

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

In the Matter of	)	
Schools and Libraries Universal Service Support Mechanism	)	CC Docket No. 02-6
Connect America Fund	)	WC Docket No. 10-90
Modernizing the E-rate Program for Schools and Libraries	)	WC Docket No. 13-184
	)	
	)	
	)	

To: The Commission

**COMMENTS OF T-MOBILE USA, INC.**

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To: The Commission

**COMMENTS OF T-MOBILE USA, INC.**

T-Mobile USA, Inc. (“T-Mobile”)<sup>1</sup> submits these comments in response to the Wireline Competition Bureau’s (“Bureau”) Public Notice<sup>2</sup> seeking comment on two petitions<sup>3</sup> requesting that the Commission allow E-rate subsidized broadband networks to be accessed by students at

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<sup>1</sup> T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.

<sup>2</sup> *Wireline Competition Bureau Seeks Comment On Petitions Regarding Off-Campus Use Of Existing E-Rate Supported Connectivity*, Public Notice, CC Docket No. 02-6, WC Docket 10-90, WC Docket No. 13-184 (rel. Sept. 19, 2016) (“Public Notice”), [https://apps.fcc.gov/edocs\\_public/attachmatch/DA-16-1051A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DA-16-1051A1.pdf).

<sup>3</sup> *Microsoft Corporation, Mid-Atlantic Broadband Communities Corporation (MBC), Charlotte County Public Schools, Halifax County Public Schools, GCR Company, and Kinex Telecom Joint Petition for Clarification or, in the alternative, Waiver of Microsoft Corporation, Mid-Atlantic Broadband Communities Corporation, Charlotte County Public Schools, Halifax County Public Schools, GCR Company, and Kinex Telecom*, WC Docket No. 13-184 (filed Jul 7, 2016), <https://ecfsapi.fcc.gov/file/60002098542.pdf> (“Microsoft Petition”); *Petition for Waiver of Samuelson-Glushko Technology Law & Policy Clinic on Behalf of Boulder Valley School District*, WC Docket Nos. 13-184, 10-90 (filed May 16, 2016), <https://ecfsapi.fcc.gov/file/60001843683.pdf> (“Boulder Valley Petition”).

home for educational purposes without any obligation by the E-rate applicant to cost-allocate the portion of the traffic attributable to off-campus use.

## I. INTRODUCTION AND SUMMARY

As one of the leading providers of mobile broadband services in the United States, T-Mobile understands the important role that mobile broadband plays in connecting students to the Internet. However, as Commissioner Clyburn has noted, while today's digital technologies provide enormous educational benefits, they also are leading to greater disparities in educational outcomes between affluent and disadvantaged students.<sup>4</sup> Mobile broadband is the most cost-effective, flexible and readily achievable way to ensure that rural, urban, low-income, and otherwise unconnected students can benefit from digital learning resources after the dismissal bell rings.

Today, roughly seven in ten teachers assign homework that requires access to broadband.<sup>5</sup> Of the 29 million households with school-aged children in this country, five million of those lack any Internet access. One in five students does not have the basic connectivity necessary to complete assigned coursework.<sup>6</sup> This "Homework Gap" has critical consequences,

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<sup>4</sup> See Statement of Commissioner Mignon Clyburn, *Modernizing the E-rate Program for Schools and Libraries*, Second Report and Order on Reconsideration, 29 FCC Rcd 15538, 15631 (2014), available at [https://apps.fcc.gov/edocs\\_public/attachmatch/FCC-14-189A1\\_Rcd.pdf](https://apps.fcc.gov/edocs_public/attachmatch/FCC-14-189A1_Rcd.pdf). Accord. Kristen Purcell, Alan Heaps, Judy Buchanan & Linda Friedrich, *How Teachers Are Using Technology at Home and in Their Classrooms*, Pew Research Center (February 28, 2013), <http://www.pewinternet.org/2013/02/28/how-teachers-are-using-technology-at-home-and-in-their-classrooms/>.

<sup>5</sup> *Modernizing the E-rate Program for Schools and Libraries*, Second Report and Order and Order on Reconsideration, 29 FCC Rcd 15538, 15633 (2014) (Statement of Commissioner Jessica Rosenworcel).

