



CLIENT ALERT:

FCC's 3.7-4.2 GHz ORDER AND NPRM

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Today the FCC approved an Order and Notice of Proposed Rulemaking for Expanding Flexible Use of the 3.7 to 4.2 GHz Band. The document proposes expanded terrestrial use of the band and seeks comment on the mechanisms for integrating new and incumbent use. Coming on the heels of a freeze on applications for new earth stations and space stations in 3.7-4.2 GHz band, it also seeks to collect specific information about earth stations and space stations currently operating in the 3.7-4.2 GHz band.

The attached statements of FCC Chairman Pai and Commissioners Carr, Rosenworcel and O'Reilly confirm the FCC's commitment to expedited transition of C-band spectrum for mobile broadband and other advanced wireless services. Thus, this proceeding will have major consequences on incumbent satellite and earth station operators, as well as satellite service providers and end users. In addition, while this proceeding does not affect satellite or earth station operations in the corresponding uplink band at 5.925-6.425 GHz, the hard-coded pairing of C-band uplink and downlink frequencies will inevitably have impacts on the uplink band and a rulemaking proceeding for that band is under consideration by the FCC.

The Order seeks additional information about current users of the 3.7-4.2 GHz band. Earth station operators are requested to provide the following types of information for each antenna:

- call sign (or IBFS file number if a registration is pending);
- licensee and point of contact information;
- geographic location and antenna operating parameters;
- satellite(s) at which the earth station is pointed, transponder used and frequency of use;
- certification that the earth station was constructed and operational as of April 19, 2018.

Satellite operators in the 3.7-4.2 GHz band are requested to provide the following types of information:

- satellite call sign, name, orbital location and expected end-of-life;
- approximate launch dates for additional C-band satellites with pending applications and which do not yet have pending applications;
- active transponders and frequency of use to serve the United States;
- center frequency and bandwidth of TT&C beam(s), and call sign and geographic location of TT&C receive site(s).

The Notice of Proposed Rulemaking seeks comment on the future of incumbent use of the band (including satellite) and proposes mechanisms for expanding flexible terrestrial use. The FCC also examines today's 3.7-4.2 GHz terrestrial microwave band plan and invites feedback on possible changes.



Incumbent Use. The FCC suggests the possibility of separating incumbents into different classes based upon length and frequency of operations, including those that still have the ability to register earth stations during the 90-day extension window. The FCC seeks comment on whether to codify the temporary freezes that have been placed on applications for satellite licenses and registrations, except in cases of existing space station authorizations. The FCC also considers reexamination of the full-band, full-arc policy for earth station operations in 3.7-4.2 GHz, and seeks input on the current and future economic value of fixed-satellite service (“FSS”) in that band.

Mechanisms for Expanding Flexible Use. The FCC proposes to add a co-primary Mobile allocation to the 3.7-4.2 GHz band and license the band for flexible mobile use (“MBX”) on an exclusive, geographic area basis. The FCC requests input on protection criteria for FSS earth stations from MBX mobile use. Nevertheless, in apparent recognition that co-frequency “sharing” will be difficult at best, the FCC focused on three different potential mechanisms for clearing incumbent users out of some or all of the band, in order to facilitate expanded flexible MBX use: a market-based approach, an auction approach, or some combination of the two.

The market-based approach would utilize a cooperative entity created by satellite operators to coordinate negotiations with terrestrial operators and clear and repack the spectrum. The FCC would have a review and authorization role in this process.

The FCC suggests four possible auction mechanisms: an overlay auction, an incentive auction, a capacity auction, or a combination of the foregoing. For each of the mechanisms described, the FCC requests an analysis of the economic benefits and disadvantages of the plan as well as means of protecting incumbents. The FCC also requests comment on implementing point-to-multipoint terrestrial fixed services, allocating spectrum for flexible terrestrial use in the lower segment in the band, and the possibility of Ku-band capacity as a replacement for C-band.

Band Plan. The FCC notes that the current band plan for incumbent terrestrial fixed service (chiefly fixed point-to-point microwave links) is segmented into 20 megahertz channels, but that it does not necessarily need to remain this way. It seeks feedback on proposals to create larger channels, or to have channels of different sizes depending on the needs and uses of operators.

