lead the way in ensuring adequate access to spectrum for satellites. It is critical that U.S. policy makers and the private sector work together to craft spectrum policy that maximizes U.S. competitive advantage internationally.

Additionally, we applaud the Committee's attention to satellite licensing's role in promoting innovation. As the demand satellite services continue grow, so does the imperative for cooperative engagement between industry and government to find the right balance between accelerating the Federal Communications Commission (FCC) license approval processes and preventing harmful interference. The SAT Act provides an opportunity for the United States to refresh the application process by eliminating processing inefficiencies and eliminating the processing round system for non-geostationary orbit satellites. We at Intelsat believe that the SAT Act recognizes both the needs of incumbent operators and new entrants, and we look forward to working with Congress as this legislation moves forward. We also believe that the United States can provide a model for the rest of the world in terms of balancing the interests of licensing speed with interference protection.

In conclusion, equitable access to spectrum and streamlining the FCC application process together with promoting U.S. leadership in international policy making bodies are critical in advancing the benefits of space commerce to Americans and people around the world.

The Honorable Rick Allen

We've learned there's a lot of satellites up there, and we know that technology is changing and updating by the hour. Do some of those satellites need to come down, and we need to put new ones up there? What is the program in place for recycling everything up there [in space]?

There are currently roughly about 32,750 objects—a combination of active spacecrafts, decommissioned spacecrafts, and organic and inorganic debris—currently tracked and catalogued by the Department of Defense's Combined Force Space Component Command (CSpOC). Given the increased interest in space, this number will increase as the industry continues expands. While estimates vary, it is likely that tens of thousands of satellites will be launched into space in the next decade, with the vast majority of those going into Low Earth Orbit (LEO).

This increased interest in and use of space, particularly LEO, has not gone unnoticed. Last fall, the Federal Communications Commission (FCC) adopted new rules requiring certain lower-LEO missions to complete disposal as soon as practicable following end of mission, but no later five year post mission. But this rule only applies to FCC-authorized satellites and systems—not NTIA authorized missions or foreign-licensed satellites/systems without market access. More needs to be done to minimize congestion and its corresponding interference, especially in LEO.

Additionally, it is imperative that current regulations and rules keep pace with innovation in the sector. This means ensuring rules are flexible enough to permit new developments of on-orbit services and promoting satellite disposal processes that are economically sustainable. This should also include promoting mission extension and rendezvous operations in order to sustain the satellites that are already in orbit as well. Intelsat has more than 50 years of experience safely deploying, operating, and retiring communications satellites in geostationary orbit (GEO), as part of its mission to connect people, businesses and communities around the world. We were able to demonstrate that in 2020 when Intelsat took part in an historic first when Intelsat 901 docked with Northrup Grumman's first Mission Extension Vehicle (MEV-1). This in-space maneuver was the first time that mission extension services were offered to a satellite in the GEO orbit. As a result, we were able to extend the life of Intelsat 901 for another five years. As demonstrated through our mission, there are many players that can contribute to the space situational awareness effort. Life extension vehicles are just one example of how we can work together to ensure there is equitable access to space. This is why legislation such as the SAT Act encourages new entrants to put space sustainability front of mind by codifying requirements for orbital debris removal.

Intelsat continues to collaborate with partners across industry and government to ensure that safe and equitable access to space. We support a stable and modern regulatory and policy backdrop supporting space sustainability as it is essential to enable expansion and innovation in the space commerce area. We appreciate the interest of Congress in space sustainability and look forward to the future collaboration on this very important topic.



March 6, 2023

Robert Latta
Chairman, Subcommittee on
Communications and Technology,
Committee on Energy and Commerce
U.S. House of Representatives

Doris Matsui
Ranking Member, Subcommittee on
Communications and Technology,
Committee on Energy and Commerce
U.S. House of Representatives

Dear Chairman Latta and Ranking Member Matsui,

Thank you again for the opportunity to testify at the hearing entitled "Liftoff: Unleashing Innovation in Satellite Communications Technologies." Attached to this letter please find responses to the questions for the record submitted by Members of the Committee.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Goldman", with a horizontal line extending to the right.

