Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of
Terrestrial Use of the 2473-2495 MHz Band for
Low-Power Mobile Broadband Networks;
Amendments to Rules for the Ancillary Terrestrial
Component of Mobile Satellite Service Systems

IB Docket No. 13-213
RM-11685

REPLY COMMENTS OF WI-FI ALLIANCE

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REPLY COMMENTS OF WI-FI ALLIANCE

Wi-Fi Alliance hereby submits these reply comments in the above-referenced proceeding regarding the proposed modification of the Commission’s rules to permit Globalstar, Inc. ("Globalstar") to offer a low-power terrestrial broadband service ("TLPS") in both its licensed 2483.5-2495 MHz portion of the S band and the adjacent unlicensed 2473-2483.5 MHz band.1/ Commenters expressed substantial concerns regarding Globalstar’s proposal and agreed with Wi-Fi Alliance that the proposed system could increase congestion in the 2.4 GHz band, compromise the open, shared architecture within which Wi-Fi has flourished, and threaten present and future innovation. Globalstar has not justified its proposal and has provided no additional technical analysis or other information sufficient for interested stakeholders to assess the impact of TLPS operations on other spectrum users. Wi-Fi Alliance therefore continues to urge the Commission to reject the proposal.

I. SUMMARY AND INTRODUCTION

The record does not support Commission adoption of rules premised on Globalstar’s proposal. As detailed by other commenters, there remain significant unanswered questions regarding Globalstar’s control of its TLPS network. Moreover, others agreed with Wi-Fi Alliance that the proposed system could actually increase, not decrease, congestion in the 2.4 GHz band, thereby harming not only present operations, but future innovation. The proposed system could also undermine the very foundation of the open, shared architecture that has fostered the enormously successful public, enterprise, and consumer Wi-Fi ecosystem. Further, despite Globalstar’s assertions, commenters agreed that the Commission has in the past—and should again here—ensure that any new operations in unlicensed spectrum do not cause unacceptable levels of interference to the millions of unlicensed devices already deployed.

The record also reflects near consensus that Globalstar has not justified its proposal. Commenters agreed that the limited information presented is insufficient to assess Globalstar’s claims. Commenters also questioned the use of a known, controlled environment in which to conduct testing and raised concerns regarding the potential bias of the testing conducted by Globalstar’s business partner. Without sufficient details regarding Globalstar’s system, the testing it conducted, or the results it attained, Wi-Fi Alliance and others cannot meaningfully assess the tests or confirm their results. Moreover, a private system will not, as Globalstar claims, relieve congestion in the public Wi-Fi bands. Instead, any benefits attained by Globalstar’s TLPS would inure to the sole benefit of Globalstar and to the detriment of public Wi-Fi installations.

Instead of providing additional capacity for Wi-Fi “like” systems in the 2.4 GHz band, more spectrum should be dedicated for Wi-Fi itself. By opening up the 2473-2483.5 MHz band
to public Wi-Fi users, the FCC could confer substantial public benefits. Although Globalstar argued that public Wi-Fi on Channels 12 and 13 would degrade or disrupt Globalstar’s MSS offerings, Globalstar’s proposal to operate TLPS suggests that its MSS likely can tolerate co-channel Wi-Fi operations. Further, Globalstar’s Petition makes clear that the rules it proposes would effectively permit Globalstar to abandon 2.4 GHz satellite operations altogether.

II. COMMENTS POINTED OUT ADDITIONAL FLAWS IN GLOBALSTAR’S PROPOSAL

A. There Are Unanswered Questions Regarding Globalstar’s Control of Its System.

In the NPRM, the Commission stated that Globalstar will be required to maintain control over the devices that access the TLPS and sought comment on how Globalstar will limit operation of equipment to parties that are authorized to use its spectrum and ensure that the modified devices would be compliant with the FCC’s proposed rules. In response, commenting parties pointed out that there remain significant unanswered questions regarding how Globalstar will control its TLPS network to achieve these goals. For example, Sprint and WCAI, concerned about whether and how the devices will avoid interference with adjacent Broadband Radio Service (“BRS”) operations, noted that Globalstar has not addressed what will occur when an “upgraded” device – one that has both Wi-Fi and Globalstar channels – is no longer a Globalstar subscriber. WCAI observed that Globalstar has not assured the Commission that it would have adequate control over client devices of former subscribers once those customers are no longer served by an operating master device. WCAI also urged the Commission to ensure that

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2/ See NPRM ¶¶ 18, 46.
4/ WCAI Comments at 9-10.
Globalstar – and not its “terrestrial partners” – would be responsible for assuring compliance with rules related to low-power use of the 2483.5-2495 MHz band so that interference to BRS Channel 1 can be promptly cured.5/

