February 24, 2021

Douglas W. Kinkoph
Associate Administrator
Department of Commerce
National Telecommunications Information Administration (NTIA)
Washington, DC 20202

Submitted via email to: broadbandusa@ntia.gov

RE: Input on Tribal Broadband Grant Program

Dear Associate Administrator Kinkoph,

Siyeh Communications (SiyCom), a wholly owned Broadband Company of the Blackfeet Tribe, is submitting this letter in response to NTIA's request for tribal input for use of the Tribal Broadband Grant Program. SiyCom is planning to apply to NTIA for Tribal Broadband funding to support broadband infrastructure deployment for the buildout of a Fiber to the Premise (FTTP) broadband system that is within the Blackfeet Tribal land area. SiyCom's estimated construction cost is more than $20 million, and the speed with which SiyCom can complete these upgrades will be a function of available funding. SiyCom's Broadband infrastructure goals are integral to the Blackfeet Tribe's goals of exercising self-determination and the advancement of a self-sustaining diversified tribal economy.

About the Blackfeet Tribe

The Blackfeet Tribe is a federally recognized American Indian Tribe whose tribal lands are in northwestern Montana east of Glacier National Park in parts of Glacier and Pondera Counties along the eastern slopes of the Rocky Mountains. Browning is the largest community within the Blackfeet Nation, and other tribal communities include Heart Butte, Blackfoot, Starr School, Babb, Saint Mary, Kiowa, and East Glacier. The Blackfeet Tribe is the largest Indian Tribe in Montana and one of the largest Tribes in the United States. According to 2015-2019 ACS Census data, the Blackfeet Indian Reservation and Off-Reservation Trust

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Lands has a population of 10,629, and there are 2,798 Occupied households. The Reservation is 1.5 million acres, or 3,000 square miles. The population density is 3.47 people per square mile.

About SiyCom

In 2018, SiyCom the Blackfeet Tribe initiated formal discussions with the incumbent wireline service provider, 3 Rivers Communications (3 Rivers) to partition and acquire the Browning Exchange from the rest of 3 Rivers' Montana Service Area, which consisted of 26 Telephone Exchanges. A significant objective of the tribe's acquisition of this Telephone Exchange was to implement a modernization plan of the telecommunication infrastructure within the Browning Exchange. On December 31, 2020, the tribe's purchase of the Browning telephone exchange became final. The ownership of the Browning Exchange, which includes approximately 2,000 voice lines, and 1,200 broadband lines, was transferred from 3 Rivers Communications to SiyCom. Integral to the purchase of the telephone exchange was SiyCom's designation by the Federal Communication Commission (FCC) as the Eligible Telecommunication Carrier (ETC) for the Browning Exchange.

The telecom industry in general is transitioning its infrastructure from telephone service delivered over copper lines to feature-rich voice and broadband services using Internet Protocols (IP) delivered over coaxial cable, fiber, and wireless networks. However, over the past 30 to 40 years 3 Rivers made only minimal capital investments in Outside Plant and telecommunication equipment in the Browning Exchange. As a result, the infrastructure in SiyCom's service area currently consists primarily of decades-old infrastructure that is woefully incapable of supporting adequate broadband services. The condition of this infrastructure is constraining economic growth, job creation, global competitiveness, and the overall quality of life for those that live and work within SiyCom's service area.

More specifically, the condition of SiyCom's recently acquired telephone plant includes significant portions of antiquated middle mile and last mile copper infrastructure. Additionally, the type and condition of the electronics that serve large segments of SiyCom's service area include older generation AFC and Conklin equipment that deliver outdated versions of Asynchronous Digital Subscriber Line (ADSL) technology. Due to the antiquated copper infrastructure in the Browning Exchange, 3.5 full time equivalent technicians are required just to troubleshoot, and repair customer-initiated trouble calls within the exchange. The techs receive approximately ten service tickets per day and each trouble ticket can take 3-4 hours to fix. In some instances, the repairs require VDSL bonding to create additional bandwidth

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for one customer which uses up scarce copper pair resources that can limit services to others. Exhibit 1 provides some visual examples of aged, archaic, bandwidth-constraining Outside Plant infrastructure in SiyCom's service area on the Blackfeet Reservation.

As further evidence of infrastructure shortcomings in the Browning Exchange, publicly available documents reveal that 3 Rivers applied to receive $24,977,000 from the 2009 ARRA Broadband stimulus program to provide Fiber to the Premise (FTTP) broadband services to underserved households and businesses in Browning, which is the largest community within SiyCom's service area (see Exhibit 2). Their objective was to provide broadband services to 2,847 households and 129 businesses. According to the application these numbers were based on the 3 Rivers' actual maps and records. 3 Rivers' ARRA application was not funded and in 2014 3 Rivers applied for FCC Rural Broadband Experiment funding in the amount of $7.5 Million, or half the costs of a $15 million electronics and partial FTTP upgrade for the Browning Exchange (see Exhibit 3). Since neither of these projects were funded, the necessary upgrades remain to be completed.

Flawed Mapping Data and SiyCom's Service Area

SiyCom requests that NTIA set aside flawed federal broadband mapping data that could potentially, and inappropriately, render vast portions of its service area ineligible for funding. The COVID-19 pandemic exposed significant existing gaps in broadband availability throughout SiyCom's newly acquired service area. These gaps have had a devastating impact on K-12 access to remote learning and telehealth options on the Blackfeet Reservation.

Federal broadband maps largely rely on Form 477 data submitted to the FCC twice a year by service providers. In 2018 the GAO submitted a Broadband Report to Congress that stated:

> "Specifically, FCC's method of collecting mobile and fixed broadband data from providers (the Form 477) does not accurately or completely capture broadband access on tribal lands because it (1) captures nationwide broadband availability data—areas where providers may have broadband infrastructure—but does so in a way that leads to overstatements of availability, and (2) does not capture information on factors that FCC and tribal stakeholders have stated can affect broadband access on tribal lands, such as affordability, service quality, and denials of service.24 Nonetheless, FCC uses its Form 477 broadband availability data in annual broadband deployment reports to measure the percentage of Americans living on tribal lands with or without access to broadband,

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and to measure progress toward FCC's strategic goal of increasing all Americans' access to affordable broadband.25 By using broadband availability data to measure broadband access on tribal lands, FCC overstates broadband access on tribal lands." [1]

SiyCom's service area on the Blackfeet Reservation is an example of how flawed Form 477 data can have a detrimental impact on SiyCom's access to federal funding sources that are in place to support broadband infrastructure deployment and ultimately high-speed internet access. According to publicly available Form 477 data submitted to the FCC by 3 Rivers, the previous service provider in the Browning Exchange, there are only 971 locations that lack broadband services within the exchange. SiyCom disputes the Form 477 data since as explained above, the Browning Exchange primarily consists of decades-old infrastructure that is simply incapable of supporting adequate broadband services. SiyCom is aware of portions of its service area where the broadband speeds reported on the Form 477 are simply not possible.

In addition, Form 477 reporting requirements use census blocks, which are the smallest geographic area used by the US Census Bureau, to define areas in which broadband is available. A census block is considered "served," i.e., broadband broadband service is presumed to be available throughout the census block if at least one home in that census block can get broadband service. That may be appropriate in urban areas where census blocks are small and may only be comprised of a single city block, but in rural and tribal areas, census blocks are often many square miles in size, and just because a single home in that census block has access to broadband does not mean that other homes that may be miles away in the same census block have access to broadband. Furthermore, the Form 477 data only shows locations service providers could provide broadband within 10 business days of a request, not areas that are actually connected. For the reasons described above, SiyCom strongly urges NTIA to be wary of relying on flawed data to determine whether or not an area is eligible for funding.

SiyCom's Broadband Deployment Objectives

As explained, above, SiyCom's newly acquired service area on the Blackfeet Reservation will need to be nearly completely rebuilt. SiyCom's broadband objective is to implement a system which meets *and exceeds* the FCC's current definition of broadband, which is 25 Mbps download speed and 3 Mbps upload speed. SiyCom's proposed FTTP IP broadband system aligns with the goals of the FCC's 2020 Broadband

[1] GAO Report to Congress, Broadband Internet, FCC's Data Overstate Access on Tribal Lands

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Report[2]. With proper broadband funding support, SiyCom's system (once operational) will be able to demonstrate progress of fixed services at multiple speed thresholds, including three speeds above the benchmark (50/5 Mbps, 100/10 Mbps, and 250/25 Mbps). In fact, the infrastructure upgrades SiyCom is installing on the Blackfeet Reservation will not only be capable of gigabit broadband speeds, but it is scalable beyond that to meet the growing broadband needs of customers for decades.

A key objective in the project planning and development phase of the FTTH IP based system upgrade is to assure that tribal and community members benefit from the principles of Universal Service as defined in the Communication Act of 1934, the Telecommunications Act of 1996; and the 2010 National Broadband Plan.

NTIA Tribal Broadband Grant Funding

SiyCom requests that NTIA support 100% tribal broadband grant funding. According to 2015-2019 ACS Census data for the Blackfeet Indian Reservation and Off-Reservation Trust Lands, 27.5% of families and people are below the Poverty Level, and the Median Household Income is $32,282. SiyCom's primary remedy for improving broadband service in the exchange is to upgrade all copper lines to fiber and upgrade all supporting electronics.

SiyCom's Broadband Plan is complete and includes projected revenues, OPEX, and CAPEX associated with launching, operating, and upgrading this tribal owned Broadband Company. SiyCom's estimated implementation costs are more than $20 million. SiyCom will utilize CAF ACAM II support, internal funding, and plans to apply for NTIA Tribal Broadband Grant Funding to support its broadband deployment objectives. Upon receipt of its Eligible Telecommunication Carrier (ETC) designation on November 16, 2020, SiyCom became eligible to receive ACAM II support for eight years that is set at $1,551,375 million per year for 971 locations. As described above, due to flawed Form 477 data, the ACAM II funding was inappropriately reduced. While we dispute the Form 477 data that was used to determine the number of locations eligible to receive ACAM II support, SiyCom will adhere to the ACAM II deployment obligations.

SiyCom agrees with the FCC's May 2019, Report on Broadband Deployment in Indian Country[3], which states that "Tribal lands often present significant obstacles to deploying broadband and are expensive to serve. These challenges to deployment on Tribal lands include rugged terrain, complex permitting

[2] FCC 2020 Broadband Report, P. 15

[3] FCC's May 2019, Report on Broadband Deployment in Indian Country pursuant to the Ray Baum Act

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processes governing access to Tribal lands, jurisdictional issues involving states and sovereign Tribal governments, lack of the necessary infrastructure, and a predominance of residential, rather than business, customers. High poverty rates and low-income levels on Tribal lands, as well as cultural and language barriers, further inhibit the widespread availability of broadband to those that reside on Tribal Lands." The Report mirrors the complexities that SiyCom is facing and SiyCom has made significant strides in overcoming these complexities and achieving its objectives, however, adequate funding remains as SiyCom's greatest hurdle. The Tribal Broadband Funding will provide much needed funding and recognizes that improved services on tribal lands requires tribal centric solutions such as the focused efforts that SiyCom is systematically implementing.

Sincerely,

Michael D. Sheard

General Manager, Siyeh Communications

CC: Chairman Timothy Davis, Blackfeet Tribal Business Council
Honorable Steve Daines, Senator
The Honorable Jon Tester, Senator
The Honorable Brian Schatz, Chairman, Senate Committee on Indian Affairs
Jessica Rosenworcel, Acting Chairwoman, Federal Communications Commission
Dennis Fitzpatrick, CEO, Siyeh Corporation

