

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of

Wireline Competition Bureau Seeks Comment  
On Petitions For Emergency Relief To Allow  
The Use Of E-Rate Funds To Support Remote  
Learning During The Covid-19 Pandemic

WC Docket No. 21-31

**COMMENTS OF QUALCOMM INCORPORATED**

Dean R. Brenner  
Senior Vice President, Spectrum Strategy &  
Technology Policy

John W. Kuzin  
Vice President & Regulatory Counsel

1730 Pennsylvania Avenue, NW  
Suite 850  
Washington, DC 20006  
202.263.0020

February 16, 2021

## CONTENTS

INTRODUCTION and SUMMARY .....	3
DISCUSSION .....	6
I.    The Commission Should Allow E-Rate Funds To Be Used For Mobile Broadband Access And Student Learning Devices During The Pandemic And Make Such Funding Permanent Post-Pandemic .....	6
II.   The FCC Should Recast The Eligible Services List As “The Eligible Services & Mobile Educational Devices List” And Include Funding For Mobile Connectivity And Devices .....	8
III.  Qualcomm Has Continued To Advance Mobile Broadband Capabilities, Developing Cost-Effective Multi-Gigabit-Per-Second Chipsets, Fixed Wireless Access Solutions, And Always Connected Wireless Laptops and Tablets .....	11
CONCLUSION.....	15

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of

Wireline Competition Bureau Seeks Comment  
On Petitions For Emergency Relief To Allow  
The Use Of E-Rate Funds To Support Remote  
Learning During The Covid-19 Pandemic

WC Docket No. 21-31

**COMMENTS OF QUALCOMM INCORPORATED**

Qualcomm strongly supports the use of E-Rate funds to support remote student learning during the Covid-19 pandemic, and the FCC should allow E-Rate funds to be used for broadband connectivity and end-user devices off school grounds as soon as possible.<sup>1</sup> Also, as Qualcomm has explained repeatedly in many prior filings with this agency for well over a decade, the Commission should update its regulations to allow E-Rate funds to be used for anywhere/anytime broadband connectivity and end-user connected devices as soon as possible so low-income students will continue to have access to the same online tools their fellow classmates use at home, on the school bus, and everywhere else to complete homework assignments and continue their learning outside of school hours.

In Qualcomm's view, allowing E-Rate to cover off campus connectivity and end-user devices to enable remote learning for low-income students has always been a good idea. But now, with the nation facing the Covid-19 crisis, it is critical to do so as soon as possible. Millions

---

<sup>1</sup> See FCC Public Notice, DA 21-98, *Wireline Competition Bureau Seeks Comment On Petitions For Emergency Relief To Allow The Use Of E-Rate Funds To Support Remote Learning During The Covid-19 Pandemic*, WC Docket No. 21-31 (Feb. 1, 2021).

of low-income students need connectivity and devices now to do their homework wherever they happen to be. Schools provide textbooks to all students, regardless of their income level.

Connected devices and connectivity are simply the 21<sup>st</sup> Century version of textbooks. Today, after the inception of Covid-19, with schools closed indefinitely all over the country, making these changes to the E-Rate program on an accelerated basis is essential.

Limiting E-Rate funds to connectivity only in school buildings that are closed makes no sense. A program that only funds computer labs in these closed buildings is not helping anyone during this crisis. Precluding the use of E-Rate funds to cover connected devices when millions of low-income students cannot receive any education without such devices is equally senseless. For these reasons, it is essential that E-Rate now cover both off campus connectivity and connected devices so millions of low-income students are not left out of education indefinitely.

Qualcomm is not a newcomer to this issue. We have funded pilot projects, made multiple filings with the FCC, and sponsored annual conferences on the educational benefits from the use of mobile technology. Multiple studies and year-long pilots have demonstrated that equipping K through 12<sup>th</sup> grade students with connected mobile devices and the necessary connectivity to use them improves their academic performance and better prepares them for success in college and beyond.<sup>2</sup> It is time for the Commission to modernize the E-Rate program and close the “homework gap” once and for all.