<sup>6</sup> Remarks of Commissioner Jessica Rosenworcel, State Education Technology Directors Association, "Broadband Imperative and the Homework Gap" at 1, Washington, DC, Sept. 2016, [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-341150A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-341150A1.pdf).

as a student without Internet access is six to eight percent less likely to graduate than a student with connectivity at home.<sup>7</sup> Moreover, half of all current jobs now require some level of digital skills. By the end of the decade, that number will be 77 percent. Too many young people without broadband access at home are not only impeded in their academic success by the Homework Gap, but, as Commissioner Rosenworcel has noted, they are also entering today's competitive job market with "a serious handicap."<sup>8</sup> As Commissioner Rosenworcel observes, "[This] loss is more than individual. It's a loss to our collective human capital and shared economic future."<sup>9</sup>

T-Mobile is pleased that the Commission is now considering the importance of off-campus use of E-rate funded connectivity for closing the Homework Gap. We urge the Commission to also consider that mobile broadband is a proven, cost-effective, and immediate solution that is superior to the untested, costly infrastructure buildouts proposed in either of the two petitions addressed in this public notice.

## **II. T-MOBILE HAS LONG ADVOCATED FOR THE COMMISSION TO RECOGNIZE THE VALUE OF OFF-CAMPUS USE OF E-RATE FUNDED CONNECTIVITY TO CLOSE THE HOMEWORK GAP**

T-Mobile commends the Commission for returning to the issue of off-campus use of E-rate funded broadband for educational purposes. As the Commission noted in the National Broadband Plan, "Online educational systems are rapidly taking learning outside the

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<sup>7</sup> Josh Gottheimer & Jordan Usdan, *FCC and Connect to Compete Tackle Broadband Adoption Challenge*, FCC Blog (Oct. 13, 2011), <http://www.fcc.gov/blog/fcc-and-connect-compete-tackle-broadband-adoption-challenge>.

<sup>8</sup> Remarks of Commissioner Jessica Rosenworcel, Cue16, "Closing the Homework Gap," Palm Springs, California, Mar. 17, 2016, [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-338474A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-338474A1.pdf).

<sup>9</sup> *Id.*

classroom.”<sup>10</sup> Comments in this proceeding from T-Mobile and other parties, including innovators and educators, demonstrate the key role that mobile broadband currently plays in bridging the Homework Gap and decreasing drop-out rates, enabling better student-teacher communication, improving educational performance, delivering interactive and inexpensive educational content, and facilitating after-hours self-directed learning.<sup>11</sup>

**A. Providing students with mobile devices for coursework has been successful in enabling and encouraging on and off-campus learning.**

Across the country, school districts are launching one-to-one initiatives to supply students with mobile devices and implement innovative programs in their classrooms.<sup>12</sup> For example, one T-Mobile customer in Indiana used E-rate funding in part to implement a program designed to reduce drop-out rates by offering students an “always-on” learning experience. This customer distributed over 400 devices to middle and high school students and offered both training and devices to their teachers. Within two years of initiating the program, the school reported a 7% decline in the overall drop-out rate. Other positive benefits included the implementation of more interactive curricula and improved student-teacher-parent communication.

Many school districts have followed suit. For example, students in the Los Angeles Unified School District received 31,000 free mobile tablets in 2013 under a \$30 million program

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<sup>10</sup> Federal Communications Commission, Connecting America: The National Broadband Plan at 254 (rel. Mar. 16, 2010) (“National Broadband Plan or NBP”), *available at* [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-296935A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296935A1.pdf).

<sup>11</sup> Comments of T-Mobile USA, Inc., WC Docket No. 13-184 (filed Nov. 8, 2013) (“T-Mobile Comments”), <https://ecfsapi.fcc.gov/file/7520957192.pdf>.