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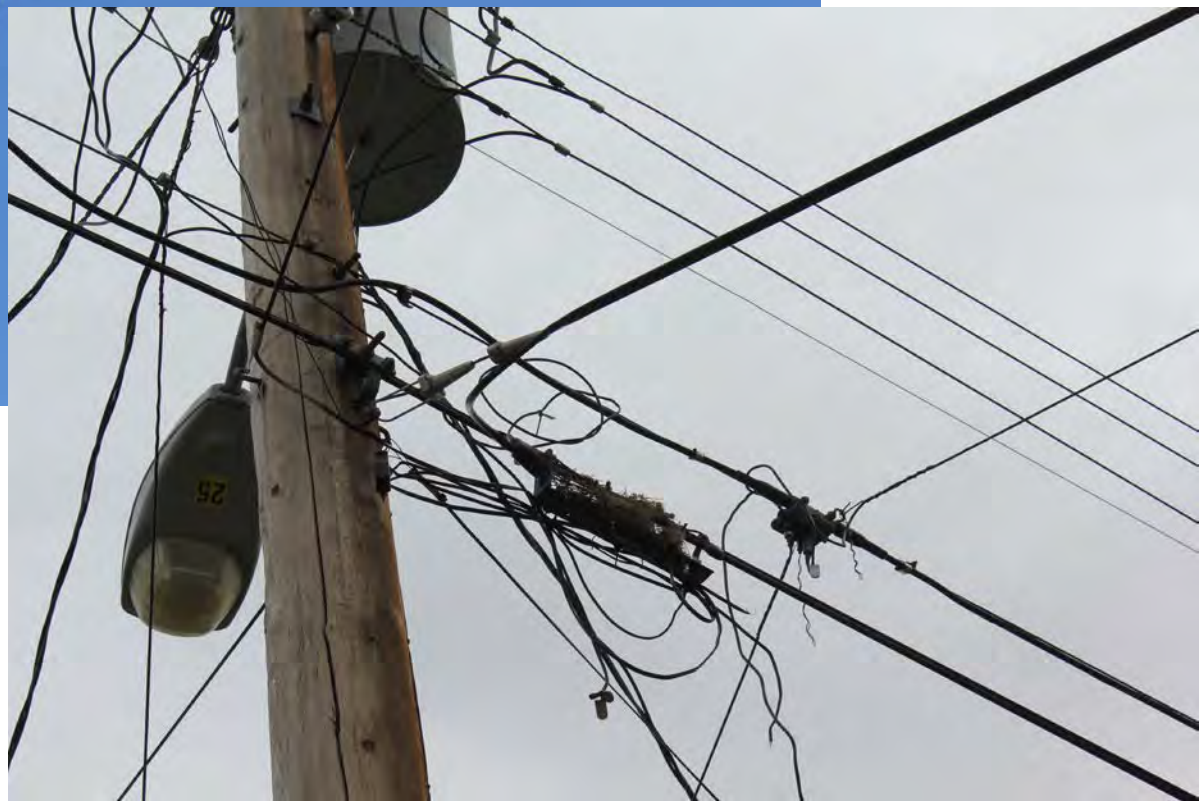
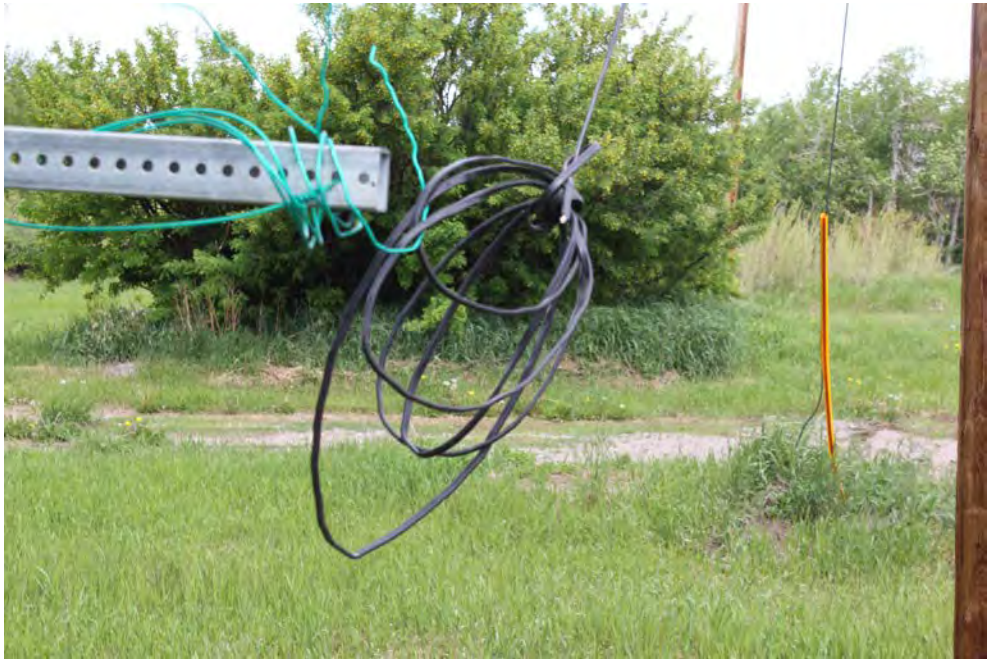
EXHIBIT 1: 3 RIVERS AERIAL PLANT TO BE ABANDONED AND REMOVED



3 RIVERS AERIAL PLANT TO BE ABANDONED AND REMOVED



3 RIVERS BURIED PLANT TO BE ABANDONED AND REMOVED

E X H I B I T 2

Broadband USA Applications Database

Applicant Name: 3 Rivers Telephone Cooperative, Inc.

Project Title: 3 Rivers - Browning, MT FTTP System

Project Type: Last Mile Non-Remote

_____Executive Summary_____

Opportunities the Proposed System Seeks to Address 3 Rivers Telephone Cooperative Inc.'s proposed Fiber to the Premises (FTTP) project will provide broadband services to households, businesses, and key community organizations that are currently underserved. These broadband services will create the potential for increased business growth, public services, public safety, and quality of life for the residents of Browning, Montana. A General Description of the Proposed Funded Service Areas The proposed project will provide broadband services to the following communities: Browning Population: 8198 Status: underserved Number of Households and Businesses Passed The following is a summary of the number of households and businesses passed by the proposed project. With funding for this project, 3 Rivers Telephone Cooperative Inc. will be able to provide broadband services to all of these households and businesses. Household Quantity Passed: 2847 Business Quantity Passed: 129 The household quantities utilized throughout the application are based on 3 Rivers Telephone Cooperative Inc.'s actual maps and records for the proposed serving areas. Number of Community Anchor Institutions, Public Safety Entities, and Critical Community Organizations Passed and/or Involved with Project 3 Rivers Telephone Cooperative Inc.'s FTTP project will pass 37 strategic institutions including community anchor institutions, public safety entities, and critical community organizations. Through the broadband services and enhanced communications capabilities, the FTTP project will greatly improve the ability of these key community organizations to provide public services. Proposed Services and Applications for the Proposed Funded Service Areas and Users FTTP technology will enable 3 Rivers Telephone Cooperative Inc. the ability to offer a variety of communications and entertainment services, including interactive two-way broadband services, carrier-class telephony, digital multimedia and VoIP. Once a fiber distribution network is constructed, bandwidth is limited only by the electronics that are placed on the fiber. 3 Rivers Telephone Cooperative Inc. will not only be able to continue to provide the "triple play" services residents, businesses, and public institutions want today but also will create a system that can easily be upgraded in the future as the end user's needs evolve. Approach to Addressing the Non-discrimination and Interconnection Obligations The network will be available to any and all end-users that subscribe to the service(s) provided by the service provider, assuming that they are in good standing. The proposed network will not discriminate against any lawful Internet applications or content. The proposed network will not be a private network from the standpoint that it will be utilized by the end users and the World Wide Web. However, the proposed network could be used as a private network for businesses that span multiple locations. Type of Broadband System that will be Deployed 3 Rivers Telephone Cooperative Inc. is proposing to construct a FTTP outside plant and electronics network infrastructure. The FTTP network architecture would provide the customers of 3 Rivers

Telephone Cooperative Inc. access to broadband data services, voice and multimedia over one unified transport. It is 3 Rivers Telephone Cooperative Inc.'s intent to deliver the highest quality and the broadest range of telecommunications services that are available today, as well as, the maximum bandwidth to their subscribers. Services that will be available include high-speed Internet access, digital multimedia, and voice telephone services. Qualifications of the Applicant that Demonstrate the Ability to Implement and Operate a Broadband Infrastructure, and/or be a Sustainable Broadband Services Provider 3 Rivers Telephone Cooperative Inc. has a proven reputation of deploying applications that can reduce operating costs, increase services, improve customer satisfaction and increase revenue generation. 3 Rivers Telephone Cooperative Inc. has provided telecommunications services since 1953 and is headquartered in Fairfield, MT. 3 Rivers Telephone Cooperative Inc. is led by experienced key staff that can manage their established organization to successfully implement and operate the proposed broadband infrastructure. Key information demonstrating the qualifications of 3 Rivers Telephone Cooperative Inc. have been included in the application. Overall Infrastructure Cost of the Broadband System The overall infrastructure cost of the broadband system is $24,977,000. Overall Expected subscriber Projections for the Project The following is a summary of the five year broadband subscriber projections. Year 1: 310 Year 2: 386 Year 3: 444 Year 4: 488 Year 5: 512 Number of Jobs Estimated to be Created or Saved as a Result of this Project The FTTP project is estimated to create and save a significant number of jobs. These include jobs required for the construction of the outside plant network and installation of the network electronics. These jobs have been estimated based on the requirements of the project scope. Additionally, the broadband services will provide an opportunity for business and organizations to grow within the funded service area. The FTTP project construction is estimated to require 15,830 man-days. Additionally, 3 Rivers Telephone Cooperative Inc. anticipates that the project will foster job growth in the Browning serving area. This number of man-day work requirements and the job growth will have a great economical impact to this rural area.

David Gibson
CEO & General Manager
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Fairfield, MT 59436
(406) 467-4101
David.Gibson@3Rivers.Coop

3 RIVERS COMMUNICATIONS

February 7, 2014

EXHIBIT 3

Ms. Marlene Dortch
Secretary
Federal Communications Commission

The purpose of this letter is to express interest in participating in the Commission's Rural Broadband Experiment.

3 Rivers Communications is a telecommunications cooperative with headquarters in Fairfield, Montana. The cooperative provides voice, data, and video services to 15,000 customers along the eastern Rocky Mountain Front and has been in existence since 1953. We are the incumbent local exchange provider in 26 exchanges encompassing 17,000 square miles. With an average density of less than one customer per square mile, 3 Rivers faces many challenges in bringing advanced services to our customers.

To provide our customers with the advanced services, notably broadband, 3 Rivers has been making major upgrades to its network. Through a combination of deploying new fiber-fed carrier systems and Fiber-To-The-Premise (FTTP), 95% of our customers have high-speed broadband available to them. The long-term solution to providing the ever increasing bandwidth our most rural customers need is to replace copper with fiber. The loop lengths required to reach many of our customers is simply too great to provide reliable high-speed broadband. Because fiber is relatively distance insensitive, it is the only way to provide high bandwidth, particularly when we look to the future when customers will need 100+ mbps speeds. To date 3 Rivers has provided FTTP to about 25% of our customers, both residential and business. Our deployment of fiber is slowed by two factors. First, we have a relatively short construction season within which to work. Second is the tremendous cost of deploying fiber. Based on the eight most recent exchange-wide projects, the average cost is approximately $17,000 per customer.

One of 3 Rivers' largest exchange is Browning, MT, which includes almost all the residences and businesses on the Blackfeet Reservation – a very large reservation located in North Central Montana. About 2,000 of those customers live in the towns of Browning and Heart Butte and generally have 6 mbps broadband available to them. Most of the anchor institutions have a FTTP connection and all can get 50 mbps service. But approximately 750 customers, primarily residential, live too remotely to receive any more than 1 mbps service.

Our project is to upgrade our Browning Exchange so that all customers living on the Blackfeet Reservation have broadband speeds of at least 50 mbps available to them. We would accomplish this through a combination of electronics upgrades (deploying

VDSL) in the towns and FTTP for the most rural customers. The estimated cost for this project is about $15 million. 3 Rivers would match any funds received from the Broadband Experiment, so the request will be for approximately $7.5 million one-time funds. 3 Rivers would not require any subsequent funds to operate the network on the reservation.

The Blackfeet Reservation, like many across this nation, suffers from high poverty and high unemployment. About half of our customers there participate in the Tribal Lifeline program. And as the Commission has voiced on many occasions; reliable high-speed broadband is increasingly critical for educating people and driving economic vitality. While many factors affect economic growth on the Blackfeet Reservation, this project would eliminate one major impediment to that growth and provide much needed assistance to the Blackfeet Nation.

I look forward to seeing the rollout of the Rural Broadband Experiment.

Sincerely,

David Gibson
CEO and General Manager
3 Rivers Communications

United States Government Accountability Office

Report to Congressional Requesters

September 2018

BROADBAND INTERNET

FCC's Data Overstate Access on Tribal Lands

GAO-18-630

GAO Highlights

Highlights of GAO-18-630, a report to congressional requesters

September 2018

BROADBAND INTERNET

FCC's Data Overstate Access on Tribal Lands

Why GAO Did This Study

Broadband furthers economic development, educational attainment, and public health and safety; however, residents of tribal lands have lower levels of broadband access relative to the U.S. population. Congress has prioritized identifying and targeting funds to unserved areas. FCC uses data from broadband providers to develop maps and reports depicting broadband availability in the United States, with specific information on tribal lands. GAO was asked to review FCC's efforts to collect broadband data for tribal lands.

This report examines the extent to which: (1) FCC's approach to collecting broadband data accurately captures broadband access on tribal lands and (2) FCC obtains tribal input on the data. GAO interviewed stakeholders from 25 tribal governments or tribally owned providers, and visited nine tribal lands. The selected tribes varied geographically and in levels of broadband availability, among other characteristics. GAO also reviewed FCC's rulemakings on broadband data and interviewed other tribal stakeholders, FCC officials, and 13 non-tribal broadband providers selected to include a diversity of technologies. Provider and tribal interviews were based on non-generalizable samples.

