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Washington, DC 20410

In the Matter of Narrowing the Digital Divide Through Installation of Broadband Infrastructure in HUD-Funded New Construction and Substantial Rehabilitation of Multifamily Rental Housing	Dkt. No. FR 5890-P-01

COMMENTS OF NEW AMERICA'S OPEN TECHNOLOGY INSTITUTE, NEW AMERICA'S RESILIENT COMMUNITIES PROGRAM, NEW AMERICA'S EDUCATION POLICY PROGRAM, BENTON FOUNDATION, CENTER FOR RURAL STRATEGIES, NATIONAL HISPANIC MEDIA COALITION, AND PUBLIC KNOWLEDGE

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INTRODUCTION AND SUMMARY

A coalition of public interest groups, New America's Open Technology Institute, New America's Resilient Communities Project, New America's Education Policy Program, Benton Foundation, Center for Rural Strategies, National Hispanic Media Coalition, and Public Knowledge ("Commenters") file these comments in support of HUD's proposal to require new and rehabilitated HUD-subsidized construction to include broadband infrastructure.[1] Commenters commend HUD's proposal and offers some potential areas where it could be improved.

Access to broadband is vitally important. In this modern era, it is extremely difficult to fully participate in society without an internet connection. Essentially every sector of the economy and every aspect of society has been transformed in some way by broadband access. Yet, as a country, we have struggled to provide access that is ubiquitous and affordable across demographic and geographic areas. That struggle has disproportionately affected low-income, elderly, and other vulnerable Americans. The infrastructure proposal will help narrow this "digital divide" and move our country toward truly high-speed, universal broadband access.

While Commenters emphatically support the proposal as a significant step forward in addressing the digital divide, it could be improved to further narrow the digital divide and ensure no one is left behind. First, HUD, rather the funding recipient, should decide when an exception applies to a particular funding project. Second, the installed infrastructure should be carrier-agnostic and therefore open access. Third, the installed infrastructure should be future-proof and suited for

[1] 81 Fed. Reg. 31181 (May 18, 2016) ("Proposal").

connecting all housing units in the construction project. Last, HUD should expand the list of programs covered by the proposal.

I. HUD's proposal will help address the serious digital divide that plagues America by expanding broadband access among this country's most vulnerable populations

The digital divide is a serious issue in America. According to the United Nations, access to the internet is as much a basic human right as shelter, food, and health care.[2] But studies show low-income, elderly, and other vulnerable communities still lack robust and affordable access. In 2015, 97 percent of households with annual incomes greater than $75,000 had internet access, compared to only 74 percent of households with annual incomes less than $30,000. Similarly, only 58 percent of people over 65 years of age had access, compared to 90 percent of 18-64 year olds.[3] Elderly and low-income households face many challenges on a daily basis, but access to the internet and its untold benefits should not be one of them. Moreover, HUD's infrastructure proposal is one of many government efforts to narrow the digital divide.

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[2] Randall Lane, *The United Nations Says Broadband Is Basic Human Right*, Forbes (Nov. 15, 2011), http://www.forbes.com/sites/randalllane/2011/11/15/the-united-nations-says-broadband-is-basic-human-right.

[3] Andrew Perrin & Maeve Duggan, *Americans' Internet Access: 2000-2015*, Pew Research Ctr. (June 26, 2015), http://www.pewinternet.org/2015/06/26/americans-internet-access-2000-2015.

A. Low income people, particularly children and students, need high quality broadband internet service in order to access educational, economic, and health care resources

Low-income households' lack of broadband access and adoption has a harmful effect on all household members, but it is particularly harmful on children. Through its federal rental assistance programs, HUD supports over five million low-income families, 30 percent of whom have school-aged children.[4] Internet access is imperative for educational success, yet low-income students are four times more likely than other students to lack connectivity.[5] 90 percent of students report that the internet would help "a lot" or "somewhat" in completing their school assignments,[6] and it is clear why: today, seven in ten teachers report assigning homework that requires reliable internet access.[7] Children who lack an in-home internet connection have extraordinary difficulty completing coursework, accessing educational resources, and reaching out for help on assignments. They also lack the ability to use the internet to participate in online study groups, access online textbook and workbook resources, or check their grades. As resources continue to move online, students without access fall behind as their connected peers use Internet-based tools. This gap between digital haves and have-nots has

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[4] *Policy Basics: Federal Rental Assistance*, Ctr. Budget & Pol'y Priorities (Dec. 21, 2015), http://www.cbpp.org/research/housing/policy-basics-federal-rental-assistance.

