

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Inquiry Concerning Deployment of)	GN Docket No. 18-238
Advanced Telecommunications Capability)	
to All Americans in a Reasonable and)	
Timely Fashion)	

**COMMENTS
of
MICROSOFT CORPORATION**

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TABLE OF CONTENTS

SUMMARY	ii
I. INTRODUCTION.....	1
II. DISCUSSION.....	3
A. If the Commission Continues to Rely on FCC Form 477 Data for Determining Fixed Service Deployment, It Should Make Modifications to Ensure the Data Is More Accurate.	3
B. To Expand Broadband, the Commission Should Encourage the Use of Excess Capacity on Subsidized Networks.....	6
1. Mid-Atlantic Joint Petition.....	8
2. Competitive Access to Broadband Infrastructure Working Group Report.	12
C. The Commission Should Continue to Move Forward Expeditiously to Expand Access to Spectrum for Broadband Wireless Service.....	13
1. 3.7 – 4.2 GHz Band.	13
2. 3.55 – 3.70 GHz Citizens Broadcast Radio Service Band.	14
3. Television White Spaces.	15
III. CONCLUSION.....	15

SUMMARY

Microsoft's Comments suggest steps the Commission should take to improve its ability to evaluate the extent of deployment of advanced telecommunications capacity, and to accelerate and expand that deployment.

Fixing FCC Form 477 Data

The Commission acknowledges that its FCC Form 477 data may overstate the extent of fixed broadband deployment. Overstated coverage is problematic because, for example, universal service support will be erroneously withheld from otherwise eligible areas because of faulty data that overstates coverage.

The Commission should fix the problem by treating census blocks as having access to broadband service only if broadband actually has been deployed in those census blocks. Under current Form 477 instructions, a census block is treated as served if a carrier could, within a typical service interval, deliver service in that census block. The vagueness and expansiveness of this instruction has tended to produce overstatements of coverage.

Utilizing Excess Broadband Capacity

The Commission's E-Rate program provides an opportunity to expand broadband accessibility, and the Commission should seize this opportunity. Schools receiving subsidized broadband through the E-Rate program generally use broadband services at full or nearly full capacity during the day, but broadband usage drops off dramatically during evening hours. Microsoft suggests steps the Commission should take to promote the use of this excess capacity.

First, the Commission should approve a pending petition filed by Microsoft and other parties requesting clarification of the E-Rate rules to permit innovative use of Television White Spaces technology. The petition proposes a pilot project in Virginia that would extend schools' subsidized E-Rate broadband service to students throughout the surrounding community who do not have any broadband connections at home. Microsoft also suggests that the Commission should seek additional ways to utilize universal service support to promote the deployment of TVWS facilities and equipment and the use of TVWS devices.

Second, the Commission should consider a proposal made by the Competitive Access to Broadband Infrastructure Working Group to authorize schools (and other institutions, such as libraries and hospitals) receiving subsidized broadband services to make available excess capacity for use beyond the schools' physical premises. Enabling such use of excess capacity would make subsidized projects more sustainable and limit the amount of E-Rate support that schools need.

Expanding Access to Broadband Spectrum

The Commission should continue to move forward expeditiously to expand access to spectrum for broadband wireless service. Access to spectrum is critical to meet the ever-growing demand for broadband wireless service and to close the digital divide.

Microsoft encourages the Commission to adopt a Report and Order in 2019 making available, on a shared basis with the Fixed-Satellite Service, 400 megahertz of spectrum from 3800 – 4200 MHz for licensed point-to-multipoint fixed wireless broadband service. Microsoft also urges the Commission to issue a final decision in the longstanding Citizens Broadband Radio Service proceeding this autumn. Making available the mid-band spectrum in the 3.55 – 3.70 GHz band is

essential to wireless Internet service providers who seek to provide high-speed broadband Internet service to un-served and underserved rural areas. Establishing final rules governing the CBRS spectrum is also critical for providing the regulatory certainty needed by wireless Internet service providers to invest in and deploy facilities in the CBRS band. Finally, Microsoft urges the Commission to expeditiously resolve the open issues in the TVWS proceedings. White Spaces technology can improve connectivity in rural areas, help close the “homework gap,” and improve the competitiveness of American farmers.