David Goldman
Senior Director of Satellite Policy

Rep. Carter**1. As both a launch and satellite company, what are the differences in the federal approval processes you have to undergo? What are the different challenges you face with each process?**

Because SpaceX launches its missions from United States soil, it works closely with federal regulators and agency partners to safely conduct its missions. For example, the Federal Aviation Administration (“FAA”) licenses commercial space launches and re-entries to protect the uninvolved public, and the Federal Communications Commission (“FCC”) licenses the spectrum used to communicate with rockets and spacecraft during launches, orbital operations, and re-entries. Launch services providers also work closely with Federal Ranges within NASA and the U.S. Space Force, as well as other Government agencies that serve specific functions related to commercial space operations (e.g., the U.S. Coast Guard for offshore hardware recovery activities). Each process covers a discrete element of launch and space services operations.

For its satellite broadband service, SpaceX designs, builds, and launches from the United States, and is licensed by the FCC to use spectrum to communicate with its ground equipment. The application material includes the frequencies the system will use, technical details regarding space station design such as type of antennas, and detailed information on how the satellites will operate in space and limit the potential for orbital debris. Unfortunately, outdated regulations, exacerbated by the proliferation of delay tactics employed for foreign competitors and late comers, has contributed to the lengthening time it takes for the FCC to process applications. For companies seeking licenses in the United States, the average processing time now takes over two and a half years, with the trend line pointing in the wrong direction. To cite one recent example, SpaceX filed the original application for our Gen 2 system in May 2020, and the Commission had not even sought public comment on the application 15 months later when SpaceX filed an amendment with details it had updated since first filing. The Commission did ask for public comment three months later, and finally granted SpaceX its license in December 2022, nearly 30 months after SpaceX filed the Gen 2 application.

One major delaying factor in satellite license applications is the ability of foreign-licensed competitors to game the system by filing frivolous comments at the FCC that fill the docket with spurious and repetitive filings in a deliberate effort to overwhelm Commission resources. FCC staff has taken the view that it is bound by the Administrative Procedure Act to respond to every filing, no matter how late in the process those filings are received. Typically, foreign-licensed operators leverage a loophole in the FCC’s rules that applies its rules unevenly to U.S. and foreign operators. Foreign operators then exploit this loophole by calling for the FCC to impose conditions and requirements on U.S. operators that would not apply to them and that they could not meet themselves. As just one example, a company that chose to license in a foreign jurisdiction to avoid U.S. oversight filed hundreds of pages in a SpaceX docket 8 months after the comment cycle closed, yet the FCC felt obligated to respond to each new argument dumped on it. Every argument in that filing was eventually rejected by the FCC and later by the courts,

but only after years of litigation and after Commission staff spent months sifting through pages of the frivolous claims.

2. You mention in your testimony that there is currently a preferential regulatory treatment for those who get licensed outside the U.S. How can we attract satellite companies to get licensed in the U.S.?

The main way that the United States government can encourage satellite operators to license in the United States is to improve the regulatory process by which operators receive licenses to provide service, and by applying its rules equally, regardless of whether a system received its license in the United States or abroad. SpaceX recently filed at the Federal Communications Commission seeking equitable application of the conditions that it placed on SpaceX's Gen 2 system for all other systems serving the U.S. market. These conditions include robust space safety requirements and reports, as well as a requirement to coordinate with the National Science Foundation with respect to radio and optical astronomy protections. To be very clear, SpaceX supports these conditions. Indeed, what is good for the SpaceX system should also be good for other satellite constellations. Commission license conditions should be equitably applied to all systems hoping to serve the U.S. market.

Rep. Allen

1. We've learned there's a lot of satellites up there, and we know that technology is changing and updating by the hour. Do some of those satellites need to come down, and we need to put new ones up there? What is the program in place for recycling everything up there [in space]?

