

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of:)	
)	
Expanding Flexible Use in Mid-Band Spectrum)	GN Docket No. 17-183
Between 3.7 and 24 GHz)	
)	

**COMMENTS OF
NATIONAL PUBLIC RADIO, INC.**

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Introduction and Summary

National Public Radio, Inc. (“NPR”) hereby submits its comments in response to the *Notice of Inquiry* in the above-captioned proceeding.¹ These comments are offered on behalf of the public radio system, a uniquely American public service, nonprofit media enterprise broadcasting weekly to more than forty one million Americans. This system includes NPR, more than 1000 independently owned local public radio stations licensed to NPR Members or otherwise affiliated with NPR, many other stations, large and small, rural and urban, and other producers and distributors of public radio programming, including American Public Media (“APM”), Public Radio International (“PRI”), the Public Radio Exchange (“PRX”), that collectively create and distribute content through the Public Radio Satellite System (“PRSS”). As manager of the PRSS, NPR specifically responds to the Commission’s request for information about existing uses of the 3.7-4.2 GHz band (“C-band”) and how additional terrestrial broadband use of the spectrum might affect incumbent operators.

¹ *In the Matter of Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, Notice of Inquiry*, at ¶¶ 12, 18, 22 (Rel. Aug. 3, 2017) [hereinafter, “*NOI*”].

NPR is concerned that additional terrestrial use of the C-band spectrum, particularly for mobile broadband, would threaten the public's access to public radio station broadcasts of *Morning Edition*, *All Things Considered*, *Marketplace*, and other popular public radio programming. The PRSS is completely dependent on extremely low-power satellite-to-earth station C-band downlinks, which, in turn, are particularly susceptible to interference. NPR also depends on the Commission's longstanding "full band, full arc" policy for authorizing earth stations to assure reliability and redundancy. Any additional terrestrial C-band use must protect the PRSS earth station downlinks from interference and accommodate full band, full arc earth station operation.

I. Over the Past Four Decades and with Significant Federal Funding, NPR and Public Radio Have Built a National System of Interconnected Public Radio Stations, Producers, and Distributors Based on C-Band Spectrum

NPR established the first satellite-based interconnection system for distributing audio content in the late 1970s. What we now know as the PRSS annually delivers more than 450,000 hours of news, music, cultural programming to 1,278 public radio stations throughout the United States, reaching 95% of the U.S. population. NPR is licensed to operate a small number of transmit-and-receive earth stations located at its Washington D.C. headquarters and a backup located at Minnesota Public Radio in St. Paul, MN. Additional transmit-and-receive earth stations that comprise key components of the PRSS are licensed and operated by public radio stations across the country. PRSS-interconnected public radio stations, including both NPR and non-NPR stations, maintain and operate 475 receive-only earth stations to permit the distribution of noncommercial news and cultural programming by a multitude of program producers and distributors. This programming is then broadcast to millions of listeners, including many in rural and other underserved areas of the country, each and every day.

The PRSS's contribution to the public interest is supported by a long-standing and substantial Federal interest. In the Public Broadcasting Act of 1967, Congress authorized the establishment of one or more interconnection systems to provide program suppliers with the means to distribute programs to local public television and radio stations.² In 1978, public television and radio became the first extensive broadcasting systems in the nation to switch from a system of land-line distribution to satellite interconnection.³ Congress subsequently authorized and appropriated to the Corporation for Public Broadcasting ("CPB") a substantial portion of the funding for the refurbishment of the PRSS in 1988,⁴ with the stated purpose of continuing and expanding the nationwide, satellite-interconnected system of distributing public telecommunications services.⁵ Congress' commitment to the PRSS follows from its belief, as stated in the Public Broadcasting Act, that it "is in the public interest to encourage the growth and development of public radio and television broadcasting, including the use of such media for instructional, educational, and cultural purposes."⁶

² Pub. L. No. 90-129, § 201, 81 Stat. 365, 370 (1967) (codified, as amended, at 47 U.S.C. § 396(g)(1)(B)).

³ H.R. Conf. Rep. No. 825, 100th Cong., 2d Sess. 11 (1988).

⁴ Pub. L. 100-626, 100th Cong., 2d Sess., 102 Stat. 3207 (amending Section 396(k) of the Communications Act of 1934). Congress appropriated \$200 million for both the public television and public radio satellite systems. Pub. L. No. 100-436, 102 Stat. 1680, 1708-09 (1988) (appropriating \$57.5 million); Pub. L. No. 101-166, 103 Stat. 1159, 1185 (1989) (appropriating \$76.25 million); Pub. L. No. 101-517, 104 Stat. 2190, 2217 (1990) (appropriating \$66.94 million).

