

**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

**COMMENTS OF THE
NATIONAL CABLE & TELECOMMUNICATIONS ASSOCIATION**

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I. INTRODUCTION AND SUMMARY.

The 2.4 GHz band is home to an enormous and ever-growing set of innovative, economically beneficial unlicensed services. Accordingly, if the Commission decides to move forward with Globalstar's proposal to operate a Terrestrial Low-Power Service ("TLPS") using a combination of 2.4 GHz unlicensed spectrum and adjacent licensed Mobile Satellite Service ("MSS") spectrum, it should craft thoughtful rules that will maximize the efficient use of the core 2.4 GHz band while preventing detrimental effects to existing unlicensed operations.

Specifically, the Commission should: (1) maximize the utility of the 2.4 GHz band by relaxing the strict unwanted emissions limits that currently prevent Wi-Fi from using Channels 12 and 13; (2) adopt rules that provide no special interference protections for TLPS and thereby place it on an equal footing with unlicensed 2.4 GHz operations; and (3) before authorizing Globalstar's TLPS, require Globalstar to demonstrate that TLPS deployments would not cause an unacceptable amount of interference to Part 15 unlicensed operations. Using this approach, the Commission can protect the hundreds of millions of consumers using the 2.4 GHz band today, ensure that the band continues to be a mainstay of innovation, and protect the substantial

investment that unlicensed network operators and equipment manufacturers have made to deploy in the band—all while providing an opportunity for more efficient use of scarce spectrum resources.

II. THE 2.4 GHz BAND IS VITALLY IMPORTANT TO THE UNLICENSED ECOSYSTEM, WHICH GENERATES BILLIONS OF DOLLARS EVERY YEAR FOR THE U.S. ECONOMY.

As NCTA and others have discussed at length in other Commission proceedings, the unlicensed wireless sector contributes billions of dollars each year to the U.S. economy.¹ The most recent study on the economic contribution of unlicensed technology to the national economy demonstrates that products and services relying on unlicensed spectrum generated \$222 billion to the economy in 2013 and contributed \$6.7 billion to U.S. Gross Domestic Product over the same period.² As the Commission noted in the recent U-NII-1 Order, unlicensed devices “play an important role in meeting public demand for wireless broadband service, particularly wireless local area networking and broadband access. This foundation, coupled with increasing demand for wireless broadband applications and new Wi-Fi technology, signals a bright future for unlicensed operations”³

The 2.4 GHz unlicensed band is the most intensively used unlicensed band in the world. An exceptionally wide variety of unlicensed technologies and services depend on the band,

¹ Comments of the National Cable & Telecommunications Association at 3-7, ET Docket No. 13-49 (filed May 28, 2013) (“NCTA 5 GHz Comments”) (discussing unlicensed Cable Wi-Fi networks); Comments of Google Inc. and Microsoft Corporation at 3-21, Docket No. 12-268 (filed Jan. 25, 2013).

² Raul Katz, *Assessment of the Economic Value of Unlicensed Spectrum in the United States*, at 8 (Feb. 2014), available at <http://www.wififorward.org/wp-content/uploads/2014/01/Value-of-Unlicensed-Spectrum-to-the-US-Economy-Full-Report.pdf>.

³ *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, First Report and Order, ET Docket No. 13-49, FCC 14-30, 2014 WL1304757, at *4 ¶ 15 (rel. Apr. 1, 2014) (“5 GHz Order”).

including indoor and outdoor Wi-Fi; Bluetooth; ZigBee; machine-to-machine communications used for supply chain management, asset tracking, access control, and smart grid implementation; wireless networks for healthcare, including for communications and patient monitoring; and rural broadband provided by Wireless Internet Service Providers (“WISPs”).⁴ NCTA’s member companies, in particular, have invested hundreds of millions of dollars to deploy hundreds of thousands of Wi-Fi access points throughout the country, which provide customers with fast, reliable Internet access both inside and outside the home.⁵ Cable Wi-Fi operators serve millions of customers, and consumer demand for cable Wi-Fi services grows every day.⁶ Every Cable Wi-Fi deployment relies heavily on the 2.4 GHz band, as well as the 5 GHz band.

