Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of
Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band

REPLY COMMENTS
OF
NATIONAL PUBLIC RADIO, INC.

National Public Radio, Inc. (“NPR”) hereby submits its reply comments in the above-captioned proceeding concerning the Commission’s proposal to create a new Citizens Broadband Service in the 3550-3650 MHz band (“3.5 GHz band”) and to potentially extend that new regulatory regime to the 3650-3700 MHz band.1 While NPR is supportive of the Commission’s efforts to enable more efficient use of radio spectrum, we agree with other commenters that a more deliberate and thorough assessment of the risks to the current uses of spectrum is required so that appropriate technical safeguards can be identified and implemented. NPR therefore opposes the creation of the Citizens Broadband Service in both the 3.5 GHz band and the 3650-3700 MHz band, pending detailed testing and analysis of potential harmful interference to incumbent operations in adjacent bands.

NPR is a non-profit, noncommercial membership organization of more than 900 public radio stations. While known for producing and distributing such noncommercial educational radio programming as All Things Considered and Morning Edition, NPR also manages and operates the Public Radio Satellite System ("PRSS"), which, for more than three decades, has

---

enabled a broad and extremely diverse community of program producers and noncommercial educational radio stations to distribute programming for broadcast. Visionary pioneers at NPR established this satellite-based interconnection system, the first of its kind, in the late 1970s.

The PRSS is a unique cooperative enterprise that provides an outstanding service to the nation. NPR is licensed to operate transmit-and-receive earth stations located at NPR’s headquarters in Washington, D.C. Additionally, more than 400 PRSS receive-only earth stations are licensed or registered to, owned by, and located at public radio stations across the country. In conjunction with the satellite transponder capacity and national operating system equipment owned by the Public Radio Satellite Interconnection System Charitable Trust, this system facilitates the exchange of noncommercial educational, cultural, and informational programming from more than 150 program producers for broadcast to a diverse public — including rural, minority, and other unserved and underserved audiences.

All public radio listeners, numbering 36 million on a weekly basis, depend on the PRSS. Distribution of public radio audio content via the PRSS is reliant upon C-band technology; the receive-only and the transmit-and-receive earth terminals all use the 3700-4200 MHz band for downlinking. Between October 2011 and September 2012, the PRSS distributed 121,805 hours of news, music, and specialized audience programming via satellite to public radio stations for broadcast to the public. Thus, ensuring that this C-band system remains safe from harmful interference is essential for continued public radio distribution in the United States.

NPR shares the concerns of content distribution entities and associations such as the National Association of Broadcasters (“NAB”)², the National Cable and Telecommunications

---

Association ("NCTA")\(^3\), and the Content Companies\(^4\), as well as the concerns of the satellite industry as voiced by the Satellite Industry Association ("SIA")\(^5\) in this proceeding. Protection of incumbent C-band earth station operations is vital, as “the satellite infrastructure in this spectrum serves as the backbone for distribution of media content globally.”\(^6\) Virtually everyone in the United States receives television content via C-band services, and “alternatives cannot be scaled to provide the same ubiquitous and dependable service” as C-band services.\(^7\)

NPR adds its voice to the chorus of concern because the record in this proceeding lacks specific details about the technical parameters of the small cell operations contemplated by the NPRM. Accordingly, data relating to the technical protection margins offered by the proposed small cell operations is insufficient. Due to the lack of fundamental operating and protection parameters, NPR strongly urges the Commission to refrain from further action in this proceeding until the record is supplemented with engineering data, including interference protection margins required by incumbent C-band earth stations. NPR echoes the calls for thorough testing, industry analysis of the technical data, and opportunity for public comment made by other commenters in this proceeding.\(^8\)