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Microsoft Corporation (“Microsoft”), by counsel, hereby submits these Comments, in response to the Commission’s Fourteenth Broadband Deployment Report Notice of Inquiry in the above-captioned proceeding.¹

I. INTRODUCTION.

As the Commission engages in its annual assessment of the deployment of advanced telecommunications capability to all Americans, it should continue to focus on the fact that too

¹ *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 18-238, Fourteenth Broadband Deployment Report Notice of Inquiry, FCC 18-119 (rel. Aug. 9, 2018) (“*Notice*”). Comments are due in the proceeding on September 17, 2018. *Communications Marketplace Report, et al.*, GN Docket No. 18-231, *et al.*, Order, DA 18-859 (rel. Aug. 17, 2018), at para. 1.

many Americans still lack any access to high-speed broadband. The Commission’s goal is to ensure that all Americans—including residents in rural areas, on Tribal lands, and students in schools and at home—“are able to enjoy the full promise of our economy.”² To make progress toward this goal, and to advance its efforts to close the digital divide, the Commission should take action on the following three issues.

First, the Commission should make modifications to FCC Form 477 to address the problem that the methods and parameters currently used to collect Form 477 data tend to overstate the deployment of fixed broadband services. The Commission must have a more accurate picture of where Americans lack access to high-speed fixed broadband, so that it can better target its efforts to promote deployment in these unserved areas.

Second, the Commission should develop policies that ensure the full utilization of broadband networks that are subsidized by federal universal service support. The Commission’s E-Rate program provides a prime opportunity to pursue this goal. Schools using broadband networks supported by E-Rate funding generally operate the facilities at full or nearly-full capacity during the day, but the networks generally have very limited usage at night. The Commission should consider options that would take advantage of this unused capacity without requiring any additional E-Rate funding.

Third, the Commission should continue to expand access to spectrum, which is critical to meet the ever-growing demand for broadband wireless service and to close the digital divide.

² *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 17-199, 2018 Broadband Deployment Report, 33 FCC Rcd 1660, 1664 (para. 9) (2018) (“2018 Report”), cited in *Notice* at para. 4, n.9.

Microsoft encourages the Commission to adopt a Report and Order in 2019 making available, on a shared basis with the Fixed-Satellite Service, 400 megahertz of spectrum from 3800 – 4200 MHz for licensed point-to-multipoint fixed wireless broadband service.

Microsoft also urges the Commission to issue a final decision in the longstanding Citizens Broadband Radio Service (“CBRS”) proceeding this autumn. Finally, Microsoft urges the Commission to expeditiously resolve the open issues in the Television White Spaces (“TVWS”) proceedings. White Spaces technology can improve connectivity in rural areas, help close the “homework gap,” and improve the competitiveness of American farmers.

II. DISCUSSION.

A. If the Commission Continues to Rely on FCC Form 477 Data for Determining Fixed Service Deployment, It Should Make Modifications to Ensure the Data Is More Accurate.

The Commission uses FCC Form 477 data to determine where broadband is being deployed. It acknowledges that “our FCC Form 477 deployment data for fixed services may overstate the deployment of services throughout an area.”³

This problem of overstated fixed service coverage is a serious one deserving careful attention.⁴ Given the statutory goal, “to make [service] available, so far as possible, to all the people

³ Notice at para. 16 (footnote omitted).

⁴ A recent news report, for example, indicates that misleading coverage data reported by Internet service providers in Form 477 reports “is cutting Iowa off from billions in broadband subsidies.” Sam Bloch, “The FCC Says All of Iowa Has Access to Broadband Internet. Speed Tests Tell a Different Story.”, THE NEW FOOD ECONOMY.ORG (June 20, 2018) (“Iowa News Report”), <https://newfoodeconomy.org/rural-iowa-broadband-data-fcc/>. Mr. Bloch quotes an explanation of the problem provided by Jonathan Chambers, identified in the article as a consultant for rural electric cooperatives:

