

No. 20-1190
(consolidated with Case Nos. 20-1216, 20-1272, 20-1274, 20-1281, and 20-1284)

**IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

AT&T SERVICES, INC.,

Petitioner,

v.

FEDERAL COMMUNICATIONS COMMISSION
and THE UNITED STATES OF AMERICA,

Respondents.

On Petitions for Review of an Order of the
Federal Communications Commission

INITIAL JOINT BRIEF OF INTERVENORS FOR RESPONDENTS

David Paul Murray
Mia Guizzetti Hayes
Willkie Farr & Gallagher LLP
1875 K Street, N.W.
Washington, D.C. 20006-1238
(202) 303-1000
dmurray@willkie.com

*Counsel for NCTA – The Internet &
Television Association*

Russell H. Fox
Robert G. Kidwell
Elana R. Safner
Mintz, Levin, Cohn, Ferris, Glovsky
and Popeo, P.C.
701 Pennsylvania Ave., N.W., Ste. 900
Washington, D.C. 20004
(202) 434-7300
rfox@mintz.com

Counsel for Wi-Fi Alliance

Christopher J. Wright
Paul J. Caritj
Jason Neal
Harris, Wiltshire & Grannis LLP
1919 M St., N.W., 8th Floor
Washington, D.C. 20036
(202) 730-1300
cwright@hwglaw.com

*Counsel for Apple Inc.,
Broadcom Inc., Cisco Systems, Inc.,
Google LLC, Hewlett Packard
Enterprise, Intel Corporation, and
Microsoft Corporation*

Dated: March 2, 2021

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

Pursuant to D.C. Circuit Rule 28(a)(1), Intervenor certify as follows:

Parties and *Amici*. All parties and intervenors appearing before this Court are listed in the Brief for Petitioners. Southern Company Services, Inc. has appeared as *amicus curiae* for Petitioners. Cable Television Laboratories, Inc., Public Knowledge, Benton Institute for Broadband & Society, and the Open Technology Institute at New America have appeared as *amici curiae* for the Respondents.

Ruling Under Review. Reference to the ruling at issue appears in the Brief for Petitioners.

Related Cases. These consolidated cases have not previously been before this Court or any other court, and Intervenor are not aware of any other related cases.

CORPORATE DISCLOSURE STATEMENTS

Pursuant to Federal Rule of Appellate Procedure 26.1 and D.C. Circuit Rule 26.1, Intervenor's hereby submit the following disclosure statements.

Apple Inc. has no parent corporation and no publicly held company owns ten percent or more of its stock. Insofar as relevant to this litigation, Apple Inc.'s general nature and purpose is to manufacture devices and provide services that use or rely on unlicensed spectrum.

Broadcom Inc. has no parent corporation and no publicly held company owns ten percent or more of its stock. Insofar as relevant to this litigation, Broadcom's general nature and purpose is to manufacture equipment for use in devices that use or rely on unlicensed spectrum.

Cisco Systems, Inc. is a publicly held corporation and has no parent corporation, and no publicly held corporation owns ten percent or more of its stock. Insofar as relevant to this litigation, Cisco Systems, Inc.'s general nature and purpose is to provide equipment, devices, and services that use or rely on unlicensed spectrum.

Google LLC is a wholly owned subsidiary of XXVI Holdings Inc., which is a wholly owned subsidiary of Alphabet Inc., a publicly traded corporation. No publicly held corporation owns ten percent or more of Alphabet Inc.'s stock. Insofar as relevant to this litigation, Google LLC's general nature and purpose is to

manufacture devices and provide services that use or rely on unlicensed spectrum.

Hewlett Packard Enterprise has no parent corporation and no publicly held company owns ten percent or more of its stock. Insofar as relevant to this litigation, Hewlett Packard Enterprise's general nature and purpose is to manufacture equipment and provide services that use or rely on unlicensed spectrum.

Intel Corporation has no parent corporation and no publicly held company owns ten percent or more of its stock. Insofar as relevant to this litigation, Intel Corporation's general nature and purpose is to manufacture equipment for use in devices that use or rely on unlicensed spectrum.

Microsoft Corporation has no parent corporation and no publicly held company owns ten percent or more of its stock. Insofar as relevant to this litigation, Microsoft Corporation's general nature and purpose is to manufacture devices and provide services that use or rely on unlicensed spectrum.

NCTA – The Internet & Television Association is the principal trade association of the cable television industry in the United States. Its members include owners and operators of cable television systems serving nearly 80 percent of the nation's cable television customers, as well as more than 200 cable program networks. The cable industry is also a leading provider of residential broadband service to U.S. households. NCTA – The Internet & Television Association has no

parent companies, subsidiaries, or affiliates whose listing is required by Federal Rule of Appellate Procedure 26.1 or D.C. Circuit Rule 26.1.

Wi-Fi Alliance is a global, non-profit industry association of over 850 leading companies from dozens of countries devoted to seamless interoperability. With technology development, market building, and regulatory programs, Wi-Fi Alliance is the organization that enables widespread adoption of Wi-Fi® worldwide by certifying thousands of Wi-Fi products each year. It is also an active participant before the Federal Communications Commission, as well as in other domestic and international proceedings seeking to promote regulatory policies that support the growing Wi-Fi ecosystem. Wi-Fi Alliance has no parent corporation and is a trade association under D.C. Circuit Rule 26.1(b).

TABLE OF CONTENTS

INTRODUCTION	1
SUMMARY OF ARGUMENT	4
ARGUMENT	6
I. THE <i>ORDER</i> RIGHTLY IDENTIFIED THE 6 GHZ BAND AS CRITICAL FOR ADDRESSING A MAJOR SHORTAGE OF UNLICENSED SPECTRUM.	6
A. The United States Needs Dramatically More Spectrum for Unlicensed Operations Like Wi-Fi to Meet Demand, Promote Innovation, and Grow the Economy.	6
B. The 6 GHz Band Is the Ideal Home for Sharing Between Incumbent Users and Unlicensed Devices.	10
II. PETITIONERS' CLAIMS THAT THE COMMISSION HAS IMPERMISSIBLY EXPOSED THEM TO A RISK OF HARMFUL INTERFERENCE MISCONSTRUE BOTH THE <i>ORDER</i> AND THE COMMISSION'S HARMFUL-INTERFERENCE RULES.	12
A. The Commission's Rules Oblige It to Determine, as It Did Here, What Constitutes a Significant Risk of Harmful Interference.	14
B. Petitioners Greatly Understate the Robustness of the Commission's Analysis.	17
III. PETITIONERS' MERE DISAGREEMENT WITH THE COMMISSION'S CONCLUSIONS IS NOT A BASIS FOR OVERTURNING THE <i>ORDER</i>	26
IV. THE COMMISSION SPECIFICALLY DETERMINED THAT PUBLIC SAFETY COMMUNICATIONS WOULD BE PROTECTED FROM HARMFUL INTERFERENCE.	33
V. THE COURT SHOULD REJECT SOUTHERN COMPANY'S INVITATION TO SECOND-GUESS THE <i>ORDER</i> BASED ON A FLAWED STUDY THAT WAS NOT BEFORE THE COMMISSION.	39
CONCLUSION	41

TABLE OF AUTHORITIES

CASES

<i>Am. Radio Relay League, Inc. v. FCC</i> , 524 F.3d 227 (D.C. Cir. 2008).....	13
<i>Am. Trucking Associations, Inc. v. E.P.A.</i> , 283 F.3d 355 (D.C. Cir. 2002).....	28
<i>City of Waukesha v. E.P.A.</i> , 320 F.3d 228 (D.C. Cir. 2003).....	26
<i>Dist. Hosp. Partners, L.P. v. Burwell</i> , 786 F.3d 46 (D.C. Cir. 2015).....	39
<i>Mozilla Corp. v. FCC</i> , 940 F.3d 1 (D.C. Cir. 2019).....	26, 29, 32, 34, 36, 37, 38, 39
<i>NTCH, Inc. v. FCC</i> , 950 F.3d 871 (D.C. Cir. 2020).....	3, 13, 25, 26
<i>Telocator Network of America v. FCC</i> , 691 F.2d 52 (D.C. Cir. 1982).....	12, 33