Cisco similarly remains concerned about Globalstar’s control over devices that operate in the 2483.5-2495 MHz band, noting that the Commission should hold Globalstar – and not device manufacturers – solely responsible for assuring that its proposed software modifications are properly restricted. While manufacturers are responsible for securing equipment authorization for the software modification in the first place, Cisco argued that Globalstar should be required to ensure that only devices authorized for TLPS actually receive the software modification, that the software modification will only be available to devices under Globalstar’s operational control, and that the devices of customers who discontinue TLPS will be returned to their pre-modified software state.6/ Cisco and the Wireless Internet Service Providers Association (“WISPA”) also urged the Commission to ensure that Globalstar does not modify or manage devices which use Wi-Fi technology in a manner that hampers their ability to communicate with non-Globalstar access points or otherwise hinders their use of public spectrum.7/ Finally, Cisco stated that it is not clear whether Globalstar can in fact activate Channel 14 for TLPS use in client devices by a software upgrade as Globalstar contends.8/ The Commission must require Globalstar to address these critical issues before it decides whether to permit Globalstar to proceed.

5/ Id. at 8-9.
7/ See Id. at 8-9; Comments of the Wireless Internet Service Providers Association, IB Docket No. 13-213, RM 11-685, at 7-8 (filed May 5, 2014) (“WISPA Comments”).
B. The Proposal May Negatively Impact Other Operations.

Although Wi-Fi Alliance is primarily concerned with the effects of Globalstar’s TLPS on unlicensed operations, others have demonstrated that the Commission must carefully evaluate the potential for interference to licensed operations in the adjacent spectrum bands, including the BRS, Broadcast Auxiliary Service (“BAS”), and Local Television Transmission Service (“LTTS”).9/ As noted above, Sprint and WCAI urged the Commission to make clear that Globalstar’s system must protect BRS Channel 1 from interference,10/ while AARL—The National Association for Amateur Radio (“AARL”) and the Society of Broadcast Engineers (“SBE”) both characterized the proposal as “profoundly ill-advised” and called for an assessment of TLPS compatibility with incumbent services – specifically, BAS and LTTS – at 2473-2483.5 MHz.11/

III. COMMENTS AGREED WITH WI-FI ALLIANCE’S CONCERNS

A. The Proposed System Could Intensify Congestion in the 2.4 GHz Band, Thereby Degrading Existing Operations.

Wi-Fi Alliance asserted that Globalstar’s proposal will cause further congestion in the 2.4 GHz band, thereby potentially degrading operations there.12/ Other commenters echoed Wi-Fi Alliance’s concerns. For example, the National Cable & Telecommunications Association (“NCTA”) asked the Commission to evaluate the extent to which Globalstar’s proposed TLPS


10/ See Sprint Comments at 4-8; WCAI Comments at 2-5.

11/ See AARL Comments at 2, 8; SBE Comments at 1-4.

operations will contribute to 2.4 GHz band congestion in order to ensure that any TLPS operations will increase, not decrease, efficient use of the spectrum.13/

As several parties noted, loss of the *de facto* guard band between the Wi-Fi channels may have the “cascading effect” of overloading Channel 11 receivers from TLPS Channel 14 transmitters, and out-of-band emissions (“OOBE”) from transmitters on Channels 14 will interfere with receivers on Channel 11 (and vice versa).14/ Thus, as WISPA pointed out, once TLPS is deployed in Channel 14, there may only be two usable Wi-Fi channels (Channels 1 and 6) since Channel 14 may interfere with a co-located Channel 11. This interference will reduce throughput, reliability, and the number of potential users on both Channels 11 and 14.15/

**B. The Proposal Contravenes Global Harmonization of the 2.4 GHz Band.**

As Wi-Fi Alliance argued, use of the 2.4 GHz band for a private TLPS is contrary to the global use of the band for Wi-Fi.16/ Others agreed. As Cisco noted, Globalstar itself recognized that the 2.4 GHz band is “the world’s best model for globally harmonized spectrum.”17/ One result of this harmonization, as NCTA stated, is that the 2.4 GHz spectrum is the most intensively used unlicensed band in the world, fostering a wide variety of technologies and services, including Wi-Fi, Bluetooth, ZigBee, machine-to-machine communications, wireless

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15/ *See* WISPA Comments at 5.
16/ *See* Wi-Fi Alliance Comments at 10-11.
17/ Cisco Comments at 7 (citing Letter from Regina M. Keeney, Counsel to Globalstar, Inc., to Marlene H. Dortch, Secretary, FCC, RM-11685, Attachment at 15 (filed Sept. 20, 2013)); *see also* AICC Comments at 5.
healthcare networks, and rural broadband. If the FCC were to license this harmonized spectrum to a single firm, the Alarm Industry Communications Committee (“AICC”) argued that it would put U.S. manufacturers at a technological disadvantage, the result of which would be higher equipment costs for industry members that would be borne by consumers and would negatively impact the U.S. economy. The many devices – including cell phones – that house both Wi-Fi and Bluetooth technologies would suffer a particularly negative impact if this spectrum were so hampered.