If you’re gonna base the service—these public funding decisions—on data, you either have to account for the errors in the data, or you have to give people a chance to challenge the data Because the funding decision means that these areas of the country

of the United States[,]”⁵ the Commission has a responsibility to prescribe methods and requirements for collecting broadband deployment data that are refined and precise in pinpointing areas where the goal of universal service is not being met. As Microsoft has explained:

Accurate broadband availability data is especially important to the FCC, which has been entrusted with distributing over \$4 billion annually in Connect America Fund and Mobility Fund universal service support (nearly \$80 billion since 2000). Having accurate broadband data can determine whether a rural community is able to participate in the 21st century economy, because any location or area incorrectly considered to be “served” becomes ineligible for universal service investment, and perhaps other government programs as well, for the foreseeable future.⁶

One way to cure the problem of overstated fixed service deployment in Form 477 data is to limit the broadband deployment dataset only to those census blocks where broadband actually has been deployed.⁷ The Form 477 Instructions take a more expansive approach, which has the effect of virtually building in an overstatement of coverage. Specifically, under the Form 477 Instructions, a census block is considered to have fixed broadband when a carrier “could, within a service interval that is typical for that type of connection,”⁸ deploy service to a requesting customer “without extraordinary commitment of resources”⁹

now won’t get funded. And if they don’t get service, then they get the worst of both worlds. They don’t have service and they won’t have funding.

Id. (internal quotation marks omitted).

⁵ Section 1 of the Communications Act of 1934 (“Act”), 47 U.S.C. § 151.

⁶ Ex Parte Letter from Paul Garnett, Senior Director, Microsoft, *et al.*, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 11-10 (filed Aug. 2, 2018) (“Microsoft Ex Parte Letter”), at 3.

⁷ See *id.* at 1-2.

⁸ FCC, FCC Form 477, “Local Telephone Competition and Broadband Reporting, Instructions,” OMB Control No. 3060-0816 (Dec. 5, 2016) (“Form 477 Instructions”), at 17.

⁹ *Id.*

Given this broad characterization of “deployment,” coupled with the fact that the Commission has not provided any guidance regarding how the instructions should be interpreted or applied, there is a high risk of overstating the number of rural census blocks with access to fixed broadband.¹⁰

Microsoft therefore suggests that the Commission should eliminate this risk by modifying the Form 477 Instructions to clarify that (1) an entire census block cannot be considered “covered” when a carrier “could” serve a very small portion of the census block, but in fact serves none of it, and (2) an area is considered to be served only if service is actually provisioned in that area.¹¹

The Commission could also consider further modifications to Form 477 to enable the Commission to conduct separate analyses of the extent of broadband deployment serving residential and business locations. The Commission’s ability to accurately determine “whether advanced telecommunications capability is being deployed to all Americans in a reasonable and

¹⁰ As the Bloch article explains, “Form 477 data have surprising limitations. Providers are not required to include information in the filing about actual on-the-ground internet speeds Instead, when providers submit data, they include lists of census blocks where they ‘can or do’ offer service to at least one location” Iowa News Report.

¹¹ See Microsoft Ex Parte Letter at 3. Microsoft also recognizes that:

there is value in understanding where broadband service could be provided without the need for an extraordinary commitment of resources. Accordingly, the Commission could separately request filers to identify census blocks where they could provision broadband service upon a reasonable request. This would allow the Commission to retain the same level of detail it has today, while increasing the accuracy of maps depicting where broadband is actually available.

Id.

timely fashion”¹² would be enhanced if Form 477 could produce more granular data, which is accurate and comprehensive, regarding residential deployment.

B. To Expand Broadband, the Commission Should Encourage the Use of Excess Capacity on Subsidized Networks.

One of the Commission’s most important missions involves its efforts to close the digital divide and eliminate the threat that rural Americans will continue to lack sufficient access to advanced telecommunications capability.¹³ For “all people of the United States”¹⁴ to benefit from the availability of advanced broadband services, the Commission must ensure that its programs and policies explore every available avenue for promoting broadband deployment, especially in unserved or underserved areas.

The Commission in fact points out in the *Notice* that its universal service programs serve as one means by which it strives to close the digital divide, and it observes that it “routinely considers how to maximize the impact of available funding to support broadband deployment.”¹⁵ One way to maximize the impact is for the Commission to adopt policies, wherever possible, to “multi-task” the utilization of broadband networks subsidized with universal service support. This will enable broadband networks to be used to the fullest extent possible, to provide the greatest benefit possible to people and businesses in areas served by the networks.