---

<sup>2</sup> See, e.g., Qualcomm Comments (at 18-19) and Reply Comments (at 7-9) on A National Broadband Plan for Our Future Notice of Inquiry in GN Docket No.09-51 (filed June 8 and July 21, 2009); Qualcomm Reply Comments in WC Docket No. 13-184 (filed Nov. 8, 2013); see also Qualcomm Ex Parte Presentation (filed Jan. 14, 2014) in WC Docket No. 13-184, GN Docket No. 09-51 & CC Docket No. 02-6 (submitting two detailed reports that show the benefits of enabling 24/7 student use of mobile broadband connectivity to support anywhere/anytime learning).

## **INTRODUCTION and SUMMARY**

In today's information age and particularly during the current Covid-19 pandemic, E-Rate funds must be used to provide low-income students with the same type of mobile devices and mobile broadband connectivity that their more fortunate classmates use all the time to access educational content and collaborate with each other and with teachers during the school day and outside of school hours. While the E-Rate program currently funds broadband access within and in the immediate vicinity of schools and libraries, which is undoubtedly necessary, the E-Rate program must be used now on an emergency basis to support remote learning, including mobile broadband connectivity and devices – because millions of students for the indefinite future remain unable to attend school in person due to the Covid-19 pandemic. In addition, the E-Rate program should continue this same funding support for low-income students in the post-pandemic world because without such support these students will continue to lag behind their peers who can afford connectivity and devices.

Today's students, no matter their income level, must have equal access to mobile broadband tools at home, on the school bus, and everywhere else outside of school grounds. Indeed, today's successful learner holds at least one mobile device (typically a laptop or tablet) with a library of information in the palm of her hand, and the E-Rate program should fully support such digital learning tools. Low-income students who cannot afford such anywhere/anytime broadband access and a mobile learning device are at a severe disadvantage, standing on the unconnected side of the digital divide, and the E-Rate program must be used to bridge that divide during the current pandemic and when students return to their classrooms because anywhere/anytime broadband access and a laptop, tablet, or smartphone are essential learning tools for all students.

Using E-Rate funds to enable universal student access to mobile broadband tools will enable new and effective ways of teaching and learning and ensure the long-term success of America's workforce. Mobile technology improvements driven by Qualcomm and the wireless industry writ large, including the wide scale deployment of 4G and 5G mobile broadband networks, and ongoing improvements and cost reductions in mobile broadband-enabled tablets, laptops, and smartphones have allowed these digital learning tools to augment or completely replace heavy paper textbooks, enabling more expansive, up-to-date content, the inclusion of educational videos, and effective online collaboration. There is no question that the proliferation of mobile learning tools is transforming our educational system for the better.

While the FCC has taken steps to modernize other universal service programs to support ubiquitous mobile broadband connectivity, the agency must now update the E-Rate program to provide emergency access to mobile connectivity and devices during the current pandemic and thereafter take the necessary actions to allow schools to leverage mobile network connectivity to support anywhere/anytime mobile connectivity and learning devices. Making such emergency access permanent will allow all students to have broadband access for homework and projects after school and on the weekends when they are completing assignments, absorbing online lectures, performing research, and collaborating with classmates. To do otherwise is to ignore the reality of the essential role of mobile technology in education and risk leaving the students who are the very target of E-Rate support standing on the unconnected side of the digital divide.

We understand and appreciate the need for funding to cover these important changes to E-Rate. We are aware of – and support – the bill in the House of Representatives providing \$7.6 billion in dedicated, emergency funding for this purpose. We also are aware of the annual roll-over in E-Rate funds which have not been spent. And we're aware of other initiatives to

establish a permanent funding source for E-Rate and other universal service programs. While these initiatives are considered, we urge the FCC to move forward on an emergency basis for E-Rate as discussed herein, using the newly enacted funds we hope will be available soon and the roll-over funding.