What GAO Recommends

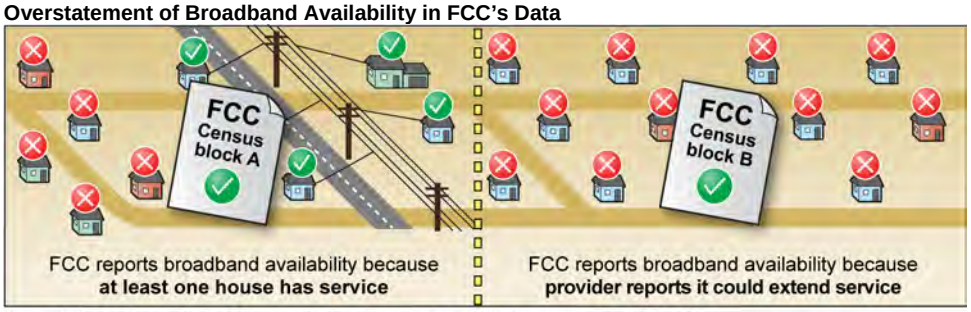
GAO is making three recommendations to FCC, including that it collect and report data that accurately measure tribal broadband access as well as develop a process to obtain tribal input on the accuracy of the data. FCC agreed with the recommendations.

View GAO-18-630. For more information, contact Mark L. Goldstein at (202) 512-2834 or goldsteinm@gao.gov.

What GAO Found

The Federal Communications Commission (FCC) collects data on broadband availability from providers, but these data do not accurately or completely capture broadband access on tribal lands. Specifically, FCC collects data on broadband availability; these data capture where providers may have broadband infrastructure. However, FCC considers broadband to be "available" for an entire census block if the provider *could* serve *at least one* location in the census block. This leads to overstatements of service for specific locations like tribal lands (see figure). FCC, tribal stakeholders, and providers have noted that this approach leads to overstatements of broadband availability. Because FCC uses these data to measure broadband access, it also overstates broadband access—the ability to obtain service—on tribal lands.

Overstatement of Broadband Availability in FCC's Data



Source: GAO analysis of Federal Communications Commission (FCC) documents. | GAO-18-630

Additionally, FCC does not collect information on several factors—such as affordability, quality, and denials of service—that FCC and tribal stakeholders stated can affect the extent to which Americans living on tribal lands can access broadband services. FCC provides broadband funding for unserved areas based on its broadband data. Overstatements of access limit FCC's and tribal stakeholders' abilities to target broadband funding to such areas. For example, some tribal officials stated that inaccurate data have affected their ability to plan their own broadband networks and obtain funding to address broadband gaps on their lands. By developing and implementing methods for collecting and reporting accurate and complete data on broadband access specific to tribal lands, FCC would be better able to target federal broadband funding to tribal areas that need it the most and to more accurately assess FCC's progress toward its goal of increasing all Americans' access to affordable broadband.

FCC does not have a formal process to obtain tribal input on the accuracy of provider-submitted broadband data. In the *National Broadband Plan*, FCC highlighted the need for a targeted approach to improve broadband availability data for tribal lands. As outlined in the plan, such an approach would include working with tribes to ensure that information is accurate and useful. About half of the tribal stakeholders GAO interviewed raised concerns that FCC relies solely on data from providers, and most stated FCC should work with tribes to improve the accuracy of FCC's data. Establishing a formal process to obtain input from tribal governments on the accuracy of provider-submitted broadband data could help improve the accuracy of FCC's broadband data for tribal lands.

Contents

Abbreviations

DSL	digital subscriber line
FCC	Federal Communications Commission
GPRA	Government Performance and Results Act
GPRAMA	GPRA Modernization Act of 2010
LTE	long-term evolution
Mbps	megabits per second
NCAI	National Congress of American Indians
NTIA	National Telecommunications & Information Administration
ONAP	Office of Native Affairs and Policy
Recovery Act	American Recovery and Reinvestment Act of 2009
USDA	United States Department of Agriculture

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

September 7, 2018

The Honorable John Hoeven
Chairman
The Honorable Tom Udall
Vice Chairman
Committee on Indian Affairs
United States Senate

The Honorable John Barrasso
The Honorable Maria Cantwell
The Honorable Steve Daines
The Honorable Martin Heinrich
The Honorable Heidi Heitkamp
The Honorable Brian Schatz
The Honorable Jon Tester
United States Senate

Broadband infrastructure is critical for economic development, educational and job opportunities, and public health and safety. In 2016, we reported that tribal lands are generally in remote and rugged areas and that broadband access can help residents develop online businesses, access telemedicine services, and use online educational tools.[1] However, residents of tribal lands have lower levels of broadband access than residents of non-tribal lands; a reflection of what is often called the "digital divide," or disparate levels of broadband access among different socioeconomic, racial, or rural groups. According to the Federal Communications Commission (FCC), as of December 2016, 35.4 percent of Americans residing on tribal lands lacked access to fixed broadband

[1] GAO, *Telecommunications: Additional Coordination and Performance Measurement Needed for High-Speed Internet Access Programs on Tribal Lands*, GAO-16-222 (Washington, D.C.: Jan. 29, 2016).

services, compared to 7.7 percent of all Americans.[2] FCC has reported that the lack of service in tribal lands presents impediments to the efforts of tribal nations related to self-governance, economic opportunity, education, public safety, and cultural preservation.[3]

One barrier to increasing access to broadband on tribal lands is the cost of deploying infrastructure to tribal lands located in rugged, sparsely populated areas. In an attempt to address this and other issues, the federal and some state governments have administered a number of programs to incentivize companies to build broadband infrastructure in unserved and underserved areas. In addition, policy makers have noted the need for accurate information in order to target these programs to the areas lacking access, and FCC has identified the need to work with tribes to ensure such data are accurate for tribal lands. However, in 2016 we reported that tribal and federal officials had concerns that the federal map of broadband availability at the time (the National Broadband Map) did not accurately depict broadband availability on tribal lands.[4]

The federal government has not updated the National Broadband Map since April 2015, with the last update containing data as of June 30, 2014.[5] Currently, the primary source of information regarding where

[2] For the purposes of this report, to determine which high-speed internet services qualify as "broadband," we are using the threshold for "advanced telecommunications capability" as used by FCC in its 2018 *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion,* 2018 Broadband Deployment Report, 33 FCC Rcd 1660 (2018) (Broadband Deployment Report). Therefore, the estimate of broadband access above refers to services capable of providing speeds of 25 megabits per second (Mbps) download and 3 Mbps upload. Megabits per second is a measure of the network's data transfer rate (speed) and refers to the number of bits per second that travel to a user's device (the download speed) and from a user's device (the upload speed). The estimate also does not include satellite services, as FCC currently reports on these services separately and until recently, satellite providers were not capable of providing broadband speeds, according to FCC officials. For the purposes of this analysis, mobile broadband refers to long-term evolution (LTE) services. LTE is an industry standard that is part of the fourth generation of wireless telecommunications technology, which is currently in common use.

[3] *Improving Communications Services for Native Nations,* Notice of Inquiry, 26 FCC Rcd 2672, 2673 (2011).

[4] GAO-16-222.

[5] However, Congress recently provided $7.5 million to the National Telecommunications and Information Administration (NTIA) to update the National Broadband Map in conjunction with FCC and the states. Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, 132 Stat. 348 (2018). In addition, as discussed later, FCC began collecting and creating maps of its own broadband data.

broadband is and is not available is the FCC, which collects this information from broadband providers. You asked us to review FCC's efforts to collect broadband data for tribal lands. This report examines:

- the extent to which FCC's approach to collecting broadband availability data accurately captures the ability of Americans living on tribal lands to access broadband Internet services, and
- the extent to which FCC obtains tribal input on the accuracy of provider-submitted broadband data for tribal lands.

To address both objectives, we analyzed FCC's December 2016—the most recent data at the time of our review—fixed and mobile broadband-availability data for federally recognized tribal lands.[6] Providers currently report this information to FCC by filing a Form 477, twice a year. We also used 2010 U.S. Census data to identify census blocks on tribal lands. To assess the reliability of FCC and Census data, we reviewed a previous GAO reliability assessment and performed additional work, such as electronic testing of the data and interviews with agency officials.[7] Based on the results of our analysis, we determined the data to be reliable for our purposes, which were to (1) inform our selection of tribal governments and providers for interviews and visits and (2) develop maps of fixed and mobile broadband availability for the 9 tribal lands we selected for visits, in order to obtain tribal representatives' feedback on the accuracy of the data. For both objectives, we also reviewed FCC documents regarding the Form 477 process and interviewed FCC officials as well as stakeholders representing tribal governments and broadband providers. These interviews included representatives from 25 tribal governments or tribally owned providers, including visits to 9 tribal lands. When we selected these tribes, we considered variation in location, level of

[6] We defined federally recognized tribal lands consistent with FCC's definition in its 2018 Broadband Deployment Report. Specifically, we considered tribal lands to be: (1) Joint Use Areas; (2) legal federally recognized American Indian area consisting of reservation and associated off-reservation trust land; (3) legal federally recognized American Indian area consisting of reservation only; (4) legal federally recognized American Indian area consisting of off-reservation trust land only; (5) Statistical American Indian area defined for a federally recognized tribe that does not have reservation or off-reservation trust land, specifically a Tribal Designated Statistical Area (TDSA) or Oklahoma Tribal Statistical Area (OTSA); (6) Alaskan Native village statistical area; and (7) Hawaiian Home Lands established by the Hawaiian Homes Commission Act of 1921. *See* 33 FCC Rcd 1660 (2018).

[7] We reviewed the data reliability assessment from GAO, *Broadband: Additional Stakeholder Input Could Inform FCC Actions to Promote Competition*, GAO-17-742 (Washington, D.C.: Sept.19, 2017).

broadband deployment according to FCC, land mass, and population size and density. The results of our interviews are not generalizable to all tribal governments or tribally owned broadband providers. In addition to tribal governments and tribally owned providers, we interviewed six organizations that include tribal entities and four stakeholders who work with tribes on broadband issues. For reporting purposes, we developed the following series of indefinite quantifiers to describe the tribal responses from the 35 entities representing tribal stakeholders we interviewed.

- 3 to 7 is defined as “a few.”
- 8 to 15 is described as “some,”
- 16 to 20 is described as “about half,”
- 21 to 27 is described as “most”; and
- 28 to 34 is described as “almost all.”

Further, to obtain industry perspectives, we reviewed public comments submitted by providers and industry associations in relevant FCC rulemaking proceedings and interviewed 10 non-tribally owned fixed and mobile broadband providers and three industry associations. We selected providers to reflect a range of carrier size, as well as the technologies used to provide broadband service. In addition, we interviewed representatives from other government entities, as well as private companies that collect and report broadband data. The results of these interviews are not generalizable. A full list of the stakeholders we interviewed can be found in appendix I.

In addition, to identify the extent to which FCC’s approach to collecting broadband data accurately captures Americans’ ability to access broadband Internet services on tribal lands, we identified factors that affect broadband access by interviewing tribal stakeholders, as described above, and reviewing FCC documents and previous GAO work.[8] We also reviewed relevant statutes and FCC’s proceedings, plans, and broadband

[8] GAO-16-222.

deployment and progress reports.[9] We compared the Form 477 process to FCC's strategic goals and to factors affecting broadband access to determine the extent to which the Form 477 collects information on those factors and aligns with FCC's goals. We further evaluated this information against the *Government Performance and Results Act (GPRA), as enhanced by the GPRA Modernization Act of 2010 (GPRAMA)* and *Standards for Internal Control in the Federal Government*.[10]

To determine the extent to which FCC obtains tribal input on the accuracy of provider-submitted broadband data for tribal lands, we reviewed FCC's policies for working with tribal governments and interviewed tribal stakeholders, among other entities.[11] We compared this information to recommendations from FCC's *National Broadband Plan*, and *Standards for Internal Control in the Federal Government*.[12] For additional details on our scope and methodology, see appendix II.

We conducted this performance audit from June 2017 to September 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that

[9] *Modernizing the FCC Form 477 Data Program*, Further Notice of Proposed Rulemaking, 32 FCC Rcd 6329 (2017); *Connect America Fund Universal Service Reform – Mobility Fund*, Order on Reconsideration and Second Report and Order, 32 FCC Rcd 6282 (2017); *Instructions for Filing 4G LTE Coverage Data to Determine Areas Presumptively Eligible for Mobility Fund II Support*, Public Notice, 32 FCC Rcd 7023 (2017). FCC, *Strategic Plan 2018-2022* (Washington, D.C.); FCC, *Connecting America: The National Broadband Plan*; 33 FCC Rcd 1660 (2018); *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2016 Broadband Progress Report, 31 FCC Rcd 699 (2016) "Broadband Progress Report."

[10] Government Performance and Results Act, Pub. L. No. 103-62, 107 Stat. 285 (1993), as enhanced by GPRA Modernization Act of 2010, Pub. L. No. 111-352, 124 Stat. 3866 (2011); GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: September 2014).

[11] *Statement of Policy on Establishing a Government-to-Government Relationship with Indian Tribes*, Policy Statement, 16 FCC Rcd 4078 (2000); 47 C.F.R. § 54.313 (a)(5); *Further Guidance on Tribal Government Engagement Obligation Provisions of the Connect America Fund*, Public Notice, 27 FCC Rcd 8176 (2012).

[12] *Connecting America: The National Broadband Plan*, Notice of Inquiry and Notice of Proposed Rulemaking, 25 FCC Rcd 6657 (2010) and GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: September 2014).

