

C-Band Alliance Proposal Fact Sheet: Transition Implementation Process

April 9, 2019

Overview

In 2017, the Federal Communications Commission (FCC) initiated a proceeding to examine expanding flexible use of the 3700 – 4200 MHz band (C-band) to speed up the deployment of terrestrial 5G in the U.S. Subsequently, the Commission released a Notice of Proposed Rulemaking (NPRM) to consider whether and how to reassign a portion of this band to terrestrial mobile operations. The C-Band Alliance (CBA), whose members are the four C-band satellite operators providing services in the U.S., has submitted a detailed proposal under this proceeding to clear 200 MHz (including a 20 MHz guard band) of C-band spectrum.

As incumbent operators in C-band, the CBA members understand the critical importance of C-band. They are well-positioned to facilitate a smooth transition for incumbent satellite customers. This expertise will also accelerate the clearing of the spectrum for Mobile Network Operators (MNOs) seeking to deploy terrestrial 5G services in the C-band. The CBA's proposed plan endeavours to make 5G in the C-band a reality without displacing the broadcasters and content providers that serve more than 100 million U.S. homes each year.

The CBA believes its proposal is the fastest way to make C-band spectrum available for 5G. The proposal

- is based on contracted services and insight to future demand for C-band satellite service;
- provides for the construction of additional satellites to ensure capacity equilibrium for continental U.S. coverage;
- suggests a market-based solution and detailed transition plan to enable transfer of the spectrum to terrestrial 5G operators within 18 to 36 months following a final FCC order; and
- offers technical operating parameters to accommodate the introduction of terrestrial wireless services into the band neighboring existing C-band satellite services.

Today's Filing

Today's Transition Implementation Process filing details CBA's proposed approach to transitioning existing services from the lower 200 MHz of C-band spectrum into the upper 300 MHz of the band. The filing documents the work completed to date, and the work planned, that will result in the clearing of spectrum within 18 to 36 months of a final FCC order approving the CBA plan.

The CBA issued a timeline from 2017 to 2019 showing seven key elements:

ID	Task Name	2017		2018												2019			
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1	Space Capacity planning and design	[Redacted]																	
2	Customer needs assessment	[Redacted]																	
3	Technical specification development	[Redacted]																	
4	Filter design and testing	[Redacted]																	
5	Space grooming plan	[Redacted]																	
6	Data validation and analysis	[Redacted]																	
7	Implementation preparation	[Redacted]																	

Main points are:

- Based on the detailed assessment of the CBA members’ current space capacity, viable orbital locations and the incumbent C-band customers’ contracted and future demand, CBA members propose to clear 200 out of the 500 MHz of mid- or C-band spectrum.
- In order to protect satellite earth stations from terrestrial 5G interference, the CBA has specified 5G operating parameters, including power levels and exclusion areas; they will apply to terrestrial wireless services deployed in the repurposed spectrum between 3700 MHz and 3880 MHz (plus 20 MHz of guard band). The 5G rejection filters will be required at every C-band downlink in the U.S. The field testing of these filters is ongoing, including conclusive filter efficacy tests at an Ellenwood, Georgia test facility featuring use of a 5G signal simulator with live transmissions.
- Detailed migration plans have been created for each network operating on the respective CBA member satellite fleets. These customer-specific plans contain the proposed timing, frequency, and new transponder or satellite location for every contracted service on the fleet. All existing contracted services are accommodated under the 200 MHz clearing plan. Customer-specific information has not been shared between CBA member companies.
- The CBA sought and acquired additional necessary details to append data collected under an FCC Public Notice which attempted to identify every C-band antenna in the U.S. The CBA continues to build a detailed analysis and survey of C-band sites and earth stations. The analysis includes the number, location, user type, antenna type (including identification of multi-feed antennas) and cable head-end affiliation.
- The CBA detailed all Transition Facilitator workflows necessary to implement its proposal. This includes data collection, logistics and inventory management, installation scheduling, billing and reimbursements.

Post-Order Implementation Plan

This section details spacecraft launch plans and timing, the ground impacts of clearing and how and when cleared spectrum could be made available for terrestrial 5G services.

- Under the CBA proposal, eight new satellites will be required in order to clear spectrum for terrestrial 5G operations while protecting contracted incumbent services. The time required to procure, build, and launch Geosynchronous Earth

Orbit (GEO) satellites usually extends beyond 36 months. In an effort to shorten that timeframe, two CBA member companies (SES and Intelsat) have completed the design and procurement activities for these satellites. A provisional contract negotiation is pending completion with a U.S. satellite manufacturer. To meet the 36-month timeline, multiple satellite manufacturers and launch providers will need to work simultaneously.

- The filing details the order in which networks will be migrated. This includes details regarding the parallel transmission in both the old and new frequency range during the transition (so-called dual illumination), the filtering of all C-band downlink antennas, which are estimated to be in the tens of thousands, the repointing or replacement of receive antennas in case of switching satellites and the reimbursement of the related cost.
- The CBA has undertaken and published a detailed analysis of registered earth stations by application.
- The transition plan details a two-tranche clearing plan, which could make some spectrum available early in the 18 to 36 months post-FCC final order timeframe. The first tranche would be 60 MHz with a 20 MHz guard band in top Partial Economic Areas (PEAs) within 18 months of an FCC final order. The remaining spectrum would be cleared in those areas plus the full 180 MHz in all regions of the continental U.S. no later than 36 months of the final order. The proposal outlines the antenna filter requirement implications for such a two-tranche spectrum release.
- The filing details the necessary operating adjustments necessary to protect other satellite services which will continue to operate in the lower 200 MHz, as the proposed spectrum clearing not only impacts the reception of signals by earth stations but also the C-band signals used in the operation of satellites. Operational details of the filing include rules protecting the continued use of the band for Telemetry, Tracking, and Command (TT&C) functions for the operation of the satellites and in the downlink of international satellite services through C-band gateways. Both would need to continue to operate in the lower 200 MHz and require an exclusion zone of as much as 150km per such type of earth station. In order to minimize the restrictions for 5G deployment, the CBA member companies have agreed to consolidate TT&C and gateway sites from 14 to 4 in the least impactful areas possible.