¹² Section 706(b) of the Telecommunications Act of 1996, 47 U.S.C. § 1302(b).

¹³ See *2018 Report*, 33 FCC at 1662 (para. 6) (indicating that “[f]ar too many Americans remain unable to access high-speed broadband Internet access, and we have much work to do if we are going to continue to encourage the deployment of broadband to all Americans, including those in rural areas, those on Tribal lands, and those in schools and classrooms”).

¹⁴ Section 1 of the Act, 47 U.S.C. § 151.

¹⁵ *Notice* at para. 25 (footnote omitted).

The Commission's E-Rate program¹⁶ provides an example of how the Commission could pursue this goal. In the *E-Rate Modernization Order*, adopted four years ago, the Commission acted to improve broadband connectivity for schools, "moderniz[ing] E-rate to ensure more equitable, reliable support for Wi-Fi networks, and other internal connections supporting broadband services, within schools"¹⁷ E-Rate funded broadband networks may operate at full or nearly-full capacity when classes are in session during the day, but these networks generally have substantial unused capacity during evening hours. Students, however, typically need after-school Internet access to complete homework assignments and to keep abreast of school-related activities. In many cases, this need is not being met, contributing to the "homework gap."¹⁸ The Commission should consider two options to address this problem that would make maximum use of E-Rate funding already expended, and would not require any additional E-Rate disbursements.

¹⁶ See Sections 54.500–54.523 of the Commission's Rules, 47 CFR §§ 54.500–54.523 (Universal Service Support for Schools and Libraries).

¹⁷ *Modernizing the E-Rate Program for Schools and Libraries*, WC Docket No. 13-184, Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8870, 8895 (para. 66) (2014). During the deliberations leading to the Commission's adoption of the Order, then-Commissioner Pai observed that "[i]n many ways, the program has been a success. Internet access in public schools has almost tripled since E-Rate's creation, and speeds have grown alongside availability. Today, schools across the country depend on E-Rate for connectivity." *Modernizing the E-rate Program for Schools and Libraries*, WC Docket No. 13-184, Notice of Proposed Rulemaking, 28 FCC Rcd 11304, 11475 (2013) (Statement of Commissioner Pai) (footnote omitted).

¹⁸ See, e.g., National Center for Education Statistics, Institute of Education Sciences, *Student Access to Digital Learning Resources Outside of the Classroom* (Apr. 2018), <https://nces.ed.gov/pubs2017/2017098.pdf>, at 66 (indicating that the percentage of 5- to 17-year-old students with either no Internet access or only dial-up access at home in 2015 was 18 percent for students living in remote rural areas); Kate Roddy, "FCC's Rosenworcel Presses 'Homework Gap' Problem, Offers Solutions," EdSCOOP (Oct. 12, 2017), <https://edscoop.com/fcc-commissioner-addresses-homework-gap-and-possible-solutions-in-public-speech> (reporting that Commissioner Rosenworcel "recalled students in Alabama 'hunkering down' in fast food restaurants and students in Michigan sitting in parking lots trying to connect to a free network so they could complete their homework. 'These students are inspiring. They've got grit in spades,' she said.

1. Mid-Atlantic Joint Petition.

In June 2016, Microsoft and the Mid-Atlantic Broadband Communities Corporation (“MBC”), together with the Charlotte County, Virginia, Public Schools, the Halifax County, Virginia, Public Schools, GCR Company, and Kinex Telecom, Inc., filed a petition with the Commission, asking for clarification of the E-Rate rules to confirm authorization for innovative uses of TVWS technology.¹⁹

The Joint Petition proposed a pilot project in Charlotte County and Halifax County, Virginia, to install a TVWS antenna on the roofs of school buildings, extending the schools’ subsidized E-Rate Internet service to students throughout the surrounding community who lack broadband connections at home. The proposed project would “provide students with access to [schools’] broadband [facilities] from their homes, allowing them to collaborate, complete homework assignments, enhance their digital literacy, and otherwise leverage the educational benefits of on-premises E-rate-funded connectivity outside of school hours.”²⁰

‘They are cobbling together whatever connectivity they can find to simply get their homework done. But, it shouldn’t be this hard.’”).