Finally, we know that taking this action can improve the education of millions of low-income students who are shut out of education today. The FCC record established in past E-Rate proceedings leaves no doubt that updating the E-Rate program in this way will dramatically improve educational outcomes. We know this because the detailed reports from the 2011 FCC Learning-On-the-Go (“LOGO”) pilot program set up to study the merits of providing students with 24/7 mobile connectivity and a mobile learning device<sup>3</sup> overwhelmingly confirmed that using E-Rate funding for off-campus use of mobile broadband connectivity and connected devices substantially improves educational outcomes for students.

Students and community members from the nineteen schools and one library who received LOGO funding (out of nearly one hundred LOGO applicants) reported improved test scores, enhanced student engagement, improved attendance, and deeper connections among students and between students and teachers. Perhaps most importantly, participating schools noted that providing connectivity and a mobile device to low-income students left them believing they could succeed in school and in the future. One school district found that providing wireless devices “engaged and motivated” students and increased student achievement.<sup>4</sup> Another district

---

<sup>3</sup> See *E-rate Deployed Ubiquitously 2011 Pilot Program*, Order, WC Docket No. 10-222, DA 11-1181 (July 11, 2011).

<sup>4</sup> See Final EDU Report of City of New Rochelle in WC Docket No. 10-222 (dated Apr. 30, 2013).

found that providing wireless devices decreased student discipline incidents by more than 19%.<sup>5</sup> Multiple school districts also noted that using connected devices for testing saved teachers many hours grading exams and quizzes.

These pilots from ten years ago provide clear proof of success and demonstrate that there is no need for any more pilots. Now is the time to modernize the E-Rate Program to fund off-campus connectivity and connected devices for low-income students.

## **DISCUSSION**

### **I. The Commission Should Allow E-Rate Funds To Be Used For Mobile Broadband Access And Student Learning Devices During The Pandemic And Make Such Funding Permanent Post-Pandemic**

Qualcomm strongly supports the use of E-Rate funds to support remote student learning during the Covid-19 pandemic and requests the Commission to immediately authorize E-Rate funds to be used for broadband connectivity and devices in student homes on an emergency basis. Also, as Qualcomm has explained in many filings in this agency's prior E-Rate proceedings, the Commission should update the E-Rate program to support anywhere/anytime broadband connectivity and devices permanently, so low-income students will have access to the same online tools their fellow classmates use at home, on the school bus, and everywhere else to complete homework assignments, collaborate with classmates and teachers, and continue their learning outside of school hours. Multiple studies have demonstrated that providing students

---

<sup>5</sup> See Final EDU Report of Sioux City Community School District in WC Docket No. 10-222 (dated Oct. 18, 2012).



with a broadband connected mobile device improves academic performance and better prepares the student for success in college and when they enter the workforce.<sup>6</sup>

Since 2010, when the FCC first proposed to fund mobile broadband connectivity off school grounds via the E-Rate program, mobile network providers have spent billions and billions of dollars upgrading their networks and have blanketed the nation with 4G and 5G mobile broadband connectivity. In many rural and underserved areas of the country, wireless connectivity is the most cost-effective means of providing broadband access.

Commercial mobile networks provide unparalleled, ubiquitous connectivity and unmatched economies of scale. Mobile broadband service offerings, with bulk rate discounts, geared toward schools and their students are now common and are proliferating. In fact, prices for mobile broadband data are decreasing.<sup>7</sup> The E-Rate program can take advantage of this mobile broadband market reality. School administrators should be given the flexibility to purchase the lowest cost commercial broadband solution that can meet student learning needs.

Qualcomm also understands and appreciates the need for funding to cover these important updates to E-Rate. We are aware of the bill in the House of Representatives to provide \$7.6 billion in dedicated, emergency funding for this purpose – which we support. We also are

---

<sup>6</sup> See Dean Brenner, Qualcomm OnQ Blog, “E-rate Funds Go Mobile” (July 11, 2011) available at <https://www.qualcomm.com/news/onq/2011/07/11/e-rate-funds-go-mobile> (last accessed Feb. 16, 2021) (seven Qualcomm-sponsored pilot projects during the 2010-2011 school year showed that readily available mobile broadband access and devices produce substantial improvements in educational performance and student engagement).