<sup>12</sup> *Kajeet honors ‘Action Heroes’ closing the Homework Gap*, EdTech Update (Feb. 13, 2016) (“Closing the Homework Gap”), <http://www.edtechupdate.com/broadband/digital-learning/mobility/?open-article-id=4607433&article-title=kajeet-honors--action-heroes--closing-the-homework-gap&blog-domain=eschoolnews.com&blog-title=eschool-news>.

launched by the district.<sup>13</sup> Likewise, Miami implemented a \$63 million plan to lease as many as 150,000 digital computing devices for students.<sup>14</sup> In fact, 70.8 percent of district leaders said that mobile technology has been adopted in at least a quarter of their schools, with another 9.8 percent saying adoption is likely to occur within the next few years.<sup>15</sup> The efficacy of these programs has been enhanced as providers have developed methods to ensure school-owned mobile learning devices only access educationally appropriate content.<sup>16</sup>

Importantly, other commenters have demonstrated how use of mobile-broadband-equipped tablets has also enhanced students' learning experiences at home. As the Los Angeles Unified School District argued in the E-rate reform proceeding, "[s]martphones and tablets, when used with 3G/4G/LTE mobile broadband access, allow students to learn on a 24/7 basis, which can dramatically improve educational achievement."<sup>17</sup> For example, one elementary school report indicated that students with take-home mobile tablets "did more online research, played more educational games, [and] communicated more with classmates and their teacher."<sup>18</sup> This evaluation also noted that "three-quarters of the device requests for access to learning or

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<sup>13</sup> M. Nadeem, *Los Angeles iPad Program to Expand to All 640,000 Students by 2014*, Education News (Aug. 2, 2016), available at <http://www.educationnews.org/technology/los-angeles-ipad-program-to-expand-to-all-640000-students-by-2014/>.

<sup>14</sup> Benjamin Herold, *Miami-Dade Approves \$63 Million Plan to Give All Students Digital Devices*, Education Week Digital Education Blog (June 20, 2013), [http://blogs.edweek.org/edweek/DigitalEducation/2013/06/miami-dade\\_schools\\_pass\\_63\\_mil.html](http://blogs.edweek.org/edweek/DigitalEducation/2013/06/miami-dade_schools_pass_63_mil.html).

<sup>15</sup> David Nagel, *Mobile Devices: 70 Percent of School Districts Have Substantial Deployments*, The Journal (June 12, 2014), <https://thejournal.com/articles/2014/06/12/mobile-devices-70-percent-of-school-districts-have-substantial-deployments.aspx>.

<sup>16</sup> Comments of AT&T, WC Docket No. 13-184 at 7 (filed Nov. 8, 2013).

<sup>17</sup> Comments of Los Angeles Unified School District, WC Docket No. 13-184 at 10 (filed Nov. 8, 2013).

<sup>18</sup> See Qualcomm *Ex Parte*, GN Docket No. 09-51, CC Docket No.02-6 (filed January 13, 2014), Making Learning Mobile 1.0 – Falconer Elementary School Project Evaluation Results at 5.

academic websites occurred between 3:00 pm and 9:00 pm.”<sup>19</sup> The same commenter noted that another middle school reported increased homework completion rates and that teachers at the middle school noted students’ developing stronger research skills due to the accessibility of the tablets.<sup>20</sup> Thus, the record amply demonstrates that one of the main benefits of mobile educational technology has been its role in creating an “anywhere, anytime” learning environment.<sup>21</sup>

**B. Off-campus mobile broadband connectivity has helped translate the benefits of digital learning to the home and is essential to creating an “anywhere, anytime” learning environment.**

In school and after-school access to mobile broadband itself facilitates connected learning. South Florida K-12 schools initiated a “Bring Your Own Device” policy in the fall of 2014, allowing students and staff to use their own technology during the school day “to enhance the learning experience.”<sup>22</sup> One charter school in Philadelphia, Pennsylvania, for example, implemented a program to replace paper textbooks with electronic textbooks loaded on mobile devices using T-Mobile’s broadband network.<sup>23</sup> Even when factoring in the cost of the devices, total near-term savings were estimated at approximately \$126,000 for 300 students, with

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<sup>19</sup> *Id.* at 7.

<sup>20</sup> *Id.*

<sup>21</sup> An additional benefit of mobile technology is that carriers have the ability to limit the access of children to sites that are age inappropriate.

<sup>22</sup> Monique O. Madan, *How Are Students Using Mobile Devices For Educational Purposes?*, EdTech Update (July 30, 2015), <http://www.edtechupdate.com/digital-learning/mobility/?open-article-id=3859996&article-title=do-smartphones-make-for-smart-students--that-depends&blog-domain=eschoolnews.com&blog-title=eschool-news>.