SpaceX is constantly innovating and improving the design and functioning of its network. To date, SpaceX has launched more than 4,000 satellites, and has launched the first of its newest satellite -- V2 "mini" satellites -- into orbit. SpaceX satellites are designed for a lifetime of 5-7 years, and when they reach their operational end, SpaceX actively deorbits the satellites safely, creating no persistent debris in space and no risk to humans on the ground. SpaceX takes space safety and sustainability very seriously, and has been an industry leader in promoting responsible space operations. SpaceX's space safety approach includes, but is not limited to:

- **Design and build reliability.** SpaceX satellites are designed and built with high reliability, with reliability now approximately 99% after the deployment of more than 4,000 satellites.
- **Operations below 600 km.** SpaceX has chosen to operate at an altitude below 600 km, since this altitude is self-healing, meaning that objects will decay out of orbit due to atmospheric drag within a short period of time in rare off-nominal scenarios, eliminating the risk of persistent orbital debris. By contrast, several other commercial satellite

constellations are designed to operate above 1,000 km, where it will take hundreds to thousands of years for spacecraft to naturally deorbit if they fail on orbit.

- **Deployment into a low insertion orbit, typically below 300 km.** At this low altitude, any SpaceX satellites that do not pass initial system checkouts are quickly deorbited actively, or by atmospheric drag.
- **Radical transparency and data sharing with the U.S. Government and other satellite owners/operators to ensure full space situational awareness.** SpaceX openly shares high-fidelity future position and velocity prediction data for all SpaceX spacecraft. SpaceX was the first operator to share both ephemeris and covariance data and calls on all other operators to do so. In addition, SpaceX volunteered to provide routine system health reports to the Federal Communications Commission, something no other operator has ever offered or does.
- **Advanced collision avoidance systems protect SpaceX and other satellites.** Every SpaceX satellite is equipped with an autonomous collision avoidance system that ensures it can maneuver away from any other tracked object that could approach it. SpaceX's autonomous collision avoidance system has been evaluated by NASA's Conjunction Assessment and Risk Analysis (CARA) program, which deemed it sufficiently trustworthy to rely on it to avoid collisions with NASA spacecraft.
- **Post-mission disposal.** In nominal scenarios, SpaceX satellites are propulsively deorbited within weeks of spacecraft end of mission. This vastly exceeds the international standard of 25 years.
- **SpaceX spacecraft are 100% demisable.** At end of life, SpaceX satellites are designed to vaporize upon atmospheric reentry, eliminating the risk of falling debris.

Unfortunately, not everyone operates in this responsible manner. The creation of large debris objects has its origins in a relatively few significant events that took place over the last two decades. Many of these events can be directly traced to irresponsible actions by foreign governments, which have intentionally destroyed satellites in space to demonstrate anti-satellite missile capability, or by poor design and operational choices by non-state actors. In addition to debris from the destruction of satellites, derelict rocket bodies have also contributed significant quantities of orbital debris. The Department of Defense currently tracks more than 27,000 pieces of orbital debris through the Space Surveillance Network. There are an estimated 500,000 objects approximately one centimeter in size or larger, and more than 100 million objects at least one millimeter in size. Low Earth orbit ("LEO") constellations, if properly conceived, manufactured and operated, present a highly manageable, low-risk to the space environment, especially when operated at altitudes below 600 km.

Rep. Pfluger

1. **Given recent concerns over spying on American territory, can you talk about the dual-use, or commercial and defense nature of satellite technology, and the importance of America leading in this area?**

SpaceX plays an important role in national defense for the U.S. government. SpaceX is developing a specific product called Starshield for use by the U.S. Department of Defense. Starshield leverages SpaceX's existing satellite technology and launch capability to support national security efforts. While Starlink is designed for consumer and commercial use, Starshield is designed for government use, with an initial focus on three areas: Earth observation, communications, and hosted payloads.

