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January 2, 2024

Sean Conway
Deputy Chief Counsel
National Telecommunications and Information Administration
1401 Constitution Ave. NW
Washington, DC 20230

Re: *National Telecommunications and Information Administration Implementation of the National Spectrum Strategy*

Dear Mr. Conway:

The Fixed Wireless Communications Coalition¹ (FWCC) respectfully submits these comments in response to the Notice of Opportunity for Public Input² published on December 7, 2023 regarding the National Telecommunications and Information Administration's (NTIA) implementation of the National Spectrum Strategy³ (NSS). The FWCC appreciates this opportunity to weigh in on the NSS, to work with stakeholders and the NTIA to improve access to spectrum resources, and to support continued U.S. leadership in advanced technology. These comments focus on the 7125-8400 MHz band (also referred to as the 7 GHz band).

¹ The FWCC is a coalition of companies, associations, and individuals actively involved in the terrestrial fixed microwave communications services. Our membership includes manufacturers of microwave equipment, fixed microwave engineering firms, licensees of terrestrial fixed microwave systems and their associations, and communications service providers and their associations. The membership also includes railroads, public utilities, petroleum and pipeline entities, public safety agencies, backhaul providers, and/or their respective associations, communications carriers, and telecommunications attorneys and engineers. Our members build, sell, and use both licensed and unlicensed fixed wireless systems.

² Implementation of the National Spectrum Strategy, 88 Fed. Reg. 85,266 (Dec. 7, 2023) (Public Notice).

³ NAT'L TELECOMM'NS AND INFO. ADMIN., U.S. DEP'T OF COM., NATIONAL SPECTRUM STRATEGY (2023).

I. Introduction and Summary

Opening access to the 7125-8400 MHz band to Fixed Service⁴ (FS) links will allow NTIA and the Federal Communications Commission (FCC) to quickly and efficiently realize the goals of the NSS in that band. As the NSS indicates, the 7125-8400 MHz band currently serves “a variety of mission-critical Federal operations ... that will make it challenging to repurpose portions of the band while protecting incumbent users from harmful interference.”⁵ The band’s current Federal uses, including Federal FS, Fixed Satellite, Mobile Satellite, Space Research, and Meteorological Satellite services, are well-suited to sharing spectrum with FS links. Federal incumbents already share with Federal FS links throughout most of the band, and non-Federal FS licensees share the 23 GHz band⁶ with Federal Fixed, Mobile, and Satellite users, demonstrating the feasibility of sharing the 7125-8400 MHz band with non-Federal FS users.

In addition, while the NSS indicates that the 7125-8400 MHz band will be studied first for wireless broadband use, opening the band to non-Federal FS links will facilitate wireless broadband service across the country. Among its many uses, non-Federal FS links are used to provide backhaul to wireless broadband services. The proliferation of wireless broadband, and especially the deployment of distributed antennas and other similar systems, has made backhaul a critical component of broadband service. Without backhaul, no amount of spectrum dedicated to wireless broadband providers will satisfy demand. Therefore, by allowing non-Federal FS links to utilize the 7125-8400 MHz band, NTIA and the FCC can support enhanced wireless broadband service.

Finally, there is significant need for additional FS spectrum below 10 GHz. Because of rain fade and other propagation characteristics, frequencies above 10 GHz can only be used for shorter links. For longer path lengths, the only FS band below 10 GHz available to non-Federal users is the 6 GHz band. That band is highly congested with more than ninety-six thousand links, and the FCC recently opened that band to unlicensed wireless operations. Moreover, critical infrastructure industries (CII) that are vital to the safety of life and property across the country are primary users of FS links. Thus, opening the 7125-8400 MHz band to non-Federal FS users will both help alleviate congestion in the 6 GHz band and ensure that CII users have access to the spectrum resources they need.