STATUTES

47 U.S.C. § 151	33
47 U.S.C. § 303(g)	12
RAY BAUM’s Act, Pub. L. No. 115-141, § 618, 132 Stat. 348, 1112 (2018)	7

REGULATIONS

47 C.F.R. § 15.3(m)	15
47 C.F.R. § 15.5(b)	3, 15, 17

FCC ORDERS

<i>Amendment of the Commission’s Rules for Unlicensed Operations in the Televisions Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, et al.</i> , Report and Order, 30 FCC Rcd. 9551 (2015)	15
---	----

OTHER AUTHORITIES

Steve Methley & William Webb, Quotient Assocs. Ltd., <i>Wi-Fi Spectrum Needs Study</i> (2017)	7
---	---

GLOSSARY

6 GHz Band	Wireless spectrum band from 5.925-7.125 GHz
dB	Decibels
dBm	Decibel milliwatts
<i>Draft Order</i>	<i>Unlicensed Use of the 6 GHz Band, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, [Draft] Report and Order and Further Notice of Proposed Rulemaking, FCC-CIRC2004-01, ET Docket No. 18-295 (rel. Apr. 2, 2020)</i>
FCC (or “Commission”)	Federal Communications Commission
GHz	Gigahertz
MHz	Megahertz
<i>Notice</i>	<i>Unlicensed Use of the 6 GHz Band, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, Notice of Proposed Rulemaking, 33 FCC Rcd. 10496 (2018)</i>
<i>Order</i>	<i>Unlicensed Use of the 6 GHz Band, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd. 3852 (2020)</i>

STATUTES AND REGULATIONS

Except for the following, all applicable statutes and regulations are contained in the Joint Brief of Petitioners and the Brief for Respondents.

47 U.S.C. § 303(g). Except as otherwise provided in this chapter, the Commission from time to time, as public convenience, interest, or necessity requires, shall— . . . Study new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective use of radio in the public interest.

INTRODUCTION

Now, more than ever, Wi-Fi technology is essential to daily life for most Americans. It allows us to connect with friends, family, teachers, healthcare providers, and others using a vast array of devices untethered by wires at home, school, work, and nearly everywhere else. With more and more of the country being connected with high-speed broadband internet, Wi-Fi allows access to those broadband connections dynamically from laptops, tablets, phones, watches, televisions, and other devices in our homes and businesses. And Wi-Fi contributes nearly a trillion dollars to our economy annually.

Wi-Fi relies on access to spectrum that can be used on an unlicensed basis. Unlike licensed spectrum, in which a particular operator typically receives the exclusive right to use some range of frequencies in a specified geographic area, unlicensed spectrum is available to all. Anyone can use frequencies authorized for unlicensed use, without obtaining an individual license, so long as they use a device that has been certified to meet the Federal Communications Commission's ("FCC" or "Commission") technical rules. Instead of excluding other users, unlicensed technologies like Wi-Fi are designed to share the spectrum with other nearby users efficiently and automatically.

As our lives increasingly depend on Wi-Fi, and newer and more data-intensive applications like high-resolution streaming video become more common,

additional spectrum is essential to handle the growing demand. Any parent whose video conference for work has lagged as her children attend school remotely or play games online understands intuitively the importance of adequate Wi-Fi spectrum.

In 2017, the FCC began examining whether to expand unlicensed use in the spectrum band from 5.925-7.125 GHz (the “6 GHz Band”). In 2018, Congress directed the Commission to make additional spectrum available for unlicensed use. And in April 2020, after years of careful consideration and well over a thousand filings from interested parties, the Commission adopted the *Order* at issue, making the 6 GHz band available for unlicensed use. The 1,200 megahertz of new spectrum available for unlicensed use will help alleviate congestion for existing applications using Wi-Fi and enable future generations of Wi-Fi that will support not-yet-imagined applications and carry even greater amounts of information at greater speeds to greater numbers of devices.

Congress entrusted the Commission with the task of managing the nation’s radiofrequency spectrum to maximize the nation’s use of this limited resource. The Commission has done so by authorizing the use of spectrum on both a licensed and unlicensed basis and seeking opportunities for different services to efficiently use the same frequencies. Under the Commission’s rules, when devices approved for unlicensed use share frequencies with licensed services, unlicensed use is

“subject to the condition[] that no harmful interference is caused” to existing licensees. 47 C.F.R. § 15.5(b). Thus, one of the central issues in this rulemaking proceeding was the appropriate technical restrictions for unlicensed operations in the 6 GHz band to protect existing licensed users from harmful interference. Before adopting the *Order*, the Commission’s engineers spent years assessing technical analyses and arguments from parties on all sides. The Commission explicitly recognized the needs of incumbent licensed users, including Petitioners, and adopted many of their requests. The Commission also limited the transmitted power for many unlicensed devices to levels far lower than levels proposed by many unlicensed advocates (including Intervenors), and 16 times lower than the Commission first proposed. *See* FCC Br. 14-15.

The resulting *Order* embodies a careful, conservative decision, based on a massive technical record, to unlock the benefits of next-generation unlicensed technologies while protecting licensed users from harmful interference. It is the kind of complex, technical decision-making in an area within the agency’s expertise that warrants “the greatest deference” on review. *NTCH, Inc. v. FCC*, 950 F.3d 871, 879-80 (D.C. Cir. 2020) (internal quotation marks omitted). Petitioners’ arguments before this Court recycle arguments that the Commission thoroughly considered and addressed in the *Order* as well as its denial of their stay requests (which this Court also denied). The Commission reasonably determined

that the technical restrictions adopted in the *Order* will ensure the availability of spectrum that Americans need for Wi-Fi and other unlicensed technologies without a significant potential for harmful interference. The Court should deny the petitions for review.

SUMMARY OF ARGUMENT

1. The Commission's decision to authorize unlicensed operations in the 6 GHz band is critical for addressing a spectrum shortage for Wi-Fi and other unlicensed technologies that Americans use to access their broadband internet connections. The Commission rightly identified the 6 GHz band as uniquely suited to meet the nation's growing need for Wi-Fi connectivity.

2. The Commission's decision was based on its expert technical judgment that unlicensed operations governed by the rules in the *Order* would not create a significant risk of harmful interference to incumbent users. Petitioners' arguments misconstrue the Commission's regulations regarding harmful interference and would cripple the Commission's ability to carry out its statutory mandate to promote more intensive and efficient use of radiofrequency spectrum.

3. Petitioners also wrongly complain that the Commission ignored or failed to respond to technical arguments they presented regarding the potential for harmful interference from unlicensed operations. The Commission thoroughly considered Petitioners' technical submissions and other evidence in this

voluminous record, easily satisfying its obligations to respond in a reasoned manner to the record and to address important aspects of the problem before it. Petitioners' real complaint is that the Commission reached conclusions different from their preferred outcome, which is no basis to overturn its judgment, especially in this highly technical area.

4. Petitioner Association of Public Safety Communications Officials wrongly argues that the Commission failed to analyze the *Order's* impact on public safety. In fact, the Commission considered the needs of public safety operators in the 6 GHz band, adopted restrictions on unlicensed operations that the Association and others supported, and concluded that its rules would protect public safety users and other incumbents from a significant risk of harmful interference. That is more than sufficient to satisfy the Commission's obligation to consider the impact of its rules on public safety.

5. The Court should reject *amicus* Southern Company's invitation to second-guess the Commission's expert judgment based on submissions that were not before the Commission when it adopted the *Order*. The post-*Order* analyses Southern Company cites are not part of the record on appeal. In any event, they suffer from many of the same flaws that led the Commission to discount previous studies by Southern Company and others.

