



Cross-Industry Engagement on 5G Spectrum Opportunities

Date: November 7, 2024

Time: 1:00 – 4:00 PM

Location: FAA HQ, Bessie Coleman Conference Center, 800 Independence Ave SW, Washington DC

Meeting Summary

There is interest across government and industry to restore the Federal Communications Commission's statutory auction authority to facilitate the sale of additional spectrum in the Upper C-band repurposed for 5G. The objective is to achieve this goal in a manner that allows wireless services and aviation safety to coexist safely and without interference, leveraging lessons learned from the prior auction of the 3.7-3.98 GHz band. Consistent with this objective, the Federal Aviation Administration convened a cross-industry discussion on 5G spectrum opportunities on November 7, 2024. A representative from the Aerospace Industries Association (AIA) facilitated the discussion.

Representatives from the following entities participated in the meeting:

Government

U.S. Department of Transportation (DOT)
Federal Aviation Administration (FAA)
National Telecommunications and Information Administration (NTIA)
Federal Communications Commission (FCC)
White House, Office of Science and Technology Policy

Industry

Aerospace Industries Association (AIA)
Airbus
Airlines for America (A4A)
Air Line Pilots Association (ALPA)
Airports Council International – North America (ACI-NA)
AT&T
Boeing
Cargo Airline Association (CAA)
CTIA
Dish
Embraer
Honeywell
International Air Transport Association (IATA)
MHI/Bombardier
National Air Carrier Association (NACA)
Radio Technical Commission for Aeronautics (RTCA)
Regional Airline Association (RAA)
T-Mobile
TRX/Collins
US Cellular
Verizon

Polly Trottenberg (Deputy Secretary of Transportation), Katie Thomson (FAA Deputy Administrator), and Di Reimold (AIA Vice President for Civil Aviation) provided opening remarks. They discussed shared objectives and stressed the need to learn from the past 5G C-Band deployment and avoid prior mistakes. Both speakers highlighted this is not an industry- only or government-only problem. It is an opportunity to leverage what we know works when we are working together and to be open about where the aviation and telecommunications sectors want to be in the next 5-15 years.

Today's State of Coexistence in the NAS Discussion:

Chris Hope (FAA) provided a briefing on the current state of coexistence between 5G C-Band wireless operations and aviation operations in the U.S. He reviewed the history, the current wireless voluntary agreement, the aviation Airworthiness Directives, and the retrofit of U.S. domestic aircraft and foreign registered aircraft operating in the U.S. He concluded the briefing by stating the 5G/aviation issue is not "solved" since wireless deployments in and around airports require special coordination, the future, robust airworthiness standards for radio altimeters are not complete, and there are still some flight operation restrictions on aircraft in the NAS.

Voluntary Agreement Open Discussion:

Verizon indicated the current state, including the voluntary agreement, largely reflects how it would deploy in any case. They are dealing with a few corner cases and a little bit of an administrative burden, but they are currently using available spectrum nearly to the full extent allowed by the licensing. The agreement is a good news story, and they believe that there is a lot more handwringing about 2028 in the aviation sector than in the telecommunications sector. Verizon is hopeful that other considerations going forward will overtake the 2028 expiration of the agreement and render it irrelevant. AT&T echoed Verizon's comments and both companies confirmed that going forward, they want to resolve issues up front.

Next Generation Radio Altimeter Standards Discussion:

Chris Hope introduced the topic and discussed the end product of the new standards for the FAA are new Technical Standards Orders (TSO) for new radio altimeter systems. He briefed that the RTCA committee is trying to achieve the best possible performance with the current technology. The President and CEO of RTCA briefed next on the SC-239 group that is working on the new standards for radio altimeters (RAs). She reported that the group is updating a 40-year-old standard from Minimum Performance Standards (MPS) to Minimum Operational Performance Standards (MOPS). RTCA does not anticipate meeting the schedule in the current terms of reference. The RA standards development is the highest priority at RTCA, and they have established an oversight committee to supervise the work of SC-239. RTCA expects to announce the new date for MOPS completion in December and anticipates that the MOPS will be completed before 2028, but RTCA appreciated the comments from Verizon and AT&T that the 2028 end of the voluntary agreement term should not be viewed as a looming deadline because they do not want another crisis.

The co-chair of RTCA SC-239 briefed that the group is taking the extra time to conduct additional validation work to produce a MOPS that is resilient and will be relevant for decades. He reiterated that the new standards would not be published in time to support retrofit completion by 2028. However, he does not believe that the delay caused by the extra validation work will ultimately delay the fielding of new RAs. The RA original equipment manufacturers (OEMs) are on the committee and have access to

the validation work as it is completed. The additional validation being conducted by RTCA will obviate the need for OEMs to repeat the validation work. Consequently, the delayed MOPS should not translate into significant delays in producing and installing new RAs.

Dr. Robert Hampshire (DOT) asked if it is possible to produce an interim standard that could be available sooner. RTCA replied that it is unlikely, but RA development work should be able to begin once the committee completes the validation work and should not have to wait until the standard is published.

Airlines for America (A4A) commented that future spectrum auctions could impact systems other than RA, such as airborne weather radar.