¹⁹ Microsoft, Mid-Atlantic Broadband Communities Corporation, Charlotte County Public Schools, Halifax County Public Schools, GCR Company, and Kinex Telecom, Inc. (“Joint Petitioners”), Joint Petition, WC Docket No. 13-184 (filed June 7, 2016) (“Mid-Atlantic Joint Petition” or “Joint Petition”).

²⁰ *Id.* at 2. The Joint Petitioners noted that, “[w]hile home connectivity will lower educational barriers for these students, it of course raises the possibility of students using E-rate-funded internet for non-educational purposes.” *Id.* at 10. The Joint Petitioners explained that the project’s design minimizes the potential for such use:

Internet access via TVWS will be technically possible only in households with a specialized TVWS access point. Even within those households, the signal can be accessed only via authentication with unique credentials issued to participating students. Further, the filtering and Internet Safety Policies ... that the Participating Schools apply to on-premises internet use likewise will govern at-home use.

Id. (footnotes omitted).

The service could be provided without any additional cost to the E-Rate program, and, if approved by the Commission, could significantly narrow the homework gap for students living in rural, low-income communities. Allowing subsidized broadband service to be extended to students' homes without any additional program cost is good public policy with no downside to the E-Rate program, to the community, or to commercial Internet providers.

Microsoft notes that, because it was not clear when the Commission would make its decision concerning whether to grant the Mid-Atlantic Joint Petition, Microsoft and its partners decided to move forward with a more limited project serving the Charlotte County and Halifax County communities. This limited project includes the activities proposed in the Joint Petition, but the project “thus far does not use E-rate-subsidized services. MBC installed separate fiber-optic connections to the first schools participating in the project to be used for supporting the TVWS transmissions. These connections are not funded through the E-rate program. Although technologically inefficient, this approach was implemented to avoid any risk of violating E-rate rules.”²¹ The project has been successful to date in bringing affordable broadband to previously unserved populations. Microsoft’s experience to date shows the project will have even greater positive impacts for students in rural communities if the Joint Petition is granted.²²

²¹ *Id.* at 8, n.15.

²² The project implemented by Microsoft and its partners is limited to just over 200 households in the two Virginia counties. The pilot program proposed by the Joint Petition “could extend E-rate-funded school connectivity to the homes of approximately 3,500 students [in those counties] who currently lack broadband access.” *Id.* at 7.

The Commission therefore should grant the over two-year-old Mid-Atlantic Joint Petition, which would extend the benefits gained from E-Rate funding into students' homes, at no additional cost to the E-Rate program or to the schools.

In addition, the Commission states in the *Notice* that its universal service programs “provide[] funding to increase the availability of fixed and mobile broadband services in unserved and rural areas.”²³ Based on its experience working with TVWS technology,²⁴ Microsoft urges the Commission to consider taking further steps to focus and expand the use of universal service support to promote the deployment of TVWS facilities and equipment and the use of TVWS devices.

The Commission has explained that:

White space devices can be used to provide a variety of wireless services, including broadband data. The fixed devices that are being deployed today are typically used to provide backhaul services for Internet connectivity offered by wireless internet service providers[,] schools and libraries. Indeed, the propagation range of the TV bands is well suited to providing high data throughput service to un-served or under-served areas of the country at relatively low cost.²⁵

²³ *Notice* at para. 25 (footnote omitted).

²⁴ Microsoft “has considerable experience with [TVWS] technology, having deployed 20 TV white spaces projects worldwide that have served 185,000 users.” Microsoft, *A Rural Strategy, Connecting Rural America to New Opportunities* (July 10, 2017) (“Microsoft White Paper”), at 2, <https://blogs.microsoft.com/uploads/2017/07/Rural-Broadband-Strategy-Microsoft-Whitepaper-FINAL-7-10-17.pdf>. Microsoft explains that “TV white spaces [are] expected to provide the best approach to reach approximately 80 percent of [the] underserved rural population, particularly in areas with a population density between two and 200 people per square mile[,]” *id.*, and that “[w]ireless technologies that utilize TV white spaces are designed to transmit in VHF and UHF spectrum that was traditionally allocated for broadcast television. By leveraging these unused frequencies, TV white spaces devices can create wireless broadband connections” *Id.* at 11.