ARGUMENT

I. THE *ORDER* RIGHTLY IDENTIFIED THE 6 GHz BAND AS CRITICAL FOR ADDRESSING A MAJOR SHORTAGE OF UNLICENSED SPECTRUM.

A. The United States Needs Dramatically More Spectrum for Unlicensed Operations Like Wi-Fi to Meet Demand, Promote Innovation, and Grow the Economy.

As the Commission explained in the *Order*, “[t]he demand for wireless broadband continues to grow at a phenomenal pace” with “[a] large proportion of this mobile data traffic . . . delivered on an unlicensed basis through Wi-Fi, Bluetooth and similar protocols.” *Unlicensed Use of the 6 GHz Band, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd. 3852, ¶ 2 (2020) (“*Order*”) (JA____). In addition to these current trends, the Commission forecast important new developments in the unlicensed wireless landscape. For example, the Commission predicted that the transition to 5G, a new generation of wireless services, will rely on unlicensed spectrum to “work in concert with” licensed spectrum to maximize the benefits of 5G and secure U.S. leadership in the global development of 5G services. *Id.* ¶¶ 1-2 (JA____). Mobile data traffic is expected to “more than double” by 2022 compared to April 2020, and as much as “59% of mobile data traffic will be offloaded to Wi-Fi by 2022.” *Id.* ¶ 2 (JA____). A new generation of consumer electronics on the horizon, including wireless augmented

reality and virtual reality devices, will likewise rely on unlicensed access to spectrum for more demanding, high-speed connectivity. *Id.* App’x C ¶ 1 (JA____).

Congress and the Commission concluded that making additional spectrum available for unlicensed use is essential to meet these growing demands. *See, e.g., Order* ¶ 22 (JA____). One widely cited study from 2019 predicted a spectrum shortfall of as much as 1.5 gigahertz by the year 2025—approximately four times more spectrum than the total amount then available (before the *Order*) for the most widely used unlicensed spectrum technologies, such as Wi-Fi. *See, e.g., Apple, Broadcom et al. 3/18/19 Reply Comments at 4 n.5* (JA____) (citing Steve Methley & William Webb, Quotient Assocs. Ltd., *Wi-Fi Spectrum Needs Study* 26, 28 (2017)).

Thus, at Congress’s urging (*see* RAY BAUM’s Act, Pub. L. No. 115-141, § 618, 132 Stat. 348, 1112 (2018)), the Commission exercised its longstanding spectrum-management authority by instituting this proceeding to identify additional spectrum that could be made available for unlicensed use. The Commission reasonably decided to make available 1,200 megahertz of spectrum in the band from 5.925-7.125 gigahertz (the “6 GHz Band”), subject to carefully crafted technical rules adopted in the *Order*. *See* FCC Br. 7-15. This dramatically increased the amount of spectrum available for unlicensed technologies and enabled much wider channels (*e.g.*, 160- and 320-megahertz channels, compared

with the 20-, 40-, and 80-megahertz channels that recent generations of Wi-Fi use) that will increase the capacity and speed of unlicensed wireless networks. *See Order* ¶ 18 (JA____).

The Commission’s decision to open the 6 GHz band to unlicensed use offers enormous economic benefits. A 2018 study estimated that Wi-Fi generated nearly \$500 billion of economic value in the United States for that year alone. *Order* ¶ 229 (JA____). Another recent study estimated the economic value of opening the 6 GHz band to unlicensed use at over \$150 billion. *Id.* These benefits are felt domestically in large part because much of the “unlicensed-technology industry—including chipmakers, device manufacturers, and integrators—is centered in the United States.” Apple, Broadcom et al. 2/15/19 Comments at 10 (JA____). Another study has projected that Wi-Fi will contribute nearly a trillion dollars to our economy in 2021 alone, based in part on the opportunity for Wi-Fi devices to use the 6 GHz band, with that contribution projected to grow to more than \$1.5 trillion by the year 2025.¹

Indeed, the *Order*’s economic benefits are already being realized. Because of the Commission’s decision, Intervenors and other technology companies are producing 6 GHz devices that will provide substantial benefits to consumers and

¹ *See* Press Release, Wi-Fi Alliance, Wi-Fi global economic value to reach \$5 trillion in 2025 (Feb. 3, 2021), <https://www.wi-fi.org/news-events/newsroom/wi-fi-global-economic-value-to-reach-5-trillion-in-2025>.

businesses. Intervenor Wi-Fi Alliance has certified a number of these devices,² and, after rigorous certification testing, the FCC in recent months has issued authorizations for the world's first Wi-Fi devices using 6 GHz spectrum.

Now that those certifications have been issued, companies have announced a new generation of 6 GHz Wi-Fi access points, smartphones, laptops, and other devices.³ Some of these devices are available for purchase now, with millions expected to be sold beginning in the spring and summer of 2021 as 6 GHz capabilities are integrated into a growing number of mainstream smartphones and other devices.⁴ The Commission's vision in the *Order* has also advanced the United States' role as a global spectrum leader, with other countries and regions around the world following its lead to open up the 6 GHz band for unlicensed use.⁵

² See Wi-Fi Alliance, Product Finder, Certified Wi-Fi 6E Devices, https://www.wi-fi.org/product-finder-results?sort_by=certified&sort_order=desc&certifications=1335 (last visited Mar. 1, 2021).

³ See Ry Crist, *All of the new routers announced at CES 2021 -- including next-gen Wi-Fi 6E*, CNET (Jan. 14, 2021), <https://www.cnet.com/pictures/all-of-the-new-routers-announced-at-ces-2021-including-next-gen-wi-fi-6e/3/>; <https://www.netgear.com/home/wifi/routers/raxe500/>.

⁴ See Ron Amadeo, *Wi-Fi 6E arrives at CES 2021*, ArsTechnica (Jan. 18, 2021), <https://arstechnica.com/gadgets/2021/01/wi-fi-6e-arrives-at-ces-2021/>.

⁵ See Press Release, Wi-Fi Alliance, Wi-Fi Alliance delivers Wi-Fi 6E certification program (Jan. 7, 2021), <https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-delivers-wi-fi-6e-certification-program>.

B. The 6 GHz Band Is the Ideal Home for Sharing Between Incumbent Users and Unlicensed Devices.

Engineers and spectrum policymakers confront the simple reality that there is no band of spectrum that is both (1) practical to use with today's technology and (2) not already occupied by at least one type of licensee or, often, many types. It was in this context that the FCC identified the 6 GHz band as a promising home for new unlicensed operations. The band offers many important benefits: the size of the band means that a significant amount of spectrum could be made available for unlicensed technologies and that it could support applications that require wider channels. It is also adjacent to frequencies in the 5 GHz band that are some of the most heavily used by unlicensed technologies today, making it easier to develop devices that use this spectrum. *See Unlicensed Use of the 6 GHz Band*, 33 FCC Rcd. 10496, ¶ 19 (2018) (“*Notice*”) (JA____). The types of licensees in the 6 GHz band also make sharing between licensed and unlicensed users more feasible than in other bands. *See Order* ¶ 241 (JA____).

The 6 GHz band is widely used for point-to-point microwave communications, which, like all licensed wireless services, require protection from harmful interference. *See Order* ¶ 7 (JA____). Critically, however, point-to-point microwave links use antennas that are typically deployed far above ground level to avoid buildings and other obstructions and are physically pointed toward the transmitter whose signals they are intended to receive (and vice versa). *See id.*

¶ 241 (JA____). These antennas make it easier for a licensee to “hear” transmissions originating from the location where the antenna is pointed and effectively suppress undesired signals from other sources. *See Notice* ¶ 37 (JA____).

Therefore, while point-to-point microwave links require protection, their particular characteristics make them less susceptible to harmful interference than some other kinds of radio systems. Due to these characteristics, they can be, and often are, packed together densely, with hundreds of 6 GHz links crisscrossing some of the most congested metropolitan areas without harmful interference. These same characteristics permit unlicensed devices to operate in much of the surrounding area, on the same frequencies, without causing harmful interference. *See Apple, Broadcom et al. 7/31/19 Letter at 10* (JA____).