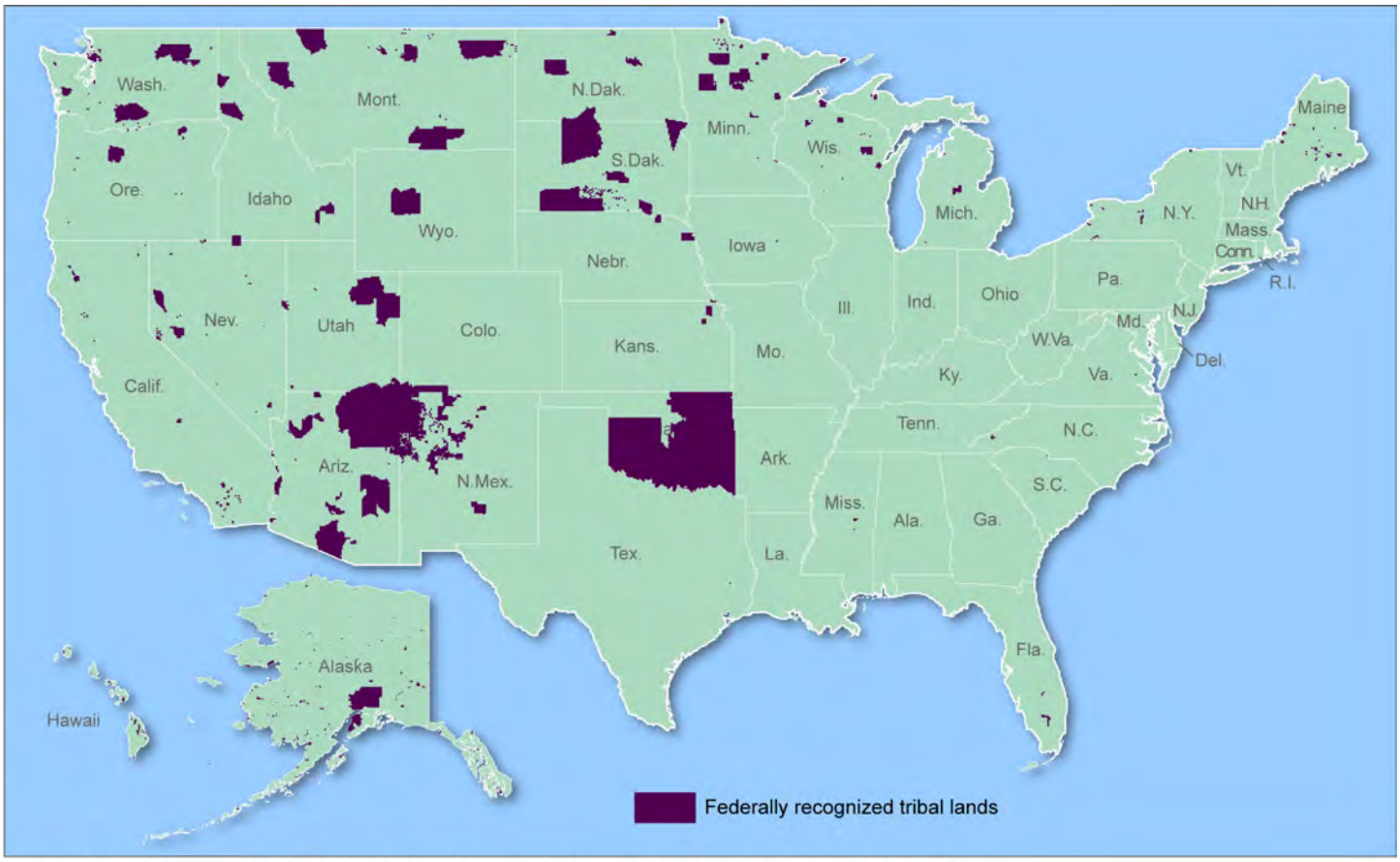
the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

The federal government has recognized 573 Indian tribes as distinct, independent political communities with tribal sovereignty. There are different categories of tribal lands, with differing implications with respect to ownership and administration. Reservations are defined geographic areas with established boundaries recognized by the United States.[13] Tribal lands vary in size, demographics, and location. For example, those lands smallest in size are less than one square mile, and the largest, the Navajo Nation, is more than 24,000 square miles (the size of West Virginia). Tribal land locations can range from extremely remote, rural locations to urban areas. Figure 1 shows tribal lands in the United States according to the 2010 Census.

[13]The land within the reservation's boundaries may include a mixture (or checkerboard) of tribal, individual Indian, and non-Indian land. Tribal and individual Indian land may be held in trust, restricted, or fee status. The allotment and assimilation period, which began with The General Allotment Act in 1887 (also known as the Dawes Act) included a number of federal efforts to divide tribal lands into individual parcels, give each tribal member a parcel, and sell the "surplus' parcels to non-Indians. In some cases, the United States government still holds individual allotments in trust, while others have transferred to private (Indian and non-Indian) ownership. In addition, restricted status, or restricted fee lands, are lands for which the title to the land is held by an individual Indian person or a tribe and "which can only be alienated or encumbered by the owner with the approval of the Secretary of the Interior because of limitations contained in the conveyance instrument pursuant to federal law." In addition, some tribes have purchased land within and outside of their reservation's boundaries.

Figure 1: Map of Federally Recognized Tribal Lands



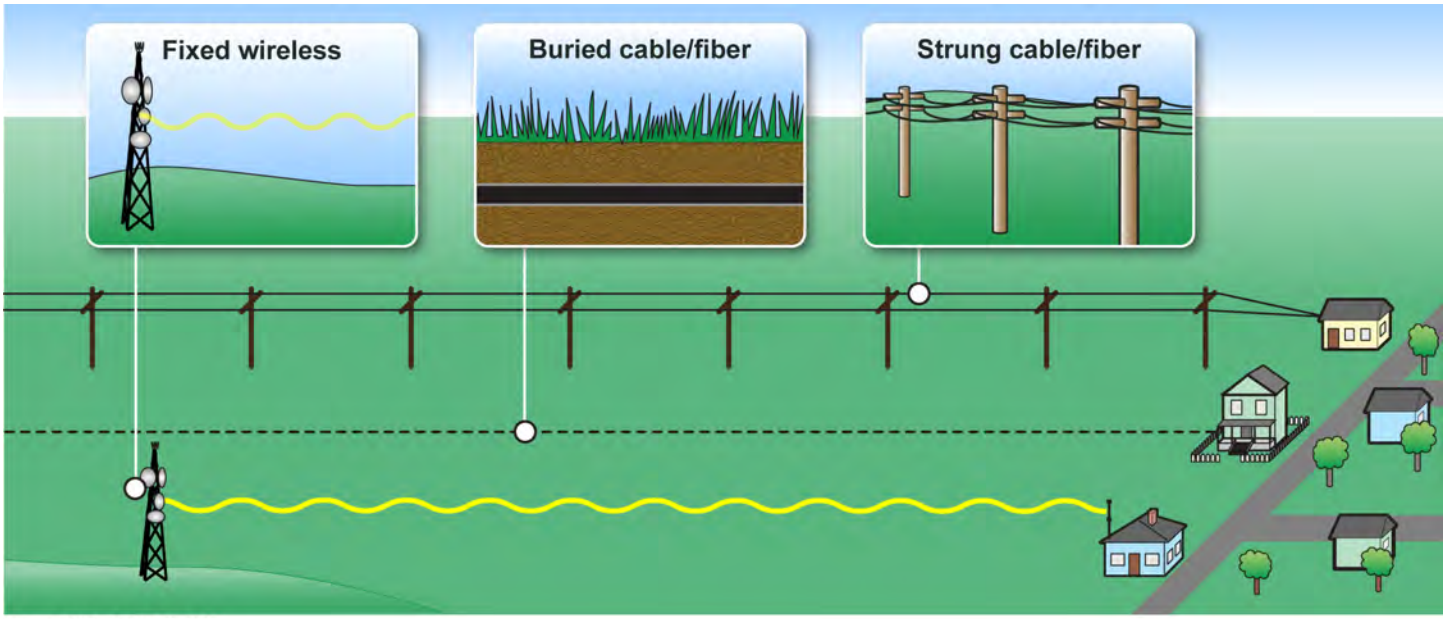
Source: GAO, based on U.S. Census Bureau data and the Federal Communications Commission's definition of tribal lands. | GAO-18-630

The term "broadband" commonly refers to Internet access that is high speed and provides an "always-on" connection, so users do not have to reestablish a connection each time they access the Internet. Broadband service may be "fixed"—that is, providing service to a single location, such as a customer's home—or "mobile," that is, providing service wherever a customer has access to a mobile wireless network, including while on the move, through a mobile device, such as a smartphone. Fixed and mobile broadband providers deploy and maintain infrastructure to connect consumers to the Internet.

Providers offer fixed Internet service through a number of technologies, such as copper phone lines, fiber-optic lines, coaxial cables, wireless

antennas, satellites,[14] or a mix of technologies (see fig. 2). To install fixed or wireless infrastructure, providers must obtain permits from government entities with jurisdiction over the land or permission from public utilities to deploy infrastructure on existing utility poles.

Figure 2: Examples of Fixed Broadband Technologies



Source: GAO. | GAO-18-630

The federal government has emphasized the importance of ensuring Americans have access to broadband, and a number of agencies, including FCC, currently provide funding to subsidize broadband deployment in areas in which the return on investment has not attracted private investment. The Communications Act of 1934, as amended by the Telecommunications Act of 1996, specifies that consumers in "rural, insular, and high-cost areas" should have access to telecommunication services and rates that are "reasonably comparable" to consumers in

[14] We did not include satellite broadband in our assessment of broadband availability on tribal lands because FCC concluded in its 2016 Broadband Progress Report that this type of service had not yet reached FCC's speed benchmark of 25 Mbps/3 Mbps. In the 2018 Broadband Deployment Report, FCC noted that some satellite services were reporting providing speeds of 25 Mbps/3 Mbps, but did not include these services in its data tables depicting broadband deployment on tribal lands.

urban areas.[15] To achieve this goal, FCC administers the High-Cost program, which provides subsidies to providers of phone service in rural, insular, and other remote areas.

In 2011, FCC launched a series of reforms to its High-Cost program, including adding support for broadband services, and created the Connect America Fund, which provides subsidies to fixed and mobile providers of telecommunications and broadband services in rural, insular, and other remote areas where the costs of providing service is high. To be eligible for Universal Service Fund support from FCC, a provider must be designated an Eligible Telecommunications Carrier by the appropriate state or by FCC and must meet certain service obligations.[16] The Connect America Fund has distributed approximately $4.5 billion per year, and has separate funding mechanisms targeted to specific goals. For example, there are funds for fixed-phone and broadband service and funds for mobile service, including a Tribal Mobility Fund (Phase 1) that awarded nearly $50 million in 2014 for the provision of 3G and 4G service to unserved tribal areas.

In addition to FCC, a number of other agencies provide funding for broadband deployment in unserved or underserved areas. For example, the United States Department of Agriculture's Community Connect Program, which provides grants to rural communities to provide high-speed Internet service to unserved areas.[17]

The American Recovery and Reinvestment Act of 2009 (Recovery Act) mandated the development of a nationwide map of broadband availability.[18] To implement the act, the National Telecommunications & Information Administration (NTIA)—an agency within the Department of Commerce—established a grant program to enable U.S. states and

[15] 47 U.S.C. § 254(b)(3).

[16] 47 C.F.R. § 54.201(a)(1). The Universal Service Fund is paid for by contributions from providers of telecommunications based of an assessment on their interstate and international end-user revenues.

[17] There are a variety of federal programs that can be used to fund broadband deployment, including additional USDA programs. NTIA maintains a list of funding resources at: NTIA, *Funding*, accessed May 29, 2018, https://broadbandusa.ntia.doc.gov/funding-list.

[18] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009).

territories to collect state-level broadband mapping data. NTIA used these data to launch the National Broadband Map (www.broadbandmap.gov) in February 2011. As the funding for the NTIA's program came to an end in 2014, NTIA stopped collecting data to update the map and, according to FCC officials, created a memorandum of understanding with FCC through which FCC agreed to maintain public access to the last version of the map. FCC issued rules in 2013 to begin collecting broadband deployment data, in addition to the broadband subscription data it had collected from providers since 2000. FCC sought, but did not receive, $3 million to update the National Broadband Map in its fiscal year 2015 and fiscal year 2016 budgets. In 2018, Congress directed FCC to develop a report by March 23, 2019, evaluating broadband coverage in certain tribal lands (to include an assessment of areas that have adequate broadband coverage, as well as an assessment of unserved areas), and to complete a proceeding to address unserved areas by September 23, 2020.[19] Currently, FCC requires broadband providers to report on their broadband deployment by filing a form twice a year (Form 477).[20]

- Fixed broadband providers submit a list of the census blocks in which their broadband service is available, and
- mobile providers submit "shapefiles"—a geospatial depiction of the coverage area, which FCC refers to as "polygons"—of their coverage areas.