Moreover, Globalstar may inhibit innovation in the 2.4 GHz band because entities may be reluctant to develop technologies for a band with an uncertain radiofrequency environment and an inconsistent international allocation. The FCC should therefore carefully consider accommodating a business plan that may hamper the utility of a globally harmonized band to the disadvantage of American entrepreneurs, manufacturers, and consumers.

IV. GLOBALSTAR’S COMMENTS DO NOT JUSTIFY ITS PROPOSAL

A. Globalstar Has Not Justified its Technical Analysis.

1. The Technical Analysis is Neither Sufficiently Detailed Nor Reliable to Support Globalstar’s Claims.

Wi-Fi Alliance urged the Commission to reject the testing results offered by Globalstar and its business partner, Jarvinian Wireless Innovation Fund (“Jarvinian”), as a basis to move forward with permitting TLPS. Other commenters agreed. Rather than provide sufficient

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18/ See NCTA Comments at 2-3.
19/ See AICC Comments at 5; see also Comments of Bluetooth Special Interest Group, RM-11685, at 3-4 (filed Jan. 11, 2013); Comments of the Consumer Electronics Association, RM-11685, at 5 (filed Jan. 11, 2013).
20/ See Bluetooth SIG Comments at 4; NPRM ¶ 13.
21/ See Wi-Fi Alliance Comments at 6-10; see also Letter from L. Barbee Ponder IV, General Counsel & Vice President of Regulatory Affairs, Globalstar, Inc., to Mignon Clyburn, Chairwoman, FCC, RM-11685, at 1 (filed June 10, 2013) (“Globalstar Report”) (arguing that Globalstar’s initial tests...
details regarding its claims, WCAI argued that Globalstar chose to “‘kick the can down the road,’ contending that ‘[g]oing forward, Globalstar anticipates providing additional technical analysis regarding these interference issues.’” NCTA said that, while the FCC need not conduct its own tests to establish whether Globalstar will disrupt unlicensed operations, Globalstar should be required to disclose in full the experimental test data and results upon which its assertions rely. Such public disclosure will help to provide the FCC, 2.4 GHz band unlicensed users, and adjacent-band licensees with “a measure of confidence” regarding unacceptable amounts of interference from TLPS.

In its evaluation of Globalstar’s tests, Wi-Fi Alliance also noted the deficiency in using a known, controlled environment in which to conduct testing. Other commenters agreed. WISPA observed that Globalstar’s claims with respect to effective distance and capacity appear to rely solely on a Wi-Fi heat map created during Jarvinian’s testing, which was conducted using a single access point within a commercial building. As Bluetooth SIG argued, “[c]onsidering “exceeded all expectations, with TLPS surpassing public Wi-Fi by 5x the effective distance and 4x the effective capacity, and no impact on public Wi-Fi operations in adjacent channels”).

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22/ See AARL Comments at 8; AICC Comments at 5-6; Bluetooth SIG Comments at 3, 5; NCTA Comments at 16-18; SBE Comments at 7-8; Sprint Comments at 3-4; WCAI Comments at 6-7; WISPA Comments at 3-8.

23/ WCAI Comments at 6-7 (quoting Globalstar Comments at 29-30); Consolidated Reply of Globalstar, Inc., RM-11685, at 7 (filed Jan. 29, 2013) (“Globalstar Petition Reply Comments”); see also AARL Comments at 8 (urging the FCC to assess Globalstar’s claims based on reliable compatibility analyses rather than mere assumptions of compatibility); SBE Comments at 7-8 (same).

24/ See NCTA Comments at 17-18.

25/ See id. at 18. Interestingly, Sprint indicated that its “discussions with Globalstar have provided some helpful information,” but that it “is still concerned about the lack of technical specifications that have been provided on the record.” See Sprint Comments at 3-4.

26/ See Wi-Fi Alliance Comments at 9-10.

27/ See Bluetooth SIG Comments at 3, 5; WISPA Comments at 7.

28/ See WISPA Comments at 7; see also Globalstar Report at 6.
the potential harm to the hundreds of millions of users of Bluetooth devices and Wi-Fi networks, the Commission should require a much higher standard for proof.”