⁴ See, e.g., *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*, Notice of Proposed Rulemaking, 28 FCC Rcd. 15351, ¶ 3 n.6 (2013) (“NPRM”) (noting that IEEE 802.11 Wi-Fi devices operate in the 2.4 GHz band); see also *id.* ¶ 16 (recognizing that Bluetooth operates in the 2.4 GHz band); ZigBee Specification Overview, ZigBee Alliance, <https://www.zigbee.org/Specifications/ZigBee/Overview.aspx> (last visited Apr. 22, 2014) (noting that ZigBee operates in the 2.4 GHz band); Comments of the Wireless Internet Service Providers Association at 2, Docket No. RM-11685 (filed Jan. 14, 2013) (noting that WISPs rely principally on the 2.4 GHz band, among other unlicensed bands); Richard Swim, *The Wireless Challenge: Understanding the Wireless Spectrum in a Healthcare Facility*, BIOMEDICAL INSTRUMENTATION & TECHNOLOGY, at 1 (2013), available at http://www.aami.org/hottopics/wireless/AAMI/Wireless_Spectrum_Healthcare_Facility_MJ2013.pdf (noting that infusion pumps, electrocardiogram carts, pulse oximeters, some physiological monitoring systems, and MRI-related communications systems rely heavily on the 2.4 GHz band).

⁵ *Challenges and Opportunities in the 5 GHz Spectrum Band: Hearing Before the Subcomm. on Commc’ns & Tech. of the H. Comm. on Energy and Commerce*, 113th Cong. (Nov. 13, 2013), available at <http://docs.house.gov/meetings/IF/IF16/20131113/101359/HHRG-113-IF16-Wstate-NagelT-20131113-U1.pdf> (statement of Thomas F. Nagel, Senior Vice President, Comcast Corporation); see also NCTA 5 GHz Comments at 3-7.

⁶ See, e.g., Comments of Comcast Corporation at 8-9, Docket No. ET 13-49 (filed May 28, 2013).

As the Commission has recognized,⁷ unlicensed wireless operations in the 2.4 GHz band have been so successful and utilize the band so intensively that the 2.4 GHz band is becoming congested.⁸ This congestion means reduced performance for Wi-Fi and other unlicensed broadband networks, in terms of both coverage and speed.⁹ The Commission must take such congestion into account in deciding how best to maximize the utility of the 2.4 GHz band going forward.

In sum, unlicensed technologies using the 2.4 GHz band make an enormous contribution to the national economy, the band remains a locus of wireless innovation, and, at the same time, congestion and demand in the band are increasing. Any Commission action that disrupts this band could have great consequences for the country. The Commission therefore should ensure, as it considers Globalstar's request for a new private terrestrial network, that any order (1) advances the public interest by permitting greater use of currently unusable portions of the 2.4 GHz band for all consumers; and (2) ensures that any new private network does not undermine or constrain the use of the core 2.4 GHz band by unlicensed technologies.

⁷ *Revision of Part 15 of the Commission's Rules Regarding Operation in the 57-64 GHz Band*, Report and Order, 28 FCC Rcd. 12517, 12534 ¶ 43 (2013) (noting that the 2.4 GHz band is "crowded" with wireless networking products); *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Notice of Proposed Rulemaking, 28 FCC Rcd. 1769, 1823 (2013) (statement of Commissioner Rosenworcel noting that "[a]lthough the 2.4 GHz band continues to serve us well, it is becoming mighty crowded"); *5 GHz Order* at *39 (statement of Chairman Wheeler noting that "Wi-Fi has become a victim of its own popularity, and now faces congestion issues"); *id.* at *40 (statement of Commissioner Clyburn noting that "[d]emand for unlicensed services, has spiked so much that the 2.4 GHz band is now congested particularly in major cities").

⁸ Rob Alderfer, et al., *WiFi Spectrum Exhaust Looms*, CABLE LABS, at 4 (2013) (included as Attachment A to NCTA 5 GHz Comments).

⁹ NCTA 5 GHz Comments at 8-9 (citing Alderfer, *supra* note 8, at 12).