FCC uses providers' 477 data to develop a statutorily mandated annual report on advanced telecommunications capability.[21] In addition, in 2016, FCC began publishing its own maps of broadband deployment, using the information from providers' Form 477 filings. In February 2018, FCC

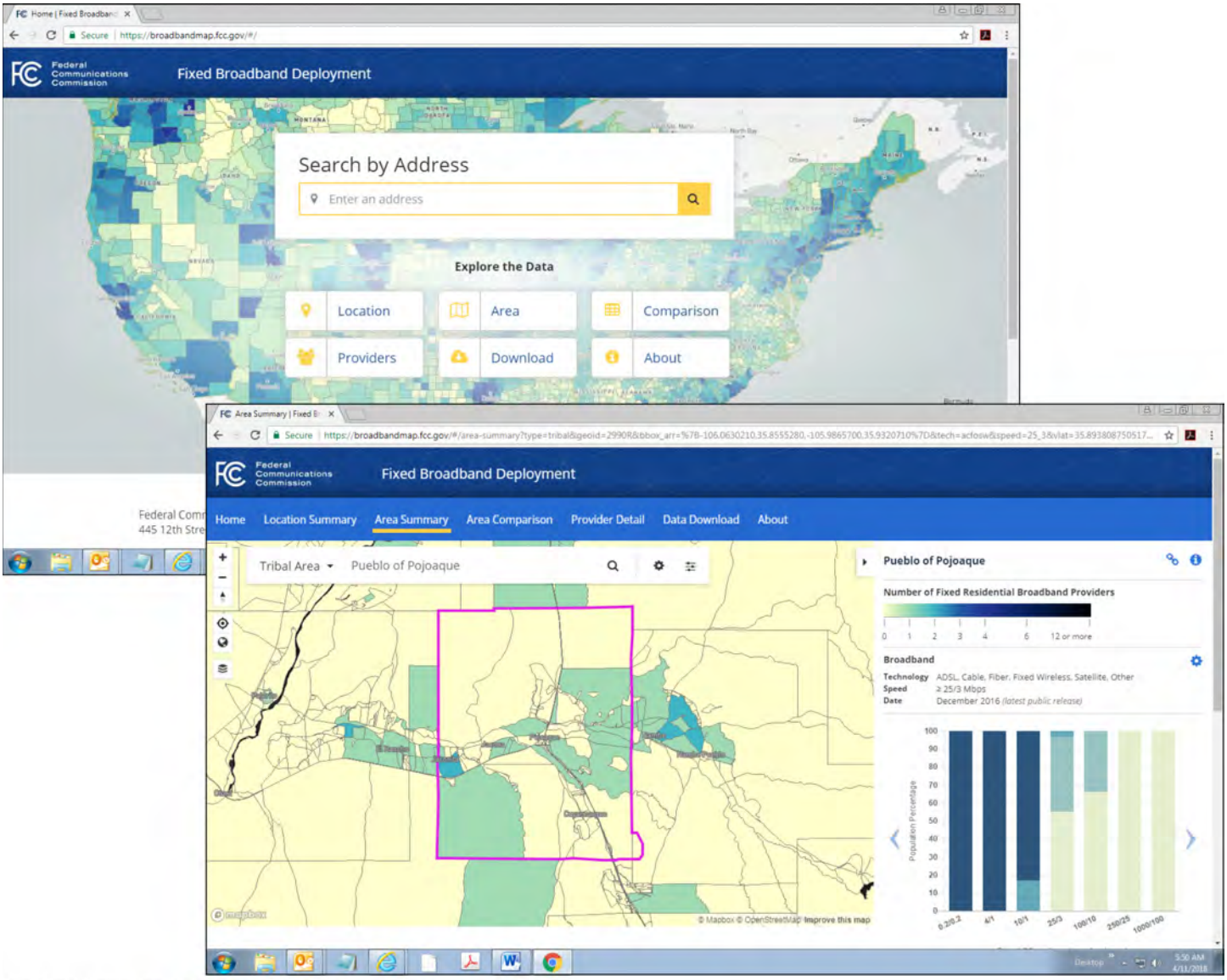
[19] The act specifically referred to Indian country (as defined in section 1151 of title 18, United States Code) and land held by a Native Corporation pursuant to the Alaska Native Claims Settlement Act. Consolidated Appropriations Act, 2018, div. P, §§ 508(a)(1), (a)(2)(B), (b).

[20] The Form 477 also collects information on subscribership: fixed providers report their number of subscribers in each census tract and mobile providers report their number of subscribers by state.

[21] Section 706 of the Communications Act of 1934, as amended by the Broadband Data Improvement Act, requires FCC to determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion, and regularly thereafter. 47 U.S.C. § 1302(b). Furthermore, advanced telecommunications capability is defined as high speed broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology. 47 U.S.C. § 1302(d)(1).

launched an updated map of fixed broadband deployment (https://broadbandmap.fcc.gov/#/). This map allows users to search for broadband deployment by address and provides summary-level statistics regarding broadband deployment in specific tribal lands (see fig. 3). According to FCC officials, this new map format will support more frequent data updates.

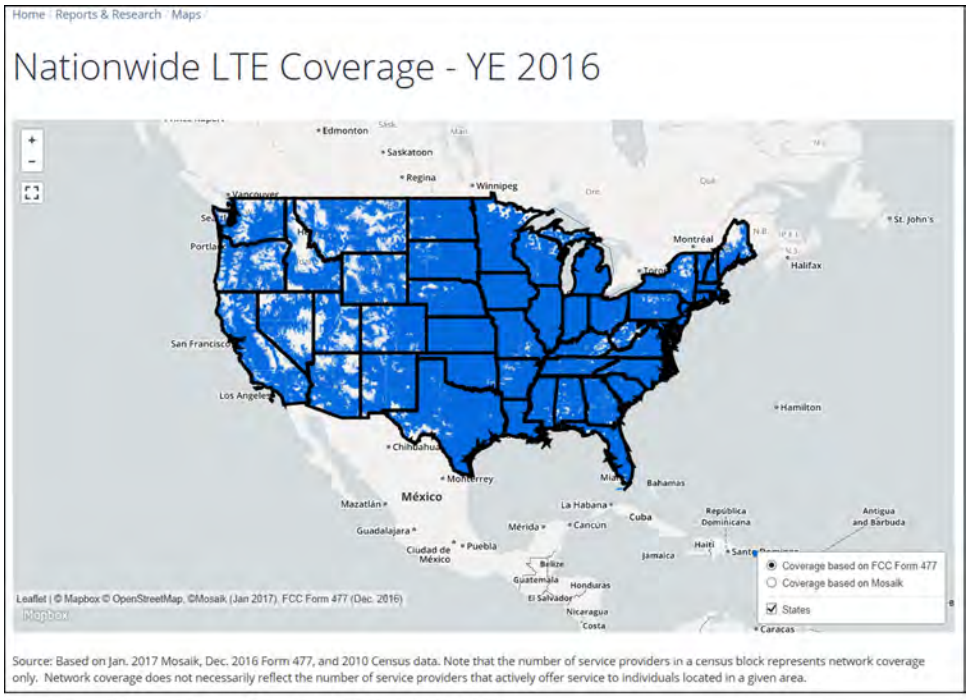
Figure 3: A Screenshot of FCC's Map Interface for Fixed Broadband Deployment (Background) and an Example of a Specific Map for a Tribal Area (Foreground)



Source: Federal Communications Commission (FCC). | GAO-18-630

FCC also provides national maps of mobile LTE coverage; these maps do not allow users to access data at the same level of granularity as the maps of fixed broadband (see fig. 4).[22]

Figure 4: Screenshot of FCC's Map of Nationwide Mobile Long-Term Evolution (LTE) Coverage



Source: Federal Communications Commission (FCC). | GAO-18-630

[22] See, for example: FCC, *Nationwide LTE Coverage – YE 2016,* (accessed May 30, 2018), https://www.fcc.gov/reports-research/maps/nationwide-lte-coverage-ye-2016/; and FCC, *LTE Coverage by Number of Providers – YE* 2016, (accessed May 30, 2018), https://www.fcc.gov/reports-research/maps/lte-coverage-number-providers-ye-2016/ .

FCC Collects Data on Broadband Availability but Lacks Accurate and Complete Data on Broadband Access on Tribal Lands

FCC collects and uses data that capture broadband availability to measure broadband access on tribal lands, leading to overstatements of broadband access on tribal lands.[23] Specifically, FCC's method of collecting mobile and fixed broadband data from providers (the Form 477) does not accurately or completely capture broadband access on tribal lands because it (1) captures nationwide broadband *availability* data—areas where providers may have broadband infrastructure—but does so in a way that leads to overstatements of availability, and (2) does not capture information on factors that FCC and tribal stakeholders have stated can affect broadband *access* on tribal lands, such as affordability, service quality, and denials of service.[24] Nonetheless, FCC uses its Form 477 broadband availability data in annual broadband deployment reports to measure the percentage of Americans living on tribal lands with or without access to broadband, and to measure progress toward FCC's strategic goal of increasing all Americans' access to affordable broadband.[25] By using broadband *availability* data to measure broadband *access* on tribal lands, FCC overstates broadband access on tribal lands.

[23] We use the term broadband availability to refer to broadband deployment. FCC officials noted that the data collected by the Form 477 reflects broadband deployment. We use the term broadband availability because FCC's Form 477 instructs fixed broadband providers to report fixed broadband deployment by submitting a list of census blocks in which the filer makes broadband connections available.

[24] FCC officials we interviewed stated that FCC has not defined the term "broadband access," and noted that the use of the term may vary across FCC documents. However, FCC and tribal stakeholders have noted that broadband access can be affected by factors such as the affordability and quality of the broadband services being offered and the extent to which providers deny service to those who request it. For example, see 2016 Broadband Progress Report 31 FCC Rcd 699 ¶ 62 (2016); FCC, *National Broadband Plan*; FCC, *Strategic Plan 2018-2022*. This is discussed in further detail below. FCC officials also identified the cost of deployment and regulatory barriers as important factors when determining whether an area has access to broadband.

[25] *See* 33 FCC Rcd 1660 ¶ 2 (2018). See also, for example, Appendix G – Americans (Thousands) Living on Tribal Lands with Access to Fixed Terrestrial 25 Mbps/3 Mbps Services and/or Mobile LTE with a Minimum Advertised Speed of 5 Mbps/1 Mbps by State. Prior to 2018, FCC referred to these reports as "Broadband Progress Reports." *Connecting America: The National Broadband Plan*, Notice of Inquiry and Notice of Proposed Rulemaking, 25 FCC Rcd 6657 (2010).

FCC Collects Broadband Availability Data, but Its Collection Method Leads to Overstatement of Availability on Tribal Lands

FCC's Form 477, its primary method of collecting nationwide broadband data, collects information on broadband availability, which identifies where providers have broadband infrastructure and could potentially provide broadband services but not where consumers can actually access those services. Moreover, the Form 477's mobile broadband data-collection methods are not standardized, and its fixed broadband data-collection methods are not sufficiently granular to provide information about broadband availability on tribal lands.

Mobile Broadband Data Collection

FCC's Form 477 requires mobile broadband providers to report their coverage areas by submitting geospatial data depicting the areas in which consumers could expect to receive the minimum advertised speed.[26] FCC has previously noted the importance of collecting nationally standardized, uniform broadband data from providers to assess broadband availability and allow for easy comparison across providers. However, the Form 477 does not require that providers use a standardized method with defined technical parameters (such as signal strength, or amount of interference) when determining their coverage area, resulting in data that cannot be meaningfully compared across providers, according to FCC. To map their coverage areas, providers may use predictive models based on different measurement methods and a variety of factors known to affect mobile broadband service such as topography, tree cover, and buildings, among other factors.

Providers and tribal stakeholders have expressed concern with the accuracy of FCC's mobile broadband data, and FCC has acknowledged concerns that the lack of a standardized method resulted in data that were unreliable for the purposes of determining mobile broadband coverage for specific geographic areas, such as tribal lands. About half of the tribal government representatives we interviewed told us that they believe FCC's data overstate mobile LTE broadband availability on their lands. For example, a few representatives expressed concerns with the accuracy of the mobile data in areas with varied terrain, such as mountains and valleys. In comments to FCC, broadband providers have also raised concerns regarding the accuracy of the mobile coverage data

[26] Mobile providers also submit a list of all census tracts in which the providers' service is advertised and available to actual and potential subscribers. FCC's requirement only applies to facilities-based mobile broadband providers, which are providers that provide services using their own network facilities and spectrum for which they hold a license, manage, or have obtained the right to use via a spectrum leasing arrangement. This would not include mobile voice service resellers.

generated by the Form 477 for the purposes of identifying areas eligible for funding through FCC's Mobility Fund Phase II program, which provides federal funding to increase mobile broadband services in unserved areas.[27] In 2017, in response to such concerns, FCC reversed its prior decision to use the Form 477 data to identify specific areas eligible for federal funding through the Mobility Fund Phase II program.[28] Instead, FCC undertook a one-time special data collection, for which it required providers to measure their coverage based on a common set of standards, in order to better identify unserved areas that would be presumptively eligible for funding.[29] FCC plans to allow parties, including tribal governments, to challenge the data where they believe the data overstate mobile broadband coverage through August, 2018.[30] Additionally, in an August 2017 Notice of Proposed Rulemaking, FCC requested comment on potential changes to modernize its Form 477 data collection, including whether it should require all providers to use a standardized method when submitting mobile coverage data on the form. FCC officials told us that they do not have a timeline for the development of a final rule, and as of August 2018, FCC had not yet issued a final rule on modernizing the Form 477.