2. Commenters Identified Additional Flaws with Globalstar’s Technical Analysis.

Commenters also identified additional flaws with the Jarvinian tests. For example, WCAI argued that because Wi-Fi devices do not operate on Channel 14 today, the 802.11-compliant equipment that Globalstar says it will employ has never been evaluated by FCC staff or any Telecommunications Certification Body for compliance with the technical limits designed to protect BRS Channel 1. The FCC cannot, therefore, presume that a given device will meet the proper unwanted emissions levels without appropriate testing.

In addition, WISPA pointed out that Globalstar did not present a statement regarding its initial expectations with respect to effective distance and effective capacity, and it further failed to assess how and whether those expectations reasonably related to real-world operations. Without knowing what Globalstar initially expected its testing to find, it is impossible to assess Globalstar’s claim that its initial TLPS testing of effective distance and capacity “exceeded all expectations.”

Further, the testing data did not mention the impact of Globalstar’s TLPS on Bluetooth. As Bluetooth SIG argued, the tens of billions of Bluetooth devices currently in operation – including medical devices – could suffer catastrophic failures if Globalstar’s TLPS is permitted

29/ Bluetooth SIG Comments at 5.
30/ See WCAI Comments at 11.
31/ See id.; see also Globalstar Comments at 37, n.83 (stating that “802.11 performance on Channel 14 . . . should be essentially the same as its performance on Channels 1, 6, and 11”).
32/ See WISPA Comments at 7.
33/ Globalstar Report at 1.
to operate above 2480 MHz, where Bluetooth operates. The Globalstar tests should therefore
demonstrate the impact of TLPS on Bluetooth.34/

Additionally, WISPA and Bluetooth SIG pointed out that the Jarvinian testing compared
Channel 6 (the worst-performing Wi-Fi channel) with Channel 14 (in which there are no existing
broadband users and therefore there is no significant interference).35/ The data, they argued, is
therefore both unclear and misleading and fails to prove either the absence of harmful
interference to Channel 11 operations or the validity of Globalstar’s claims regarding its own
service.36/

AARL argued that it would be unfair to permit Globalstar to deploy its TLPS network in
the 2473-2483.5 MHz segment premised on the fact that the band is unused by Part 15 devices
when those devices and systems avoided that portion of the 2.4 GHz band for Globalstar’s
benefit in the first place.37/

Finally, AICC correctly observed that the testing conducted by Globalstar and its
business partners is not sufficient given the “obvious room for biased results.”38/ The testing
process, it argued, should therefore be opened up for participation by affected stakeholders,
including Wi-Fi and Bluetooth manufacturers, wireless internet service providers, alarm industry

34/ See Bluetooth SIG Comments at 3-4.
35/ See id. at 3; WISPA Comments at 7.
36/ See id.
37/ See AARL Comments at 8; see also WISPA Comments at 8 (“WISPA notes the irony in
Globalstar’s proposal – that existing Commission Wi-Fi technical limitations originally designed to
protect Globalstar’s MSS operations and which have prevented broadband use of 2473-2483.5 MHz need
no longer apply.”); Cisco Comments at 3 (“TLPS will be nothing more than a paid Wi-Fi offering using
the legacy IEEE 802.11b/g/n amendments – an offering that is only possible because of the happenstance
that Globalstar’s MSS spectrum is adjacent to the unlicensed commons. The offering is aided by the
Commission’s technical restrictions on unlicensed commons that were adopted to protect a satellite
service that Globalstar de-emphasizes at every turn.”).
38/ See AICC Comments at 6.
representatives, and consumer groups. Wi-Fi Alliance agrees. Until additional information is provided, interested stakeholders cannot reasonably produce technical analyses detailing interference concerns of the proposed Globalstar system.

B. Designating 22 Megahertz of Spectrum to a Private Network Will Not Aid Network Congestion in Public Wi-Fi Bands.

1. The Value of Public Wi-Fi.

Globalstar argued that, if the Commission adopts its proposal, “it would add 22 megahertz to the nation’s wireless broadband spectrum inventory” which would have the benefit of, among other things, helping to alleviate the increasing congestion in the 2.4 GHz band. The record, however, does not support this claim. Access to the TLPS would only be permitted with Globalstar’s permission. This means that any relief the system would provide would accrue only to Globalstar and its customers, assuming the system is a success at all. Similarly, Globalstar argued that carriers may have additional access to low-power terrestrial service, but this would only occur if they had a commercial relationship with Globalstar. Moreover, as noted above, commenters agreed that the proposed system could increase, not decrease, congestion in the remainder of the 2.4 GHz band.