[5] John Horrigan, *The Numbers Behind the Broadband 'Homework Gap,'* Pew Research Ctr. (Apr. 20, 2015), http://www.pewresearch.org/fact-tank/2015/04/20/the-numbers-behind-the-broadband-homework-gap.

[6] John Horrigan, The Essentials of Connectivity at 3 (Mar. 2014), http://corporate.comcast.com/images/Final_IE_Research_Full_Paper.pdf.

[7] Press Release, Statement of FCC Commissioner Jessica Rosenworcel on Pew Research Center Homework Gap Findings, Apr. 20, 2015, https://apps.fcc.gov/edocs_public/attachmatch/DOC-333103A1.pdf.

created significant barriers to educational success, causing children from low-income households to perform far below their potential.[8]

Even for students who have a home internet connection, there are often large quality-of-service disparities that tend to fall along similar demographic and economic lines. Research from the Joan Ganz Cooney Center reveals that among families that have a home internet connection, "52 percent say it is too slow, 26 percent share their computer with too many people, and 20 percent have had interrupted connectivity in the past year due to non-payment."[9] Similarly, many of those families rely on mobile connections, which are more limited in capacity and presented challenges related to the size of the devices used to access the connections.[10]

Without reliable internet access, students preparing for college face great challenges. One challenge is that it has become very difficult to research and apply to colleges without internet, as nearly 700 colleges and universities in the United States primarily use the Common App, which is accessible only online.[11] For those

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[8] Daniel Boffey, *Children with Internet Access at Home Gain Exam Advantage, Charity Says*, Guardian (May 21, 2011), https://www.theguardian.com/education/2011/may/21/children-internet-access-exam-advantage.

[9] Victoria Rideout & Vikki S. Katz, *Opportunity for All?*, Joan Ganz Cooney Center at Sesame Workshop at 5 (Winter 2016), http://digitalequityforlearning.org/wp-content/uploads/2015/12/jgcc_opportunityforall.pdf.

[10] *Id.*; *see also* Sarah Morris & Vikki Katz, *Building a Digital Lifeline for America's Families*, Hill (Apr. 11, 2016), http://thehill.com/blogs/pundits-blog/technology/275801-building-a-digital-lifeline-for-americas-families.

[11] The Common App offers general information about schools, applications, and scholarship resources to over one million students. The Common Application, http://www.commonapp.org.

without broadband access, the Common App is difficult to access and use, which creates huge barriers to higher education and receiving crucial financial resources.

Another challenge for disconnected students is the inability to take advantage of online classes to earn a degree. Online college courses are cheaper, more accessible, allows students to set their own schedules and pace, and allows the student to continue earning income if necessary. Eight million adult learners have decided to go back to school.[12] Yet, students from low-income families are eight times less likely than students from higher earning families to earn a bachelor's degree by the time they are twenty-four years old.[13] This disparity is likely caused, at least in part, by the lack of internet access in those households.[14]

Lack of access creates problems for low-income job seekers as well. Over 80 percent of all Fortune 500 companies, including Walmart, Walgreens, and Target, require applicants to apply online, effectively cutting off low-income people without internet access from one of the largest markets for employment in the United States.[15] Even with a successful application, low-income people may still face challenges in the interview process because many employers use bandwidth-

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[12] Fast Facts: Back to School Statistics, Nat'l Ctr. for Edu. Statistics, http://nces.ed.gov/fastfacts/display.asp?id=372 ("In 2013, there were about . . . 8.2 million students 25 years old and over.").

[13] Jon Marcus & Holly K. Hacker, *Here's the Devastating Way Our College System Fails Poor Kids*, Huff. Post (Dec. 17, 2015), http://www.huffingtonpost.com/entry/why-its-harder-than-ever-for-a-poor-kid-to-get-into-a-good-college_us_567066bde4b0e29215of7d40.

[14] Adult learners seeking supplemental educational opportunities face similar challenges. Educational sites such as Khan Academy, Coursera, and Code Academy offer substantial resources for continued learning, but can be accessed only online through an internet connection that can handle video.