⁵ See H. Rep. No. 825, 100th Cong., 2d. Sess. 10-15 (1988); S. Rep. No. 444, 100th Cong., 2d Sess. 6-10 (1988).

⁶ 47 U.S.C. § 396(a)(1).

Following the failure of the Galaxy IV satellite in 1998, Congress appropriated \$48 million to secure replacement transponder capacity and related facilities to extend the life of the then-current PRSS.⁷ Congress completed an additional, three-year \$78 million Federal appropriation for the replacement and upgrade of significant portions of the PRSS in 2009.⁸ The current generation of the PRSS content distribution system is ContentDepot (prss.org/contentdepot), which uses satellite-based distribution to deliver IP-based live streams and file transfers through an automated protocol that increases efficiency and decreases the workload for local stations.

Most recently, Congress has appropriated \$90 million in initial funding for the next generation of the public radio and public television interconnection systems,⁹ and NPR is projecting to spend in excess of \$50 million over ten years for satellite transponder capacity, ground system refurbishment, and related project support for the next generation of the PRSS. PRSS continues to use satellite technology as its primary delivery platform because satellite continues to be the most cost-effective and reliable means of delivering high-quality audio programming to a national network of public radio stations serving hard to reach and geographically diverse communities. Terrestrial delivery is not an option for live content that

⁷ Emergency Supplemental Appropriations, Pub. L. No. 106-31, Title III, Ch. 5, 113 Stat. 57, 91-92 (1999).

⁸ See Consolidated Appropriations Act 2010, Pub. L. No. 111-117, 123 Stat. 3274 (2009); Omnibus Appropriations Act, 2009, Pub. L. No. 111-8, 123 Stat. 797 (2008); Consolidated Appropriations Act, 2008, Pub. L. No. 110-161, 121 Stat. 2202 (2007).

⁹ See Consolidated Appropriations Act, 2016, Pub. L. 114-113, § 407, 129 Stat. 2242, 2642-43 (Dec. 18, 2016) (appropriating \$40 million “for the costs associated with replacing and upgrading the public broadcasting interconnection system”); Consolidated Appropriations Act, 2017, Pub. L. 115-31, § 405, 131 Stat. 135 (May 5, 2017) (appropriating \$50 million for such costs).

must be available across the public radio network: it is too expensive, unreliable and in many rural areas of America either not reliable or simply non-existent.

The PRSS's use of C-band spectrum to connect public radio stations is also a remarkably efficient use of federal funding. In June 2016, the CPB engaged an independent consultant to review the PRSS and potential alternative distribution platforms. The consultant found that "[n]o other alternative discussed or examined, including commercially available options – is more cost effective or likely to result in success."¹⁰ The PRSS's efficiency and reach are possible only because of the C-band satellite spectrum's ability to serve rural and remote locations, where cost-effectiveness is a necessary requirement for providing service.

II. The PRSS Makes Possible the Important Public Services Public Radio Provides

Simply put, public radio could not serve more than 41 million Americans each week without the PRSS and would not exist without the indispensable, highly efficient programming distribution methods currently employed. The PRSS is used by a large variety of program producers, syndicators and distributors; national, state, and local organizations; and public radio stations. The PRSS reaches stations in geographically diverse areas, from remote villages in northern Alaska and Native American lands in the Southwest, to major market stations such as WNYC in New York and KUSC in Los Angeles. Programs distributed over the PRSS span a variety of formats, including news, cultural information, public affairs, drama, documentaries, classical music, and jazz, and come from a wide variety of producers and distributors in addition to NPR, including American Public Media (APM), Public Radio International (PRI), and more than 100 others.

¹⁰ Cognizant Technology Solutions, *Interconnection for Public Radio: Optimizing Success: Key Findings and Recommendations* at 3 (June 2016) (report to the Corporation for Public Broadcasting).

By enabling its interconnected stations to receive and send programming across the satellite interconnected network, the PRSS is able to bring important voices to listeners throughout a state, a region, or the country. Rural communities in particular rely on their local public radio station and, in turn, the PRSS, as an important and sometimes exclusive source of news, public affairs, and cultural programming. Among numerous examples, four in particular demonstrate the irreplaceable role the PRSS plays in communities that rely on public radio for important news and cultural programming and other public service.