See also Qualcomm Ex Parte Presentation (filed Jan. 14, 2014) in WC Docket No. 13-184, GN Docket No. 09-51 & CC Docket No. 02-6 (submitting detailed reports showing the multiple educational benefits of enabling 24/7 student use of mobile broadband connectivity to support learning).

<sup>7</sup> See, e.g., T-Mobile USA Comments in WC Docket No. 13-184 at 2-3 (filed Aug. 7, 2017) (noting that its mobile Internet service plans prices have dropped drastically).

aware of the annual roll-over in E-Rate funds that have not been spent.<sup>8</sup> And, we are aware of other initiatives to establish a permanent funding source for E-Rate and other universal service programs. While those initiatives are advancing, Qualcomm urges the Commission to move forward on an emergency basis to use E-Rate funds for 24/7 mobile connectivity and mobile learning devices, using in the first instance the roll-over funds and new funds we hope will be available soon.

Accordingly, the FCC should immediately allow E-Rate funds to be used for mobile broadband access and student learning devices during the pandemic and take appropriate actions to ensure such funding remains available for such important uses even after students and teachers return to the classroom. The FCC has ample legal authority to take these actions now, as Acting Chairwoman Rosenworcel has asserted, and a dozen U.S. Senators, including the principal author of the E-rate statute, recently reiterated.<sup>9</sup>

## **II. The FCC Should Recast The Eligible Services List As “The Eligible Services & Mobile Educational Devices List” And Include Funding For Mobile Connectivity And Devices**

As explained above, the Commission should provide E-Rate funding not only for wired broadband, fiber connections, and 5G Fixed Wireless Access (“FWA”) systems<sup>10</sup> and local Wi-Fi hotspots to schools and libraries, but – to put low-income students on more equal footing with their classmates – the agency must fund mobile broadband connectivity and portable learning

---

<sup>8</sup> See, e.g., FCC Public Notice DA 20-712, Wireline Competition Bureau Directs USAC To Fully Fund Eligible Category One And Category Two E-Rate Requests, CC Docket No. 02-6 (20-712).

<sup>9</sup> See Letter from Senator Ed Markey, *et al.* to Acting FCC Chairwoman Rosenworcel (Feb. 4, 2021) (urging the FCC to take immediate action to provide home internet connectivity and devices to students who are unable to participate in online learning during the pandemic) available at [https://www.markey.senate.gov/imo/media/doc/\(2.4.2021\)%20Letter%20--%20E-Rate%20New%20Leadership%202-4-21.pdf](https://www.markey.senate.gov/imo/media/doc/(2.4.2021)%20Letter%20--%20E-Rate%20New%20Leadership%202-4-21.pdf) (last accessed Feb. 16, 2021).

<sup>10</sup> FWA systems are discussed in further detail in Section III of these comments.

devices too. In this regard, Qualcomm reiterates its request that the FCC recast the Eligible Services List as the “Eligible Services & Mobile Educational Devices List.”<sup>11</sup>

Failure to authorize such E-Rate fund support will continue to hinder low-income students’ education and critical access to broadband services and mobile learning tools. The outstanding results of providing students with mobile broadband devices is well documented by Qualcomm, other technology companies, and educators in prior Commission E-Rate proceedings.<sup>12</sup> A decade ago, the Katy Independent School District in Texas distributed Android smartphones to 1,500 fifth graders in ten schools, and teachers and school administrators “witnessed surging levels of engagement and achievement among students who had access to the technology tools.” For example, test performance increased from the 70<sup>th</sup> to 90<sup>th</sup> percentile on math exams.<sup>13</sup> Furthermore, the Piedmont City School System in Alabama became the first school system in the state to implement a one-to-one laptop initiative, called MPower Piedmont, providing connected laptops for use inside and outside of school. Piedmont noted: “Our teachers

---

<sup>11</sup> See Qualcomm Comments and Reply Comments (filed July 9 and July 26, 2010, in response to the 2010 E-Rate NPRM in CC Docket No. 02-6 & GN Docket No. 09-51). See also Qualcomm Comments and Reply Comments in WC Docket No. 13-184 (filed Sept. 16 and Nov. 8, 2013). In Qualcomm’s Reply Comments in this agency’s 2013 E-Rate proceeding (at pages 5-6), we noted that at least 57 parties urged the Commission to authorize E-rate funding to provide students with anytime/anywhere access to mobile broadband connectivity.