<sup>23</sup> T-Mobile Comments, *supra* note 13 at 6.

additional future savings to be realized by replacing costly hard-copy textbook updates with less expensive electronic updates.<sup>24</sup>

Innumerable mobile apps have been developed to enable and enrich education, ranging from elementary school state history quizzes to simulated pre-med anatomical dissections. For example, the app “Virtual History Roma” allows students to tour 3D models of the structures of ancient Rome while learning the history of the city through maps, timelines, video, and other interactive multimedia features.<sup>25</sup> The “Star Chart” app turns students’ smartphones into virtual observatories, providing extensive information about stars, planets, or constellations, and allowing students to obtain a “close look” at objects in the night sky without an expensive telescope.<sup>26</sup> In addition to delivering educational content in novel and interactive ways, mobile apps can also assist with the educational process, by helping students and teachers manage projects, deadlines, and schedules.<sup>27</sup> As one high school student from Guam said, “I have many apps on my phone that help me on school a lot.... I have a homework app that organizes all of my homework and reminds me when something is due.”<sup>28</sup> “The greatest strength of mobile devices could be for outside-the-classroom learning,” remarked one Professor in Learning

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<sup>24</sup> *Id.*

<sup>25</sup> See <https://itunes.apple.com/us/app/virtual-history-roma/id410358487?mt=8>.

<sup>26</sup> See <https://play.google.com/store/apps/details?id=com.escapistgames.starchart&hl=en>.

<sup>27</sup> For examples, see, e.g., Comments of CTIA, WC Docket No. 13-184 (filed Nov. 8, 2013) (“CTIA Comments”), <https://ecfsapi.fcc.gov/file/7520943955.pdf>. Examples cited include “My Study Life,” available at <https://www.mystudylife.com/>, and “Teacher Aid PRO,” available at <https://play.google.com/store/apps/details?id=com.glen.apps.TeacherAidePro&hl=en>.

<sup>28</sup> Lisa Nielsen, *Nearly Sixty Percent of Teens Use Their Own Mobile Devices in School of Learning*, EdTech Update (May 3, 2015), <http://www.edtechupdate.com/digital-learning/mobility/?open-article-id=3507825&article-title=nearly-60--of-teens-use-their-own-mobile-devices-in-school-for-learning&blog-domain=blogspot.com&blog-title=the-innovative-educator>.

Technologies at Harvard University's Graduate School of Education, "It's a cheaper way of doing one-to-one learning, and students would have a shorter learning curve because they're used to these devices."<sup>29</sup>

As mobile broadband resources are increasingly interwoven into modern classrooms, districts are also investing in ways to continue the benefits of mobile internet access for students without broadband at home.<sup>30</sup> For example, educational institutions are rapidly adopting cloud-based solutions that enable faculty, students, and parents to access tools for educational purposes on their mobile devices from anywhere and at any time. One E-rate customer in Indiana has implemented a cloud solution on the T-Mobile network allowing students to create and complete projects outside of the classroom that can easily be accessed by their peer group and teachers for review and grading.<sup>31</sup>

T-Mobile will continue to demonstrate the benefits of mobile broadband to address the Homework Gap with its recent commitment to spend at least \$5 million to provide free devices and mobile broadband service to students in low-income school districts.<sup>32</sup> T-Mobile will provide mobile broadband service to enable students to take these devices home to do their school work, at reduced cost to the schools and no cost to the students or their families. T-Mobile expects to begin its program in October 2017 and enroll 5,000 students per quarter over four years, totaling up to 80,000 students.

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<sup>29</sup> Rick Allen, *Can Mobile Devices Transform Education?*, 53 ASCD Feb. 2011, available at <http://www.ascd.org/publications/newsletters/education-update/feb11/vol53/num02/Can-Mobile-Devices-Transform-Education%C2%A2.aspx>.

<sup>30</sup> Closing the Homework Gap, *supra* note 13.

<sup>31</sup> T-Mobile Comments at 15.

<sup>32</sup> *T-Mobile USA, Inc.*, Order, DA 16-1125 (Enf. Bur. Oct. 19, 2016).