Native Voice One (nv1.org) is a Native American radio network that utilizes the PRSS to distribute programming among 60 native stations. Because of the remoteness of the station coverage areas, there is no practical alternative to satellite distribution via the PRSS, and interference from new terrestrial C-band use has the potential to compromise this important service. Native Voice One offers an invaluable service to its listeners, with programs ranging from an investigation of the opioid crisis among Native American communities¹¹ to gavel-to-gavel coverage of the entirety of the Alaska Federation of Natives convention.¹²

West Virginia Public Broadcasting (wvpublic.org) is a statewide network spanning the state and broadcasting important news and information to hard-to-reach places. WVPB is the only media outlet in West Virginia that provides a live broadcast of the Governor's address, and also broadcasts unique stories on such local topics as the evolution of the local timber industry¹³

¹¹ <http://www.nv1.org/responding-opioid-drug-crisis-american-indian-communities/>

¹² <http://www.nv1.org/20th-annual-gavel-gavel-broadcast-alaska-federation-natives/>

¹³ <http://wvpublic.org/post/wva-timber-mechanization-driving-change-logging-practices#stream/0>

and national recognition of the last commercial broom-maker in the state.¹⁴ WVPB's coverage and reach would not be possible without the PRSS.

The **Kansas News Service** (kcur.org/term/kansas-news-service), which comprises a network of public radio stations and translators across urban and rural Kansas and Missouri, provides coverage of local news and events through a community-based, multiplatform system that relies on the PRSS.¹⁵ The Service recently received a \$500,000 grant from CPB to support the Kansas Public Media News Collaboration, which will allow Kansas reporters to collaborate with national programs, including NPR's *Morning Edition* and *All Things Considered*, and other public media programs. Such collaboration could not exist without the PRSS's ability to connect the participating stations to each other and to the larger national public radio system.

Finally, in addition to the broadcast programming services it enables, the PRSS plays an important role in the **Emergency Alert System** by serving as a Primary Entry Point, or PEP, and by having the capability to relay Presidential-level alerts to its interconnected radio stations. NPR was requested to participate directly in the dissemination of emergency alerts by the Commission's Emergency Alerting Advisory Committee in 2000. Public radio stations have long served an important EAS role because radio broadcasting is an inherently robust technology for communicating with the public during serious emergencies.¹⁶ At that time, NPR established

¹⁴ <http://wvpublic.org/post/inside-appalachias-broommaker-film-will-be-screened-library-congress#stream/0>

¹⁵ <http://kcur.org/post/kcur-awarded-500k-create-kansas-public-media-news-collaboration#stream/0>

¹⁶ See, e.g., Trust, G., Oklahoma City Radio Works To Help After Disaster, *Billboard*, May 21, 2013, retrieved from <http://www.billboard.com/biz/articles/news/legal-andmanagement/1563092/oklahoma-city-radio-works-to-help-after-disaster>; Sisario, B., After Hurricane Sandy, People Flock To Radio For Information, *The New York Times*, Nov. 18, 2012, retrieved from http://mediadecoder.blogs.nytimes.com/2012/11/18/after-hurricane-sandy-peopleflock-to-radio-for-information/?_r=0; Pearce, M., Joplin Radio Stations Become Lifeline

a shared channel for dissemination of the National Emergency Action Notification message through the PRSS for receipt by any interconnected public radio station and began monitoring a nearby PEP station. Today, the PRSS receives the Presidential-level EAS feed directly from FEMA, which can then be transmitted to the 1,278 interconnected stations it serves.

III. Interference Caused by the Introduction of Additional Terrestrial Uses of the C-Band Spectrum Would Threaten the Reliability of the PRSS and the Public's Ability to Receive Public Radio Broadcast Programming and Emergency Alerts

Authorizing additional terrestrial uses of the C-band spectrum, particularly for mobile broadband, threatens the ability of the PRSS to distribute, and public radio stations to receive and broadcast, public radio programming to millions of Americans every day. To avoid a catastrophic outcome, the Commission should refrain from introducing any new interference to the system's satellite-to-earth station downlinks. In addition, the Commission should preserve its long-standing "full-band, full-arc" policy for authorizing earth stations, which has proven essential to the efficiency and effectiveness of satellite delivered communications.

PRSS downlink earth stations are exceptionally susceptible to interference because satellite-to-earth station transmissions use very little power. That is simply a function of the long distance (22,000 miles) they must travel to reach the intended downlink receivers. As a result, earth-station downlinks would be prone to disruption by *any* nearby transmitters, including handheld mobile devices. Interference, even if it occurred only intermittently, would also block

For Tornado-Stricken Residents, Los Angeles Times, retrieved from <http://articles.latimes.com/2011/may/25/nation/la-na-tornado-radio-20110526>.