II. Background

a. FS Operations are Critical to the Safety of Life and Property and to U.S. Economic Activity

Critical infrastructure often goes unnoticed until it fails, revealing our reliance on it. That is the case with FS links, which provide point-to-point communications channels used by first

⁴ As used herein, the term “fixed service” (FS) includes the Part 101 Common Carrier and Private Operational Fixed Services, but not the Part 74 Broadcast Auxiliary Service.

⁵ *Id.* at 6.

⁶ The 23 GHz band describes a group of sub-bands from 21.2-23.6 GHz.

responders, utilities, pipeline operators, railroads, and telecommunications providers. These links offer high-speed, high-reliability connections that can span dozens of miles. Reliability is a hallmark of the FS industry with links often operating at 99.999% to 99.9999% uptime (so-called five or six nines reliability). FS users depend on this reliability to provide first responder communications, Supervisory Control and Data Acquisition (SCADA) for utility and pipeline systems, centralized train control systems for railroads, and backhaul for telecommunications systems across the country.

Reliability is more than just a marketing tool. FS users depend on the reliability of FS systems. Links that operate at a reliability level of 99.9999% can only have downtimes of thirty seconds per year. Most links operate at 99.999% reliability, which equates to five minutes of outage time per year. For telecommunications providers, FS systems are typically more reliable and faster to restore after emergencies than fiber and other wireline backhaul options. Given the FS industry's reliability, it is easy to understand why first responders rely on FS systems for their communications and why utilities, pipeline owners, and railroads rely on these systems to monitor and control their operations. It is also easy to imagine the damage, both human and economic, that could occur if a critical FS system went down at the wrong time. In addition to being an indispensable part of the country's public safety, CII, and telecommunications infrastructure, a wide variety of businesses depend on FS links to quickly transmit business data, including time-sensitive trading information. It is not an exaggeration to say that the FS industry impacts the lives of every American.



Figure 1: FS site subject to extreme weather (photo by George Kizer)

Because of the critical role FS systems play in supporting CII, the industry can be counted on to interact responsibly with Federal incumbents in the 7125-8400 MHz band. FS bands are frequency coordinated, and FS engineers take pride in designing links that will meet a user's needs without disrupting existing users. The industry is accustomed to designing systems to tight tolerances in congested bands. Frequency coordinators that support the industry expertly ensure new links will not interfere with incumbent users. As noted above, it is not mere speculation that effective coordination among non-Federal FS users and Federal spectrum users is possible because such coordination already occurs in the 23 GHz band.

b. Proceeding History

While the immediate impetus for the Public Notice was the release of the NSS on November 13, 2023, discussions regarding the shared use of the 7125-8400 MHz band significantly predate the NSS. In 2010, President Obama release a Presidential Memorandum

directing NTIA and the FCC to collaborate in making Federal spectrum bands available to non-Federal users.⁷ Shortly before that Presidential Memorandum, the FWCC filed a Petition for Rulemaking asking the FCC to insert FIXED in the non-Federal Table of Allocations for each sub-band in the range of 7125-8500 MHz and to make other rule changes necessary to permit non-Federal users to operate in those sub-bands.⁸ The FWCC's Petition was widely supported, and no party opposed the Petition when the FCC sought comment. The Petition remains pending before the FCC.

With respect to the instant proceeding, the NTIA asked commenters to focus on near-term implementation goals. "NTIA is interested in public views on implementing the [NSS], with a focus on the next 1-3 years, as such inputs allow NTIA and other federal agencies to benefit from expertise and viewpoints outside the federal government."⁹ With the competitive nature of advanced technology, it makes sense to prioritize spectrum solutions that can be implemented in NTIA's 1-3 year timeframe. Fortunately, expanding access to the 7125-8400 MHz band to non-Federal FS users can be accomplished within that timeframe, and doing so will advance the NSS's goals of ensuring access to spectrum necessary to support critical infrastructure, transportation, emergency response, public safety, economic growth, and advanced communications technologies.