In short, the benefits of digital learning compound outside of the classroom, as students are also more likely to self-direct their learning after school hours by tapping into these mobile apps, finding online videos to help with homework, emailing their teachers with questions, and even posting online content they create for public commentary.<sup>33</sup> There can be no doubt that off-campus mobile broadband access serves an educational purpose that dramatically improves educational outcomes.

### **III. A MOBILE BROADBAND SOLUTION WOULD BE MORE EFFECTIVE AT CLOSING THE HOMEWORK GAP THAN THE BOULDER VALLEY OR MICROSOFT PETITIONS**

T-Mobile, Boulder Valley, and Microsoft agree that off-campus E-rate funded connectivity for educational purposes is a crucial step towards realizing the enormous benefits of connected learning and mitigating the Homework Gap. However, T-Mobile does not believe that the Boulder Valley and Microsoft Petitions present the most effective ways of achieving these laudable goals.

The Microsoft Petition seeks to use TV White Spaces (“TVWS”) technology in a pilot program to extend the Internet access service of 18 schools in rural Charlotte County and Halifax County public school districts to the homes of eligible students in and around those schools for educational purposes without having to cost-allocate the traffic that originates off campus. The Microsoft Petition would deploy untested TVWS technology for the benefit of only a limited number of students. The Boulder Valley Petition also seeks a waiver of the cost allocation rule in order to allow students at housing authorities near schools to get Internet access through Boulder Valley’s E-rate subsidized, self-provisioned fiber network after school hours. It would

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<sup>33</sup> Speak Up, *Digital Learning 24/7: Understanding Technology — Enhanced Learning in the Lives of Today’s Students*, Project Tomorrow (April 2015), available at [http://www.tomorrow.org/speakup/SU14\\_StudentReportTEXT.html](http://www.tomorrow.org/speakup/SU14_StudentReportTEXT.html).

require expensive, non-E-rate-funded infrastructure to deliver the E-rate funded connectivity to the homes of low-income students.

As educators have stressed, the new digital learning environment requires always-on, anytime, anywhere access for students and teachers,<sup>34</sup> and neither the Microsoft or Boulder Petitions' proposals would significantly aid students in any of the many locations outside their homes where they may need to do schoolwork, such as en route to school on the bus,<sup>35</sup> while traveling with parents to other activities, or while studying at other relatives' or caregivers' homes.

**A. Mobile broadband services are more cost effective than the services in either proposal, including all necessary costs described in the Petitions.**

If the Commission is going to waive the E-rate cost-allocation rules to allow off-campus use of E-rate funded services to help close the Homework Gap, it could much more productively allow such funding for mobile broadband services.

There are a number of factors that will ensure that mobile wireless services purchased with E-rate funds are cost effective. Vigorous mobile broadband competition will continue to keep the costs low compared to other new and untested technologies.<sup>36</sup> As the Commission's own data show, the mobile wireless marketplace is crowded: 98.8 percent of Americans are

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<sup>34</sup> See, e.g., Comments of City of Boston, WC Docket No. 13-184 at 7-9 (filed Nov. 8, 2013); Comments of Connected Nation, WC Docket No. 13-184 at 14-15 (filed Nov. 8, 2013); Comments of Houston Independent School District, WC Docket No. 13-184 at 3 (filed Nov. 8, 2013); Comments of Los Angeles Unified School District, WC Docket No. 13-184 at 10 (filed Nov. 8, 2013); Comments of NACEPF, WC Docket No. 13-184 at 4-9 (filed Nov. 8, 2013); Comments of San Diego County Office of Education, WC Docket No. 13-184 at 6-8 (filed Nov. 8, 2013).

<sup>35</sup> Comments of Iowa Dept. of Ed., WC Docket No. 13-184 at 6-7 (filed Nov. 8, 2013) (noting that many children in rural areas have especially long bus rides and live far away from their schools or public libraries).

<sup>36</sup> CTIA Comments, *supra* note 26 at 9-10.

covered by two or more providers, and 95.9 percent covered by three or more providers.<sup>37</sup> This competition and nationally uniform mobile broadband pricing will help ensure that schools and libraries have the pricing transparency that they need to make informed purchasing decisions.