[15] Broadband Adoption Taskforce, Presentation to FCC, Nov. 30, 2011, at 10, https://apps.fcc.gov/edocs_public/attachmatch/DOC-311281A1.pdf.

intensive video conferencing apps like by Skype or Google Hangout.[16] Without access to high speed internet capable of supporting video services, low-income communities will be at a significant disadvantage in employment.

Low-income communities are also more likely to suffer from depression, asthma, obesity, diabetes, and other chronic conditions;[17] however, they often lack the resources to physically go the doctor.[18] The rise of telemedicine has created new opportunities to save time and money while still getting treatment. Many people are unable to take time off from work to go to the doctor, but with a high-speed connection to the internet they can video conference with a healthcare professional when it is convenient. Telehealth visits save consumers approximately $100 per visit on average, not including indirect costs such as having to leave work (foregone income) or having to pay for childcare.[19] Telemedicine also allows people to, among other things, more easily request a second opinion or more information

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[16] The number of employers using such apps has increased and is likely to continue increasing. In 2010, 10 percent of companies conducted video interviews as a part of the hiring process for entry level, management, and senior executive positions. By 2011, that number had risen to 42 percent. Ashley Milne-Tyte, *Seeking Work? Ready Your Webcam*, Wall St. J. (Sept. 26, 2011), http://www.wsj.com/articles/SB10001424053111904537404576554943587087926.

[17] Danielle Kurtzleben, *Americans in Poverty at Greater Risk for Chronic Health Problems*, U.S. News (Oct. 30, 2012), http://www.usnews.com/news/articles/2012/10/30/americans-in-poverty-at-greater-risk-for-chronic-health-problems.

[18] Tami Luhby, *Millions Can't Afford to Go to the Doctor*, CNN Money (Apr. 26, 2013), http://money.cnn.com/2013/04/26/news/economy/health-care-cost.

[19] Dale H. Yamamoto, Assessment of the Feasibility and Cost of Replacing In-Person Care with Acute Care Telehealth Services at 1 (Dec. 2014), http://www.connectwithcare.org/wp-content/uploads/2014/12/Medicare-Acute-Care-Telehealth-Feasibility.pdf.

about health conditions if they prefer.[20] In general, telemedicine can save people significant sums of money that otherwise may have been wasted on unneeded procedures and medications.

Low-income communities deserve access to all of these benefits, and HUD's rule will help provide that access.

B. Elderly populations increasingly rely on the internet

Elderly people make up a sizeable portion of the U.S. population[21] and generally adopt internet at lower rates; yet they still rely on the internet to access a variety of information and services—particularly health information and social media.[22]

There is a vast wealth of health information online, which can be particularly useful to elderly people. Having access to basic health information, but also having the ability to communicate with doctors, healthcare professionals, and support groups can be potentially life-changing. More than half of seniors report going online to get health-related information.[23] The importance of accessing

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[20] For a discussion of the pros and cons of telemedicine, see Jessica Harper, *Pros and Cons of Telemedicine for Today's Works*, U.S. News (July 24, 2012), http://health.usnews.com/health-news/articles/2012/07/24/pros-and-cons-of-telemedicine-for-todays-workers.

[21] Hillary Schaub, *Why Senior Citizens Use the Internet*, Brookings Inst. (Apr. 11, 2014), http://www.brookings.edu/blogs/techtank/posts/2014/04/11-why-senior-citizens-use-the-internet.

[22] *See generally* Aaron Smith, *Older Adults and Technology Use*, Pew Research Ctr. (April 3, 2014), http://www.pewinternet.org/2014/04/03/older-adults-and-technology-use.

[23] Hillary Schaub, *Why Senior Citizens Use the Internet*, Brookings Inst. (Apr. 11, 2014), http://www.brookings.edu/blogs/techtank/posts/2014/04/11-why-senior-citizens-use-the-internet.

health information is critical for this aging population, many of whom have substantially more health issues than their younger counterparts.

Access to social media provides a platform for the elderly to connect with distant friends and family, which is critically important for the 43 percent of seniors who report feelings of loneliness on a regular basis.[24] Social connectivity to family and friends via online sites has helped alleviate these feelings, which can cause a severe decline in overall health in the elderly.[25] People 65 and over who report feelings of isolation and depression have a 59 percent greater risk of health decline, and a 45 percent greater risk of death.[26] These numbers can be drastically reduced with internet access, as social media has given seniors the opportunity to speak with friends, engage with family members, and connect with support groups for the elderly online.[27] High-speed, reliable access also allows seniors to *see* friends and family through applications such as Skype and FaceTime.