III. Discussion

a. FS Ideal for Sharing 7125-8400 MHz Band with Federal Incumbents

The directional and channelized nature of FS paths make them ideal for coordination among links and with other licensed users. In the simplest terms, an FS link is a wireless beam

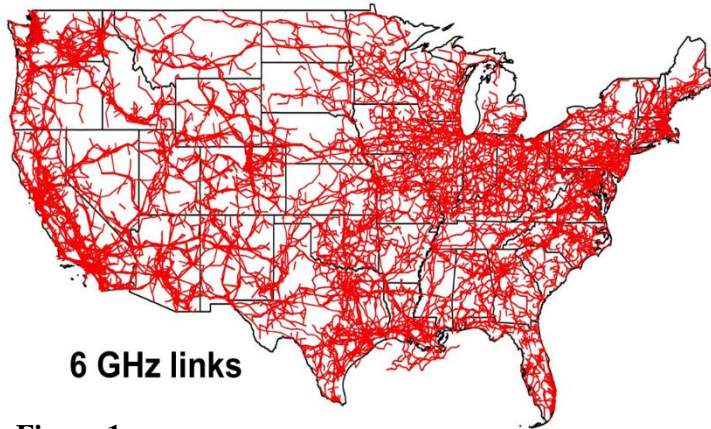


Figure 1

extending from a transmitter at one end to a receiver at the other end of the link. Unlike omnidirectional antenna, FS transmitters use highly directional antennas to focus their energy into a beam directed at the boresight of a receiver at the far end of the link. Of course, in the real-world, there are complicating factors, such as atmospheric refraction, but FS links are often depicted as lines on a map. Figure 2, for example, shows all the FS links in the 6 GHz band,

⁷ Presidential Memorandum on Unleashing the Wireless Broadband Revolution, 75 Fed. Reg. 38,387 (July 1, 2010).

⁸ *In re Amendment of Parts and 101 of the Commission's Rules to Provide for Federal and Non-Federal Sharing in the 7125-8500 MHz Band*, Petition for Rulemaking of the Fixed Wireless Communications Coalition, RM-11605 (Filed March 16, 2010) (Petition).

⁹ Public Notice at 85266.

illustrating why FS is also referred to as microwave point-to-point communications. This point-to-point nature allows consulting engineers, frequency coordinators, and other industry professionals to predict a link's path in detail during the planning and coordination process and to describe that path with accuracy once it is constructed. Engineers can also fine tune the path during installation to ensure that the path is consistent with the licensed path that cleared coordination.

Channelization provides predictability in placing FS links in close proximity to one another. Channelization allocates a segment of the band (for example, a 30 MHz channel) for a link. Channel size depends on the bandwidth needed for the link's planned use and the technical rules for the band in which the link is operating. As with essentially all radio receivers, FS receivers are subject to interference from signals in adjacent channels, but the properties of a receiver are predictable as a function of the signal strength of an adjacent signal and the amount of separation between the interfering signal and the receiver channel. See Figure 3. By using channelization, densely packed sites can host many FS transmitters and receivers operating on different channels.

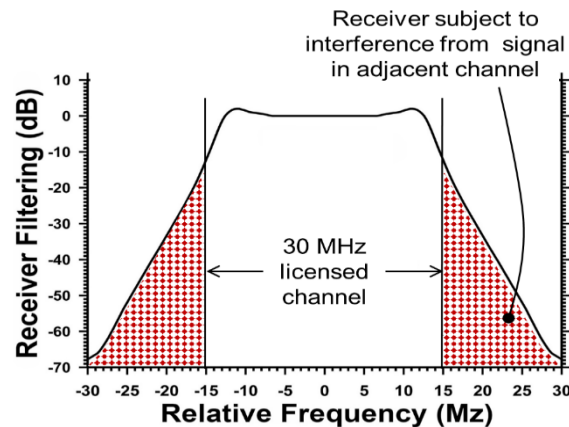


Figure 3: 30 MHz FS victim receiver passband response

Because FS links are tightly confined to their licensed path and frequency, other licensees can make effective use of other portions of FS bands. In other words, an FS license defines both where a link *will* operate and where it *will not* operate. FS bands conduct frequency coordination based on this principle. That coordination can be applied to other types of fixed spectrum users. For example, Fixed Satellite shares the 6 GHz band with FS users. Mobile services can also operate in frequency coordinated bands, such as the 23 GHz band, provided the mobile service technical rules for the band have a mechanism to avoid co-channel or adjacent-channel transmission in the vicinity of FS links or other fixed services in the band.