Licensed point-to-point links also already share the band—or segments of it—with other kinds of users. These include users of an unlicensed technology called “ultrawideband,” which uses very low power levels to determine distances, among other applications. *Order* ¶ 10 (JA____). Other users of the band include the mobile transmitters described by the National Association of Broadcasters, as well as other operators that use the band to communicate with satellites. These latter two categories of users, as Commission licensees, are also entitled to interference protection. As with point-to-point microwave links, the Commission

determined that the technical rules adopted in the *Order* would also protect these users from harmful interference while helping to satisfy the growing demand for unlicensed spectrum. *See* FCC Br. 71-75.⁶

II. PETITIONERS’ CLAIMS THAT THE COMMISSION HAS IMPERMISSIBLY EXPOSED THEM TO A RISK OF HARMFUL INTERFERENCE MISCONSTRUE BOTH THE *ORDER* AND THE COMMISSION’S HARMFUL-INTERFERENCE RULES.

One of the core responsibilities that Congress assigned to the Commission is to “generally encourage the larger and more effective use of radio in the public interest.” 47 U.S.C. § 303(g). To accomplish this, this Court has concluded that “the Commission is empowered by the Communications Act to foster innovative methods of exploiting the radio spectrum.” *Telocator Network of Am. v. FCC*, 691 F.2d 525, 538 (D.C. Cir. 1982). When it does so, “the Commission functions as a policymaker and . . . [is] accorded the greatest deference by a reviewing court.” *Id.* The *Order* is a paradigmatic example of this form of Commission action, adopting rules to allow far more intensive use of 6 GHz spectrum to meet current needs and anticipate future trends—a policymaking capability that is only becoming more critical as demand for radiofrequency spectrum accelerates.

⁶ Although some satellite licensees raised concerns about the risk of harmful interference from unlicensed users to satellite systems, the Commission considered and addressed those issues in the *Order* as well. No party raises them on appeal.

Of course, the Commission's authority to make such decisions is not unconstrained. Among other things, the Commission's rules require it to protect licensed services from harmful interference—a highly technical task that leverages both the Commission's substantial engineering expertise as well as its expert predictions about patterns and trends in the use of wireless services. This Court's precedent recognizes that “[w]here a highly technical question is involved, courts necessarily must show considerable deference to an agency’s expertise.” *Am. Radio Relay League, Inc. v. FCC*, 524 F.3d 227, 233 (D.C. Cir. 2008) (internal quotation marks omitted). In particular, the Court has instructed that the highly technical nature of spectrum management makes this an area of Commission expertise “to which we afford the greatest deference.” *NTCH*, 950 F.3d at 879-80 (internal quotation marks omitted). The Court “accept[s] the Commission’s technical judgment[s] when supported with even a modicum of reasoned analysis, absent highly persuasive evidence to the contrary.” *Id.* at 880 (internal quotation marks omitted).

Petitioners’ opening brief ignores this established case law. *Cf.* FCC Br. 23-24 (setting out the standard of review). It is evident from the comprehensive analysis in the *Order* that the Commission used its policymaking authority and technical engineering expertise in evaluating the record evidence and adopting the rules at issue. Rather than acknowledging the applicable

standard of review, and in the guise of “fram[ing]” the case based on asserted “common ground,” Pet. Br. 18, Petitioners misconstrue the *Order*’s treatment of both the legal framework for harmful interference and the Commission’s findings on the risk of harmful interference. On the law, they proffer an unreasonably restrictive view of the Commission’s regulations regarding harmful interference that ignores relevant precedent, is virtually impossible to meet, and would cripple the Commission’s ability to make efficient use of limited spectrum resources. Petitioners also greatly understate the degree of protection that the *Order* provides. Though Petitioners portray the *Order* as reckless, the Commission carefully analyzed and concluded, based on its technical judgment, that the risk of harmful interference is insignificant under the rules it adopted.

A. The Commission’s Rules Oblige It to Determine, as It Did Here, What Constitutes a Significant Risk of Harmful Interference.

Petitioners’ challenge is premised on the theory that the Commission may not authorize unlicensed operations in the 6 GHz band if there is *any possibility*, no matter how remote, that any device will cause harmful interference to any fixed-service link at any time. *See* Pet. Br. 21-22. The Commission rightly rejected that overly restrictive proposition, which would make it impossible for the Commission to authorize any new services (licensed or unlicensed) in a world of increasing spectrum scarcity. *Order* ¶ 146 (JA___). Instead, the Commission’s rules prohibit operators of unlicensed devices from causing

harmful interference, 47 C.F.R. § 15.5(b), defined as interference that “seriously degrades, obstructs or repeatedly interrupts a radiocommunications service” or “endangers the functioning of a radio navigation service or of other safety services,” *id.* § 15.3(m).⁷ This standard necessarily involves the Commission’s expert judgment in evaluating the unlicensed services at issue. There is no one-size-fits-all power level or other metric that the Commission can rely on to define harmful interference categorically. Rather, “the Commission considers the particular technical and operational parameters necessary to minimize the potential for harmful interference to authorized services in that particular situation and acts accordingly.” *Order* ¶ 145 (JA____). The FCC’s rules for unlicensed operations “apply th[ese] criteria on a case by case basis for different bands after careful consideration of the incumbent services in each band that ensures such harmful interference is unlikely to occur.” *Id.*; see, e.g., *Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Televisions Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, et al.*, Report and Order, 30 FCC Rcd. 9551, ¶ 152 (2015) (discussing “factors” in that proceeding that “lead to very little risk of harmful

⁷ The Commission has never interpreted “safety service” in this definition to apply broadly to all communications used for any public safety purpose, as opposed to more specialized “safety services” such as radionavigation, as Petitioners appear to assume.

interference” in the circumstances of the incumbent uses). In carrying out this important task, it “is the Commission and not the parties who determines what degree of interference constitutes harmful interference” in the context of a particular unlicensed use of spectrum and given the particular characteristics of the relevant licensees. *Order* ¶ 145 (JA ____).

The FCC applied the same technical expertise in this proceeding, “following an exhaustive examination of a voluminous record.” FCC Br. 23. While Petitioners attempt to mischaracterize the *Order* as “subject to only one interpretation”—that the Commission concluded, and had to conclude, that no single device might ever pose any significant risk of harmful interference to any single fixed-service link, Pet. Br. 21—that “is not what the *Order* held.” FCC Br. 31. The FCC explained at length its technical judgment that “the restrictions and requirements that we are establishing for indoor use of low power access points eliminates any significant risk of causing harmful interference” consistent with the “public interest.” *Order* ¶ 146 (JA ____); *see also id.* n.388 (JA ____) (citing Commission precedent taking this same approach).⁸

⁸ For example, although CableLabs’ studies indicated that limiting low-power devices to 8 dBm/MHz would fully protect incumbent transmissions, the Commission set the limit at 5 dBm/MHz in the *Order* as an additional “precaution.” *Order* ¶ 110 (JA ____).

Petitioners’ preferred approach to spectrum policy, as the Commission explained in the *Order*, “would rule out virtually all services and unlicensed operations, given that there is virtually no [radiofrequency]-emitting device that does not have the potential for causing such interference if used incorrectly.” *Order* ¶ 146 (JA____); *see* FCC Br. 32. Instead, the Commission establishes technical requirements for services in its rules; its engineers develop rigorous tests used to certify devices for unlicensed use; and its Enforcement Bureau investigates and remedies reported instances of harmful interference by users, consistent with its rules specifying that unlicensed operation by a user is “subject to the condition[] that no harmful interference is caused.” 47 C.F.R. § 15.5(b); *see Order* ¶¶ 149-50 (JA____); FCC Br. 75-78. Petitioners’ theory that the Commission must eliminate *ex ante* any potential risk of harmful interference is an “impossible standard,” FCC Br. 17, not just in the 6 GHz band, but everywhere services share the same or adjacent spectrum, either in terms of geography or radiofrequency.