<sup>12</sup> See, e.g., Cisco White Paper, High-Speed Broadband in Every Classroom: The Promise of a Modernized E-Rate Program (Sept. 2013) at 12-13 (“There wasn’t one teacher who didn’t see improvements in engagement and test scores” and reporting testimonials from teachers who said, “I’ve been teaching for 20 years, and I’ve never seen anything like this;” the “creativity these tools allowed was just amazing.” The mobile devices enabled differentiated learning by allowing students to use pencil and paper or podcasts.)

<sup>13</sup> See *id.* at 13.

regularly comment[ed] that the one-to-one aspect is important but ‘Internet access at home is what allows us to take instruction to a level that most districts never experience.’”<sup>14</sup>

For more than a decade, educators have requested that the FCC provide E-Rate support for mobile learning devices to truly realize the educational benefits of 24/7 wireless broadband access.<sup>15</sup> Moreover, funding the cost of wireless broadband access without funding the acquisition of mobile learning devices itself may not properly equip low-income students. In addition, while there is no functional difference between a wired modem, which is eligible for E-Rate support, and a portable wireless hotspot, which may not be, the mobile hotspot has important benefits because it can be used by the student whenever and wherever they are, at home in the evenings and on the weekends. Mobile hotspots as well as laptops, tablets and portable learning devices should be covered without restriction by the E-Rate program.

As the Ohio E-Rate Consortium explained more than a decade ago:

Adding portable learning devices to the Eligible Services List would not unduly impact other services. Adding these devices would not increase the broadband capacity schools need and thus would not increase the cost of services to the schools. In addition to having no financial impact on the E-Rate program, these devices would prove invaluable to students in completing their homework assignments or preparing extra-curricular school projects.<sup>16</sup>

Students in low-income areas can use these devices to gain access to digital textbooks, educational publications, and libraries of information at lower costs. There is no better use of E-

---

<sup>14</sup> See Final EDU Report of Piedmont City School District in WC Docket No. 10-222 (Oct. 22, 2013).

<sup>15</sup> See, e.g., Comments of CloudED Mobility at 5; Comments of the Ohio E-Rate Consortium at 15-16 (both filed July 9, 2010 in response to the 2010 E-Rate NPRM in CC Docket No. 02-6 & GN Docket No. 09-51).

<sup>16</sup> Comments of the Ohio E-Rate Consortium at 16 (filed July 9, 2010 in response to the 2010 E-Rate NPRM in CC Docket No. 02-6 & GN Docket No. 09-51).

Rate funds than to support student laptops and tablets and other portable learning devices because it directly facilitates continued learning outside the classroom.

The E-Rate program, which has traditionally focused on serving schools with wired broadband connections and installing Wi-Fi infrastructure in classrooms – and in many cases has achieved that goal – should be broadened to cover mobile broadband connectivity provided by 5G mobile and Fixed Wireless Access (“FWA”) systems (discussed in Section III below) and devices for low-income students. Countless studies show that doing so would have a tremendous positive impact on low-income students’ learning and overall academic performance. Students who cannot afford a mobile learning device with connectivity will benefit greatly from the E-Rate program’s funding of portable learning tools and broadband connectivity allowing them to learn anywhere and anytime, just like many of their classmates.