---

\(^3\) Comments of NCTA, GN Docket No. 12-354 (filed Feb. 20, 2013).
\(^4\) Comments of the Content Companies, GN Docket No. 12-354 (filed Feb. 20, 2013).
\(^6\) See id. at 5.
\(^7\) Comments of the Content Companies, GN Docket No. 12-354 at 2 (“All 114 million US television households rely on C-band operations from 3.7-4.2 GHz in some measure for content distribution.”).
\(^8\) Comments of NAB, GN Docket No. 12-354 at 3; Comments of NCTA, GN Docket No. 12-354 at 2; Comments of SIA, GN Docket No. 12-354 at 13-15.
Due to the need for more data regarding the potential impact of the proposed Citizens Broadband Service and because of the substantial Federal investment in the PRSS, NPR will undertake interference susceptibility tests in mid-2013 to objectively evaluate possible interference mechanisms associated with the Commission’s proposed Citizens Broadband Service. NPR will test (1) the level of out-of-band emissions from the 3.5 GHz band and the 3650-3700 MHz band that may overcome the band-pass filtering of earth station low-noise amplifiers and low-noise block downconverters (“LNA/LNBs”), and (2) the level of spurious emissions from the proposed wireless devices that may fall within the 3700-4200 MHz downlink receive band.

The first aspect of NPR’s interference susceptibility test is required because the upper edge of the 3.5 GHz band is only 1.35% below the lower edge of the 3700-4200 MHz receive band. This presents a technical challenge to blocking such closely-spaced emissions. Further, with the 500 MHz bandwidth required by the downlink receive system, a sharper filter cutoff imposes penalties for the earth station. As explained in the NAB’s engineering statement, sharper filtering at the input of the LNA/LNB “will impact the overall receive performance of the terminal, degrading the system G/T [Gain divided by System Noise Temperature] by a

---


10 NPR’s tests are referred to as “interference susceptibility” because the tests will be performed on normal, operating C-Band earth stations, determining the effect of the two emission conditions described above. The tests will radiate calibrated emissions, representing a variety of probable modulation types, in the physical space around the earth stations, to measure the impact of the signals on the received Eb/No (the energy per bit to noise power spectral density ratio) and received data failure point. The tests will be collected on azimuths surrounding the earth station, to consider receive antenna directivity effects.
potentially significant amount.”\textsuperscript{11} Overcoming the filter penalties could require substantially higher cost LNA/LNBs or larger receive antennas, which could be prohibitive for operators based on cost and zoning considerations.\textsuperscript{12}

The emission parameters of the proposed service are essential for a thorough understanding of the interference thresholds for earth stations operating in the C-Band. It is normal for all emitters to produce out-of-band spectral products, as the FCC routinely anticipates in its rules, as well as in this NPRM.\textsuperscript{13} If mobile devices and base stations with limited placement oversight are permitted, it is possible for these emitters to operate in close proximity, possibly even within the antenna beamwidth, of a C-Band earth station. To complete the rules governing output power, out-of-band emissions, and frequencies of operation, it is imperative to understand the thresholds of interference to earth stations operating in the C-Band.

NPR believes that its interference susceptibility tests will enable NPR to contribute to an informed conversation about the Commission’s proposed alteration of C-band spectrum allocation. NPR also looks forward to reviewing technical data regarding interference risks posed by the proposed new small cell operations to C-band incumbents and the protection margins that would be necessary if the service is introduced. Until the technical, financial, and operational impacts are assessed and documented in the record of this proceeding, the Commission should not move forward to implement its Citizens Broadband Service proposal.

\textsuperscript{11} Comments of NAB, Engineering Statement of Skjei Telecom, Inc., GN Docket No. 12-354 at 3.
\textsuperscript{12} Id.
\textsuperscript{13} See NPRM ¶ 136.
Conclusion

For the foregoing reasons, and as demonstrated above, NPR urges the Commission to refrain from establishing the proposed Citizens Broadband Service until further testing is conducted, interference protections can be developed, and other basic questions about the service have been addressed.

Respectfully submitted,

NATIONAL PUBLIC RADIO, INC.

Pete Loewenstein
Vice President, Distribution
Michael Starling
Chief Technology Officer and Executive Director,
NPR Labs
Michael Riksen
Vice President, Policy & Representation
Rishi Hingoraney
Director of Public Policy and Legislation
/s/ Mariah Dodson
Counsel

National Public Radio, Inc.
1111 North Capitol Street, NE
Washington, D.C. 20002
(202) 513-2040

April 5, 2013