A representative from FAA asked whether there is a mechanism by which RTCA can release preliminary information prior to the publication of the MOPS. RTCA noted that the committee is discussing the possibility but have not yet reached any conclusions.

Boeing stated the last round of RA retrofits were simple in that they involved filtering. The next round of RA will not be as easy. As the boxes get more complex, it becomes technically more difficult to improve performance. The integration is also important to consider. In the end, as additional spectrum is repurposed, Boeing is concerned that MOPS will no longer be sufficient; the aviation sector will need a spectrum management solution, or more resilient integrations, or both.

Boeing also emphasized that FCC certification of the RA installations is required (in addition to FAA) and that the FCC's publication of those certification rules is a critical path action.

One of the industry representatives questioned whether the new MOPS will be specific to the existing 3.7-3.98 GHz deployment and, if so, whether it would have to be revised to support future auctions. RTCA replied that the standards under development are not specific to the current deployment; they contain assumptions about power but go all the way up to the RA band of 4.2-4.4 GHz. Future auctions are covered if they are within the assumptions used.

Beyond 3.7-3.98 Discussion:

AT&T commented that there is a lot of interest in additional spectrum in the C-band by the telecommunications industry. The telecommunications industry needs three specific things: the use of current licenses without disruption, a future auction (preferably all the way up to 4.2) and reaching a stable state. AT&T supports the development of a reasonable timeline, that can be turned into a set of prerequisites for a new auction.

Verizon stated that there is ongoing urgency to find more spectrum in general, not just in the C-band. Rules for a future auction could place conditions on the use of the spectrum (*e.g.*, the sooner you want the spectrum, the more you pay, or vice versa).

A4A stressed the need for a formal process, such as a Federal advisory committee or an aviation rulemaking committee (ARC), with federal government involvement to guide the process.

NTIA expressed its interest in getting the best altimeter possible on as many planes as possible as quickly as possible. Incentives may be the way to do that. There was significant discussion on incentives. FCC briefed that incentives are complex. There are restrictions that must be considered. IATA asked about

foreign companies receiving incentives but no one in the room could provide an answer. In summary, many attendees expressed support for using incentives and being bold and aggressive with them. However, there will need to be more discussion around incentive mechanisms and structures.

Next Steps for Coexistence:

The FAA Deputy Administrator steered the discussion to identification of steps needed for the successful auction of additional spectrum for both wireless and aviation. She emphasized that specific steps and the sequence of those steps are critical to ensuring that wireless services and aviation safety can coexist safely and without interference. Steps should be completed in a way that informs future actions and proper sequencing could help us avoid the challenges of last time. To align on next steps, the FAA presented a notional list of steps that make up the critical path appropriate for an auction of additional spectrum. There were no dates provided. The first step was the completion of the next generation RA standards – the MOPS. The final step was the completion of the retrofit of commercial aircraft coincided with the new spectrum broadcasts.

NTIA asked representatives from the telecommunications industry what they consider an acceptable time between the auction and having the spectrum released to them? AT&T replied that it is a difficult question. 1.5 to 2 years may be acceptable, but 4 years is likely not acceptable. The time period between the auction of the spectrum and the use of the spectrum should be built into FCC auction rules. It will be important for potential purchasers of the spectrum to know up-front what the delay will be between the purchase date and the date the spectrum can be used. NTIA replied that the FCC auction should occur after the FAA establishes the compliance date for installation of new RAs.

Honeywell asked about the R&D incentive money that is currently available to the FAA. Honeywell's understanding is that the funds are intended to support RA research and development irrespective of the new standards work. Honeywell urged the FAA to use the funding to accelerate development of new standard as a step towards completion of the RA standards.

AT&T, Verizon, T-Mobile and US Cellular acknowledged that non-standard practices such as those in the voluntary agreement will have to continue beyond 2028.

The remaining discussion concerned linking the FCC auction rules to the new RA MOPS. Boeing asked if there will be mitigations specific to the areas around airports that are spelled out in the auction rules. FAA stated the new RA standards set the stage for what those mitigations would be. The new standards are the lynchpin.

Boeing stated that regardless of the substantive RA standards, the RA must be integrated into the airplane and the airframers need to weigh in on what is possible. The sooner manufacturers of airplanes and airframes have access to preliminary data, the sooner they can weigh on feasibility. FAA added preliminary RA performance capabilities as the second step in sequence ahead of RTCA's completion of the RA MOPS.

Assuming Congress authorizes FCC to auction additional spectrum, meeting attendees discussed the sequence of critical path actions necessary prior to a new auction. They are:

- Congressional funding to FAA to accelerate development of new MOPS

- Preliminary RA performance capabilities
- RTCA completion of new MOPS
- FAA publication of Technical Standard Order
- FCC completion of service and auction rules
- FAA initiation of rulemaking
- FCC initiation of auction
- FAA publishes final rule
- Compliance date for new RAs (possibly earlier with financial incentives) coincides with spectrum broadcast

Next Steps:

Further discussion would be helpful in assessing a timeframe for a roadmap for execution. Among other topics,

- A smaller group of affected parties should discuss the 2028 expiration of the voluntary agreement;
- More discussion is needed to gather information regarding incentives (*e.g.*, what they might look like); and
- Another roundtable to continue the discussion may be appropriate.