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[24] Anne-Marie Botek, *The Elder Loneliness Epidemic*, AgingCare, https://www.agingcare.com/Articles/loneliness-in-the-elderly-151549.htm.
[25] Social Media Decreases Loneliness for Older Adults, Univ. of Sydney (Australia) (Mar. 19, 2013), http://sydney.edu.au/news/84.html?newsstoryid=11208. Pew Research Center recently found that 56% of people aged 65 and over use Facebook. Maeve Duggan et al., *Demographics of Key Social Networking Platforms*, Pew Research Ctr. (Jan. 9, 2015), http://www.pewinternet.org/2015/01/09/demographics-of-key-social-networking-platforms-2.
[26] Leland Kim, *Loneliness Linked to Serious Health Problems and Death Among Elderly*, Univ. Cal. San Francisco (June 18, 2012), https://www.ucsf.edu/news/2012/06/12184/loneliness-linked-serious-health-problems-and-death-among-elderly.
[27] *Social Media Helps Seniors Facing Depression, Loneliness*, LifeMatters Media (Jan. 2, 2015), http://www.lifemattersmedia.org/2015/01/social-media-helps-seniors-facing-depression-loneliness.

Thus, HUD's infrastructure proposal will have a profound effect on the lives of vulnerable Americans and the proposal should ensure these benefits will continue to be felt long into the future.

C. HUD's Proposal is an Important Piece of a Government-Wide Effort to Narrow the Digital Divide

Since the 1996 Telecommunications Act passed, Congress has understood that "advanced telecommunications capabilities" would be both essential for Americans in the 21st century[28] and critical to preserving "vigorous economic competition, technological advancement, and promotion of the public interest, convenience, and necessity."[29]

Recognizing the importance of broadband access, various government agencies and actors have implemented programs intended to bring more Americans online both at home and in their communities. The most recent effort includes the President's ConnectALL Initiative, which will increase access to affordable devices, deliver digital literacy skills, and bring together private sector companies to help deliver affordable connectivity.[30] The initiative, among other things, directs the Corporation for National and Community Service and the Institute of Museum and Library Services to collaborate on a Digital Literacy Pilot Project, and establishes a "comprehensive online assessment tool to help community leaders identify critical broadband needs and connect them with

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[28] 47 U.S.C. § 1302(a).
[29] 47 U.S.C. § 257(b).
[30] *FACT SHEET: President Obama Announces ConnectALL Initiative*, White House (Mar. 9, 2016), https://www.whitehouse.gov/the-press-office/2016/03/09/fact-sheet-president-obama-announces-connectall-initiative.

expertise, tools, and resources for overcoming the challenges to expanded broadband deployment and adoption."[31] In addition to ConnectALL, ConnectEd will connect 99 percent of America's students to next-generation broadband and high-speed wireless in their schools and libraries by 2018.[32]

Government programs have also focused on getting low-income Americans online. Earlier this year, the Federal Communications Commission (FCC) reformed its Lifeline program to include a subsidy for broadband to address the way people communicate in the 21st century.[33] Moreover, HUD's ConnectHome has recently expanded to bring Comcast's Internet Essentials program to all public housing residents in Comcast's service area, which will result in 1.3 million additional households being eligible for the low cost internet service.[34] In conjunction with these other initiatives, HUD's proposal will make substantial gains in attempting to narrow the digital divide.

II. Some aspects of the rule could be improved to further narrow the digital divide

While Commenters support HUD's efforts to expand broadband deployment, Commenters suggest some improvements to certain aspects of the proposal. First, HUD—rather than the funding recipient—should decide when an exception applies to a particular project. Second, the installed infrastructure should be carrier-

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[31] *Id.*
[32] Megan Slack, *What Is ConnectED?*, White House (June 6, 2013), https://www.whitehouse.gov/blog/2013/06/06/what-connected.
[33] *Lifeline and Link Up Reform and Modernization*, Third Report and Order, 31 FCC Rcd 3962 (2016).
[34] Jon Brodkin, *Comcast Expands $10 Low-Income Internet Plan*, ArsTechnica (July 15, 2016), http://arstechnica.com/business/2016/07/comcast-expands-10-low-income-internet-plan.

agnostic and open access. Third, the infrastructure should be future-proof or else the benefits of the rule may be short-lived. Last, HUD should expand the list of programs covered by the proposal.