As discussed in detail in Section III, the Commission can advance these goals and encourage more efficient use of the 2.4 GHz band by relaxing the out-of-band emission (“OOBE”) limits at the upper 2.4 GHz band edge to enable Wi-Fi to use 802.11 Channels 12 and 13. The Commission should also evaluate the extent to which Globalstar’s proposed TLPS operations could disrupt existing 2.4 GHz users in a manner that would contribute to 2.4 GHz congestion. For instance, Wi-Fi Alliance and the Bluetooth SIG have suggested that Globalstar’s TLPS operations could result in the loss of Wi-Fi Channel 11 and prevent Bluetooth operations in the 2473-2483.5 MHz band, which would crowd these operations down into the lower portions of 2.4 GHz spectrum, further exacerbating existing congestion.¹⁰ The Commission should ensure that any TLPS operations would increase, not decrease, efficient use of 2.4 GHz spectrum before authorizing Globalstar to create a proprietary network using MSS downlink spectrum and the top portion of the unlicensed band.

III. THE COMMISSION SHOULD MAXIMIZE THE EFFICIENT USE OF THE 2.4 GHZ BAND BY RELAXING THE OOBE LIMIT FOR UNLICENSED OPERATIONS AT THE UPPER 2.4 GHZ BAND EDGE.

The Commission’s existing out-of-band emissions limit for unlicensed devices operating near the upper edge of the 2.4 GHz band is so stringent that it has rendered the upper two Wi-Fi channels virtually useless for Wi-Fi operations. Given that Globalstar has now proposed to offer a “Wi-Fi-like” service co-channel with its existing MSS operations, the Commission should revisit whether Globalstar’s MSS service could co-exist with unlicensed devices in the adjacent 2.4 GHz band that operate using typical out-of-band emissions limits.

¹⁰ Comments of the Wi-Fi Alliance at 4-5, Docket No. RM-11685 (filed Jan. 11, 2013); Comments of Bluetooth Special Interest Group at 3, Docket No. RM-11685 (filed Jan. 14, 2013).

A. The Commission’s Existing Restrictive Emissions Limits Render Wi-Fi Channels 12 and 13 Unusable for Wi-Fi.

As the Commission notes in the 2.4 GHz NPRM, Section 15.205 of the Commission’s rules “prohibits any emissions in the [2483.5-2500 MHz] band by unlicensed operations, other than spurious emissions,”¹¹ and such “spurious emissions must not exceed the unwanted emissions limit in Section 15.209.”¹² These “unwanted emissions limits for the 2483.5-2500 MHz band in Section 15.209(a) . . . preclude IEEE 802.11 devices from operating in the United States on IEEE 802.11 Channel 12 (2456-2478 MHz) and Channel 13 (2471-2483 MHz) at the full power level specified in the IEEE 802.11 standard and Section 15.247.”¹³ As a result, consumers and service providers cannot use Channels 12 and 13 for Wi-Fi operations.¹⁴

Permitting expanded Wi-Fi operations in Channels 12 and 13 would promote efficient use of the upper portion of the 2.4 GHz band at a time when the country must work to make every megahertz count. The rule change would result in a variety of consumer benefits. Most importantly, as noted in Part II, above, such a rule change would ease 2.4 GHz congestion by expanding the number of Wi-Fi channels for use by Access Point operators. This change would give Wi-Fi devices the flexibility to select the “cleanest” channel in a given operating environment. Moreover, advanced interference avoidance techniques are now being designed into Wi-Fi equipment. As this technology becomes more prevalent, the legacy practice of

¹¹ NPRM ¶ 39; *see also* 47 C.F.R. § 15.205(a).

¹² NPRM ¶ 39 n.107; *see also* 47 C.F.R. § 15.209(a).

¹³ NPRM ¶ 39 n.107.

