



Insight

Interagency Challenges to Allocating 5G Spectrum

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Executive Summary

- The Federal Communications Commission (FCC) completed a lengthy proceeding to clear satellite operators out of the 3.7-4.2 GHz C-Band to make bandwidth available for 5G, and the auction saw record revenues due to significant interest from carriers.
- Interagency disputes are becoming a challenge for the deployment of 5G networks; while there are legitimate parochial concerns, resolving these disputes will be critical to successful deployment of 5G services.
- Recent conflicts between the FCC and the Federal Aviation Administration regarding the deployment of 5G services in the C-Band highlight the importance of streamlining the interagency process and mitigating public disputes between federal agencies late in the deployment process.

Introduction

Broadband has never been more [critical](#) for Americans, and so much promise exists for advancements in the technology that can radically change the way we connect to one another across the country and the globe. For mobile networks, carriers are moving [full speed ahead](#) to deploy 5G wireless networks, the newest generation of broadband cellular technology. These networks will need mid-band frequency allocations to transmit more data over shorter distances, and with increasing speeds and lower latency for consumers.

In 2020, the Federal Communications Commission (FCC) issued an [order](#) reallocating the C-Band for commercial 5G operations, and at auction carriers paid over [\\$80 billion](#) to acquire licenses in the band. Regulators should ensure new services do not cause harmful interference. In the case of the C-Band, and the FCC engaged in a lengthy, technical review of the record to mitigate potential harms from the auction of band licenses. After its review of the evidence in the record, the FCC concluded that adequate protections were in place to prevent harmful interference.

Despite this lengthy and comprehensive review by the FCC, the Federal Aviation Administration (FAA) recently raised spectrum-related safety concerns about the deployment of 5G services by mobile network carriers in the C-Band (3.7-4.2 GHz band). As a result, 5G deployment in the band has been delayed and could be delayed further as the FAA contemplates issuing new aviation restrictions and carriers offer temporary [operating restrictions](#) to alleviate concerns while study continues.

Nevertheless, the FAA's concerns have already [stalled the deployment of 5G services](#) in the band. While safety concerns should absolutely be raised when they are well-founded, the process and timing have been less than ideal. This FCC/FAA dispute demonstrates the need for more proactive engagement from and cooperation

among federal agencies to ensure that concerns are properly assessed and that crucial operations move forward.

Need for Mid-band Spectrum

Traditionally, mobile networks relied heavily on operations using [frequencies](#) below 1 GHz because they allow signals to travel farther than at higher frequency bands. Next generation 5G networks, however, require less coverage area for a given station because of the [densification](#) of the network: A larger number of smaller wireless facilities cover an area that would be traditionally covered by a single macro-cell site. As a result, the networks can use [higher frequencies](#), which may not cover the same geographic area but can provide significant increases in capacity. Mid-band frequencies fit the bill perfectly, allowing for a relatively broad coverage area but offering significantly more capacity than lower frequency bands.

Most carriers initially lacked a strong mid-band portfolio, as older technology did not require it. Yet while emerging technology requires mid-band frequencies, there are currently no open bands to which the FCC can simply allocate frequencies to 5G networks. Instead, it must [attempt](#) to either relocate incumbents into other bands or find opportunities for services to share spectrum. The FCC has made significant strides in this regard, most notably making available bandwidth in the [C-Band](#) by working with incumbent satellite operators to relocate existing operations into other bands, as well as by creating a tiered sharing regime in the [3.5 GHz CBRS](#) band and beginning to relocate Department of Defense (DoD) operations in the [3.1-3.55 GHz](#) band to make room for commercial use. Despite this progress, disputes over the use of this spectrum persist.

Dispute Over C-Band

The C-Band presented a difficult [challenge](#) for the FCC. Because the band was already allocated to a range of satellite operators who all used the entire band via a full band/full arc [model](#), the FCC couldn't move the existing operations if even just one licensee remained. After significant technical analysis and input from a wide range of stakeholders, the FCC ultimately developed a plan that would sufficiently incentivize a [quick transition](#) from the incumbents and designed a technical ruleset to ensure no harmful interference to neighboring operations.