That is why the Federal Emergency Management Agency ("FEMA") recommends including a battery-powered or hand-crank radio as part of an emergency preparedness kit. www.fema.gov/news-release/2012/12/22/give-your-loved-ones-gift-emergency-preparedness

C-Band reception rather than merely producing artifacts in an otherwise usable signal. The result would be a catastrophic failure of a station's broadcast service.¹⁷

The Commission should also retain its policy of authorizing earth stations to use the entire C band, subject to coordination with Fixed Service operations.¹⁸ The Commission's policy is rooted in a basic fact of satellite communications: Satellite operators and earth station receivers require flexibility to assure reliable service:

Our full-band licensing policy promotes important operational objectives in the FSS, in particular by providing earth station licensees the needed flexibility to change transponders or satellites on short notice, and without having to be re-licensed by the Commission, to meet changing operational requirements. As commenters observe, the potential transmission path for a satellite earth station can include any authorized space station within the portion of the geostationary satellite arc seen by the earth station. Many satellite earth stations employ multiple antennas and regularly communicate with a constantly changing mix of FSS satellites, both domestic and foreign. This type of operation requires access over a wide range of orbital arc and frequencies.¹⁹

To operate effectively, earth stations must have the ability to reorient to different frequencies or different satellites in case of a disruptive event, as demonstrated by the failure of the Galaxy IV satellite in 1998.

¹⁷ Attempting to address the issue by mandating the use of filtering or the factoring in of earth station "look angles" would be insufficient for the reasons NPR previously addressed in the Citizens Broadband Service proceeding concerning spectrum adjacent to the C band. See Comments of National Public Radio, Inc., *In the Matter of Amendment of the Commission's rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, at 3-8, filed July 14, 2014.

¹⁸ See NOI at ¶¶ 17-18.

¹⁹ *In the Matter of FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service That Share Terrestrial Spectrum; FWCC Petition for Rulemaking to Set Loading Standards for Earth Stations In the Fixed-Satellite Service that Share Terrestrial Spectrum; Onsat Petition for Declaratory Order that Blanket Licensing Pursuant to Rule 25.115 (c) is Available for Very Small Aperture Terminal Satellite Network Operations at C-Band; Onsat Petition for Waiver of Rule 25.212(d) to the Extent Necessary to Permit Routine Licensing of 3.7 Meter Transmit and Receive Stations at C-Band; Ex parte Letter Concerning Deployment of Geostationary Orbit FSS Earth Stations in the Shared Portion of the Ka-band, Notice of Proposed Rulemaking*, 15 FCC Rcd 23127, at 23146, 47 (2000).

NPR's backup plan at the time included restoration of service at the same orbital location as the failed satellite. Physically moving the backup satellite to the orbital location of the failed satellite took approximately a week to accomplish, during which NPR moved its operations to an interim satellite. Many of the PRSS uplinks were unable to operate during this period because frequency coordination restrictions that were meant to protect fixed microwave users precluded operation on the specific transponder frequency that was made available to NPR.

As a result, NPR was required to "backhaul" a substantial amount of traffic that ordinarily would have been uplinked at those sites to the NPR Washington, D.C. uplink (which is coordinated for full-arc, full-frequency) for transmission to the PRSS. NPR was also forced to rely on various non-satellite means to deliver programming. If NPR's Washington, D.C. uplink were not coordinated for full-arc, full frequency transmission, NPR and other public radio producers would have been forced to rely on burdensome and expensive non-satellite means of distribution to an even greater extent.

Based on this experience, NPR believes the only viable licensing approach for C-band spectrum is one that both protects down-link earth stations and incorporates the Commission's full-band, full-arc policy. For decades, the PRSS has successfully shared the C-band with terrestrial, fixed microwave service providers whose wireless use is carefully coordinated and which accommodates the Commission's full-band, full-arc licensing regime. As NPR's experience with the Galaxy IV satellite demonstrates, any limitations on this regime would put public radio's reliability, and the public's access to important public radio services, in jeopardy.

Conclusion

For these reasons, in considering any additional terrestrial use of the C-band spectrum, NPR urges the Commission to protect C-band earth stations from interference and preserve full-band, full-arc licensing to avoid disruption to the nation's public radio system.

Respectfully submitted,

NATIONAL PUBLIC RADIO, INC.

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