B. Petitioners Greatly Understate the Robustness of the Commission’s Analysis.

Petitioners are likewise wrong in claiming that the Commission failed to consider that the risk of harmful interference from low-power unlicensed devices—the devices that are not required to use automated frequency

coordination⁹ but are subject to special power-level restrictions and must be used indoors, *see* FCC Br. 26; *Order* ¶ 3 (JA____)—would accumulate over time and as the number of 6 GHz unlicensed devices increased. Pet. Br. 37-39. As the Commission explained, it properly accounted for these factors in the *Order*. The Commission relied on studies that assumed a large number of 6 GHz unlicensed devices and considered a huge number of possible interactions between these devices and point-to-point microwave receivers. This probabilistic analysis showed that the risk of harmful interference is insignificant, even without the more restrictive rules adopted in the *Order*. FCC Br. 44-45.

Petitioners also rely on selective readings and distortions of the *Order* to support their argument that it will lead to a significant risk of harmful interference over time. For example, they claim that the Commission’s own calculations showed that signals from unlicensed devices would, in rare cases, exceed a certain “interference protection benchmark.” Pet. Br. 34. Petitioners theorize that this would “jeopardiz[e]” a nearby licensed receiver, implying that a licensee would experience harmful interference in this scenario, and accuse the Commission of engaging in “sleights of hand” to make it seem as though this situation would not occur. Pet. Br. 32-33.

⁹ An automated frequency coordination system uses an online database to provide a list of permissible frequencies for unlicensed users before they transmit. *See Order* ¶ 21 (JA____).

But it is Petitioners, not the Commission, who rely on misdirection here. They seize on the phrase “interference protection benchmark” as if it denotes harmful interference, but fail to disclose that the Commission explicitly, and repeatedly, explained that the benchmark is simply a tool to facilitate analysis and that exceeding it does not constitute harmful interference. *See, e.g., Order* ¶ 71 (JA____). Petitioners’ narrow focus on a single paragraph of the Commission’s *Order* also obscures the detailed, multilayered analysis in which the paragraph was situated. That analysis convincingly demonstrates that the risk of harmful interference remains very remote, even in rare, hypothetical cases like the ones Petitioners cherry-pick.

To be sure, the Commission fully considered the probability that an unlicensed device would operate in a way that caused a licensee to receive energy at or above the so-called “interference protection benchmark,” which it defined as an energy level that was one quarter the strength of the prevailing background noise, expressed as “-6 dB I/N.” In doing so, the Commission cited at least five studies: (1) a study submitted by CableLabs, *Order* ¶¶ 117-22 (JA____); (2) a study submitted by a coalition of “Critical Infrastructure Incumbents,” including *amicus* Southern Company, and several Petitioners, *id.* ¶¶ 136-38 (JA____); (3) a study prepared by Apple, Broadcom et al., analyzing all 6 GHz microwave links passing near New York City, *id.* ¶¶ 139-40 (JA____); (4) a study prepared by Apple,

Broadcom et al., analyzing all 6 GHz microwave links operated by the Los Angeles Department of Water and Power, *id.*; and (5) a study performed by RKF Engineering and submitted by Apple, Broadcom, et al. analyzing all fixed microwave links in the United States, *see, e.g., id.* ¶¶ 113 n.276; 116 nn. 290, 291, 293; 125 n.324; and 141 n.373 (JA ___, ___, ___, ___, ___, ___).

The Commission ultimately agreed with the conclusion of many of these studies that the odds of exceeding the benchmark were extremely small, even assuming that very large numbers of low-power unlicensed devices would ultimately be sold. *See, e.g., Order* ¶ 117 (JA ___) (“The simulations showed that the I/N ratio is far below the conservative -6 dB I/N threshold.”); ¶ 141 n.373 (JA ___) (explaining that the potentially large number of devices does not affect its conclusions, because this was already accounted for in many of the studies on which the FCC relied).

The Commission likewise considered studies submitted by Petitioners and other licensees that identified specific situations where they alleged harmful interference could occur. *See Order* ¶¶ 123-35 (JA ___). Like Petitioners’ brief, these studies were generally premised on the assertion, which the Commission reasonably rejected, *see, e.g., id.* ¶ 71 (JA ___), that exceeding the benchmark constituted harmful interference. They generally involved identification of specific microwave receivers and nearby structures where, they claimed, an unlicensed

device could cause harmful interference if it operated within the identified building. These were largely mathematical exercises where parties sought to show that the interference benchmark could be exceeded if a confluence of worst-case assumptions held regarding the degree to which building walls would block the signal, whether the signal would be obstructed by other sources of “clutter” such as trees and other buildings, how the unlicensed device was oriented in space, and other factors. *See, e.g., id.* ¶¶ 127-29 (JA____).

The Commission analyzed the cases identified by AT&T in great detail, resulting in Tables 4 and 5 of the *Order*, which compared AT&T’s own analysis with another competing analysis of the same scenarios filed by Apple, Broadcom et al., and then provided the Commission’s own analysis and conclusions from these data. *Id.* On point after point, the Commission concluded that AT&T’s analyses were unrealistic because they omitted important real-world factors that would reduce the energy that a licensee was likely to receive. *See id.* ¶¶ 127-31 (JA____).

The Commission’s own analysis resulted in only a single scenario, described in the final column of Table 5, where it concluded that a fixed microwave receiver might receive energy in excess of the -6 dB benchmark. Petitioners wrongly assert that this single scenario “showed” that a low power unlicensed access point would “jeopardiz[e] the microwave link across the street,” Pet. Br. 32, and improperly

rely on this one benchmark in claiming that the Commission identified situations that would “make interference likely (*e.g.*, no building loss, no clutter loss, etc.),” *id.* at 38. But, as the Commission explains, it found such scenarios to be unrealistic and “reasonably refused to give significant weight to highly unrepresentative cases.” FCC Br. 37. And the Commission went further still. Having concluded that such unrealistic cases did not merit “significant weight,” the Commission nonetheless conducted a separate analysis that demonstrated why, even in such cases, harmful interference would still be extremely unlikely.

First, the Commission emphasized that mere exceedance of the “interference protection benchmark” in these corner cases did not mean that harmful interference would occur. It stressed that “[w]e are not . . . making a determination that any signal received with an I/N greater than -6 dB would constitute ‘harmful interference.’” No commenter provides technical justification for using a particular I/N level as the actual level necessary to protect fixed microwave receivers against harmful interference.” *Order* ¶ 71 (JA____).¹⁰

¹⁰ See also *Order* ¶ 117 n.299 (JA____) (“we are not making a determination that any signal received with an I/N greater than -6 dB would constitute harmful interference.”); ¶ 117 (JA____) (referring to “the conservative -6 dB I/N threshold”); ¶ 131 (JA____) (explaining that the single exceedance identified in its review of AT&T’s submission does not suggest a significant risk of harmful interference because “a -6 dB I/N interference protection criterion is a conservative approach to ensuring that the potential for harmful interference is minimized”).

The Commission then explained why the possibility of rare situations where the benchmark could be exceeded does not suggest a significant probability of harmful interference. Petitioners give this aspect of the *Order* short shrift, mentioning only two factors that the Commission identified as reducing the risk of harmful interference in these rare cases: the fact that an unlicensed device (1) “will probably be dormant and not transmitting any signals” at any given time and (2) “will probably not be using frequencies overlapping with those used by a proximate microwave receiver.” Pet. Br. 38. Both factors are important. The Commission rightly found that a typical microwave link uses a channel 30 megahertz wide, and it is unlikely that it will overlap with the channel used by a given unlicensed device, even if that channel is 160 megahertz wide, because the 6 GHz band itself is a far wider 1,200 megahertz. *See Order* ¶ 131 (JA ____). Similarly, the Commission found that a typical 6 GHz unlicensed device would only transmit an average of 0.4% of the time in the 6 GHz band, making it very unlikely that an unlicensed device would transmit simultaneously with conditions that would allow that signal to be received at a level greater than the interference benchmark. *See id.* ¶ 141 n.375 (JA ____).