Further information regarding the effective date of the Order and Notice, and the comment filing dates, will be published shortly in the Federal Register. The FCC has not yet released the final text of its proposal, but the FCC’s News Release announcing its action can be found [here](#), and a public draft of the FCC’s Order and Notice of Proposed Rulemaking for Expanding Flexible Use of the 3.7 to 4.2 GHz Band can be found [here](#).

Please feel free to contact Carlos Nalda, Richard Cameron, or any of the LMI Advisors team if you have any questions or would like to discuss the scope or impact of the FCC’s proposals.

**STATEMENT OF
CHAIRMAN AJIT PAI**

Re: *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122; *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, GN Docket No. 17-183; *Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band*, RM-11791; *Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service*, RM-11778

In the 1975 summertime blockbuster *Jaws*, Police Chief Martin Brody, after a single glance at the massive shark lurking just beneath the water's surface, memorably observed, "You're gonna need a bigger boat." This summer, we face a similar situation as next-generation 5G wireless innovations loom. It's apparent that we're gonna need a bigger boat as well—or in our case, more spectrum.

Our boat gets bigger today as we aim to make more spectrum available for the 5G future. Our focus here is on making more intensive use of the 3.7-4.2 GHz band, commonly called the C-band. To help us figure out the best way forward, we authorize the collection of additional information from the band's current users. That data will help us figure out how to accommodate the needs of incumbents, which are primarily using the band to provide Fixed Satellite Service. It'll also enable us to free up more spectrum for advanced wireless services.

Additionally, we seek comment on ways to open up some or all of this band for terrestrial wireless broadband use. Most notably, we tee up a number of market mechanisms for reallocating C-band spectrum. Like the \$3,000 bounty placed on the shark in *Jaws*, we hope to identify a mechanism that will unleash a frenzy of activity in this band.

Many thanks to the staff who have contributed to this complicated item. From the Wireless Telecommunications Bureau: Stephen Buenzow, Peter Daronco, Thomas Derenge, Ariel Diamond, Anna Gentry, Joyce Jones, John Lambert, Roger Noel, Matthew Pearl, Paul Powell, Becky Schwartz, Blaise Scinto, Dana Shaffer, Jeffrey Tignor, Colin Williams, Brian Wondrack, and Janet Young; from the International Bureau: Jose Albuquerque, Christopher Bair, Paul Blais, Kathleen Campbell, Diane Garfield, Jennifer Gilsean, Kal Krautkramer, Robert Nelson, and Jim Schlichting; from the Office of Engineering and Technology: Bahman Badipour, Martin Doczkat, Chris Gao, Navid Golshahi, Michael Ha, Ed Mantiply, Tom Mooring, Nicholas Oros, Robert Pavlak, Barbara Pavon, Jamison Prime, Ron Repasi, and Rodney Small; from the Office of Strategic Planning & Policy Analysis: Evan Kwerel, Paul Lafontaine, and Jonathan Levy; from the Media Bureau: Thomas Horan and Sean Yun; and from the Office of General Counsel: Ashley Boizelle, Deborah Broderson, David Horowitz, Thomas Johnson, Linda Oliver, and Bill Richardson.

**STATEMENT OF
COMMISSIONER BRENDAN CARR**

Re: *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122; *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, GN Docket No. 17-183; *Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band*, RM-11791; *Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service*, RM-11778

Americans now send and receive nearly two exabytes of mobile data per month. If you have no idea how much data is in an exabyte, you're not alone. The World Cup final is on Sunday, so I thought I'd put it in soccer terms. Stay with me. If one gigabyte were the size of a soccer ball, and you were to fill a World Cup stadium from the field to the roof with them, it would take eleven stadiums to equal those two exabytes.

Not a soccer fan? OK, try this. With the amount of mobile data Americans send, you could transmit the entire printed collection of the Library of Congress every 12 seconds.

But Americans aren't just reading library books on their smartphones, of course. They're binge watching videos, they're hearing the voices of loved ones through VoLTE calls, and they're engaging the world around them using augmented reality. They're lifting themselves up and providing more opportunities for their families.

A few weeks ago in Philadelphia, I had the privilege of meeting someone who used her mobile broadband connection—and a whole bunch of grit and determination—to bring her family out of poverty and into a new life. Her name is Tommi. She's the mom to five kids, and many people have had an easier path in life. Tommi grew up in public housing. She dropped out of high school after giving birth to her first child. For the next 16 years, she made calls for a debt collection agency, which she described as a "dead end job." Tommi knew that she could do more with her life. So she enrolled in Philadelphia's Orleans Technical College. It was "four years of peanut butter and jelly sandwiches—often made for me by my kids," she said.