A. HUD, rather than the funding recipient, should decide when an exception applies to a particular project, especially given the breadth of the exceptions

HUD's proposal will have a dramatic effect on broadband build-out and correspondingly on broadband demand among low-income, elderly, and other vulnerable Americans—but only to the extent funding recipients determine that the proposed exceptions do not apply. HUD's proposal would allow funding recipients to decide whether to install broadband infrastructure for reasons of "location," "cost," and "structure."[35] HUD also states it "will consider providing additional guidance on this issue when the final rule becomes effective."[36] HUD then asks whether the exceptions are too broad and whether there should be sanctions for grantees that do not comply.[37] HUD should provide additional guidance and should impose sanctions on funding recipients who attempt to inappropriately gain advantage by capitalizing on the exceptions.

Allowing the party subject to a regulation to decide whether he or she should be exempt from the regulation is not an optimal system. Ideally, HUD would make the decision based on an application for an exemption that the funding recipient would file when construction is in the planning stages. This system would allow the funding recipient to argue why building the infrastructure is infeasible,

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[35] Proposal, at 31182.
[36] Proposal, at 31184.
[37] Proposal, at 31185.

but would also allow HUD to review the application for veracity and reasonableness. Given that HUD is providing the funds for these build-outs, it should have a say in whether new construction is allowed not to include the broadband access infrastructure. HUD could impose a shot-clock to avoid unreasonably delaying construction.[38]

By using broad language for the exception ("location," "cost," and "structure") as a basis for refusing to install broadband infrastructure, HUD has left the recipient-made determination too open-ended. As HUD recognizes in this proposal, broadband build-out is a national priority;[39] the reasons underlying a refusal to build infrastructure to HUD-funded housing should be persuasive and real. The determinations should not be left to the whims of funding recipients, nor to unsubstantiated claims of burden. In that way, HUD should (in addition to reviewing applications for exceptions) provide detailed guidance regarding what it considers too costly, an inappropriate location, or an unfit structure fitting of an exception. The "cost" exception, in particular, should be very narrow and limited because HUD is providing the funds that would be used for the broadband infrastructure as a component of the broader housing build. For instance, HUD

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[38] One relevant parallel is the waiver process at the Federal Communications Commission. Typically, the party that would be subject to a rule may seek a waiver of that rule if the burden is too heavy on the party and the public interest would warrant a waiver. 47 C.F.R. § 1.3 ("[a]ny provision of the [FCC's] rules may be waived by the Commission on its own motion or on petition if good cause therefor is shown."); 47 C.F.R. § 1.925 (requests for waiver must show that (1) the underlying purpose of the rule(s) would not be served by application to the instant case and that grant of the waiver would serve the public interest; or (2) in view of unique or unusual circumstances of the instant case, the application of the rule would be inequitable, unduly burdensome, or contrary to the public interest).

[39] Proposal, at 31183.

may require that the cost of building the infrastructure be so high that it would significantly affect the inclusion of other basic necessities such as water or heat. With this type of requirement, funding recipients would not be allowed to trade luxuries for necessities like broadband.

In any event, HUD should take seriously any efforts to inappropriately avail oneself of the benefit of the exception. Whatever infrastructure is installed at the time of construction is likely to be the only infrastructure installed for many years—until the next HUD-funded project begins on that site. Thus, if a funding recipient decides not to install broadband infrastructure, then the building's residents will lack broadband access for the foreseeable future. HUD should consider imposing sanctions on funding recipients who inappropriately available themselves of the exception and therefore deprive low-income residents broadband access. One potential sanction would be a significant fine. Fines collected by HUD for violations of this rule would be most appropriately used to fund digital literacy programs, which are important tools for closing the digital divide.[40] Alternatively, the recipient could be disqualified from receiving HUD funding in the future.

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[40] When non-adopters were asked what the primary reason was for their decision not to access broadband internet, 32 percent responded that it was primarily because the technology was not easy to use. They reported feeling frustrated when trying to access online resources, as well as fear that they may inadvertently make themselves victims of spyware and hackers. Kathryn Zickuhr, *Who's Not Online and Why*, Pew Research Ctr. (Sept. 25, 2013), http://www.pewinternet.org/2013/09/25/whos-not-online-and-why.