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39/ See id. Indeed, WISPA asserted that it “stands ready to conduct joint testing with Globalstar.” WISPA Comments at 4. Nevertheless, it indicated that its “good faith efforts” to conduct cooperative interference testing with Globalstar for submission on the record were not successful. Id. at 4-5.  
40/ See NPRM ¶¶ 16, 23.  
41/ See Globalstar Comments at 11, 14-15.  
42/ See id. at 37-39; see also Globalstar Petition at 41-42.  
43/ See Globalstar Comments at 11-12.  
44/ See, e.g., AICC Comments at 6; Bluetooth SIG Comments at 4; NCTA Comments at 5; WISPA Comments at 5; Wi-Fi Alliance Comments at 12-13.
Although Globalstar presented what it considered to be public interest benefits of its proposed system, it has not demonstrated why consumers and carriers would abandon the ubiquity of Wi-Fi for an uncertain and limited managed network. Accordingly, by authorizing Globalstar’s system, the Commission would not be providing consumer access to unlicensed spectrum or relieving the Wi-Fi traffic jam as Globalstar asserted. Instead, as others noted, it would be creating limited access to Globalstar customers to the sole benefit of Globalstar and to the detriment of the public Wi-Fi network, which has fostered spectrum sharing and innovation and which has resulted in the deployment of millions of consumer devices in the unlicensed spectrum bands.

As discussed in Wi-Fi Alliance’s initial comments, the ubiquity of Wi-Fi networks is due, in part, to the fact that they are based on an open, shared, interoperable architecture. As Wi-Fi Alliance asserted, 2.4 GHz band Wi-Fi is important to the American economy, businesses, and consumers. As a matter of public policy, then, the Commission should not authorize a system on privately licensed spectrum that could be more efficiently used to supplement capacity for public, enterprise, and consumer Wi-Fi systems. Moreover, the Commission should not permit the introduction of a Wi-Fi “like” wireless service in the 2.4 GHz band that will have preferential use of a part of that band. In fact, the term “Wi-Fi ‘like’” has no meaning in the context of this proposal because it is not based on an open, shared, interoperable architecture used by Wi-Fi devices.

45/ See Globalstar Comments at 10-17.
46/ See id.
47/ See, e.g., Bluetooth SIG Comments at 4; Cisco Comments at 7; NCTA Comments at 2-5; WISPA Comments at 8-9.
48/ See Wi-Fi Alliance Comments at 12-13.
49/ See id. at 1-5.
The other commenters in this proceeding similarly noted the importance of public Wi-Fi spectrum.\footnote{See Cisco Comments at 5-8; Bluetooth SIG Comments at 3-4; NCTA Comments at 2-5; WISPA Comments at 2, 8-9.} As WISPA argued, Globalstar’s TLPS is in sharp contrast to the spirit of public unlicensed operations, and effectively privatizing the use of the 2473-2483.5 MHz band would be “contrary to years of spectrum policy that have promoted spectrum sharing, innovation and the deployment of millions of other devices by the public in unlicensed bands.”\footnote{WISPA Comments at 8-9.} Indeed, as Bluetooth SIG said, the success of both the Wi-Fi and Bluetooth industries “can be inextricably linked to the free and open nature of the unlicensed spectrum.”\footnote{Bluetooth SIG Comments at 6.} As a policy matter, commenters urged the Commission to assure that access to the unlicensed spectrum below 2483.5 MHz by the millions of Americans who rely on the band every day is not frustrated by deployment of Globalstar’s TLPS network.\footnote{See Cisco Comments at 5-8; Bluetooth SIG Comments at 3-4; NCTA Comments at 2-5; WISPA Comments at 2, 8-9.}

Commenters also agreed that the FCC should not permit the introduction of a Wi-Fi “like” wireless service in the 2.4 GHz band that will have preferential use of a part of that band. The Association of Home Appliance Manufacturers and others agreed that the Commission should expressly state that Globalstar’s TLPS network is entitled to neither interference protection from nor superior status over other operations in the 2473-2483.5 MHz band.\footnote{See Comments of the Association of Home Appliance Manufacturers, IB Docket No. 13-213, RM 11-685, at 3-5 (filed May 5, 2014); see also AICC Comments at 6; Cisco Comments at 7-8; NCTA Comments at 4.} Indeed, Globalstar itself stated that it has not requested and will not request operating rights in the 2473-2483.5 MHz band that are superior to those of other unlicensed users.\footnote{See Globalstar Petition Reply Comments at 14.}
Commission should unambiguously express this determination in any decision granting Globalstar’s proposal so as to preserve the operating environment that has allowed Wi-Fi and other unlicensed operations to flourish.