Moreover, mobile broadband providers are experimenting with low-cost unlimited or generous data programs that further unlock the potential of mobile devices, school-provided or otherwise. In addition, carriers also are providing increased flexibility in their plan offerings, such as shared data plans and plans with rollover policies for customer data use.<sup>38</sup> These data-saving offerings hold enormous potential to help bridge the Homework Gap and as MMTC points out, bring more students—especially students of color—into the digital world.<sup>39</sup> Indeed, with the rise of low-cost generous or unlimited data plans, students from smartphone-dependent households in rural areas, such as Hatch, New Mexico, have been able to use their mobile devices as digital hotspots.<sup>40</sup> One Hatch teacher remarked, “While we may criticize students for

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<sup>37</sup> *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, WT Docket No. 16-137, Nineteenth Report, DA 16-1061, ¶ 39 (WTB rel. Sept. 23, 2016).

<sup>38</sup> See White Paper, *Ericsson Mobility Report: On the Pulse of the Networked Society*, Ericsson at 18 (Nov. 2015), <http://www.ericsson.com/res/docs/2015/mobility-report/ericsson-mobility-report-nov-2015.pdf>.

<sup>39</sup> *Understanding and Appreciating Zero-Rating: The Use and Impact of Free Data in the Mobile Broadband Sector*, Multicultural Media, Telecom & Internet Council (MMTC) at 10 (May 9, 2016), [http://mmtconline.org/WhitePapers/MMTC\\_Zero\\_Rating\\_Impact\\_on\\_Consumers\\_May2016.pdf](http://mmtconline.org/WhitePapers/MMTC_Zero_Rating_Impact_on_Consumers_May2016.pdf). (“[F]ree data can and should play a key role in finally making progress toward universal first-class digital citizenship for every American.”)

<sup>40</sup> Damien Willis, *Digital Divide Hits Small Towns Hard*, EdTech Update (May 10, 2016), <http://www.edtechupdate.com/broadband/digital-learning/mobility/?open-article-id=5022836&article-title=digital-divide-hits-small-towns-hard&blog-domain=eschoolnews.com&blog-title=eschool-news>.

being tethered to their phones ... we need to turn that connectivity into something purposeful and powerful when it comes to opportunities to learn and engage with their academics.”<sup>41</sup>

**B. Mobile broadband facilities are available across a much wider geography, to a far larger number of potential students, than either of the services proposed in the Petitions.**

Deployment and adoption of 4G LTE networks in the United States has been a remarkable achievement, and nearly the entire United States population, including those living in remote areas of the country, are now covered by 4G LTE service.<sup>42</sup> Three hundred and twenty-six million people in the United States now have subscriptions for 377.9 million wireless connections, an increase of more than 6 percent from last year.<sup>43</sup> Nearly 70 percent of Americans own smartphones, and approximately 20 percent of U.S. households with Internet access rely solely on mobile services for connectivity at home.<sup>44</sup> Twelve percent of all African Americans and 13 percent of Latinos rely on smartphone-only connectivity for home Internet,

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<sup>41</sup> *Id.*

<sup>42</sup> *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, WT Docket No. 16-137, Nineteenth Report, DA 16-1061, ¶ 39 (WTB rel. Sept. 23, 2016).

<sup>43</sup> Jacob Poushter, *Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies*, Pew Research Ctr. (Feb. 22, 2016), [http://www.pewglobal.org/files/2016/02/pew\\_research\\_center\\_global\\_technology\\_report\\_final\\_f ebruary\\_22\\_2016.pdf](http://www.pewglobal.org/files/2016/02/pew_research_center_global_technology_report_final_f ebruary_22_2016.pdf).

<sup>44</sup> *Evolving Technologies Change the Nature of Internet Use*, NTIA Blog, at 3 (Apr. 19, 2016), <https://www.ntia.doc.gov/blog/2016/evolving-technologies-change-nature-internet-use>.

compared with only four percent of Caucasians.<sup>45</sup> And the number of smartphone-only minority consumers will likely continue to increase.<sup>46</sup>

Low-income consumers including children that live in temporary shelters, are more likely to live in accommodations without fixed broadband connections, including in underserved urban and unserved rural communities. As a result, for 15 percent of all Americans, smartphones are the primary—and sometimes only—option for getting online.<sup>47</sup> Many schools and school districts have observed that mobile broadband is often the only option for obtaining reliable, high-speed broadband service, especially in rural and remote areas where fixed broadband networks are not available.<sup>48</sup> The California Department of Education summarized the plight of many small and rural communities in its comments in which fixed broadband solutions are “not an option ... due to the lack of infrastructure in remote locations.”<sup>49</sup>