B. HUD should require installed infrastructure to be carrier-agnostic and subject to open access policies

HUD should impose open access provisions for broadband infrastructure that is funded by the agency. The concept of open access dictates that the infrastructure should be usable by and shared among potential competitive entrants.[41] Open access networks are critical in traditionally underserved areas where a dearth of choice has led to higher prices and fewer choices for consumers.[42] Allowing any internet service provider to service new and substantially renovated buildings would increase the number of competitors and lower the barriers to entry for new providers, forcing providers to compete for customers by reducing prices and improving offerings.[43] HUD should therefore require open access networks in all building projects.

Open access is also important given the stranglehold internet service providers (ISPs) have over multi-dwelling units (MDUs). ISPs dominate the MDUs they service, despite an FCC rule that attempts to prevent exclusive contracts.[44] The situation is dire. "Network operators like Comcast, Time Warner Cable, and AT&T, in cahoots with developers and landlords, routinely use a breathtaking array of

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[41] *See, e.g., Stimulating Competition through Open Access Networks*, OECD (Mar. 5, 2013), http://oecdinsights.org/2013/03/05/stimulating-competition-through-open-access-networks ("'Open access' is an arrangement that provides effective, wholesale access to network infrastructure or services at fair and reasonable prices, and on transparent and non-discriminatory terms.").

[42] *Id.*

[43] *See* Open Access, Community Broadband Networks, https://muninetworks.org/content/open-access.

[44] Susan Crawford, *Dear Landlord: Don't Rip Me Off When it Comes to Internet Access*, Backchannel (June 27, 2016), https://backchannel.com/the-new-payola-deals-landlords-cut-with-internet-providers-cf60200aa9e9.

kickbacks, lawyerly games of Twister, blunt threats, and downright illegal activities to lock up buildings in exclusive arrangements."[45] ISPs pay landlords in exchange for the landlords' exclusive preference. Comcast even sent a letter to a landlord with which it has an exclusivity agreement (of questionable legality), complaining that the landlord allowed one of Comcast's competitors to conduct marketing activities on site.[46]

Ultimately, "these shenanigans will only stop when . . . every building ha[s] neutral fiber/wireless facilities that make it easy for residents to switch services when they want to."[47] Other cities have begun doing this, including Stockholm, Paris, Brentwood, Calif., and Loma Linda, Calif.[48] HUD should thus ensure that buildings are ready for any competing provider to provide service without the worry that funding recipients have entered into exclusive service or marketing contracts with other ISPs.

C. HUD should ensure the infrastructure installed is future-proof and is best for connecting large numbers of people and units

The importance of future-proofing cannot be understated. Without the ability to easily upgrade infrastructure in the future, people living in HUD-sponsored housing will, over time, find themselves with access only to second-class internet access. While Commenters appreciate HUD's attempt to create a

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[45] *Id.*
[46] *Id.* For this reason, HUD may want to consider preventing HUD funding recipients from entering into exclusive service or marketing agreements with ISPs.
[47] *Id.*
[48] For Brentwood, see http://qcode.us/codes/brentwood/view.php?topic=16-16_120-16_120_120&frames=on; for Loma Linda, see http://lomalinda-ca.gov/asp/Site/LLCCP/AboutLLCCP/TheLLCCPStandard/index.asp.

technology-neutral rule, the proposal could be improved in some ways to ensure infrastructure is future-proof.

1. The FCC's definition of "broadband" speeds will increase going forward, and HUD's rule should consider how technology can be upgraded to meet those new definitions

HUD's final rule should take into account the changing nature of the FCC's definition of "broadband" service speeds. The proposal requires new infrastructure to be capable of meeting the FCC's definition of broadband that exists at the time of the relevant construction.[49] Right now, that standard is 25 Mbps download and 3 Mbps upload. However, not long ago the standard was 4 Mbps download and 1 Mbps upload, a standard that even for its time was inadequate.[50] Additionally, the definition of broadband is a bare minimum, and many ISPs offer much faster speeds.[51]

Consumers' demand for higher broadband speeds will grow over time, likely exponentially, as new technology develops and new services become available. As demand for faster broadband speed grows, so too will the FCC's speed benchmark. Yet, HUD residents living in housing that was built for a previous era would be stuck with slow internet access, further perpetuating the digital divide.