Beyond these factors, however, the Commission recognized that the benchmark only assesses the strength of a potentially interfering signal relative to the background noise. It leaves out the other decisive factor in determining

whether potential interference will actually affect a licensed link: the strength of the desired licensed signal.

Signals transmitted via 6 GHz microwave links are very powerful—so much so that the Commission concluded that a link would be degraded only if a fixed microwave received an “excessively high powered transmission from an unlicensed device” at the same instant as a rare meteorological event called a “deep atmospheric multipath fade,” *Order* ¶ 143 (JA____), which could significantly reduce the received power of the desired microwave signal. The Commission rightly concluded that this confluence of events was extremely unlikely. *Id.* These so-called “deep fading events” are rare and brief, and the greater the severity of the fading event (*i.e.*, the more it suppresses the microwave signal), the rarer and briefer it tends to be.¹¹ The Commission further determined that these deep fading events typically occur late at night—from midnight to 8 AM—when use of unlicensed devices will be least intense, making it even less likely that a rare deep fading event would occur at the same instant as a rare—and, in fact, purely

¹¹ The Commission cited studies which concluded that these deep fading events are so infrequent that even unlicensed transmissions that vastly exceeded the interference benchmark—to a degree far beyond what the Commission concluded would ever realistically occur—would have no effect at all on a fixed microwave link 99.88% of the time. *See, e.g.*, Apple, Broadcom et al. 10/7/19 Letter at 7 (JA____).

hypothetical—unlicensed transmission received above the interference benchmark.

Order ¶ 143 (JA____).

These additional factors are especially significant given the Commission’s conclusion that unlicensed transmissions are infrequent and “bursty,” making them even less likely to coincide with a rare, momentary, fading event. *Order* ¶¶ 142-43 (JA____). And the Commission guaranteed that unlicensed 6 GHz transmissions would be “bursty” in this way by requiring them to use a contention-based protocol.¹² *Id.* ¶ 141 (JA____).

Thus, taken as a whole, the Commission’s analysis determined that there is a vanishingly small probability of harmful interference, even in the “unrepresentative” cases that Petitioners rely upon, where an unlicensed device exceeds the so-called “interference benchmark.” FCC Br. 37. The Commission’s conclusion is well reasoned and involves the kind of highly technical analysis that is entitled to “the greatest deference.” *NTCH*, 950 F.3d at 880. As in the proceeding itself, Petitioners fail to demonstrate that the Commission’s predictive judgment is incorrect; nor can they plausibly claim that the Commission failed to offer “even a modicum of reasoned analysis” supporting it. *Id.*

¹² A contention-based protocol requires a device to transmit for only a limited period of time, accounting for the amount of other traffic on the same frequency. *See Order* ¶ 101 n.259 (JA____).

III. PETITIONERS' MERE DISAGREEMENT WITH THE COMMISSION'S CONCLUSIONS IS NOT A BASIS FOR OVERTURNING THE *ORDER*.

Petitioners, as well as *amicus* Southern Company, argue that the *Order* was arbitrary and capricious because the Commission ignored or failed to respond meaningfully to evidence they presented regarding the potential of unlicensed 6 GHz devices to cause harmful interference to licensed services. Or, in cases where incumbents are willing to concede that the Commission *did* respond to their concerns, they fault the Commission for reaching a conclusion with which they disagree. *See, e.g.*, Pet. Br. 68 n.34 (criticizing the Commission for concluding that a supplemental study submitted by Edison Electric Institute did not address its concerns with an earlier study). These arguments again overstate the Commission's obligations and mischaracterize its thorough consideration of the issues in the record.

Plainly, the Commission cannot be faulted for reaching conclusions with which parties disagree. Its obligation is to provide a reasoned analysis based on the record before it. *NTCH*, 950 F.3d at 879-80. Nor is the Commission required to specifically address every comment that a party might raise. Rather, the agency "must respond in a reasoned manner to those [comments] that raise significant problems." *City of Waukesha v. E.P.A.*, 320 F.3d 228, 257 (D.C. Cir. 2003) (internal citation omitted); *see also Mozilla Corp. v. FCC*, 940 F.3d 1, 60 (D.C.

Cir. 2019) (per curiam) (the proper inquiry is whether the agency failed to address “an important aspect of the problem”). This complex proceeding illustrates the wisdom of this standard: with more than a hundred technical studies and thousands of filings, an obligation to respond to every point raised in every filing would impose huge burdens on the Commission without justification. Indeed, it would encourage parties to unleash new filings at the eleventh hour, and then demand that the Commission respond point by point before it can finally act.

The FCC more than satisfied this standard here. It thoroughly examined the evidence in the record regarding the potential for harmful interference, including each of the studies that Petitioners and *amicus* Southern Company discuss in their briefs. And while the Commission was not required to respond to every point that incumbents raised, Petitioners’ repeated claims that the Commission “disregard[ed],” “ignored,” or attempted to “sweep [issues] under the rug” are simply not fair characterizations of the careful review and explanations that the Commission and its experts provided. Pet. Br. 25, 31, 46.

Petitioners and Southern Company dispute the reliability of the interference studies that the Commission credited, the most appropriate study design, and the quality of the Commission’s own engineering judgment—judgments that involve many complex variables to predict whether unlicensed devices will, under real-world conditions, pose a significant risk of harmful interference. *See generally*

Pet. Br. 25-51 (JA____); Southern Br. 15-26 (JA____). On such a complex topic, it is unsurprising that different experts may disagree. But this is not a basis for finding an agency's decision arbitrary and capricious; the FCC's decision simply needs to have been "reasonable and supported by the record" to withstand review. *Am. Trucking Ass'ns, Inc. v. E.P.A.*, 283 F.3d 355, 362 (D.C. Cir. 2002).

From the voluminous record, Petitioners focus on four studies, submitted by AT&T, CTIA, Edison Electric Institute, and Southern Company, which purported to demonstrate that there is a significant risk that unlicensed 6 GHz devices will cause harmful interference. *See* Pet. Br. 25-37 (discussing AT&T and CTIA studies), 66-68 (Edison Electric Institute and Southern studies); Southern Br. 15-26. The *Order* discussed each of these studies in turn, ultimately rejecting each one, largely because they were based on improper assumptions. *See Order* ¶¶ 123-39 (JA____).

For instance, with respect to AT&T's study purporting to show "real-world examples" of likely harmful interference, the Commission explained that the study incorporated a number of unrealistic assumptions about the many variables involved. *See Order* ¶ 124 (JA____). Among other things, AT&T's analysis assumed an unlicensed device that was constantly transmitting, operating on the same frequency as the nearby microwave receiver, transmitting directly toward the microwave receiver, and with no intervening obstructions. *Id.* AT&T responded

to the FCC's conclusions about its study in a letter filed during the three weeks between the issuance of the *Draft Order* and the *Order*. AT&T 4/16/20 Letter (JA____). But, notwithstanding these last-minute objections, the Commission plainly evaluated AT&T's study and identified its flaws.

Petitioners also take issue with what they characterize as the Commission's "single throw-away sentence" explaining that it "conducted a similar analysis of" the study submitted by CTIA "as [it] did with AT&T's study." Pet. Br. 37. But again, the Commission was not required to provide a detailed discussion of every comment submitted. As the Commission has explained, this study, "like AT&T's, focused on a handful of scenarios in which frame houses were in direct line of sight with microwave receivers." FCC Br. 41 n.14. In other words, the CTIA study contained more of the unrealistic, worst-case scenarios that the Commission addressed in its response to AT&T's filing. Petitioners fail to show what "important aspect[s] of the problem" CTIA's filing raised that had not already been raised and addressed elsewhere. *See Mozilla*, 940 F.3d at 60.