¹⁴ *Cf.* NPRM ¶ 41 (proposing “to enable the use of Channels 12 and 13 by Wi-Fi”); *see also* Letter from Edgar Figueroa, President and CEO, Wi-Fi Alliance, to Marlene H. Dortch, Secretary, Federal Communications Commission, Docket No. RM-11685 (filed May 8, 2013) (“Wi-Fi Alliance Letter”); Globalstar Petition for Rulemaking, at 17 n.26 and App. B at 1-2, Docket No. RM-11685 (filed Nov. 13, 2012) (“Globalstar Petition”).

utilizing only non-overlapping channels (e.g. 1, 6, and 11) will yield to more sophisticated techniques that would take advantage of the additional spectrum in Channels 12 and 13. For these reasons, NCTA supports the request by the Wi-Fi Alliance that the Commission revisit its restrictive unwanted emissions limits at the upper 2.4 GHz band edge and permit robust Wi-Fi operations in Channels 12 and 13.¹⁵

B. Globalstar’s Proposal to Operate a Terrestrial “Wi-Fi-Like” Network Co-Channel with Its MSS Operations Suggests that Its MSS System Likely Can Tolerate a Normal Amount of OOB from Adjacent-Channel Unlicensed Operations.

Globalstar has proposed to offer a terrestrial low-power service, similar to Wi-Fi, using both its licensed spectrum at 2483.5-2495 MHz, as well as the adjacent 2473-2483.5 MHz portion of the 2.4 GHz band, “pursuant to the applicable technical rules for unlicensed operations in that band.”¹⁶ Specifically, Globalstar’s proposed TLPS will use “existing IEEE 802.11 technology,”¹⁷ “consistent . . . with existing Part 15 regulations for use of the ISM band.”¹⁸ Globalstar proposes a managed deployment, in which its “access points will be carefully controlled by a Network Operating System (‘NOS’), [which] will be analogous to that currently deployed by CMRS operators to manage pico- and femto-cellular infrastructure.”¹⁹ Globalstar presumably has concluded that, through use of the NOS or otherwise, it will be able to operate its TLPS both co-channel with its MSS operations in the 2483.5-2495 MHz band, and in the

¹⁵ See Wi-Fi Alliance Letter at 2; see also NPRM ¶ 41 (seeking comment on the Wi-Fi Alliance proposal).

¹⁶ NPRM ¶ 1.

¹⁷ Globalstar Petition at iii.

¹⁸ *Id.* at 16.

¹⁹ Reply Comments of Globalstar, Inc., at 9, RM-11685 (filed Jan. 29, 2013) (“Globalstar Reply”).

adjacent unlicensed spectrum, without causing harmful interference to its licensed MSS service. In other words, Globalstar’s proposal indicates that it is possible for its MSS service to co-exist even with *co-channel* 802.11 Wi-Fi operations—let alone with *adjacent channel* operations.

The Commission did not create today’s severe adjacent-channel interference restrictions to protect Globalstar’s operations. The limits stem from a Commission decision in 1989 to designate the 2483.5-2495 MHz band as a “restricted band” to protect the separate radiodetermination satellite service.²⁰ But circumstances have changed significantly in the past twenty-five years in ways that support reconsideration of the Commission’s “restricted band” determination. Unlicensed technologies have flourished while operating on a non-interference basis both co-channel with and adjacent to licensed services in a variety of bands with no “restricted band” limits, demonstrating that the Commission’s severe restrictions in this band are not needed.²¹ Indeed, Globalstar has proposed to offer a “Wi-Fi-like” service that will operate adjacent to and *even in the same band as* the radiodetermination satellite service, its own MSS service, and other licensed services.

Wi-Fi and TLPS operations would also likely be somewhat separate geographically from Globalstar’s MSS operations, providing MSS additional protection from harmful interference. This is because Wi-Fi and TLPS are likely to be most heavily used in urban and suburban areas,²² while Globalstar’s MSS system is used primarily to provide satellite telephone services

²⁰ *Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices without an Individual License*, GEN. Docket No. 87-389, RM-5193, RM-5250, RM-5575, First Report and Order, 4 FCC Rcd. 3493 ¶ 66 (1989); NPRM ¶ 39 n.106.

²¹ See 47 C.F.R. Part 15 (authorizing unlicensed operations in the television white spaces, the 2.4 GHz band, the 5 GHz band, and the 900 MHz band, among others).