Finally, the sharing of the 23 GHz band between non-Federal and Federal users shows that coordination is feasible in the 7125-8400 MHz band. Throughout most of the 23 GHz band, non-Federal users conduct frequency coordination through NTIA before beginning operations. There are six channel pairs that are pre-approved by NTIA for conditional licensing by non-Federal users in the band.¹⁰ The current coordination process in the 23 GHz band can take weeks. The FWCC suggests that the FCC and NTIA consider how non-Federal frequency coordinators can access information regarding Federal users in both the 7 and 23 GHz bands, so non-Federal applicants can quickly determine whether a proposed link can be accommodated. However, even if non-Federal coordinators cannot be used in those bands, NTIA coordination in the 23 GHz

¹⁰ 47 C.F.R. § 101.31(b)(1)(vii).

band demonstrates that non-Federal FS users can also coordinate operations in the 7125-8400 MHz band.

b. Allowing Non-Federal FS Access to 7125-8400 MHz Band Will Advance U.S. Economic and Public Safety Interests

FS links support nearly every aspect of modern life, including CII, public safety, and economic use cases. FS applications in the 6 GHz band include:¹¹

- remote control of railroad switches and signals for the synchronization of train movement;
- control of pumps and valves in petroleum and natural gas pipelines;
- control of electric utility circuit breakers and switches to operate and maintain the national electric grid;
- backhaul to dispatch public safety and emergency vehicles (first responders, emergency repair crews, etc.)
- Internet and telephone carriage;
- backhaul for cellular systems, including voice and 4G/5G data;
- connecting commercial centers with real-time financial and market data; and
- vast amounts of business data.

As the Public Notice notes, “Sufficient access to spectrum is vital to national security, critical infrastructure, transportation, emergency response, public safety, scientific discovery, economic growth, competitive next-generation communications, and diversity, equity, and inclusion.”¹² These are precisely the type of uses that rely on FS links. Therefore, allowing FS users to operate in the 7125-8400 MHz band will squarely address the goals of the NSS.

Expanding access to the 7125-8400 GHz would also help alleviate the existing shortage of usable non-Federal FS frequencies below 10 GHz. More than a decade ago, the FWCC warned that the 6 GHz band was congested in many markets.¹³ There are currently more than ninety-six thousand FS links in the 6 GHz band, and as Figure 2 illustrates, many metropolitan areas and the paths between them cannot accommodate further deployment in the 6 GHz band. Opening the 7125-8400 MHz band to non-Federal FS users will relieve substantial strain on the 6 GHz band.

¹¹ Due to the similar propagation characteristics of the 6 GHz band to the 7125-8400 MHz band, the FWCC expects similar FS applications in the 7125-8400 MHz band as those using the 6 GHz band.

¹² Public Notice at 85266.

¹³ Petition at 3.

Finally, allowing non-Federal FS operations in the 7125-8400 GHz band could act as a relief valve for FS users that experience a degradation of service in the 6 GHz band. The FCC recently opened the 6 GHz band to unlicensed use. Although the FCC order authorizing that use found that there is an insignificant risk of harmful interference, FS users in the band remain concerned with how interference cases will be resolved. Across the band, the risk of harmful interference may be insignificant.¹⁴ However, for any individual FS users that experience harmful interference, the impact will be anything but insignificant. And due to the nature of FS users in the 6 GHz band, the impact of harmful interference on even a single user could also be catastrophic for the public. For that reason, some FS users have already expressed less confidence in 6 GHz FS reliability. Limiting the 7125-8400 MHz band to Federal and non-Federal frequency coordinated services would ensure continued protection of mission-critical Federal incumbent users in the band and give non-Federal 6 GHz users an exclusive frequency coordinated band in which to operate below 10 GHz.