### **III. Qualcomm Has Continued To Advance Mobile Broadband Capabilities, Developing Cost-Effective Multi-Gigabit-Per-Second Chipsets, Fixed Wireless Access Solutions, And Always Connected Wireless Laptops and Tablets**

Qualcomm has driven the wireless industry’s progression from 2G to 3G to 4G and now 5G, and we have a particular interest in ensuring all students have access to mobile learning tools. Qualcomm is the industry leading provider of 5G chipsets that operate in all spectrum bands the FCC has made available for flexible use services, providing multimode solutions that operate in low-band, mid-band, and high-band millimeter wave spectrum and enabling the best possible broadband connectivity.<sup>17</sup> Our company’s 5G mobile platforms offer a comprehensive modem-to-antenna system for 5G devices that provides ultra-high data speeds, superior coverage, and power efficiency in miniscule form factors.

---

<sup>17</sup> See, e.g., Qualcomm 5G website available at <https://www.qualcomm.com/products/5g> (last accessed Feb. 16, 2021).

Earlier this month, we announced the world’s first 10 Gigabit-per-second 5G modem-RF system for use in laptops, tablets, smartphones, and countless other wireless devices.<sup>18</sup> This latest modem-RF system supports the fastest 5G speeds currently available with fiber-like wireless performance and makes the best use of all available spectrum bands (licensed, unlicensed, and shared) for ultimate network flexibility, capacity, and coverage.

Qualcomm also provides mobile compute platforms in the form of always-connected 5G, 4G LTE, and Wi-Fi 6-enabled laptops with long-lasting, multi-day battery life on a single charge.<sup>19</sup> Qualcomm Snapdragon compute platforms for Windows 10 and for Chrome OS are available from multiple manufacturers, including HP, Lenovo, Samsung, Acer, and Asus. These always-on, always-connected laptops and tablets powered by Qualcomm technology allow students and educators to learn and teach from anywhere, supporting education solutions for today and tomorrow.<sup>20</sup> Most recently, Acer announced a low-cost, education-focused Chromebook powered by Qualcomm Snapdragon, the Acer Chromebook 511.<sup>21</sup> With 4G LTE and 5G connectivity built right into the laptop, students can be online when there is no home internet connection, in city apartments and in remote areas lacking wired broadband service.

In addition, Qualcomm has developed the world’s first fully integrated high-power millimeter wave antenna module for 5G-enabled extended range Fixed Wireless Access (“FWA”), the QTM527 millimeter wave antenna module, that provides fiber-equivalent

---

<sup>18</sup> See Qualcomm Press Note, “[Qualcomm Announces World’s First 10 Gigabit 5G Modem-RF System](#),” (Feb. 9, 2021) (*last accessed* Feb. 16, 2021).

<sup>19</sup> See [Qualcomm Mobile Computing website](#) and see [Qualcomm 5G Snapdragon 8cx Gen 2 5G Compute Platform website](#) (*last accessed* Feb. 16, 2021).

<sup>20</sup> See Qualcomm OnQ Blog, “[Empowering students and educators to learn and teach from virtually anywhere, How Qualcomm Snapdragon compute platforms offer education solutions for today and tomorrow](#),” (Jan. 25, 2021) (*last accessed* Feb. 16, 2021).

<sup>21</sup> See [Acer Chromebook 511 on Acer website](#) (*last accessed* Feb. 16, 2021).

performance at extended ranges, enabling service providers and 5G network equipment makers to deliver multi-gigabit speeds and ultra-low latency to an increasingly broader footprint.<sup>22</sup> Scores of equipment manufacturers have chosen Qualcomm’s Snapdragon X55 5G Modem-RF system for more than 80 FWA modem-routers. This FWA equipment receives and transmits 5G services and connects with devices either because it is a hybrid modem-router located indoors, or, if located outdoors, the modem unit connects via ethernet to an indoor router. This equipment can provide fixed wireless 5G connectivity over 7 kilometers with speeds greater than 100 Megabits per second to small towns, homes, schools, businesses, libraries, and recreation centers, and serve low-income students in rural and underserved communities that are the very target of the E-Rate program. This equipment should be covered by E-Rate because it can provide connectivity to low-income students who would otherwise lack it.