The importance of U.S. leadership in satellite technology cannot be overstated. Other countries are moving forward with significant investment in LEO space systems, and are clearing regulatory obstacles to allow for their state-backed networks to rapidly launch and deploy. China is aggressively pursuing a satellite constellation that is similar to the one operated by SpaceX, with plans to launch approximately 13,000 satellites in the coming years. The European Union is also pursuing its own LEO system, as are Russia and India. Beyond the clear benefits to the U.S. government in having U.S. companies lead in LEO broadband, ceding U.S. leadership in the race to provide satellite internet globally creates significant geopolitical risks. China's "Starnet" system will be folded into the larger Belt and Road Initiative, with aggressive plans to expand into foreign markets in Asia, Africa, and South America. While the U.S. has blocked the installation or use of Chinese hardware for telecommunications networks domestically due to security concerns, many nations have few options when it comes to telecommunications infrastructure and must rely on whoever can provide connectivity. If the United States cedes leadership in this sector, other countries will not hesitate to use their increased leverage to their geopolitical advantage.

Rep. Eshoo

- 1. In your written testimony you mention the regulatory asymmetry that allows foreign licensed systems to evade U.S. regulations. You mention how the current approach drives company operators out of the U.S., but allows them to continue to take advantage of the U.S. market. For the record, please explain how the current U.S. system allows foreign licensed systems to evade U.S. regulations, what the FCC has done and could do to address this issue, and what actions, if any, congress should take to address the issue.**

With the pace of space innovation speeding up, the U.S. needs a regulatory process that can keep up. Unfortunately, outdated regulations, exacerbated by the proliferation of delay tactics employed for foreign competitors and late comers, has contributed to the lengthening time it takes for the FCC to process applications. For companies seeking licenses in the United States, the average processing time now takes over two and a half years, with the trend line pointing in the wrong direction.

These timelines create an impossible situation for American operators. The extreme demand to connect unserved Americans quickly, coupled with a lengthy timeline for regulatory reviews,

drive U.S. licensees to begin work on these complex satellite constellations years before the license is granted. If they did not, no U.S. system would be able to compete with foreign—and often state-backed—competitors. As a result, U.S. operators are forced to build at risk, exposing themselves and investors to significant capital risk. Worse, the FCC issues each satellite license with its own unique operating conditions, meaning the operator generally is not aware of what restrictions will be placed on its system—or whether those conditions will be debilitating to their operations—until the license is issued. Not only does this place U.S. companies at a competitive disadvantage, it undermines the U.S. as a regulatory venue of choice, and it needlessly delays critical services to consumers.

This case-by-case nature of satellite licensing in the U.S. has made it an unfortunate target for gaming by foreign competitors and late comers to the market with legions of lawyers and lobbyists. Foreign-licensed operators will call for conditions and requirements on U.S. operators that would not apply to them and that they could not meet themselves.

These same operators that game the U.S. process to slow down decisions for U.S. licensees rely on a glaring loophole that exempts foreign-licensed systems from the U.S. regulations. Specifically, while the FCC generally exempts foreign licensees from U.S. rules for orbital debris and space sustainability, no other country has comparable regulatory requirements, combined with the transparency associated with American public notice and comment. As a result, while many foreign jurisdictions employ protectionist regimes to support their domestic licensees, the U.S. uses an asymmetric set of rules that benefit foreign-licensed systems over U.S.-authorized systems. This legacy loophole has been a leading cause for most satellite operators to license overseas—outside the reach of U.S. oversight—while still taking advantage of the U.S. market.

To help correct this imbalance, SpaceX recently filed at the FCC seeking equitable application of the conditions that it placed on SpaceX's Gen 2 system for all other systems serving the U.S. market. These conditions include robust space sustainability requirements and reports, as well as a requirement to coordinate with the National Science Foundation with respect to radio and optical astronomy protections. To be very clear, SpaceX supports these conditions. Indeed, what is good for SpaceX's system should also be good for other satellite constellations. Commission license conditions should be equitably applied to all systems hoping to serve the U.S. market. Asymmetric regulatory treatment of U.S. systems, unbounded anti-competitive regulatory triage against U.S. licenses, and long delays have a cost. As noted, they introduce enormous amounts of risk for investment and innovation, especially in a sector as capital intensive as satellite communications. Many innovative companies may simply not have the wherewithal to accept these risks and delays.