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[49] Proposal, at 31182.
[50] Micah Singleton, *The FCC Has Changed the Definition of Broadband*, Verge (Jan. 29, 2015), http://www.theverge.com/2015/1/29/7932653/fcc-changed-definition-broadband-25mbps; *see also* Mike Masnick, *Big Broadband Begs FCC Not to Expose Their Lies by Defining Broadband Accurately*, techdirt (Sept. 9, 2014), https://www.techdirt.com/articles/20140908/16295828456/big-broadband-begs-fcc-not-to-expose-their-lies-defining-broadband-accurately.shtml.
[51] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2015 Broadband Progress Report, 30 FCC Rcd 1375, ¶ 28 (2015).

HUD should therefore clarify in its final rule that the technology that funding recipients choose should be easily upgradeable and allow for low-cost upgrades in the future to keep up with emerging technologies and increased consumer demand for faster broadband access.

2. Some types of technology allowed by the proposal are not as effective for bringing high-speed broadband to medium and large MDUs

Given that HUD funding recipients may find themselves in a variety of circumstances, Commenters generally favor a technology-neutral approach for funding broadband infrastructure build-out.[52] However, different circumstances create some complexity. Large, dense building projects increase the amount of aggregate capacity required to provide "every housing unit covered by this proposed rule" with FCC-mandated broadband speeds.[53] Such variance has different implications for different technologies, where a larger number of residents increases the likelihood that fixed wired service will be necessary.

In particular, cellular wireless (LTE or "Long-Term Evolution"), for the foreseeable future, is unlikely to provide the speeds necessary to all housing units. A recent study by OpenSignal found that Verizon and T-Mobile both averaged

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[52] *See* Proposal, at 31185-86.

[53] For instance, a large MDU may require a gigabit connection to the building in order to ensure all units have the required 25 Mbps download and 3 Mbps upload speeds. *See* Fiber Backbone Cabling in Buildings, Commscope (2015), http://www.commscope.com/Docs/Fiber-Backbone-Cabling-in-Buildings-WP-109423-EN.pdf ("As [new wireless] technologies become more widely deployed, the aggregate effects of user bandwidth are expected to drive even higher speeds in network backbones.").

approximately 12 Mbps download speeds in the eleven largest U.S. cities.[54] AT&T and Sprint had average download speeds of 7.9 Mbps and 6.6 Mbps respectively.[55] In addition, quality and reliability of mobile service is largely dependent on physical location and surroundings, with some areas having patchy coverage that can have a negative effect on user experience.[56]

Moreover, satellite service has long been plagued by latency issues.[57] Satellite service is inherently latency-heavy because its signals must travel much longer distances compared to traditional networks.[58] In 2013, the FCC found that ViaSat "had a measured latency of 638ms . . . , approximately 20 times that [of] the terrestrial average."[59] Increased latency has a dramatic effect on video and voice services that require fast data transmission, like Skype and Google Hangouts—exactly the type of services low-income communities need more access to.

Wi-Fi may also pose problems. There are few circumstances where the building itself should receive its internet connection through Wi-Fi. Wi-Fi is instead

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[54] Zach Epstein, *Which Carrier Has the Fastest LTE Network in America?*, BRG (Feb. 2, 2016), http://bgr.com/2016/02/02/fastest-lte-network-america-testss.
[55] *State of Mobile Networks: USA*, OpenSignal (Feb. 2016), http://opensignal.com/reports/2016/02/usa/state-of-the-mobile-network.
[56] *See* Kim Staples, *Mobile Broadband vs Fixed Line Broadband: Which Is Best for Me?*, broadbandchoices (July 28, 2015), https://www.broadbandchoices.co.uk/reviews/mobile-broadband-vs-fixed-line-broadband.
[57] Latency is the delay that occurs in a round-trip data transmission. *Latency – Why Is It a Big Deal for Satellite Internet?*, VSAT Systems, http://www.vsat-systems.com/satellite-internet-explained/latency.html.
[58] *Id.*
[59] Jon Brodkin, *Satellite Internet Faster than Advertised, but Latency Still Awful*, ArsTechnica (Feb. 15, 2013), http://arstechnica.com/information-technology/2013/02/satellite-internet-faster-than-advertised-but-latency-still-awful.

better used to distribute a connection that comes into the building through wired infrastructure like fiber optic or cable connections. In that way, Wi-Fi should be considered supplemental to a wired connection, rather than a substitute. To ensure that all units have access to at least 25 Mbps download, HUD should specify that buildings should have sufficient access points to ensure sufficient through-put (and to ensure that all units of the building are within range of those access points) so that each unit has fast, reliable service. Thus, without significant improvements in cellular wireless, satellite, or Wi-Fi, those technologies alone are unlikely to satisfy HUD's rule at the premises level.