Petitioners also contend that AT&T's and CTIA's "worst-case scenarios" were in fact "real-world examples" and that the Commission failed to meaningfully respond to their objections to the *Draft Order*'s treatment of these outliers. Pet. Br. 35-37; *see also id.* at 30 (noting that "petitioners stressed the need to account for" outlier scenarios after the Commission issued the *Draft Order*). But, as the *Order*

explained, AT&T's study failed to acknowledge that various factors for which the study used specific values "can [actually] take on a *range* of values," and that "it is unlikely that each" variable "will be worst case at the same time and location."

Order ¶ 124 (JA____) (emphasis added). The FCC did not ignore AT&T's and CTIA's examples as Petitioners suggest, *see* Pet. Br. 35; rather, it reasonably concluded in its technical judgment that those scenarios were unlikely to actually *become* "real-world examples" of harmful interference. *See Order* ¶ 124 (JA____).

The Commission similarly criticized the studies relied on by Southern Company and Edison Electric Institute for their use of unrealistic assumptions and for ignoring relevant factors that would reduce the risk of harmful interference in the real world—criticism that is entitled to deference. Southern Company makes much of the fact that after filing its initial study results, its representatives met with the Commission and revised and re-ran the study based on its feedback—an anecdote that, if anything, illustrates the Commission's deep engagement with the technical issues in the 6 GHz proceeding. *See* Southern Br. 18-20. Southern faults the FCC's "fail[ure] to acknowledge, let alone discuss," the revised materials. *Id.* at 20. But Southern did not address the Commission's fundamental objection to its study methodology: by examining a single static scenario, the study "ignores many significant statistical factors." *Order* ¶ 135 n.345 (JA____). While Southern disagrees with the Commission's conclusion on this point, Southern Br. 23-24, it

cannot show that the Commission's judgment was unreasonable or that it failed to consider significant issues.¹³

Edison Electric Institute appears to have expected even greater special treatment from the Commission than other Petitioners. Like Southern, Edison followed up with the Commission after its *Draft Order* found the Critical Infrastructure Industry study “fundamentally flawed and unreliable” because of the assumptions it made. *Order* ¶ 138 (JA____). Edison's response letter, filed only two weeks before the final *Order* was issued, asked that the Commission's “response on [multiple specific] issue[s] be reflected in the text of the final *Order*.” Pet. Br. 68. But the Commission is under no obligation to respond specifically to each and every objection from a commenter in the text of an order. *See* FCC Br. 70-71 (explaining that the letter “merely repeated arguments Edison had made in ‘technical submissions’ that were previously placed in the record”).

In short, Petitioners' and Southern's studies all focused on the same issue: whether unlicensed low-power indoor devices are likely to cause harmful interference to licensed incumbents in the 6 GHz band, due to the possibility that

¹³ Indeed, Southern's argument is entirely conclusory: it asserts that, given the large number of microwave receivers and the potentially large number of unlicensed devices, “actual harmful interference events become a statistical certainty.” Southern Br. 22-23. Without having performed an actual statistical analysis, this is pure, question-begging conjecture, contradicted by the actual statistical analyses in the record. Far more is required to overturn the Commission's expert judgment.

an unlicensed device would operate under a confluence of unrepresentative, worst-case conditions. The *Order*'s discussion of those studies demonstrates that, far from ignoring the issue, the Commission thoroughly considered "important aspects of [this] problem" in the rulemaking. *Mozilla*, 940 F.3d at 60.

Moreover, these studies represent only a fraction of the evidence that the Commission weighed in reaching its decision. While Petitioners focus on a handful of their own studies, the Commission received well over a thousand filings, including approximately 100 technical studies, from a diverse range of stakeholders. These included more than 30 studies submitted by fixed microwave licensees and a similar number of studies by advocates of unlicensed use, including Intervenors, *see Order App'x E* (JA____) (listing technical studies submitted), many of which the Commission specifically discussed in its *Order*. *See supra* pp. 19-20 (listing studies). That the Commission did not address each of them point by point reflects only the fact that many focused on the same aspects of the problem. It does not suggest any failure by the Commission to grapple seriously with the evidence.

IV. THE COMMISSION SPECIFICALLY DETERMINED THAT PUBLIC SAFETY COMMUNICATIONS WOULD BE PROTECTED FROM HARMFUL INTERFERENCE.

The Association of Public Safety Communications Officials (in an argument not joined by AT&T and CenturyLink) contends that the Commission “failed to properly analyze its *Order*’s impact on public safety despite warnings the decision had dire public safety implications.” Pet. Br. 59-64. In fact, the Commission addressed the needs of public safety operators. The Association simply disagrees with the Commission’s conclusions.

Congress created the Commission to pursue a variety of goals, including regulation to both “make available . . . [a] radio communication service with adequate facilities at reasonable charges,” and to “promot[e] safety of life and property.” 47 U.S.C. § 151. Accordingly, the Commission took care to ensure that its efforts in the *Order* to “foster innovative methods of exploiting the radio spectrum,” *Telocator*, 691 F.2d at 538, did not come at the expense of public safety. As the *Order* reflects, the Commission carefully considered the needs of public safety licensees and adopted specific rules to ensure that these licensees in particular would be protected from harmful interference. The Commission “recognized that incumbent users of fixed microwave services include ‘public safety agencies,’” identified “‘the importance of maintaining high link reliability’ for ‘public safety organizations,’” and “addressed this issue by adopting rules that

‘protect incumbent fixed microwave operations’ in the 6 GHz band” from harmful interference. FCC Br. 61 (quoting *Order* ¶¶ 7, 115, 23 (JA____, ____, ____)). It concluded categorically that “fixed microwave receivers will be protected from harmful interference.” *Order* ¶ 112 (JA____). While the Association disagrees with the Commission’s conclusions, there is no merit to its claim that the Commission failed to consider “the ‘multi-faceted public safety concerns’ involved” in the *Order*. Pet. Br. 62 (quoting *Mozilla*, 940 F.3d at 63).

In particular, the Association disputes that the Commission’s determination that its rules would protect all fixed-service incumbents from a significant risk of harmful interference—including public safety organizations—was sufficient. *See* Pet. Br. 61-62. The Association’s first argument, that this explanation was an impermissible “*post hoc* rationalization,” is simply wrong. *Id.* at 62. The *Order* makes clear that the Commission considered the views of public safety licensees and made several specific rule changes that they had requested. For example, in light of issues raised by public safety organizations and utilities, the Commission: (1) adopted a particular protection threshold for standard-power devices subject to automated frequency coordination; (2) required standard-power devices subject to automated frequency coordination to be registered; (3) mandated that the automated frequency coordinator have the capability to deny access to spectrum to specific devices; (4) required the automated frequency coordination system to

account for geolocation uncertainty; (5) required automated frequency coordination-controlled devices to verify channel availability on a daily basis; and (6) declined to authorize higher power unlicensed operations in rural areas. *See, e.g., Order* ¶¶ 41, 46, 69-71, 81, 83, 187-88 (JA____, ____, ____, ____, ____, ____). The Commission also discussed a study analyzing “the potential impact of 6 GHz unlicensed use on the incumbent [critical infrastructure] and public safety providers that currently use the band.” *Id.* ¶ 136 (JA____). As discussed in Section III above, the Commission ultimately disagreed with that study’s conclusion that 6 GHz unlicensed use posed a significant risk of harmful interference, highlighting errors that greatly exaggerated the risk. *Id.* ¶¶ 136-38 (JA____).