Fixed Broadband Data Collection

The Form 477 collects fixed broadband data that are not sufficiently granular to accurately depict broadband availability on tribal lands. Specifically, FCC directs fixed broadband providers to submit a list of census blocks where service is available on the Form 477. FCC defines

[27] *See* 32 FCC Rcd 6282 (2017).

[28] As part of its universal service reforms, FCC established the Mobility Fund to target support for mobile service. For the Mobility Fund Phase 1, FCC identified unserved areas and held a reverse auction in 2012. In the reverse auction, eligible telecommunications carriers submitted "bids," outlining how much support they needed to serve specific unserved areas, and FCC awarded support based on the lowest bid as well as the number of road miles covered by the bids. In March 2017, FCC announced that it would be conducting another reverse auction to distribute up to $4.53 billion to providers that will deploy service to areas lacking LTE service (Mobility Fund Phase 2). FCC has not announced a date for the auction.

[29] Only providers that previously reported 4G LTE services on the Form 477 were required to submit data for FCC's Mobility Fund data collection. According to FCC, limiting the scope of the special data collection reduced the burden on providers, especially smaller providers. 32 FCC Rcd 6282 ¶ 11 (2017).

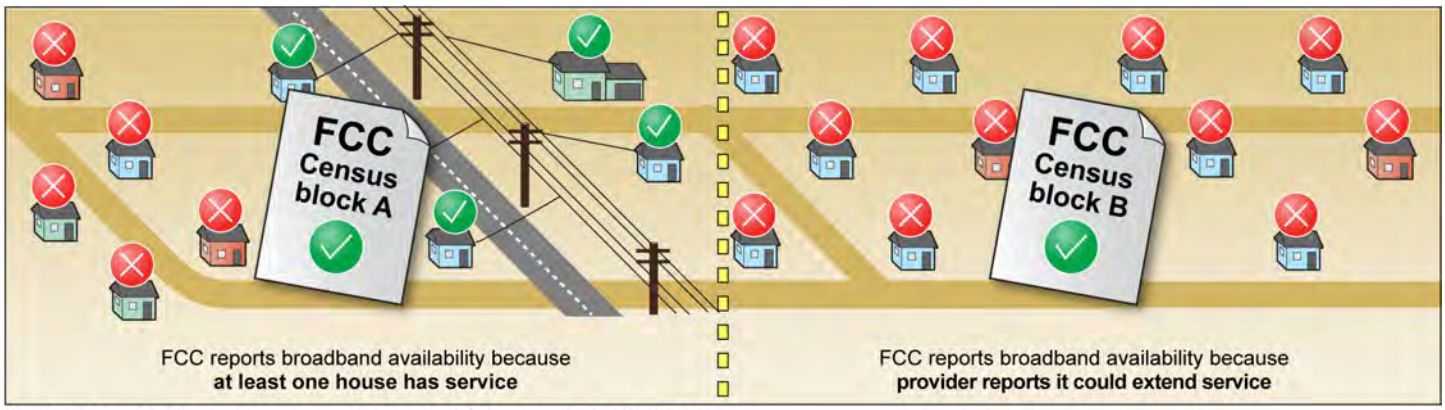
[30] In February 2018, FCC completed its initial analysis of the special data collection and released a map of areas it initially deemed eligible for the Mobility Fund Phase II auction based on the data. According to FCC, 64 entities have access to the challenge process as of May 2018, including 11 tribal governments.

"available" as whether the provider does—*or could, within a typical service interval or without an extraordinary commitment of resources*—provide service to *at least one* end-user premises in a census block.[31] Thus, in its annual reports and maps of fixed broadband service, FCC considers an entire block to be served if a provider reports that it does, or *could* offer, service to *at least one* household in the census block. FCC does not define a typical service interval or an extraordinary commitment of resources in its Form 477 instructions. However, FCC officials stated that providers should not report service in areas in which major construction would be required to provide service. A few providers told us that the lack of clear guidance from FCC regarding how to determine where broadband is available has led different providers to interpret the Form 477 directions in different ways, which can affect the accuracy and consistency of reporting from provider to provider. For example, in a filing with FCC, one provider stated that it had misapplied the definition of "available" and, as a result, overstated the availability of its services by almost 3,000 census blocks.[32] As shown in figure 5, FCC's definition of availability leads to overstatements of fixed broadband availability on tribal lands by: (1) counting an entire census block as served if only one location has broadband, and (2) allowing providers to report availability in blocks where they do not have any infrastructure connecting homes to their networks if the providers determine they could offer service to at least one household. Almost all the providers and private companies, and most of the representatives of tribal governments and organizations we spoke with told us that due to these issues, FCC's definition of availability results in data that overstate broadband availability.

[31] A "typical service interval" refers to the amount of time between when a customer requests service, and when a provider is able to begin providing service.

[32] 31 FCC Rcd 7790 (2016). FCC officials noted that there are more than 11 million total census blocks nationwide.

Figure 5: Overstatement of Broadband Availability in the Federal Communications Commission's Form 477 Data



Source: GAO analysis of Federal Communications Commission (FCC) documents. | GAO-18-630

According to FCC officials, FCC requires providers to report fixed broadband availability where they could provide service within a "typical service interval" and without "an extraordinary commitment of resources" in order to: (1) ensure that it captures instances in which a provider has a network nearby but has not installed the last connection to the homes, and (2) identify where service is connected to homes, but homes have not subscribed. FCC officials also told us that FCC measures availability at the census block level because sub-census block data may be costly to collect. In 2013, FCC considered collecting more granular nationwide data on broadband deployment but decided against collecting these data because it determined that the burden would outweigh the benefit.[33]

However, FCC, tribal stakeholders, and providers have noted that FCC's approach leads to overstatements of availability. For example, in its 2017 Notice of Proposed Rulemaking on modernizing the Form 477 data collection, FCC acknowledged that by requiring a provider to report where it *could* provide service, it is impossible to tell whether the provider would be unable or unwilling to take on additional subscribers in a census block it lists as served. According to FCC, this limits the value of the data to inform FCC policies. In addition, several providers and tribal stakeholders we interviewed said that some "digital subscriber line" (DSL) and fixed wireless providers may overstate their service areas on the Form 477

[33] *In the Matter of Modernizing the FCC Form 477 Data Program*, Report and Order, 28 FCC Rcd 9887 ¶ 35 (2013).

because they may not take into account technological or terrain limitations that would affect their ability to actually provide service.[34] FCC has also recognized that by measuring availability at the census block level, not every person will have access to broadband in a block that the data show as served, and FCC has noted that in rural areas, such as tribal lands, census blocks can be large and providers may only deploy service to a portion of the census block.[35] A few representatives for tribal governments and organizations noted that the use of census blocks may uniquely overstate broadband availability on tribal lands when census blocks contain both tribal and non-tribal areas, because availability in the non-tribal portion of the block can result in the tribal area of the census block also being counted as served.

FCC is considering requiring providers to report whether they are willing and able to serve additional customers in a census block and collecting sub-census block data in its 2017 proposed rulemaking on modernizing the Form 477.[36] About one-third of the parties that commented on FCC's proposals were not in favor of FCC collecting these more granular data on the Form 477, stating that the data would be less accurate and more burdensome for providers to collect and report, among other reasons, and questioned whether more detailed information on nationwide broadband availability is necessary.[37] We heard similar concerns from a few of the providers and trade associations we interviewed. However, about one-third of the parties that commented on FCC's proposals were in favor of collecting more granular data, stating that such data would be more useful for policymakers and more accurate. Additionally, a few tribally

[34] "Digital subscriber line" (DSL) service typically refers to internet services delivered over traditional copper phone lines.

[35] *Modernizing the FCC Form 477 Data Program*, Further Notice of Proposed Rulemaking, 32 FCC Rcd 6329 (2017).

[36] FCC requested comment on the cost and burden of requesting more detailed data from providers, namely, whether to require fixed broadband providers to submit information identifying areas where: (1) there are existing customers and a provider could add new customers within a standard time interval upon request; (2) existing customers are served but providers cannot add new customers; and (3) there are no existing customers but new customers could be added within a standard time interval upon request. FCC also requested comment on whether to collect more granular data, such as data by street address. 32 FCC Rcd 6329 (2017).

[37] For example, commenters raised concerns that the lack of addresses in rural areas, such as tribal lands, would impose a burden on providers that are required to file a Form 477 and that the use of inconsistent geolocation methodologies would result in inaccurate data.

owned and non-tribal providers we interviewed told us that providers already maintain data for business purposes that would allow them to report more granular information on broadband availability. One stakeholder we spoke with pointed out that, as the federal government and states work to ensure the last remaining unserved areas—rural, low-population density areas including tribal lands—have service, sub-census-block-level data are needed to ensure that governments are making wise and accurate investments.

FCC Does Not Collect Data on Several Factors That Affect Broadband Access on Tribal Lands

FCC does not collect information on several factors that FCC and tribal stakeholders have stated can affect broadband access. FCC and tribal stakeholders have noted that broadband access can be affected by factors such as the affordability and quality of the broadband services being offered, and the extent to which providers deny service to those who request it. By collecting and using data on factors that can affect broadband access, FCC would have more complete information on the extent to which Americans living on tribal lands have access to broadband Internet services.

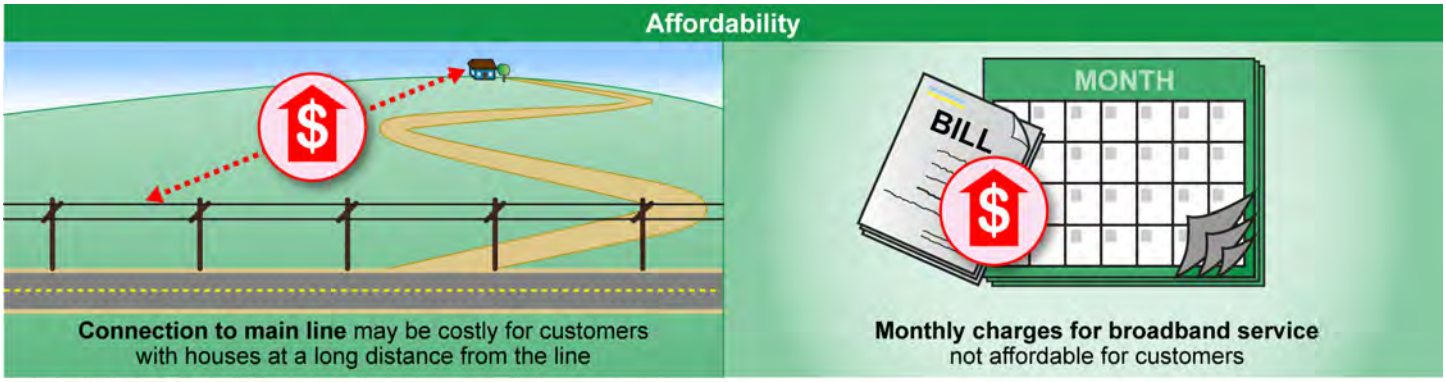
- *Affordability*: FCC has noted that affordability of broadband services can affect broadband access but does not collect information on the cost of broadband service on tribal lands on the Form 477. For example, in the *National Broadband Plan*, FCC cited affordable access to robust broadband service as a long-term goal, and in its *Strategic Plan 2018–2022*, FCC acknowledged that affordability is an important factor affecting broadband access and a key driver of the digital divide.[38] Moreover, most of the representatives of tribal governments and organizations we spoke to told us that the affordability of broadband services is an important factor for understanding whether or not people on tribal lands could realistically access broadband services.[39] Tribal government officials from one tribe we spoke with told us that residents on their lands cannot access broadband because it is too costly. For example, a provider that advertises services on the tribe's land charges $130 per month for

[38] FCC officials also noted that affordability is a key factor that affects whether people choose to subscribe to broadband services—known as "broadband adoption." As a result, according to officials, availability alone may be an incomplete indicator of broadband adoption.

[39] We have previously reported that tribal officials and providers identified affordability as a barrier to broadening the availability of services on tribal lands. GAO-16-222.

broadband services, approximately one-and-a-half times the average rate providers charge for comparable services in urban areas, according to FCC (see fig. 6).[40]

Figure 6: Examples of Scenarios That Affect Broadband Access: Affordability



Source: GAO. | GAO-18-630

In the 2018 Broadband Deployment Report, FCC acknowledged that affordability can influence a consumer's decision on whether to purchase broadband, but FCC did not consider cost in its assessment of broadband access on tribal lands, stating that pricing does not go to the congressional requirement to assess deployment and availability in conducting its inquiry as required by Congress under section 706 of the Telecommunications Act and also citing a lack of reliable comprehensive data on this issue. In addition, FCC officials we interviewed acknowledged that while broadband service may be technically available, it may be prohibitively expensive for some, which may make availability alone an incomplete indicator of broadband access.