Earlier this month, Qualcomm announced its second generation FWA solution powered by the Snapdragon X65 5G Modem-RF System and latest extended-range QTM547 millimeter wave antenna module, allowing mobile providers to offer fixed internet broadband services to homes and businesses using their 5G network infrastructure.<sup>23</sup> This FWA equipment eliminates capital expenditures for wired network rollouts, coupled with removing the need to secure permits or send technicians out to each home for installation. This allows for smoother rollouts, quicker time to commercialization, and the delivery of 5G multi-gigabit speeds and low-latency connectivity to a much wider coverage footprint.

---

<sup>22</sup> See, e.g., Gautam Sheoran, [Qualcomm OnQ Blog - FWA breakthroughs show promise of 5G mmWave for extended ranges](#) (Sept. 17, 2020) (*last accessed* Feb. 16, 2021).

<sup>23</sup> See Qualcomm Press Note, [“Qualcomm Announces Second-Generation 5G Fixed Wireless Access Platform with 10 Gigabit 5G Connectivity for Homes and Businesses”](#) (Feb. 9, 2021) (*last accessed* Feb. 16, 2021).

Recent third-party testing of Qualcomm’s first generation 5G NR millimeter wave FWA equipment by the Signals Research Group demonstrated downlink data speeds of more than 1.8 Gbps at 1.7 kilometers and 180 Mbps at 5.1 kilometers, which is more than sufficient for remote learning in rural and underserved locations.<sup>24</sup> The FWA customer premises equipment (“CPE”), which receives broadband signals from the service provider’s fixed access node and enables connectivity to student devices within the home, delivers Gigabit speeds with near line-of-sight and non-line-of-sight radio conditions on a commercial network, even when the CPE was situated well off-angle from the serving cell site. Also, millimeter wave FWA equipment supported uplink data speeds greater than 100 Mbps, exceeding what many fixed broadband service plans presently provide.

Thus, the FCC should ensure that the E-Rate program covers FWA equipment and connectivity to schools and low-income homes. To be clear, the E-Rate program should fund FWA services, including FWA CPE, for low-income students and a laptop or tablet. As noted above, FWA CPE is an integral part and enabler of broadband Internet access service.

---

<sup>24</sup> See Signals Research Group, All Things 5G NR mmWave – An Update on 5G NR Millimeter Wave Network Performance and New Use Cases (Jan. 26, 2021) available at <https://signalsresearch.com/issue/all-things-5g-nr-mmwave/> (last accessed Feb. 16, 2021).

In Australia, nbn, Ericsson, Qualcomm, and Casa Systems achieved a 1 Gbps 5G millimeter wave communications data rate at a distance of 7.3 kilometers. See nbn Press Release, “[nbn sets 5G Long-Range Transmission World Record](#)” (Jan. 13, 2021) (last accessed Feb. 16, 2021).

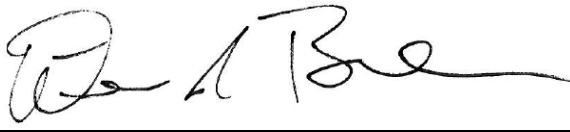


## CONCLUSION

Qualcomm respectfully requests that the FCC immediately permit on an emergency basis E-Rate funds to be used for mobile access and devices for low-income remotely-learning students. The FCC also should promulgate rules to update the E-Rate program post-pandemic so it permanently supports full access to mobile broadband connectivity and places portable learning devices into the hands of low-income students to be used both on and off of school grounds, on the school bus and at home. These straightforward updates to the E-Rate program are needed as soon as possible to ensure today's low-income students do not fall further behind and can keep pace with their classmates that have mobile learning tools, laptops, tablets, and smartphones with them wherever they go.

Respectfully submitted,

QUALCOMM INCORPORATED

By: 

Dean R. Brenner  
Senior Vice President, Spectrum Strategy &  
Technology Policy

John W. Kuzin  
Vice President & Regulatory Counsel

1730 Pennsylvania Avenue, NW  
Suite 850  
Washington, DC 20006  
202.263.0020

*Attorneys for Qualcomm Incorporated*

February 16, 2021