The record also readily supports the Commission’s reasoning that protecting all incumbents from a significant risk of harmful interference entails protecting public safety users. *See* FCC Br. 63. Public safety organizations are among the 6 GHz band licensees that, just like AT&T and CenturyLink, use 6 GHz spectrum for point-to-point microwave communications. For example, a public safety licensee might use the 6 GHz band to create a communications link between an individual police precinct and headquarters. *See Order* ¶ 115 (JA____). Electric utilities similarly argued that their links carried public-safety communications because, among other things, they use 6 GHz fixed microwave links to monitor and control parts of the electric grid. *See id.*

Despite such claims, the record did not include any substantial evidence that these licensees' microwave links use different equipment or are designed in a way that makes them more likely to experience harmful interference. To the contrary, the record indicated that these licensees use the same types of microwave links as other licensees, but connect these links to different types of systems and use them for different purposes. The distinguishing feature of these public safety links is therefore not the conditions under which their links would experience harmful interference, but rather the effects of this interference, if it were to occur—factors that the Commission specifically acknowledged. *Order* ¶ 115 (JA___).

Ignoring those portions of the *Order*, the Association presents a series of *post hoc* questions that it claims the Commission did not consider, such as the number of public safety entities that use the 6 GHz band, how they would be affected by harmful interference, and the costs of addressing cases of harmful interference. Pet. Br. 61. Despite attributing those questions to a “statutory requirement,” *id.*, the Association cites no authority for it and has no serious response to the Commission’s explanation that it fully considered impacts on public safety based on these analyses in the *Order*.

The Association’s reliance on this Court’s recent decision in *Mozilla* to bolster its arguments is likewise unavailing. In the Restoring Internet Freedom Order at issue in *Mozilla*, some commenters raised concerns that broadband

internet service providers could engage in “blocking or throttling of . . . Internet communications during a public safety crisis,” with “dire, irreversible results.” *Mozilla*, 940 F.3d at 61. The Commission had not addressed the concerns of public safety entities in its order there, but argued on appeal that it had not needed to because those concerns “were redundant of the arguments made by edge providers” (*i.e.*, content or service providers, like Netflix or Facebook). *Id.* at 62. This Court rejected that argument as (1) “an off-limits *post hoc* rationalization” and (2) “facially inadequate” without specific discussion of implications for public safety given that the impacts of blocking and throttling on typical edge providers were unlike the harms of blocking or throttling of communications involving public safety. *Id.*

Here, by contrast, the Commission specifically addressed the concerns of public safety commenters in the *Order*. As noted above, for example, the Commission credited the Association’s assertion that “public safety organizations use microwave links that are designed to have downtime of no more than 30 seconds a year,” *Order* ¶ 115 (JA___),¹⁴ and therefore adopted requirements for unlicensed operations that the Association and others requested and supported,

¹⁴ See also, *e.g.*, *id.* ¶ 7 (JA___) (“Fixed microwave service licensees” support “critical services provided by” “public safety agencies,” among others); ¶ 97 (JA___) (citing the Association among other representatives of incumbents that “expressed concerns about the potential for interference to their services”).

see FCC Br. 63-64. And the Commission was “fully convinced” that, based on its rules, “fixed microwave links” supporting public safety and other services “will have an insignificant chance of experiencing harmful interference from indoor low-power unlicensed operations.” *Order* ¶ 141 (JA____); *see also id.* ¶ 143 n.379 (JA____) (“we have concluded based on the technical studies that harmful interference will not occur”).¹⁵ In short, the Commission did “analyze[] and account[] for the impact of its decision on public safety,” Pet. Br. 63—it adopted rules that it concluded made those users, like other incumbents, unlikely to experience harmful interference. Neither *Mozilla* nor anything else in the law compels the FCC to do everything the Association thought it “should have required,” *id.*, based on the Association’s disagreements with the Commission’s technical judgment.

¹⁵ The Commission reached a similar conclusion on the potential impact on standard-power devices. *See Order* ¶ 23 (JA____) (“The [Automated Frequency Coordination] mechanism, combined with the technical and operational rules that we are adopting, will protect incumbent fixed microwave operations from the potential of harmful interference from unlicensed standard-power operations in the U-NII-5 and U-NII-7 bands.”).

V. THE COURT SHOULD REJECT SOUTHERN COMPANY’S INVITATION TO SECOND-GUESS THE *ORDER* BASED ON A FLAWED STUDY THAT WAS NOT BEFORE THE COMMISSION.

In its *amicus* brief, Southern Company wrongly asks the Court to vacate the *Order* based on field testing performed *after* the *Order* was issued, which it claims shows that the Commission’s analysis was unsound. *See* Southern Br. 26-30. The Court should not consider this procedurally improper argument. But even if it did, this untimely “evidence” is flawed and provides no reason to second-guess the Commission’s conclusions.

The Court should not consider this evidence or Southern’s accompanying arguments because they were not before the Commission when it issued the *Order* and, separately, because “no petitioner made the argument” in an opening brief. *See* FCC Br. 69 n.21. “In evaluating agency action under the APA,” courts limit their review to the “administrative record that was before the” agency when it made its decision. *Dist. Hosp. Partners, L.P. v. Burwell*, 786 F.3d 46, 55 (D.C. Cir. 2015). Courts “do not allow parties to supplement the record unless they can demonstrate unusual circumstances justifying a departure from this general rule.” *Mozilla*, 940 F.3d at 61 (internal quotation marks omitted). None of the “unusual circumstances” that might warrant an exception to this rule exists here, and Southern has “made no attempt to demonstrate” that they do. *Id.*

In any event, this improper *post hoc* field testing is fundamentally flawed. It raises no concern that confining review to the administrative record would cause this Court to overlook important issues. As Intervenor has explained in recent filings before the Commission, this testing suffers from many of the same kinds of flaws that led the Commission to discount their previous analyses. Like the technical studies the Commission addressed in the *Order*, the testing relies on unrealistic assumptions and focuses exclusively on a combination of scenarios designed to make harmful interference appear more likely, but that are each worst-case examples unlikely to occur in the real world by themselves, let alone all at once. *See* Letter from NCTA to Ms. Marlene H. Dortch, Secretary, FCC, ET Docket No. 18-295, at 2-4 (filed Jan. 11, 2021). Even if it had been part of the record before the Commission, therefore, it would not provide a basis to conclude that the Commission's action was arbitrary and capricious.

CONCLUSION

The Court should deny the petitions for review.

Respectfully Submitted,

/s/ David Paul Murray

David Paul Murray
Mia Guizzetti Hayes
Willkie Farr & Gallagher LLP
1875 K Street, N.W.
Washington, D.C. 20006-1238
(202) 303-1000
dmurray@willkie.com
*Counsel for NCTA – The Internet
& Television Association*

/s/ Russell H. Fox

Russell H. Fox
Robert G. Kidwell
Elana R. Safner
Mintz, Levin, Cohn, Ferris,
Glovsky and Popeo, P.C.
701 Pennsylvania Ave., N.W.
Suite 900
Washington, D.C. 20004
(202) 434-7300
rfox@mintz.com
Counsel for Wi-Fi Alliance

/s/ Christopher J. Wright

Christopher J. Wright
Paul J. Caritj
Jason Neal
Harris, Wiltshire & Grannis, LLP
1919 M St., N.W., 8th Floor
Washington, D.C. 20036
(202) 730-1300
cwright@hwglaw.com
*Counsel for Apple Inc.,
Broadcom Inc., Cisco Systems, Inc.,
Google LLC, Hewlett Packard
Enterprise, Intel Corporation, and
Microsoft Corporation*

CERTIFICATE OF COMPLIANCE

I certify that the foregoing document complies with the requirements of Federal Rule of Appellate Procedure 32(a)(5) and (a)(6) because it has been prepared in 14-point Times New Roman font.

I further certify that the foregoing document complies with the requirements of D.C. Circuit Rule 32(e)(2)(B) and the Court's November 23, 2020 order because it contains 9,074 words according to the word-count feature of Microsoft Word, not counting the parts excluded by Federal Rule of Appellate Procedure 32(f) and D.C. Circuit Rule 32(e)(1).

/s/ Christopher J. Wright
Christopher J. Wright

CERTIFICATE OF SERVICE

I hereby certify that on this 2nd day of March, 2021, the foregoing document was filed via CM/ECF. Service was accomplished on all parties or their counsel of record via CM/ECF.

/s/ Christopher J. Wright
Christopher J. Wright