2. Additional Spectrum Should Be Made Available for Public Wi-Fi.

In order to truly provide additional capacity for and to continue to promote the various benefits of Wi-Fi, commenters agreed that more spectrum should be dedicated to public Wi-Fi systems.56/ Wi-Fi is not the “unreliable broadband delivery mechanism” Globalstar claims.57/ To the contrary, as noted by various commenters (including AICC, Bluetooth SIG, Cisco, and NCTA) and the Commission itself, Wi-Fi is relied upon by consumers and public safety industries.58/ Therefore, in order to relieve 2.4 GHz congestion and to promote the unlicensed operations, the FCC should provide more capacity in the 2.4 GHz band for Wi-Fi.59/

Globalstar’s reliance on the 2 GHz proceeding in asserting that its TLPS network will provide additional broadband capacity is misplaced.60/ Globalstar is correct that the Commission adopted flexible use rules to enable the provision of stand-alone terrestrial services in the 2 GHz

56/ See Bluetooth SIG Comments at 4, 6; Cisco Comments at 5; NCTA Comments at 6-9; Wi-Fi Alliance Comments at 11-13.
57/ Globalstar Comments at 14.
58/ See, e.g., AICC Comments at 2-4 (noting the importance of Wi-Fi to the alarm industry in protecting residential and business facilities and their occupants); Bluetooth SIG Comments at 6 (noting the success of the Wi-Fi industry); Cisco Comments at 4 (noting the remarkable growth of consumer demand for Wi-Fi); NCTA Comments at 3 (highlighting that NCTA member companies have invested hundreds of millions of dollars to deploy hundreds of thousands of Wi-Fi access points across the country); Wi-Fi Alliance Comments at 1-5 (discussing the role of Wi-Fi in the Nation’s wireless ecosystem, including in enabling wireless backhaul and in supporting the development of the Internet of Things); see also NPRM ¶ 13.
59/ See Bluetooth SIG Comments at 4, 6; Cisco Comments at 5; NCTA Comments at 6-9; Wi-Fi Alliance Comments at 11-13.
60/ See Globalstar Comments at 12-13.
MSS band in order to increase the amount of spectrum available for mobile broadband.\(^{61/}\)
However, the spectrum at issue in that proceeding was already adjacent to broadband spectrum
and the rules adopted in that proceeding are similar to those that already governed the advanced
wireless service (“AWS”) spectrum. That is not the case here, where adjacent channel use may
not be compatible. The more apt analogy would be the LightSquared proceeding, in which it
became apparent that converting MSS spectrum to non-ancillary, high-power terrestrial
operations would cause harmful interference to an adjacent band service.\(^{62/}\) The FCC should not
authorize a proposal that would lead to the same result, particularly where that service would not
offer any meaningful benefits.

C. Globalstar Has Not Supported its Contention that Only its Operations
Should be Permitted at 2473-2483.5 MHz.

Globalstar asserted that public Wi-Fi on Channels 12 and 13 would “seriously degrade
and disrupt Globalstar’s MSS offerings in affected areas” and, at any rate, would not be practical
since those channels overlap with Channel 11.\(^{63/}\) Globalstar’s concerns are misplaced.\(^{64/}\)
Globalstar has offered no technical data to support its claim of harmful interference. As Cisco
asserted, Globalstar should bear the burden of establishing why Wi-Fi operations in Channels 12
and 13 would be harmful to its operations:

\(^{61/}\) See id.; see also Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-
2200 MHz Bands; Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz
and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200
MHz; Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025
MHz and 2175-2180 MHz Bands, Report and Order and Order of Proposed Modification, 27 FCC Rcd.
16102 (2012).

\(^{62/}\) See Wi-Fi Alliance Comments at 12-13; see also, e.g., International Bureau Invites Comment on
(finding that LightSquared’s proposed business model would violate the Commission’s “integration"
requirements for services using the MSS L-Bands).

\(^{63/}\) Globalstar Comments at 32-33.

\(^{64/}\) See Bluetooth SIG Comments at 4; Cisco Comments at 9, n.17; NCTA Comments at 6-9; Wi-Fi
Alliance Comments at 14-15.
“Given Globalstar’s diminishing use of MSS (particularly in the United States), its own willingness to operate TLPS in the MSS spectrum, and the unmistakable congestion in the 2.4 GHz band, the burden must be on Globalstar to establish why it would suffer actual harm were the 2473-2483.5 MHz band made widely available for use of Channels 12 and 13. Moreover, Globalstar is in a unique position to assess the effect of increased use of the 2.4 GHz band on its operations.”