**DANIELLE PIÑERES
PLANET LABS PBC
Questions for the Record**

**Subcommittee on Communications and Technology Hearing
Liftoff: Unleashing Innovation in Satellite Communications Technologies
February 8, 2023, at 10:30 a.m., 2322 Rayburn House Office Building**

The Honorable Earl L. “Buddy” Carter

When it comes to orbital debris management, there are numerous domestic and international jurisdictions. Is this difficult to navigate? How can this process be simplified?

The protection of the orbital operating environment to ensure the sustainability of space is a global problem which requires global participation. This is an opportunity for United States leadership to work with industry to develop standard practices around space situational awareness data, communication and deconfliction activities between operators, and how to reduce the creation of debris in orbit. As various U.S. Government agencies work independently to address orbital debris and space sustainability, there is an opportunity to closely collaborate on policy developments to avoid conflicting or duplicative regulation and then lead among their global peers to encourage adoption of U.S. standard practices.

From Planet’s perspective, there are four areas of top priority for further orbital debris initiatives. First, we need better modeling for the LEO atmospheric environment. Positional uncertainty remains a thorny problem for satellites operating in LEO. The margin of error for measuring the distance between two objects at risk of collision using existing models of the LEO environment can sometimes be as high as several kilometers when predicted even 24 hours in advance. Space operators need better atmospheric models and space situational data to reduce those positional uncertainties, weed out “false positive” conjunction alerts, and minimize the maneuver distances required in the event of potential collisions. National governments and international organizations should continue to encourage industry efforts to validate and standardize models and define best practices for their use while also investing in R&D in the area of astrodynamics modeling for the LEO environment.

Second, we need better data sharing among space operators. National governments and international organizations should take additional steps to encourage private operators to share best accuracy orbit ephemerides with other operators. Planet performs orbit determination on its own satellites from GPS and 2-way UHF ranging and provides this data publicly in various formats. Transparent sharing with other operators of orbit ephemerides and contact information for operational personnel processing conjunction data messages would reduce uncertainty around

active-on-active conjunctions. In addition, operators should also regularly communicate details of planned maneuvers, especially those initiated in response to conjunction alerts.

Third, we need better ground-based tracking assets. Better data on space objects and space debris monitoring information is critical to limiting the creation of additional debris. Planet suggests that national governments and international organizations consider supporting R&D into improved public and private ground-based optical and radar sensors that would provide more data with higher accuracy for object tracking and characterization.

Finally, Planet supports public-private sector partnerships to explore active debris removal (ADR) technologies. Although efforts in this area are still under development, governments around the world are partnering with the private sector to push ADR activities forward. Other national governments and international organizations should follow such examples and increase R&D and cooperative efforts around ADR. These efforts should include (1) creating a conducive legal and regulatory environment (including a reasonable liability framework); and (2) providing economic incentives that will promote industry participation. Given the right framework and appropriate incentives, industry-led ADR solutions will emerge.

The Honorable August Pfluger

Where can Congress be most supportive of the intersection of agriculture and space tech given the national security implications of both?

Congress has an opportunity to continue advancing the adoption and integration of space-based technology and data into decision making back here on Earth, including in the agricultural sector. Continued investments in research and development for the next generation of space-based sensors, the applications of those novel technologies across a wide range of industries, and the integration of multiple data sets into actionable insights will maintain U.S. leadership in both space technology and the utilization of that technology by U.S. farmers. Planet is working with NASA to provide access to our daily Planetscope imagery to federally funded scientists and researchers for scientific purposes, and we work with universities around the world to provide access to our data at reduced costs to enable new research. These researchers are identifying new ways to use space-based satellite imagery to understand what's happening around the world and improve life on Earth. This includes new research in agriculture practices, air and water quality, and forest health to name a few, and targeted R&D investments from Congress can accelerate these efforts across the industry.