c. Proposed Implementation of NSS in 7125-8400 MHz Band

As noted above, an FWCC Petition for Rulemaking regarding the 7125-8500 MHz band is currently pending before the FCC. The FCC could speed implementation of the NSS for the 7125-8400 MHz band by taking up that Petition. Specifically, the Petition asks the FCC to make the following changes to its rules:

- **Section 2.106 (Table of Allocations):**

For each sub-band in the range 7125-8500 MHz, insert “FIXED” in the column heading “Non-Federal Table.”

(Alternatively, as to any sub-band in which the Commission and NTIA determine that non-Federal use must be secondary to Federal use, to insert “Fixed” in that column.)

Over the range 7125-8500 MHz, insert “Fixed Microwave (101)” in the column headed “FCC Rule Part(s).”

- **Section 101.31(b):** Insert 7125-8500 MHz as eligible for conditional authorization.¹⁵

¹⁴ *AT&T Servs., Inc. v. FCC*, 21 F.4th 841, 846 (D.C. Cir. 2021) (“[The FCC] never claimed that the Order would reduce the risk of harmful interference to zero. To the contrary, the Commission repeatedly explained that the Order makes the ‘potential for harmful interference to incumbent services operating in the 6 GHz band ... insignificant.’”).

¹⁵ Under conditional licensing, an application may begin operating a link as soon as the license application is filed, if the link has been frequency coordinated and certain other conditions are met. 47 C.F.R. § 101.31(b)(1). The applicant agrees to cease operation immediately if the application is dismissed or denied. 47 C.F.R. §§ 101.31(b)(2), (3).

- **Section 101.101:** Insert a line in the table as follows:

Frequency band (MHz)	Radio Service				Notes
	Common carrier (Part 101)	Private radio (Part 101)	Broadcast auxiliary (Part 74)	Other (Parts 15, 21, 22, 24, 25, 74, 78 & 100)	
7125-8500	CC	OFS	(blank)	(blank)	(blank)

- **Section 101.147:** Insert pairings and channel assignments for bandwidths of 2.5 MHz, 5 MHz, 10 MHz, 20 MHz, and 30 MHz over the range of 7125-8500 MHz.¹⁶

The FCC should draft a Notice of Proposed Rulemaking (NPRM) seeking comment on the proposed rule changes in the FWCC’s Petition. In addition, the NPRM should seek comment on whether and how non-Federal frequency coordinators can have secure access to information regarding Federal incumbent operations in the 7 and 23 GHz bands. Such information sharing could allow non-Federal coordinators to take on the responsibility of conducting coordination in those bands for non-Federal users and speed the coordination process. Because of the compatibility of non-Federal FS operations with the 7125-8400 MHz band, the FWCC believes it is possible to open access to the band to non-Federal users in the next year to 18 months.

IV. Conclusion

For the foregoing reasons, the FWCC believes that opening the 7125-8400 MHz band to non-Federal FS users offers the best option for implementing the NSS in this band. Non-Federal FS users have a proven track record of coordination with Federal users proving their ability to implement this proposal quickly and seamlessly. Moreover, FS links play a vital role in U.S. economic and public safety interests. The industry desperately needs additional frequencies below 10 GHz to supplement the increasingly congested 6 GHz band. Therefore, opening the 7125-8400 MHz band to non-Federal FS users will serve the NSS’s goals and advance the public interest.

If you have any questions, please do not hesitate to contact the undersigned.

¹⁶ Petition at 5-6.

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January 2, 2024
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Respectfully submitted,

/s/ Seth L. Williams
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Communications Coalition*

Cc: John Alden