²⁵ *Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, et al.*, ET Docket No. 14-165, *et al.*, Report and Order, 30 FCC Rcd 9551, 9552 (para. 1) (2015) (footnote omitted).

The Commission also has recognized the importance of Wi-Fi devices in helping to close the homework gap and bridge the digital divide faced by rural consumers and low-income households.

For example, the Commission has required Lifeline carriers providing supported broadband service and devices to their customers to provide devices that are Wi-Fi enabled, and to offer devices that are equipped with hotspot functionality, finding that “Wi-Fi enabled phones are essential tools to help individuals stay connected, and ... the hotspot requirement will help to ensure that households without fixed Internet access will be able to share their access to the Internet among multiple members if so desired.”²⁶

Finding additional options for utilizing the Commission’s universal service funding to advance the use of TVWS devices and facilities will promote the program’s goal of bringing broadband services to unserved and underserved rural communities. In particular, such a step would further the Commission’s policy of supporting the use of Wi-Fi enabled devices, since, as Microsoft has explained, TVWS spectrum “is uniquely suited for delivering broadband to rural areas because it can carry communications over far greater distances and penetrate through walls and other obstacles than cellular and other spectrum bands. Because of these unique characteristics, technologies leveraging TV white spaces are sometimes referred to as ‘Super Wi-Fi.’”²⁷

²⁶ *Lifeline and Link Up Reform and Modernization, et al.*, WC Docket No. 11-42, *et al.*, Third Report and Order, Further Report and Order, and Order on Reconsideration, 31 FCC Rcd 3962, 4095 (para. 367) (2016).

²⁷ Microsoft White Paper at 14.

2. Competitive Access to Broadband Infrastructure Working Group Report.

In January of this year, the Competitive Access to Broadband Infrastructure Working Group (“Working Group”) submitted a report to the Commission’s Broadband Deployment Advisory Committee,²⁸ which contained proposals for maximizing the use of broadband infrastructure that is eligible for E-Rate subsidies.²⁹

The Working Group’s proposal offers an innovative way of “accelerating broadband deployment and lowering the cost of broadband to community anchor institutions, such as schools, libraries and hospitals, to ensure that use of the resulting infrastructure is maximized.”³⁰ Similar to the Mid-Atlantic Joint Petition, the Working Group’s proposal seeks to leverage the fact that, “[w]hile the program-subsidized broadband facilities are heavily utilized during the day, they are largely idle otherwise, resulting in underutilization of available—and paid-for—broadband capacity that could be exploited to the benefit of the community.”³¹ The proposal suggests that E-Rate-funded broadband service could be used beyond the physical premises of a school, including to provide ancillary commercial broadband services (“under the control of the relevant school or institution”),³² subject to certain conditions.³³

²⁸ Competitive Access to Broadband Infrastructure Working Group, Final Report (Jan. 23-24, 2018), <https://www.fcc.gov/sites/default/files/bdac-competitiveaccess-report-012018.pdf>.

²⁹ *Id.* at 45-50.

³⁰ *Id.* at 45.

³¹ *Id.* at 46.

³² *Id.* at 47.

³³ *Id.* at 48.

Microsoft urges the Commission to consider the Working Group’s proposal concerning the provision of ancillary commercial broadband services in limited circumstances, because this approach could serve as a means to make E-Rate projects more sustainable and to limit the amount of E-Rate support that a school needs. At the same time, the proposal offers a means of addressing the homework gap as well as providing adults with access to high-speed broadband.³⁴

C. The Commission Should Continue to Move Forward Expeditiously to Expand Access to Spectrum for Broadband Wireless Service.

Access to spectrum is critical to meet the ever-growing demand for broadband wireless service and to closing the digital divide. The Commission must keep its foot on the pedal by continuing to make spectrum available for the deployment of advanced telecommunications capability.

1. 3.7 – 4.2 GHz Band.