Certain wired services in the HUD proposal are not ideal for some housing situations. Broadband over Power Lines (BLP) is an ineffective technology that never "deliver[ed] the reach and bandwidth required to formulate" a viable business model.[60] BLP therefore should not be an approved technology unless it undergoes major improvements. Further, VDSL is not common in the United States.[61] Speeds are dependent on distance from the nearest node or cabinet, and housing units with VDSL2 further than 0.6 miles from the nearest cabinet likely will not receive 25 Mbps download speeds.[62] Thus, even some wired services may not be sufficient to satisfy HUD's rule.

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[60] Martin Courtney, *Whatever Happened to Broadband over Power Line?*, Engineering and Tech. Mag. (Oct. 15, 2013), http://eandt.theiet.org/magazine/2013/10/broadband-over-power-line.cfm. BPL has "petered out." *Id.*

[61] List of VDSL and VDSL2 Deployments, Wikipedia, https://en.wikipedia.org/wiki/List_of_VDSL_and_VDSL2_deployments#North_America (listing the few VDSL and VDSL2 deployments in the United States).

[62] Mark Heath, *Chart of BT Fibre Broadband FTTC (VDSL2) Speed Versus Distance from the Cabinet*, Increase Broadband Speed (UK) (Apr. 2, 2013),

The best type of infrastructure is optical fiber. It is easily upgradable, provides lightning-fast broadband connections, and is cheaper than copper wires, which are slowly becoming obsolete.[63] While ultimately remaining technology "neutral," HUD should favor investments using fiber technology, as it will provide the most benefit for the longest amount of time to the housing units and their residents.

D. HUD Should Expand the Programs Covered Under the Proposed Rule

HUD requests comment on which programs should be subject to the proposed rule.[64] HUD should aim for maximum benefit from the proposed rule. HUD can further its "efforts to narrow the digital divide in low-income communities served by HUD"[65] by expanding the list of covered programs to include all programs that provide low-income housing assistance. This would include programs such as Rental Assistance Payment and Rental Supplement as these are the exact communities that the proposed rule should reach.[66] They should not be left behind.

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http://www.increasebroadbandspeed.co.uk/2013/chart-bt-fttc-vdsl2-speed-against-distance.

[63] *8 Advantages of Choosing Fiber over Copper Cable*, Black Box (Apr. 15, 2015), http://blog.blackbox.com/technology/2015/04/8-advantages-to-choosing-fiber-over-copper-cable; *5 Reasons Why IT Professionals Choose Fiber Optic Cables Instead of Copper*, Cablexpress, http://www.cablexpress.com/blog/5-reasons-why-it-professionals-choose-fiber-optic-cables-instead-of-copper.

[64] Proposal, at 31184.

[65] Proposal, at 31185.

[66] Participants in low-income housing assistance programs earn less than the median income for their metropolitan area. Eligibility for these programs is based on income levels set by HUD. *See generally* FY 2016 Income Limits Documentation

CONCLUSION

Commenters support the broadband infrastructure proposal. HUD can improve the proposal as discussed above, which it should do without delay.

Respectfully submitted,

/s/Eric G. Null

Eric G. Null
Sarah J. Morris
Katie Watson
Google Policy Fellow
Open Technology Institute
New America
740 15th St, NW, Suite 900
Washington, DC 20005

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Greta Byrum
Director
Resilient Communities Program
New America NYC
18 W 21st St, Suite 900
New York, NY 10010

Lisa Guernsey
Deputy Director
Lindsey Tepe
Senior Policy Analyst
Education Policy Program
New America
740 15th St, NW, Suite 900
Washington, DC 20005

System, HUD User, https://www.huduser.gov/portal/datasets/il/il2016/2016summary.odn.

Amina Fazlullah
Director of Policy
Benton Foundation
1825 K Street NW, Suite 400
Washington, DC 20006

Jessica J. González, Esq.
Executive Vice President & General Counsel
National Hispanic Media Coalition
55 South Grand Avenue
Pasadena, CA 91105

Marty Newell
Chief Operating Officer
Center for Rural Strategies
46 East Main Street
Whitesburg, KY 41858

Dallas Harris
Policy Fellow
Public Knowledge
1818 N St NW, Suite 410
Washington, DC 20036