²² Cf. Globalstar Petition at 4 (noting that Globalstar intends for its TLPS service to “alleviate the congestion . . . currently experienced by many Wi-Fi users at high-traffic ‘hotspots’ in dense metropolitan areas (emphasis added)); see, e.g., *Xfinity WiFi*, Comcast Corporation,

in rural and unserved locations where traditional telephone service is not available.²³

Globalstar's MSS service is particularly unlikely to have ubiquitous coverage in indoor locations, where Wi-Fi devices most often operate. The fact that TLPS and Wi-Fi would likely operate largely in separate geographical areas further demonstrates that the "restricted band" protections are no longer needed. If Globalstar's TLPS can operate in Channel 14 without causing harmful interference to radiodetermination satellite services and its MSS service in the band, the Commission should determine whether it can remove the "restricted band" designation and allow 802.11 Wi-Fi operators to use the adjacent Channels 12 and 13 under more reasonable unwanted emission limits.

IV. GLOBALSTAR'S PROPOSED "WI-FI LIKE" SERVICE SHOULD RECEIVE NO GREATER PROTECTION FROM HARMFUL INTERFERENCE THAN EXISTING UNLICENSED OPERATIONS IN THE 2.4 GHZ BAND.

Although terrestrial operations using MSS downlink frequencies could increase the amount of spectrum available for wireless broadband, the Commission has correctly proposed that Globalstar's TLPS—at least the portion of that service that would operate using the 2473-2483.5 MHz band—should receive no greater protection from harmful interference than 2.4 GHz unlicensed operations.²⁴ Globalstar has acknowledged that its TLPS requires no such protections when operating in the unlicensed band.²⁵ In order to ensure that the 2.4 GHz band continues to serve as a robust band for existing unlicensed operations and future unlicensed innovation, the

<http://wifi.comcast.com/> (last visited Apr. 22, 2014) (showing a map of Comcast's Wi-Fi deployments, which are concentrated in urban and suburban areas).

²³ See Globalstar Petition at 9 ("Since initiating commercial MSS, Globalstar has been dedicated to providing mission-critical, emergency, and safety-of-life services to commercial, recreational, and government customers in remote, unserved, and underserved areas not reached by terrestrial deployments.").

²⁴ NPRM ¶¶ 19-20.

²⁵ Globalstar Reply at 14.

Commission should establish technical and interference protection rules that place *the whole* of Globalstar’s TLPS on an equal footing with unlicensed operations. If the Commission finds, however, that the portion of the proposed TLPS operating in Globalstar’s licensed spectrum is entitled to some interference protection, it should establish a safe harbor for all compliant Part 15 operations and deem such operations not to cause harmful interference to Globalstar’s TLPS.

A. The Commission Should Adopt Its Proposal Not to Grant Globalstar Any Additional Interference Protection for Its TLPS than that Afforded to Existing Unlicensed Operations.

The Commission should adopt technical operating rules and rules for interference protection that place Globalstar’s TLPS on the same footing as 2.4 GHz unlicensed operations. Globalstar proposes to create its TLPS channel using both unlicensed and licensed spectrum. As a result, Globalstar’s TLPS will rely on unlicensed spectrum to provide service to all TLPS customers. Therefore, this service should not receive the special protection from interference that the Commission affords to licensees who offer services using only their licensed spectrum. Globalstar acknowledges that this is a practical reality. It is also the correct result. To provide Globalstar with superior interference protection could disrupt existing 2.4 GHz unlicensed operations and chill future unlicensed innovation in the band.

NCTA therefore supports the Commission’s proposal “not . . . to grant Globalstar any additional or different interference protection rights than those that currently apply to existing unlicensed operations in the 2473-2483.5 MHz band under Part 15.”²⁶ The Commission should make explicit that this means that it will not grant “Globalstar’s low-power ATC operations in

²⁶ NPRM ¶ 19.

the 2483.5-2495 MHz band . . . interference protection from . . . other authorized operations,” including from out-of-band emissions from adjacent unlicensed users.²⁷

Globalstar has already acknowledged that it does not require or expect to receive special protection, stating that

Globalstar does not request operating rights in the 2473-2483.5 MHz band that are superior to those of other unlicensed users. Like other unlicensed services, TLPS transmissions on unlicensed spectrum below 2483.5 MHz will enjoy no protection from interference from other licensed and unlicensed operations. In particular, Globalstar’s TLPS will accept harmful interference from unlicensed operations on Wi-Fi Channel 11.²⁸