Mobile broadband networks, unlike the networks proposed in the Petitions, already are in place and educators recognize that disadvantaged students cannot afford to wait. Accordingly, the Kansas Department of Education “recommended that schools garner access in the most cost

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<sup>45</sup> John B. Horrigan & Maeve Duggan, *Home Broadband 2015: The share of Americans with broadband at home has plateaued, and more rely on their smartphones for online access*, Pew Research Ctr. (Dec. 21, 2015), <http://pewinternet.org/files/2015/12/Broadband-adoption-full.pdf>.

<sup>46</sup> *Id.*

<sup>47</sup> *U.S. Smartphone Use in 2015*, Pew Research Ctr. (Apr. 1, 2015), [http://pewinternet.org/files/2015/03/PI\\_Smartphones\\_0401151.pdf](http://pewinternet.org/files/2015/03/PI_Smartphones_0401151.pdf).

<sup>48</sup> *See, e.g.*, Comments of Alaska Dept. of Ed., WC Docket No. 13-184 at 5-6 (filed Nov. 8, 2013) (“Prioritizing fiber connectivity would penalize locations where fiber is not an affordable or available option”); Comments of California Dept. of Ed., WC Docket No. 13-184 at 8 (filed Nov. 8, 2013); Comments of Illinois Fiber Resources Group, WC Docket No. 13-184 at 7 (filed Nov. 8, 2013).

<sup>49</sup> Comments of California Dept. of Ed., *supra* note 53 at 8.

efficient manner available, which for some is through cellular providers.”<sup>50</sup> As a result, many schools and school districts have already forged successful relationships with mobile broadband providers to tremendous benefit to their students, as discussed above.

It is critical to the well-being of children in low-income families and the country as a whole for the Commission to act under its universal service mandate to act boldly to attack the Homework Gap by allowing E-rate to fund the same access to mobile broadband that children from wealthier families currently have. By acting to make mobile broadband available to children in low-income families, the Commission can reduce the risk of the country losing a generation of children whose only fault is that they lack the resources to utilize mobile broadband to succeed in school and later in life.

Moreover, the growing use of mobile broadband solutions in education to attack the Homework Gap parallels the increasing reliance on mobile devices and mobile broadband to access online content by most Americans in their daily life. Mobile data traffic is expected to grow 3.4 times faster than fixed-network data traffic over the next five years.<sup>51</sup> As CTIA observed, “There is, in short, a platform shift to mobile underway, and education is part of this phenomenon.”<sup>52</sup> T-Mobile encourages the Commission to embrace this phenomenon, follow the lead of educators in rural and underserved communities, and trust in the ample evidence in the record that mobile broadband offers a cost-effective and proven solution to the Homework Gap that requires minimal intervention to encourage student adoption and minimal deployment.

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<sup>50</sup> Compare Comments of Kansas Dept. of Edu., WC Docket No. 13-184 at 2 and 5 (filed Nov. 8, 2013).

<sup>51</sup> CTIA Comments, *supra* note 26 at 7; Cisco Visual Networking Index, VNI Mobile Forecast Highlights 2012 – 2017, available at [http://www.cisco.com/web/solutions/sp/vni/vni\\_mobile\\_forecast\\_highlight/index.html](http://www.cisco.com/web/solutions/sp/vni/vni_mobile_forecast_highlight/index.html).

<sup>52</sup> CTIA Comments, *supra* note 26.

#### IV. CONCLUSION

T-Mobile applauds the Commission for considering once again the benefits that can be obtained from allowing off-campus use of E-rate funded services for educational purposes to help equalize academic resources and increase academic opportunities available to students across the United States. However, it is critical that the Commission seize the moment and take advantage of the benefits of mobile broadband to equalize the educational opportunities available to children in low income families that are otherwise available to families of wealthier means. Ubiquitous, familiar, cost-effective, and proven-funding commercial mobile wireless broadband solutions would be considerably more effective than granting either of the Microsoft or Boulder Valley Petitions.

Respectfully submitted,

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