To the contrary, Wi-Fi can operate without causing interference to MSS operations. The very nature of Wi-Fi is shared spectrum use; Wi-Fi can share with TLPS as it shares with other services today. As NCTA pointed out, advanced interference avoidance techniques are currently being designed into Wi-Fi equipment. Moreover, most Wi-Fi uses occur indoors; MSS operations occur outdoors. Further, as Bluetooth SIG noted, Globalstar’s MSS operations would continue to be protected from interference under the provisions of Part 15.5(b) of the Commission’s rules.

Globalstar has not shown why it will be able to manage its own network to prevent TLPS operations from interfering with MSS, but it will be unable to manage nearby Wi-Fi operations. To the contrary, Globalstar’s proposal to operate a Wi-Fi “like” network suggests that its MSS likely can tolerate co-channel Wi-Fi operations. As NCTA argued, Globalstar’s TLPS will use existing IEEE 802.11 technology and will be consistent with existing Part 15 regulations. Thus, “Globalstar’s proposal indicates that it is possible for its MSS service to co-exist even with

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65/ Cisco Comments at 9, n.17.
66/ See NCTA Comments at 6-7; see also Wi-Fi Alliance Comments at 14.
67/ See, e.g., NCTA Comments at 8-9 (“Globalstar’s MSS service is particularly unlikely to have ubiquitous coverage in indoor locations, where Wi-Fi devices most often operate.”).
68/ Bluetooth SIG Comments at 4.
69/ See Cisco Comments at 9, n.17; NCTA Comments at 7-8.
70/ See NCTA Comments at 7 (citing Globalstar Petition at iii, 16).
co-channel 802.11 Wi-Fi operations – let alone with adjacent channel operations.”  Moreover, protection need not rely on Globalstar. Wi-Fi devices can protect Globalstar’s operations by sensing when a Globalstar access point is using Channel 14 and then avoiding operations on Channels 12 and 13. When Wi-Fi devices do not sense a Channel 14 transmission, they should be permitted to operate on Channels 12 and 13.

Wi-Fi Alliance has therefore urged the Commission to open the 2473-2483.5 MHz band to public Wi-Fi users – whether or not it authorized TLPS – and others agreed. As Cisco and Bluetooth SIG argued, the FCC can better promote future innovation and spectrum efficiency by declining to foreclose future use of the 2473-2483.5 MHz band by 802.11 devices in the U.S. Additionally, NCTA noted that expanding the number of available Wi-Fi channels would also relieve congestion in the 2.4 GHz band. Given the rapid pace of development of Wi-Fi technologies, Cisco and NCTA agreed that there is no reason to believe that the 2473-2483.5 MHz band would not one day be able to support Wi-Fi operations. Therefore, by modifying its rules to remove the barriers to Channel 12 and 13 Wi-Fi operations, regardless of how it proceeds on Globalstar’s proposal, the FCC would open up additional spectrum in a way that would truly benefit the public, thereby fostering innovation and decreasing overall congestion in the 2.4 GHz band.

71/ NCTA Comments at 7-8 (emphasis original).
72/ See Wi-Fi Alliance Comments at 14-15.
73/ See Bluetooth SIG Comments at 4; Cisco Comments at 9, n.17; NCTA Comments at 6.
74/ See Bluetooth SIG Comments at 4; Cisco Comments at 9, n.17.
75/ See NCTA Comments at 6.
76/ See Cisco Comments at 9, n.17; NCTA Comments at 13; Wi-Fi Alliance Comments at 14.
D. Globalstar’s Comments Make It Clear that TLPS is Not Ancillary to MSS.

Globalstar asserted that it is “fully committed to the continued development and future success of its satellite business.” However, as Wi-Fi Alliance stated, it is clear that permitting Globalstar to make use of any part of the 2.4 GHz band for terrestrial operations is contrary to what the Commission anticipated when it adopted its ATC rules. Others agreed. As Iridium Constellation LLC (“Iridium”) observed, the rules proposed in the NPRM would effectively permit Globalstar “to abandon 2.4 GHz satellite operations altogether, provided it maintains some minimal commercial satellite service offering somewhere in the world.” Indeed, as Iridium pointed out, Globalstar cites to the incompatibility of its TLPS system with MSS as justification for why TLPS must be solely managed by Globalstar.