While stating its willingness to accept harmful interference from other users within the 2473-2483.5 MHz band, Globalstar also claims it should have “protection [in the 2483.5-2495 MHz band] from interference from unlicensed Part 15 equipment just like other primary terrestrial wireless services within their licensed spectrum bands.”²⁹ Nevertheless, Globalstar recognizes that, as a practical matter, “to the extent that (i) Globalstar cannot determine the location of the interference within the 2473-2495 MHz band, or (ii) such interference occurs in both the licensed and unlicensed portions of the TLPS spectrum, Globalstar will have to accept this interference to its TLPS.”³⁰ In other words, Globalstar recognizes that, in practice, if its “unlicensed” TLPS must accept interference from Part 15 devices, the “licensed” portion of TLPS must be prepared to do the same.

Given Globalstar’s admission that it will be difficult to distinguish interference to its lower TLPS service from interference to its upper TLPS service, attempting to provide superior

²⁷ *Id.* ¶ 20.

²⁸ Globalstar Reply at 14.

²⁹ *Id.* at 14 n.30.

³⁰ *Id.*

interference protection to TLPS operations in its licensed spectrum would create a nearly impossible administrative and enforcement problem for the Commission. Moreover, granting Globalstar special protection for the upper 11 MHz of its service would give Globalstar an incentive to claim that interference with any part of its network is interference to the upper 11 MHz. For instance, Globalstar might claim that the two parts of its service are inextricable, or might create two 11 MHz channels for some purposes. Mandating special protections for the upper portion of Globalstar's TLPS would place the Commission in an extremely difficult position in judging interference claims of this sort. The Commission would be forced to mediate Wi-Fi-to-TLPS disputes that are better governed by technical sharing standards than Commission enforcement.

Instead of providing Globalstar with special protection from interference, the Commission should encourage Globalstar to commit to the politeness protocols inherent in the 802.11 family of standards. Politeness protocols advance the Commission's efficiency goals and reduce administrative costs, without requiring the Commission to attempt to resolve interference disputes between like services on a case-by-case basis. The most effective way for Globalstar to demonstrate such a commitment would be to seek a recognized industry certification and determination that TLPS devices will be compatible with Wi-Fi devices designed to operate in the 2.4 GHz band.

The Commission should decline to provide Globalstar's TLPS with superior interference protection for several additional reasons. First, the 2.4 GHz band is already host to a wide variety of unlicensed services, including Wi-Fi, Bluetooth, and Zigbee, among others discussed in more detail in Part II, above. Each of these services has a large existing user base and relies on an ecosystem of deployed unlicensed equipment. A new requirement to protect Globalstar's

TLPS from interference could disrupt the already widespread and socially beneficial unlicensed operations in the band, particularly if such interference protection were to require software or hardware upgrades to deployed network equipment and/or client devices.

Second, a requirement to protect Globalstar's TLPS could stymie further unlicensed innovation in the 2.4 GHz band. Unlicensed spectrum, including at 2.4 GHz, is so valuable because its low barriers to entry foster the development of innovative services. Those barriers to entry increase, however, when additional incumbents complicate the necessary sharing protocols. As Wi-Fi Alliance has stated, Wi-Fi technologies continue to evolve at a rapid pace, and Wi-Fi network operators may someday find a way to use Wi-Fi Channels 12 and 13 *even if* the Commission does not relax the rules for unwanted emission limits.³¹ A requirement to protect yet another licensee in the band could thwart the development of new unlicensed technologies. This is particularly true where the frontier for 2.4 GHz innovation—the upper portion of the band—would directly abut Globalstar's proposed TLPS operations.

NCTA therefore urges the Commission to: (1) adopt its proposal not to provide Globalstar with any special protection from harmful interference; (2) clarify that TLPS operations in the 2483.5-2495 MHz band are not entitled to interference protection; and (3) require Globalstar's TLPS to operate like all other "Wi-Fi-like" services and accept interference from other licensed and unlicensed users of the band. Granting Globalstar special and superior status compared with its neighbors would undermine efficiency, unnecessarily provoke disputes, and reduce innovation.