Most notably among those neighboring operations, the aviation industry uses the adjacent 4.2-4.4 GHz band for altimeters (devices used to measure a plane's distance above sea level). Many groups in the aviation industry raised [concerns](#) that out-of-band emissions would cause harmful interference to these altimeters, potentially reducing the safety of the aircraft. The FCC concluded that technical rules on [power limits and a large guard band](#) between the operations should offer all due protections to the radionavigation services. Still concerned, the aviation industry subsequently filed a [petition for reconsideration](#) in May 2020, reiterating these potential hazards. A year and a half later, the FCC has maintained its position and found that the protections imposed by the C-Band order are sufficient.

The FAA [raised alarms](#) in November 2021 about the altimeter issue, after the completion of a record-setting auction and close to the initial deployment date for services in the band. It now argues that drastic action may be needed to resolve potential safety concerns to existing flights, already [delaying](#) industry's deployment of services in the band, despite the FCC's conclusion that the potential hazards to aviation are not of concern. Meanwhile, commercial operations with similar, though distinct, operating parameters have worked in other [countries](#) without altimeters experiencing harmful interference.

Regardless of the potential for harmful interference to altimeters in this specific case, the FAA's protest is not

uncommon. In recent years, agencies have often gone outside of the regular [interagency processes](#) to stall FCC decisions where their constituencies are impacted.

A Problem Larger than the C-Band

While the delays in the deployment of the C-Band present the most noticeable recent example of a government agency threatening significant responses to an FCC spectrum reallocation decision, this isn't a problem for a single band. In recent years, federal agencies have continually gone outside the interagency process and caused delays and uncertainty with 5G auctions, limiting the significant economic [benefits](#) 5G can provide. In the 24 GHz band, for example, NASA and NOAA (the National Oceanic and Atmospheric Association) raised [concerns](#) about harmful interference to weather data collection, despite the FCC's proceeding to make 24 GHz available for commercial operations lasting almost 10 years. In the 3.1-3.55 GHz band, the DoD has only made available the top 100 MHz after congressional intervention, and even still the DoD [hesitated](#) to share operational information needed by industry.

The debate over the C-Band is simply the latest [dispute](#) between an agency and the FCC over a 5G allocation. Ideally, concerns from executive branch agencies would be raised by the National Telecommunications and Information Administration (NTIA), the agency responsible for managing federal use of radio spectrum. While some reports indicate that the FAA did [raise](#) some of these concerns, the NTIA did not act. As outsiders to the interagency process, it can be difficult to determine why the NTIA didn't pursue the matter more aggressively, or why the FAA didn't raise the possibilities of issuing restrictions much earlier in the process. Given the prospect of imposing restrictions on planes as a result of the unresolved dispute, however, there has clearly been a process failure.

Increasing demand for operating rights has added even more tension to these normal procedures, and it may be time to look for potential reforms. If an agency such as the FAA truly believes that an FCC decision could cause harmful interference, solutions to these concerns should be actively sought between agencies. Perhaps collaboration between the FCC and the executive branch should be streamlined and rely on a common understanding of the technical parameters. Updating the outdated [memorandum of understanding](#) between the agencies and increasing the [technical capacity](#) of the agencies could go a long way toward preventing similar disputes from arising in the future. At the same time, even if the process works when concerns are identified, it is also incumbent on the executive branch to act quickly when concerns are raised around an FCC decision. As long as the coordination process between executive branch agencies and the FCC continues to falter, these disputes will continue to arise.

Conclusion

Mobile carriers need access to additional mid-band spectrum allocations to deploy the next generation of wireless networks. Delays are costly to the U.S. economy and reduce our global competitiveness as other nations deploy these networks. In that regard, the C-Band auction was a significant step forward in the rollout of 5G. Now interagency disputes threaten to continue to delay the deployment of 5G services in the band. Too often these interagency disputes threaten FCC spectrum proceedings; mitigating these disputes will be critical to continued deployment of 5G.