Tommi earned a perfect 4.0 GPA. She got a job at the Public Housing Authority, and she just bought her first home. Now she's starting a masters program in mental health so that she can give back to her community. None of this, Tommi told me, would have been possible without a mobile broadband connection. "Broadband is the backbone of a community—for finding a job, for education," she said. A mobile hotspot that she shared with her neighbors let her finish her homework, which was required to be completed online. A mobile connection enabled her to apply for employment and for admission to school.

Tommi is an inspiration. Getting the chance to meet her is something that has stuck with me. But in a lot of ways, Tommi's story is not unique. At the school in Philadelphia's Sharswood neighborhood where I met her, I spoke with kids that are in much the same position Tommi was in just a few years ago. Today, the Public Housing Authority is partnering with a wireless carrier to give each student at that school a tablet and a mobile connection. The Public Housing Authority did this because digital literacy is no longer optional for the next generation.

How do we ensure that Americans, and especially the least advantaged Americans, have the opportunity to learn, grow, and provide for a family of their own, like Tommi? It begins with a connection.

Which brings us back to this item—to all of those soccer balls and the eleven World Cup stadiums filled to the brim every month. Five years from now, that data consumption will look more like 60 stadiums—and growing. The challenge we face is keeping up with that demand so that everyone gets a fair shot at next-generation opportunities.

At the federal level, we can help empower the private sector to meet Americans' mobile data demand through smart infrastructure policies and aggressive allocation of spectrum. On the infrastructure side, the Commission cut 1.6 billion dollars of red tape in our March order. We did so by exempting small cells, the physical building blocks of 5G, from certain federal historic and environmental review. And we're looking at additional reforms with the goal of ensuring that wireless infrastructure can be deployed in all communities.

The other key input for the future of mobile broadband is in the item before us: spectrum. I am proud of what the Commission has done so far on this front in just the past few months. In February, we paved the way for opening up spectrum above 95 GHz. In March, we sought comment on designating the 4.9 GHz band for flexible use. In April, we took a step towards bringing over 1.5 GHz of millimeter wave spectrum to auction. In May, we started a proceeding to put spectrum in the 2.5 GHz band to even more productive use. In June, we finalized rules for the 24 GHz band and sought comment on opening up the 26 GHz and 42 GHz bands for flexible use. And just this week, Chairman Pai announced that we're moving forward with the auction of spectrum in the 37 GHz, 39 GHz, and 47 GHz bands next year.

With these efforts and the race to 5G fresh in mind, we have now freed up more spectrum than any other country in the world. We're more than 4 GHz ahead of second place China. But there's still work to be done in the mid-band, where other countries have freed up substantial amounts of spectrum. That's why today's item is so important. The C-band encompasses 500 MHz of mid-band spectrum that some believe is primed for 5G deployment. As the item recognizes, we have some challenges in bringing more intensive use to this band in the U.S., including long-standing incumbent operations. This decision tees up a number of potential paths forward.

I want to draw particular attention to the notice's section on a market-based mechanism for clearing the spectrum. Under that option, we would authorize incumbents to clear on a voluntary basis all or nearly all of the band and allow them to engage in secondary market transactions. In my view, this could provide the quickest path to clearing the spectrum, and it could do so without the inevitable issues that arise when the Commission begins imposing mandates and repurposing the spectrum itself.

Financial analysts predict that investment in 5G infrastructure will peak around 2021. If this spectrum will be used for 5G, it makes the most sense to press forward with options that have the best shot at bringing this spectrum online during the initial 5G rollouts. So I encourage all stakeholders to come together to help resolve the issues.

After all, winning the race to 5G is important. And success in my view is ensuring that we get the spectrum and policies in place that will spur deployment and opportunities not just in New York or San Francisco but also in neighborhoods like Sharswood in North Philly.

This is a substantial item. I want to thank everyone who worked on it, especially the team in the Wireless Telecommunications Bureau. It has my support.

**STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL**

Re: *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122; *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, GN Docket No. 17-183; *Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band*, RM-11791; *Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service*, RM-11778

The United States is not in the lead when it comes to making mid-band spectrum available for next-generation 5G networks. If you want evidence, it's right there, out in the open for all to see. You can start with South Korea, which just wrapped up an auction for the 3.5 GHz and 28 GHz bands last month, generating more than \$3 billion by moving the two bands together. You can also look at the United Kingdom, which auctioned the 2.3 GHz and 3.4 GHz bands earlier this year. In Spain, the process of auctioning 200 megahertz of spectrum in the 3.6-3.8 GHz bands is already underway. This morning Italy announced that on September 10 it will kick off an auction of 200 megahertz in the 3.6-3.8 GHz band. On top of that, China has already cleared and reserved the 3.3-3.6 GHz and 4.8-5.0 GHz bands for 5G service.

We're behind. That's the not-so-good news. Because the price we pay when we cede leadership is a loss in early scale and a voice in standards development and device specifications that can yield innovation and jobs we want to see here, on our shores.

Now the good news. With today's rulemaking and order we are doing something about it. We explore a variety of mechanisms for clearing the 3.7-4.2 GHz band for 5G use. And if we make headway here, we can start to reclaim lost leadership in spectrum that is critical for success in 5G networks.

To this end, we seek comment on a wide range of proposals for opening up the the 3.7-4.2 GHz band. We ask about everything from overlay licenses to incentive auctions to capacity auctions in order to expand the possibility of flexible use in this spectrum.

We also seek comment on a proposal from satellite operators that hold equal, non-exclusive rights to the entire band. Together, they have put forward a market-based mechanism to repurpose these airwaves in an expedited fashion. This proposal is creative. But it also raises challenging questions that this agency must tackle to fulfill our statutory obligations. First, the combination of a limited number of operators, non-exclusive licensing, and the scarcity of mid-band spectrum could create opportunities to price this resource above what a truly competitive market with a large pool of fungible spectrum would support. Second, that means we need to acknowledge that what incumbent providers stand to reap from a secondary market sale of repurposed spectrum is significant. We need a framework to ensure that this approach truly serves the public interest. Third, we need to acknowledge that these frequencies are used right now by television and radio broadcasters and cable operators to deliver programming to more than 100 million American households. I believe we need a record that addresses all three of these challenges in addition to the other proposals that aim to expand flexible use in this band.

Finally, I believe any effort to reclaim leadership in mid-band spectrum for 5G needs to include other airwaves, like the 3.5 GHz band, which for several years has been ready to go but is still inexplicably mired in this agency's bureaucracy. In addition, we need a spectrum calendar. We have no reason for not being transparent about how and when new resources will be made available to the public. With a blitz of proceedings before us involving the 2.5 GHz, 3.5 GHz, 3.7-4.2 GHz, 4.9 GHz, 5.9 GHz, 6

GHz, 12 GHz, 24 GHz, 26 GHz, 28 GHz, 32 GHz, 37 GHz, 39 GHz, 42 GHz, 47 GHz, 50 GHz, and above 95 GHz, it is time to put every band on a schedule that is publicly available. There is no reason for this agency to be so opaque about what is being auctioned and when. Moreover, when we do hold auctions we should put a premium on auctioning 5G bands together, instead of one-by-one, as proposed for the 28 GHz and 24 GHz auctions coming up this fall. If we do these things, we have a fighting chance to lead in the deployment of the next generation of wireless networks—for which mid-band spectrum is key both at home and abroad.

But most importantly, we need to get started. Right here, right now. As a result, today's rulemaking and order has my support.

**STATEMENT OF
COMMISSIONER MICHAEL O'RIELLY**

Re: *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122; *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, GN Docket No. 17-183; *Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band*, RM-11791; *Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service*, RM-11778

As someone who has spent considerable time on this issue, I thank the Chairman for bringing this important spectrum item to a vote. More than two years ago, it became readily apparent to me that a global shift in the future of spectrum had occurred and the world was eyeing mid-band spectrum as a component for 5G deployment. Thus, it became vital for the United States to have available a serious mid-band play to complement our spectrum work in the low and high bands. Since that time, I have pushed for this spectrum and other bands, such as the frequencies below 3.5 GHz, to be opened for commercial wireless use.

Given the limitations and difficulties elsewhere in mid-band, the 3.7 to 4.2 GHz band, or C-band downlink, became my primary focus. Specifically, it provides a wide swath of spectrum and it just so happens that the current primary users, certain satellite providers, are receptive to reducing their spectrum footprint. It is rare that you can see the stars align to be able to execute such a large change in spectrum policy.