³¹ Wi-Fi Alliance Letter at 1-2.

B. If the Commission Determines that TLPS Operating in Globalstar’s Licensed Spectrum Is Entitled to Interference Protection, the Commission Should Deem Unlicensed Users that Operate in Compliance with the Commission’s Rules Not to Cause Harmful Interference to Adjacent TLPS Operations.

For the reasons described above, NCTA believes that no part of Globalstar’s TLPS operations should be entitled to special interference protection. Globalstar claims it will be a good neighbor who would not undermine the 2.4 GHz band and the Commission should create rules that effectuate this promise. However, if the Commission nonetheless determines that the portion of TLPS operating in Globalstar’s licensed spectrum—2483.5-2495 MHz—is entitled to some form of protection from harmful interference, then the Commission should adopt a safe harbor for adjacent unlicensed operations similar to the safe harbor it adopted in the Location and Monitoring Service (“LMS”) proceeding.

In the LMS proceeding, the Commission established a new multilateration LMS service in the 902-928 MHz band where unlicensed Part 15 devices were already operating. To help define the relationship between these two services, the Commission provided a safe harbor for unlicensed users that operate in compliance with the Commission’s rules, stating that such unlicensed operations would be deemed not to cause harmful interference to multilateration LMS:

To promote cooperative use of the 902–928 MHz band we are elaborating on this standard to define what is not harmful interference from . . . unlicensed Part 15 devices to multilateration LMS systems. This “negative definition” will promote effective use of the 902–928 MHz band by the various services by clearly establishing the parameters under which . . . unlicensed users of Part 15 devices may operate without risk of being considered sources of harmful interference to services with a higher allocation status. Part 15 . . . operators who voluntarily operate within the following parameters will not be subject to harmful interference complaints from multilateration LMS systems at 902–928 MHz. Thus, we are adopting rules that provide that a Part 15 device will not be deemed to be causing interference to a multilateration LMS system if it is otherwise

operating in accordance with the provisions of 47 C.F.R. Part 15 and it meets [certain] conditions.³²

Similarly, here, to promote clarity in the relationship between the upper portion of Globalstar’s unique, new TLPS and existing unlicensed operations in the adjacent 2.4 GHz band, the Commission should adopt a safe harbor. An effective safe harbor rule would deem unlicensed users that operate in compliance with the Commission’s rules not to cause harmful interference to adjacent TLPS operations.

Commission rules designed to prevent harmful interference to Globalstar’s MSS operations from adjacent unlicensed operations—even if revised to permit the use of Wi-Fi Channels 12 and 13—should also be sufficient to protect Globalstar’s less-vulnerable proposed TLPS. Moreover, such a safe harbor would help to address the innovation-chilling effects discussed in Part IV.A, above. Therefore, if the Commission decides to provide some degree of interference protection for the portion of Globalstar’s TLPS that relies on Globalstar’s licensed spectrum, the service should receive no greater interference protection than what is provided by the Commission’s technical rules. Provided that unlicensed users are operating in accordance with those rules, they should be able to “operate without risk of being considered sources of harmful interference to” Globalstar’s TLPS.³³

³² *Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, Report and Order, 10 FCC Rcd. 4695, 4715 ¶ 36 (1995) (“LMS Order”).

³³ *Id.*

V. BEFORE AUTHORIZING GLOBALSTAR’S PROPOSED TERRESTRIAL SERVICE, THE COMMISSION SHOULD REQUIRE GLOBALSTAR TO DEMONSTRATE THAT IT WILL NOT CAUSE AN UNACCEPTABLE AMOUNT OF HARMFUL INTERFERENCE TO UNLICENSED USERS.

Much as it did in the Progeny proceeding, the Commission should require Globalstar to demonstrate that it will not cause an unacceptable amount of interference to unlicensed users of the 2.4 GHz band before authorizing Globalstar to begin TLPS operations. As described in more detail in Parts II and IV.A, above, a wide variety of unlicensed services already operate in the 2.4 GHz band, serving a huge user base and contributing billions of dollars every year to the U.S. economy. These services rely on existing equipment developed for the band, including a large embedded base of Cable Wi-Fi access points and the associated Wi-Fi-enabled client devices. Given the substantial investment that unlicensed network operators and equipment manufacturers have made to deploy in the band, the Commission should require Globalstar to demonstrate that its proposed TLPS will not disrupt 2.4 GHz unlicensed operations or prevent the unlicensed sector from reaping the benefits of its investment.