Microsoft applauds the Commission for issuing its Notice of Proposed Rulemaking proposing, among other things, “to promote more efficient and intensive fixed use of the [3.7 – 4.2 GHz] band”³⁵ As the Commission recognized:

³⁴ As the Working Group’s report explains:

In many cases, students remain without access at home where either broadband service is prohibitively expensive or is not available at all. Others in the community likewise are unable to access the Internet at home. In these situations, the students without access are at an educational disadvantage—hence the “homework gap”—and adults without access are similarly disadvantaged, leaving them unable to pursue online education, take advantage of online news and entertainment, apply for a job, or otherwise participate in the 21st century digital world.

Id. at 46.

³⁵ *Expanding Flexible Use of the 3.7 to 4.2 GHz Band, et al.*, GN Docket No. 18-122, *et al.*, Order and Notice of Proposed Rulemaking, FCC 18-91 (rel. July 13, 2018), at para. 2.

The 3.7 – 4.2 GHz band has excellent propagation characteristics compared to high-band spectrum, offers near line-of-sight capability at low power for last-mile services, and has 500 megahertz of contiguous spectrum to accommodate twenty-five 20 megahertz channels. Such capacity could facilitate the provision by multiple entities of last-mile, fixed wireless broadband connectivity at gigabit or near-gigabit speeds.³⁶

The Commission further recognized that “fixed wireless services provide an additional opportunity to connect rural communities and to offer competitive wireless alternatives in urban areas.”³⁷ Microsoft encourages the Commission to adopt a Report and Order in 2019 making available, on a shared basis with the Fixed-Satellite Service, 400 megahertz of spectrum from 3800 – 4200 MHz for licensed point-to-multipoint fixed wireless broadband service.

2. 3.55 – 3.70 GHz Citizens Broadcast Radio Service Band.

Microsoft urges the Commission to issue a final decision in the longstanding CBRS proceeding this autumn.³⁸ Making available the mid-band spectrum in the 3.55 – 3.70 GHz band is essential to wireless Internet service providers who seek to provide high-speed broadband Internet service to unserved and underserved rural areas.

Establishing final rules governing the CBRS spectrum is also critical for providing the regulatory certainty needed by wireless Internet service providers to invest in and deploy facilities in the CBRS band. The Commission adopted its first Notice of Proposed Rulemaking in April 2014, followed by its first Report and Order in the CBRS proceeding in April 2015. In October 2017, the

³⁶ *Id.* at para. 116.

³⁷ *Id.* at para. 3.

³⁸ *Promoting Investment in the 3550 – 3700 MHz Band, Notice of Proposed Rulemaking and Order Terminating Petitions, et al.*, GN Docket No. 17-258, *et al.*, Notice of Proposed Rulemaking and Order Terminating Petitions, 32 FCC Rcd 8071 (2017) (“CBRS NPRM”).

Commission, in the *CBRS NPRM*, proposed to modify the rules it adopted in April 2015. It has now been more than four years since the first Notice of Proposed Rulemaking, and Microsoft submits that the time has come to adopt final rules.

3. Television White Spaces.

Microsoft urges the Commission to expeditiously resolve the open issues in the TVWS proceedings. As discussed above, White Spaces technology can improve connectivity in rural areas, help close the “homework gap,” and improve the competitiveness of American farmers. But without regulatory certainty, Microsoft and its partners cannot increase investment, produce equipment at scale, and drive down prices to levels necessary to serve less-densely populated areas. The Commission can improve regulatory certainty by resolving pending petitions for reconsideration of the White Spaces rules from its August 2015 Report and Order and other open proceedings affecting utilization of the white spaces.³⁹

III. CONCLUSION.

Microsoft respectfully encourages the Commission, in its annual review of the deployment of advanced telecommunications capability, to consider policies and actions to achieve greater access to broadband services, including modifying FCC Form 477 to eliminate overstatements of fixed broadband deployment, promoting full-capacity utilization of schools’ broadband networks operated with E-Rate support, and continuing to make spectrum available for the deployment of advanced telecommunications capacity.

³⁹ See *Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, et al.*, ET Docket No. 14-165, *et al.*, Report and Order, 30 FCC Rcd 9551 (2015).

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