To execute this win-win scenario, certain principles – at least from my view – need to be acknowledged and respected. First, the reallocation needs to happen fairly quickly. We cannot wait five or ten years to open the band for flexible wireless use. Second, a reallocation must release a sufficient amount of spectrum. In my mind, that is far more than the 100 megahertz initially proposed by the resident satellite providers. In particular, I have strongly advocated for at least 200 or 300 megahertz, with a serious review to release even more. Third, any reallocation must fully protect the incumbent contractees that currently use C-band to bring many services to consumers. From my perspective, any final proposal that doesn't do that will be close to a non-starter. That does not mean they all must be accommodated on remaining C-band spectrum, but their ability to offer services cannot be disrupted. And fourth, the proposal must include permitting unlicensed spectrum use in the C-band uplink, better known as 6 GHz. As a strong supporter of unlicensed spectrum use, this is a necessary ingredient to addressing the needs for more unlicensed spectrum users, while meeting our statutory obligations under the RAY BAUM'S Act of 2018.

The reality is that if everyone puts aside preconceived notions, a final proposal, in the very near future, can address everyone's concerns and needs. Cooperation and avoiding unnecessary tangents will be paramount. In the end, adding these frequencies to 3.5 GHz and, hopefully, spectrum at 3.4 GHz will be a firm foundation of new spectrum opportunities for 5G in the mid-bands. Today's item moves sufficiently in the right direction for my purpose, at least for the NPRM stage, so I am pleased to support it.

There are, however, some things I would have done differently than what is contained in the item. As previously stated, it is of utmost importance that this proceeding is concluded and spectrum is released into the marketplace quickly. There can be no unnecessary delays or distractions. Parts of this item, while interesting, are not practical and unlikely to be adopted. I'll just mention a couple for now. Consider that the record clearly supports a market-based approach, but the item veers off seeking

comment on various auction mechanisms, many of which were not suggested in the record and some of which are incredibly complex or downright troubling. For example, those I have spoken with are scratching their heads at the transponder capacity incentive auction and are being forced to hire experts to try to make sense of it, unclear how it would work in practice. I am concerned that such ideas may detract time and attention from more viable options.

Although there are still many details to be worked out about the market-based approach, it is easy to see how the spectrum can be expeditiously put into the hands of the wireless industry and how the satellite industry and its broadcast, cable, and other customers can be made whole. The money received by the satellite industry from these free market negotiations will cover the costs of repacking their users, improving technology and filters, launching new satellites, laying fiber, or moving their customers to new technologies or satellite systems. It is not clear how some of these issues will be tackled under some of the other ideas proffered in this notice.

I also question whether eliminating full-band, full-arc is feasible. Further discussions will have to be held with industry to determine how the business model works under a different mechanism. I look forward to discussing these issues with satellite and the other affected industries as we move forward.

Additionally, I have serious concerns about the idea to permit fixed wireless use in 160 megahertz of spectrum in the upper portion of this band. I am fully supportive of fixed wireless, but the focus of this item should be clearing as much of this spectrum as possible for flexible use. It doesn't make sense to put fixed operations in 160 megahertz of this band if there are future possibilities to clear more spectrum. For example, entities have told me that 100 megahertz channels are ideal for 5G mobile operations, but taking 160 out of 500 megahertz takes two channels off the table. Once fixed operations are present, it will be hard to move them elsewhere and mobile or other uses would likely have to protect incumbents, minimizing its potential use. It is also unclear whether sharing between satellite and fixed wireless uses is compatible in bands that are likely to be congested when all satellite use is condensed into fewer frequencies. Basically, we have no idea whether and how this proposal will work.

Finally, I appreciate the Chairman's efforts to free up mid-band spectrum, including his commitment to me to bring the 6 GHz NPRM for the Commission's consideration this fall. This spectrum, which is next to the 5 GHz band, provides the next best opportunity, other than 5.9 GHz, to expand Wi-Fi and other unlicensed operations. Further, it will provide spectrum for new innovative opportunities for America's entrepreneurs and those who want to enter the marketplace without the expense of purchasing spectrum at auction. I wish we were voting on this item today, but recognizing that it will soon come will suffice.