Under the Commission’s rules, individual unlicensed users cannot claim protection from harmful interference from any other user.³⁴ But Commission precedent establishes that the Commission can prevent new entrants—even licensees entitled to interference protection—from causing unacceptable disruption to an entire class of existing unlicensed users. In the LMS Order, for example, the Commission not only adopted the safe harbor for unlicensed operation discussed in Part IV.B, above, it also “condition[ed] [the] grant of each [Major Trading Area] multilateral license on the licensee’s ability to demonstrate . . . that their systems do not cause

³⁴ 47 C.F.R. § 15.5(a).

unacceptable levels of interference to Part 15 devices” operating in the 900 MHz band.³⁵ The Commission imposed this requirement in order to “ensure that LMS systems are not operated in such a manner as to degrade, obstruct, or interrupt Part 15 devices to such an extent that Part 15 operations will be negatively affected.”³⁶

The Commission recently applied this conditional grant in the Progeny proceeding. Specifically, the Commission required Progeny, a prospective multilateration LMS licensee, to demonstrate that it would not cause an unacceptable level of interference to Part 15 devices before the Commission licensed its service.³⁷ As part of this process, the Commission “examine[d] whether Progeny’s M-LMS system ha[d] been designed in a manner that reasonably minimizes the potential for interference to Part 15 operations.”³⁸

Because the instant proceeding presents a similar issue—how to ensure that unlicensed Part 15 operators can continue to operate substantially undisrupted in the 2.4 GHz band upon the entry of a new service—the Commission should require Globalstar to demonstrate that its TLPS operations will not cause an unacceptable amount of interference to unlicensed 2.4 GHz operations. Specifically, Globalstar should demonstrate to the Commission’s satisfaction that its TLPS will operate with the minimal potential for interference with existing unlicensed operations in the 2.4 GHz band. The Commission need not conduct its own tests to establish that Globalstar will not disrupt unlicensed operations if Globalstar’s submissions are satisfactory on their own. But the Commission should require Globalstar to disclose publicly and in full the experimental

³⁵ LMS Order, 10 FCC Rcd. at 4737 ¶ 82.

³⁶ *Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules*, Order, 28 FCC Rcd. 8555, 8560 ¶ 11 (2013).

³⁷ *Id.* at 8565-68 ¶¶ 21-29, 8569 ¶ 32.

³⁸ *Id.* at 8565 ¶ 20.

test data and results on which it based its conclusion that TLPS interference to unlicensed is unlikely so other stakeholders can analyze Globalstar's methods and results.³⁹ Requiring such disclosure—both to the Commission and in the public record—will help to provide the Commission and 2.4 GHz unlicensed users with a measure of confidence that 2.4 GHz unlicensed operations will not be disrupted by an unacceptable amount of interference from TLPS.

VI. CONCLUSION.

The Commission should only consider Globalstar's petition if the Commission can permit TLPS in a manner that (1) advances the public interest by permitting greater use of currently unusable portions of the 2.4 GHz band; and (2) ensures that any new private network does not undermine or constrain the use of the core 2.4 GHz band by unlicensed technologies. To advance these two important goals, NCTA recommends that the Commission: (1) relax the unwanted emissions limit at the upper 2.4 GHz band edge to permit use of Wi-Fi Channels 12 and 13; (2) adopt technical and interference protection rules for Globalstar's TLPS that place it on an equal footing with unlicensed operations; and (3) require Globalstar to demonstrate that it will not cause an unacceptable amount of interference to unlicensed users of the 2.4 GHz band.

³⁹ Letter from L. Barbee Ponder IV, General Counsel & Vice President Regulatory Affairs, Globalstar, Inc., to Mignon Clyburn, Chairwoman, Federal Communications Commission at 1, RM-11685 (filed June 10, 2013) (stating that the TLPS test results showed “no impact on public Wi-Fi operations in adjacent channels”).

Respectfully submitted,

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