Globalstar’s comments make it clear MSS will become the ancillary service. Globalstar said that the revenue it produces from TLPS will “ensure the commercial viability” of its MSS system. In other words, TLPS will support MSS, not the other way around, as the FCC anticipated when it authorized ancillary operations. Moreover, as Bluetooth SIG observed, the

77/ Globalstar Comments at 3.
78/ See Wi-Fi Alliance Comments at 12; see also Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd. 1962, ¶ 67 (2003) (“Our decision to permit MSS ATC is based upon the premise that ATC remains ‘ancillary’ to a fully operational space-based MSS system.”).
79/ Comments of Iridium Constellation LLC, RM-11697, IB Docket 13-213, RM-11685, at 7 (filed May 5, 2014) (“Should the proposed rules be adopted, 2.4 GHz MSS/ATC licensees would be excused from requirements to offer mobile satellite service throughout the United States on a continuous basis, to maintain spare satellites, to offer commercial service throughout their satellite coverage area, to offer integrated MSS and ATC services, and to limit ATC operations to authorized channels, as well as detailed interference protections for adjacent services. Seemingly, the only requirement that would be imposed under the new flexible terrestrial regime would be to demonstrate ‘commercial availability of MSS, without regard to coverage requirements.’”).
80/ See id. at 9 (citing Globalstar Petition at 29-30).
81/ See Globalstar Comments at 17; Globalstar Petition at 7, 23.
commercial viability of Globalstar’s MSS is not the responsibility of the FCC.\textsuperscript{82/} Instead, the viability of a technology and the industry it fosters “should be based on the need it fills, and not the regulations that give it an advantage over others competing for the same spectrum.”\textsuperscript{83/} The Commission should therefore not take action to support Globalstar’s MSS business; if it is not viable, the spectrum should be repurposed in a way that is compatible with current requirements and neighboring services.

E. Globalstar Was Incorrect When it Stated that it Has No Obligations to Protect Unlicensed Operations.

Globalstar claimed – without technical proof – that its TLPS network “would coexist successfully with other unlicensed operations below 2483.5 MHz,” but that, at any rate, the Commission’s precedent “in interpreting its Part 15 rules is clear – unlicensed operations do not receive interference protection.”\textsuperscript{84/} However, the former assertion is unproven (as detailed above) and the latter is incorrect. Wi-Fi Alliance and others acknowledged that Part 15 devices are not entitled to interference protection under the Commission’s rules.\textsuperscript{85/} Contrary to Globalstar’s claim, however, the FCC has in the past recognized the need to balance different operational needs within a frequency band. Specifically, as Wi-Fi Alliance and others noted, the Commission adopted rules in the context of the multilateration location and monitoring service (“M-LMS”) to ensure the coexistence of different uses of the 902-928 MHz band “without undermining the established relationship between unlicensed operations and licensed

\textsuperscript{82/} Bluetooth SIG Comments at 2.
\textsuperscript{83/} Id.
\textsuperscript{84/} Globalstar Comments at 29-32.
\textsuperscript{85/} See, e.g., AARL Comments at 3; Cisco Comments at 8; NCTA Comments at 16; WISPA Comments at 3; Wi-Fi Alliance Comments at 7; see also 47 C.F.R. § 15.5(b).
services.” These rules required M-LMS licensees to demonstrate through actual field tests that their systems did not cause “unacceptable levels of interference” to Part 15 devices. 

Although Globalstar cites to the Progeny Order, it does so for the sole purpose of stressing that unlicensed devices are not entitled to interference protection under the Commission’s rules. Globalstar fails to acknowledge the precedent the Commission established in the M-LMS context and which it reaffirmed in the Progeny Order – that the lack of protection does not mean that licensed services are free to disrupt Part 15 operations.

As WISPA pointed out, the FCC “cannot ignore the significant number of unlicensed devices in the 2400-2483.5 MHz band” either. Therefore, just as the FCC recognized the responsibility of M-LMS licensees to ensure through actual field tests that an established unlicensed consumer device base is not severely crippled, “unlicensed users deserve no less consideration now.” Globalstar has not met this burden.

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87/ See LMS Report and Order ¶ 82; see also 47 C.F.R. §§ 2.1, 90.353(d).

88/ See Globalstar Comments at 31.

89/ WISPA Comments at 3-4.

90/ WISPA Comments at 4 (citing LMS Report and Order at 4699); NCTA Comments at 16-17.
V. CONCLUSION

The record is clear in this proceeding: the rules should not be changed as Globalstar requests in light of the limited technical support and the numerous concerns raised by nearly every commenting party. Wi-Fi Alliance therefore urges the Commission to reject Globalstar’s proposal, which would perpetuate the designation of what would otherwise be spectrum used for public, enterprise, and consumer Wi-Fi systems for the sole benefit of a private licensee and to the detriment of the American economy, businesses, and consumers.

Respectfully submitted,

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