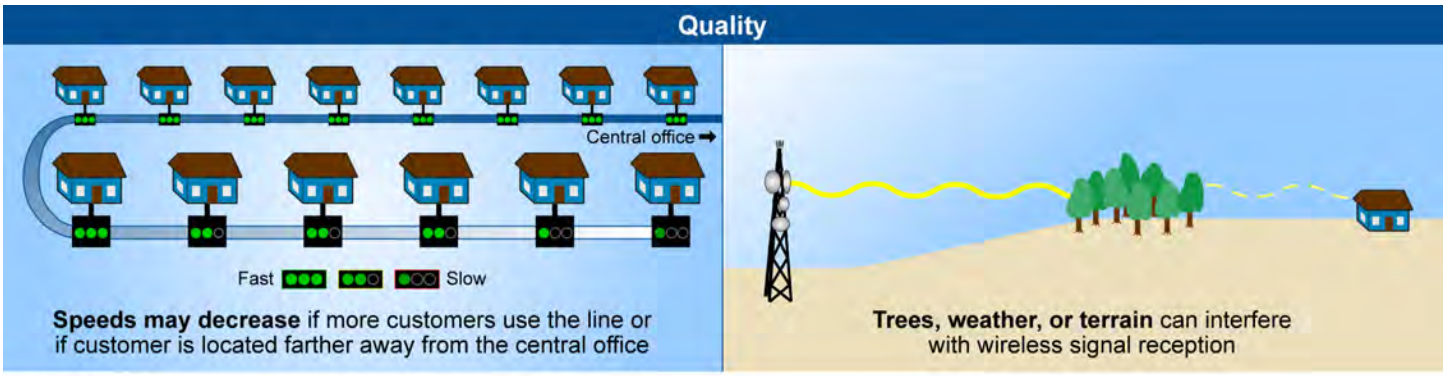
[40] Tribal government officials told us that this was the cost for services with maximum speeds of 10 megabits per second (Mbps)/4 Mbps. FCC's Urban Rate Survey collects information on the prices providers charge for fixed services in urban areas, in order to determine the benchmark rate Universal Service Fund recipients can charge customers. In its 2018 Urban Rate Survey, FCC surveyed providers to identify fixed broadband rates in urban areas and determined that the average rate plus two standard deviations for 10 Mbps/1 Mbps services ranged from $87.68 to $88.13. FCC uses the Urban Rate Survey to set rate benchmarks, and requires recipients of high-cost and/or Connect America Fund support to offer broadband services at rates that are at or below the relevant reasonable comparability benchmark.

- *Quality of Service*: In the *Telecommunications Act of 1996* Congress recognized the importance of service quality by defining advanced telecommunications capability as any technology that enables users to originate and receive *high-quality* voice, data, graphics, and video telecommunications. In keeping with this legislation, FCC has consistently set thresholds for speeds that qualify as broadband services and has stated that "latency" and consistency of service figure prominently into whether a broadband service is able to provide advanced capabilities and thus whether users can access high-quality telecommunications.[41] Likewise, almost all of the representatives for tribal governments or organizations we interviewed told us that quality of service is a key component of access to broadband and that routine outages, slow speeds, and high latency keep people on tribal lands from consistently accessing the Internet. Most tribal stakeholders and a few providers we interviewed told us that factors such as terrain, weather, and type of technology can all affect the quality of service an end user receives and, ultimately, the subscribers' ability to access the Internet (see fig. 7). For example, some representatives of tribal governments and organizations told us issues like oversubscription—when a provider signs up more customers than its equipment can handle—and outdated or limited infrastructure result in low-quality services that cannot support advanced and, in some cases, basic functions.[42]

[41] "Latency" refers to the amount of time it takes for data to travel from a computer to a server and back again. A high-latency network connection experiences long delay times, which can affect the performance of videoconferencing, phone, and streaming media services. In the 2016 Broadband Progress Report, FCC noted that latency may make a variety of applications unusable, regardless of the download/upload speeds being offered. 31 FCC Rcd 699 ¶ 62 (2016); FCC has made similar statements in other contexts as well. *See also In the Matter of 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 ¶ 24 (2015); FCC, *National Broadband Plan*; FCC, 2016 *Measuring Broadband America Fixed Broadband Report: A Report on Consumer Fixed Broadband Performance in the United States* (Washington, D.C.: 2016).

[42] Advanced functions include, for example, Voice over Internet Protocol (VOIP), videoconferencing, and video streaming. Basic functions would include, for example, e-mail.

Figure 7: Examples of Scenarios That Affect Broadband Access: Quality of Service



Source: GAO. | GAO-18-630

Though FCC uses the Form 477 to collect some data on advertised speeds from providers, FCC does not collect data on actual speeds, service outages, and latency on the form.[43] In its 2018 Broadband Deployment Report, FCC stated that it did not consider FCC data on actual speed, latency, or consistency of service when evaluating broadband access due to the lack of appropriate data. FCC noted that the lack of Form 477 data on actual speeds in particular constrained evaluation of mobile broadband access.[44]

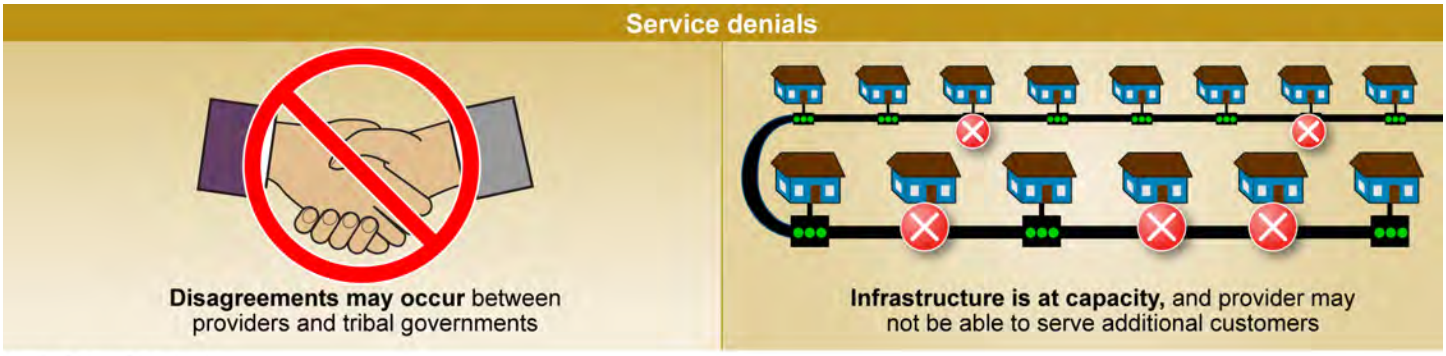
- *Service Denials*: FCC has recognized that information on denials of service is pertinent to understanding actual broadband access but does not collect data on service denials in the Form 477. Specifically, in the *National Broadband Plan*, FCC recommended that FCC collect

[43] On the Form 477, FCC collects data from providers on maximum advertised speeds for fixed broadband, and minimum advertised speeds for mobile broadband. In a 2011 Notice of Proposed Rulemaking on modernizing the Form 477 data program, FCC requested comment on whether to include measures of service quality, including service outages and latency, on the Form 477. In its subsequent 2013 Rule on the Form 477 program, FCC did not address the collection of service quality data, noting that this issue remained open for consideration. FCC did not address this issue in the 2017 Notice of Proposed Rulemaking on the 477 program. *Modernizing the FCC Form 477 Data Program,* Notice of Proposed Rulemaking, 26 FCC Rcd 1508 ¶¶ 91, 97-98 (2011); and *In the Matter of Modernizing the FCC Form 477 Data Program*, Report and Order, 28 FCC Rcd 9887 FN 29 (2013).

[44] 33 FCC Rcd 1660 ¶¶ 31-32 (2018). FCC also considered third-party data on actual speeds in its 2018 Report, but noted that these data have some limitations because they were not collected pursuant to statistical sampling techniques.

data to determine whether broadband service is being denied to potential residential customers based on the income of the residents in a particular geographic area. Some representatives of the tribal governments or organizations told us that that they were aware of a provider denying service to residents of tribal lands, despite the provider reporting broadband availability on at least a portion of those lands, according to our analysis of the Form 477 data. These representatives told us that they believed service was denied because of disputes with the tribal government, low demand for service, or the high costs of extending services to the home on tribal lands. Some representatives of tribal governments or organizations we spoke with also told us that providers may have denied service because their equipment was at capacity and could not accommodate new users (see fig. 8).

Figure 8: Examples of Scenarios That Affect Broadband Access: Service Denials



Source: GAO. | GAO-18-630

For example, on three of the tribal lands we visited, we observed fiber optic cable located close to government and residential structures that did not have broadband access via fiber. According to tribal government officials, despite the physical proximity of the fiber optic cable, the tribal government and residents could not access it because the provider was not offering service or was unwilling or unable to build to the structures. A few providers we interviewed stated that they may not provide services to individuals who request them because of high-costs, administrative

barriers, or technical limitations. However, FCC does not collect data on service denials on the Form 477.[45]

FCC Uses Broadband Availability Data to Measure Broadband Access on Tribal Lands, Overstating Access on Tribal Lands

In its *Strategic Plan 2018–2022* and the *National Broadband Plan*, FCC identified increasing all Americans' access to affordable broadband as a long-term, strategic goal.[46] Congress has similarly directed FCC to develop policies and programs aimed at increasing access to affordable broadband in all regions of the United States, including tribal lands, and required FCC to report annually on its progress.[47] According to the *Government Performance and Results Act (GPRA), as enhanced by the GPRA Modernization Act of 2010 (GPRAMA)*, agencies should use accurate and reliable data to measure progress toward achieving their goals. Additionally, *Standards for Internal Control in the Federal Government* state that agencies should use quality information—information that is complete, appropriate, and reliable—to inform decision-making processes and evaluate the agency's performance in achieving goals. According to these standards, agencies should also communicate quality information externally to achieve the agency's goals.

However, FCC has used its Form 477 data, which do not accurately or completely measure broadband access on tribal lands, as its primary source to evaluate progress toward FCC's strategic goal of increasing broadband access and to develop maps and reports intended to depict broadband access on tribal lands. For example, in its 2018 Broadband Deployment Report, FCC found that 64.6 percent of Americans residing on tribal lands have access to fixed broadband services. By using these data, FCC has overstated the extent to which Americans living on tribal lands can actually access broadband Internet services and FCC's progress toward increasing broadband access. As a result, the digital

[45] Separate from the Form 477 process, FCC used to collect information on "unfulfilled service requests," as part of an effort to determine whether certain broadband providers receiving funding were meeting obligations to offer broadband service upon a customers' reasonable request. However, FCC stopped requiring that providers submit data on unfulfilled requests after modifying the obligations to outline specific deployment thresholds, rather than requiring that service be available at a customer's "reasonable request." *In the Matter of Connect America Fund, ETC Annual Reports and Certifications*, Report and Order, 32 FCC Rcd 5944 ¶ 6 (2017).

[46] *See* FCC, *Strategic Plan 2018—2022*, Strategic Goal 1, and; FCC, *Connecting America: The National Broadband Plan*, Long-Term Goal No. 3.

[47] 47 U.S.C. § 1302(b); 47 U.S.C. §§ 254(b)(1), (b)(2).

divide may appear less significant as a national challenge, and FCC and tribal stakeholders working to target broadband funding to unserved or underserved tribal lands will be limited in their ability to make informed decisions. This increases the risk that residents living on tribal lands will continue to lack broadband access. Some tribal officials stated that inaccurate data have affected their ability to plan their own broadband networks and obtain federal broadband funding, and most of the tribal stakeholders we interviewed identified a pressing need for accurate data on the gaps in broadband access on tribal lands in order to ensure that tribes can qualify for federal funding and to effectively target the areas that need it most. For example, representatives for one tribal government that is providing broadband services said the government will not be able to use a federal grant to build broadband infrastructure in areas of their reservation that lack access, because the Form 477 data overstate actual access on the tribe's land. As more than three quarters of the tribal governments we spoke to are working to provide broadband services on their lands in some capacity, overstating broadband access on tribal lands could affect the ability of a number of tribes to access federal funding to increase broadband access on their lands.

As previously discussed, FCC is considering proposals to modify its Form 477 data collection as part of a 2017 Notice of Proposed Rulemaking, but FCC officials told us that the Commission does not have a timeline for issuance of a final rule. While some of FCC's proposals could help address some of the limitations identified above by, for example, collecting more granular nationwide broadband availability data, FCC has not addressed specifically the collection of more accurate and complete data on broadband access for tribal lands in this proceeding. FCC has identified the need to improve broadband data for tribal lands in particular, and as previously noted, in 2018 Congress directed FCC to develop a report evaluating broadband coverage in certain tribal lands and initiate a proceeding to address the unserved areas identified in the report.[48] FCC officials told us that FCC has not determined how it will address this requirement, but it is currently considering its options, including potentially addressing the requirement as part of its ongoing proposed rulemaking on modernizing the Form 477 data collection. An evaluation of broadband coverage on tribal lands that relies on the current Form 477 data would

[48] FCC, *Connecting America: The National Broadband Plan;* Consolidated Appropriations Act, 2018, div. P, §§ 508(a)(1), (a)(2)(B), (b).

be subject to the limitations described above, including the overstatement of broadband access on tribal lands.

Additionally, FCC has demonstrated that it is possible in some circumstances to collect more granular data when such data collection is targeted to a specific need or area. For example, in 2017 FCC began requiring certain providers that receive funding through the Connect America Fund to report the latitude and longitude of locations where broadband is available, and FCC has noted that these more granular data are extremely useful to the Commission, especially for rural areas where census blocks can be quite large.[49] A few large providers and trade associations similarly stated in public comments on FCC's proposed rulemaking to modernize the Form 477 process that FCC should target its collection of more granular broadband data to areas where the data are most likely to be overstated—specifically, large, rural census blocks with low population densities, such as those on tribal lands. Additionally, as discussed above, FCC undertook a one-time special data collection for Mobility Fund II to ensure that the mobile broadband data it collected would be reliable for the intended use. By developing and implementing methods for collecting and reporting accurate and complete data on broadband access specific to tribal lands, FCC would be able to better identify tribal areas without access to broadband and to target federal broadband funding to the tribal areas most in need.

[49] This requirement applies only to locations that were deployed or upgraded with Connect America Funds after May 25, 2016. Under this data collection, FCC requires providers to report broadband as available at locations where (1) there is a current subscriber, or (2) a provider could offer service within 10 days upon request, and to report maximum available—not actual—speeds. FCC began collecting geolocation data from some carriers in 2016 and is expanding this requirement to remaining recipients of Universal Service Funds on a rolling basis. 32 FCC Rcd 6329 (2017).

FCC Does Not Have a Formal Process to Obtain Tribal Input on Its Broadband Data, and Tribal Stakeholders Reported a Lack of Provider Engagement

FCC Does Not Have a Formal Process to Obtain Tribal Input on Its Broadband Data

FCC uses data submitted by broadband providers via the Form 477 process to develop maps and datasets depicting broadband services nationwide, and in specific locations, such as tribal lands, but does not have a formal process to obtain input from tribes on the accuracy of the broadband data. FCC's 2010 *National Broadband Plan* noted the need for the federal government to improve the quality of data regarding broadband on tribal lands and recommended that FCC work with tribes to ensure that any information collected is accurate and useful. It also noted that tribal representatives should have the opportunity to review mapping data about tribal lands and offer supplemental data or corrections. Similarly, federal internal control standards note the need for federal agencies to communicate with external entities, such as tribal governments, and to enable these entities to provide quality information to the agency that will help it achieve its objectives.[50] FCC officials told us that they address questions and concerns regarding provider coverage claims submitted to the Office of Native Affairs and Policy, which will work with tribal governments to help them identify inaccurate broadband data for tribal lands, and share tribal questions and concerns with the appropriate FCC bureaus.[51] However, FCC does not have a formal process for tribes (or other governmental entities) to provide input to ensure that the broadband data FCC collects through the 477 process, or the resulting maps that FCC creates to depict broadband on tribal lands, are accurate. Similarly, FCC does not use other methods to verify

[50] GAO-14-704G.

[51] FCC officials also stated that they conducted a more proactive outreach campaign to inform tribes of the ability to participate in the Mobility Fund Phase II challenge process, which is discussed earlier and later in this report.

provider-submitted Form 477 data on tribal lands against other sources of information, such as on-site tests or data collected by other agencies.[52]

When discussing the lack of a formal process for tribal representatives or other governmental entities to provide feedback on the accuracy of the 477 broadband data, FCC officials noted that if consumers and local officials have information on individual locations that lack broadband service, such information does not indicate that the entire census block lacks broadband service. Additionally, FCC officials noted that providers attest to the accuracy of the data and that FCC staff validate the data by conducting internal checks to identify possible errors, such as unlikely changes in a providers' coverage area, and may follow-up with a provider to discuss such changes. However, these checks do not include soliciting input from tribes.

About half of the tribal stakeholders we spoke to raised concerns that FCC's broadband deployment data rely solely on unverified information submitted by providers. Additionally, most tribal stakeholders we interviewed told us that consistent with the recommendations in the *National Broadband Plan*, FCC should work directly with tribes to obtain information from them to improve the accuracy of its broadband deployment data for tribal lands. These stakeholders identified several ways in which FCC could work with tribes on this issue, including:

- conducting on-site visits with tribal stakeholders to observe the extent to which broadband infrastructure and services are present;[53]
- conducting outreach and technical assistance for tribal stakeholders to raise awareness and use of FCC's broadband data; and
- providing opportunities for the tribes to collect their own data or submit feedback regarding the accuracy of FCC's data.

[52] For example, USDA's Rural Utilities Service sends field representatives to verify the presence or absence of broadband infrastructure before funding broadband grant projects. The field representatives may meet with local representatives as well as local providers, in addition to identifying any existing broadband infrastructure and testing the performance of the services provided. However, FCC officials said that they do not have the resources to conduct field tests of the data.

[53] FCC has done such site visits in the past and reported on discrepancies between their observations of broadband infrastructure on tribal lands and the National Broadband Map, noting, "[w]e walked along a route where a carrier had reported broadband service via fiber on the National Broadband Map, yet saw none." Federal Communications Commission, Office of Native Affairs and Policy, *2012 Annual Report* (2012).

FCC's *National Broadband Plan* notes the importance of supporting tribal efforts to build technical expertise with respect to broadband issues, and federal internal control standards state that federal agencies should obtain quality information from external entities.[54] Officials we interviewed in FCC's Office of Native Affairs and Policy told us that they provide some outreach and technical assistance to tribal officials at regional and national workshops, and FCC officials stated that they conducted specific outreach to tribal entities regarding the Mobility Fund Phase II challenge process,[55] while, about half of the tribal representatives we spoke to stated that they were not aware of the Form 477 data or corresponding maps, or raised concerns about a lack of outreach from FCC to inform tribes about the data. Some tribal stakeholders stated that if FCC were to solicit tribal input as part of its verification of the broadband data and maps, technical training and assistance could help tribes use and provide feedback on the data, or improve the collection and submission of their own data. A few of the stakeholders we interviewed noted that tribes can face difficulties when they attempt to challenge FCC's broadband availability data. For example, in 2013, prior to the auction that distributed Tribal Mobility Fund Phase 1 support, FCC allowed interested parties to challenge FCC's preliminary determinations regarding which census blocks lacked 3G or better service and would be eligible for support in the auctions.[56] However, all of the tribal entities that challenged the accuracy of FCC's data were unsuccessful in increasing the number of eligible areas. According to FCC officials, the tribal entities did not provide sufficient or sufficiently verifiable information to support their challenges. A few tribal stakeholders provided varying reasons for this, one of which was the need for more technical expertise to help the tribe meet FCC's requirements.

[54] GAO-14-704G.

[55] In commenting on a draft of this report, FCC described its outreach to tribal entities regarding the Mobility Fund Phase II challenge process as sending e-mails to the leaders and information technology managers of all 573 federally recognized tribes, conference calls and webinars open to all tribes, formal presentations at multiple inter-tribal conferences around the country, and a session at a tribal workshop conducted at the Lac du Flambeau Reservation in Wisconsin that was open to all tribes.

[56] In 2011, as part of its reform to the Universal Service Fund programs and the establishment of new funding mechanisms, FCC decided to use data from a third-party source to identify census blocks without wireless coverage, stating that it could not use Form 477 data due to a lack of census block-level data for wireless service or data from the National Broadband Map due to concerns regarding inconsistencies in how wireless services were reported.

Because FCC lacks a formal process to obtain tribal input on its broadband data, FCC is missing an important source of information regarding areas in which the data may overstate broadband service on tribal lands. Tribal stakeholders are able to provide a first-hand perspective on the extent to which service is available within their lands and the extent to which factors like affordability, service quality, and service denials affect residents' ability to access broadband. FCC plans to award nearly $2 billion in support from the Connect America Fund to areas that it has identified as lacking broadband, including tribal lands. Any inaccuracies in its broadband data could affect FCC's funding decisions and the ability of tribal lands to access broadband in the future.[57] Additionally, in its 2017 report on tribal infrastructure, the National Congress of American Indians stressed the importance of including tribal governments in a leadership role with respect to collecting data on local infrastructure needs.[58] Specifically, it stressed the need for the federal government to invest in tribal data systems and researchers to generate useful, locally specific data that can inform the development and implementation of infrastructure development projects and assess the effectiveness of those projects over time. By establishing a process to obtain input from tribal governments on the accuracy of provider-submitted broadband data that includes outreach and technical assistance, as recommended in the *National Broadband Plan*, FCC could help tribes develop and share locally specific information on broadband access, which would in turn improve the accuracy of FCC's broadband data for tribal lands. The success of such an effort may rely on the tribes' knowledge of, and technical ability to participate in, the process.

[57] As part of Connect America Fund Phase II, FCC is conducting a reverse auction by which providers submit bids for support to provide fixed broadband service to specific unserved areas. The auction is scheduled to begin July 24, 2018. FCC is not conducting a challenge process to determine whether any census blocks are incorrectly listed as having fixed broadband service, although it has conducted challenge processes in the past before awarding funds. In explaining this decision, FCC stated that a prior challenge process was time consuming and administratively burdensome, and it was difficult for challengers to prove that a company was not serving an area it claimed to serve. FCC also stated that the 477 data was reliable because providers are required to file the data and attest to its accuracy. *In the Matter of Connect America Fund, ETC Annual Reports and Certifications, Rural Broadband Experiments*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 5949 ¶¶ 58-59 (2016).

[58] National Congress of American Indians (NCAI), *Tribal Infrastructure: Investing in Indian Country for a Stronger America,* An initial report by NCAI to the Administration and Congress, 2017.

Half of the Tribal Stakeholders We Interviewed Reported a Lack of Provider Engagement

When discussing the need to improve data regarding broadband on tribal lands, FCC's 2010 *National Broadband Plan* recommended that FCC develop a process for tribes to receive information from providers about broadband services on tribal lands. In 2011, FCC required that Eligible Telecommunications Carriers (providers receiving Universal Service Funds from FCC) serving tribal lands meaningfully engage with tribes regarding communications services (including broadband).[59] Specifically, the providers must file an annual report documenting that this engagement included a discussion of, among other things, a needs assessment and deployment planning for communications services, including broadband. FCC's 2012 guidance on fulfilling the engagement obligations, which FCC officials confirmed is still in effect, noted that the stated goal of the engagement requirement was to benefit tribal government leaders, providers, and consumers by fostering a dialogue between tribal governments and providers that would lead to improved services on tribal lands. The guidance further noted that the tribal engagement process "cannot be viewed as simply another 'check the box' requirement by either party," and states that a provider should "demonstrate repeated good faith efforts to meaningfully engage with the tribal government."[60] Finally, FCC noted in its 2012 guidance that the guidance would evolve over time based on the feedback of both tribal governments and broadband providers and that FCC would develop further guidance and best practices.[61] This approach is consistent with federal internal control standards, which call for agencies to communicate with, and obtain quality information from, external parties.[62]

About half of the tribal stakeholders we interviewed raised concerns about difficulties accessing information from providers regarding broadband deployment on their tribe's lands, a key part of the provider engagement process, according to FCC's guidance. For example, a representative from one tribe stated that a provider declined his requests to meet more

[59] *In the Matter of Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663 (2011).

[60] *Office of Native Affairs and Policy, Wireless Telecommunications Bureau, and Wireline Competition Bureau Issue Further Guidance on Tribal Government Engagement Obligation Provisions of the Connect America Fund*, Public Notice, 27 FCC Rcd 8176 (2012).

[61] 27 FCC Rcd 8176 (2012).

[62] GAO-14-704G.

than once a year to discuss the provider's deployment of broadband services on the tribe's land. A representative from another tribal government stated that some providers are very focused and transparent about their broadband plans and work with the tribe, while other providers treat tribal engagement as a "box to check" and send the tribe broadband deployment information that is not useful because it is redacted. Similarly, some tribal stakeholders stated that providers heavily redacted deployment information (which providers may consider proprietary) or required the tribe sign non-disclosure agreements to access deployment data. According to one tribal stakeholder, these non-disclosure agreements could possibly require tribes to waive tribal sovereign immunity in order to view the data.

Some of the industry stakeholders we interviewed stated that they attempt to engage with tribes but the level of responsiveness from tribes varies. For example, some stakeholders stated that they send letters and do not hear back from tribes. One stakeholder stated that they make repeated attempts to contact tribes when they do not hear back after their initial contact, while another stated that a provider meets regularly with some tribes.

Although FCC stated in its 2012 guidance that it would update the tribal engagement guidance and develop best practices based on feedback from tribal governments and broadband providers, it has taken limited steps to obtain such feedback from providers and tribal governments to determine whether its guidance is enabling meaningful tribal engagement. Additionally, FCC has not updated the guidance or issued best practices.[63] Thus, FCC has limited information regarding whether its tribal engagement requirement is fulfilling its intended purpose. FCC officials we interviewed said that the Office of Native Affairs and Policy (ONAP) provided information and, in some cases, held training sessions about the tribal engagement obligation during workshops with tribal representatives, and encouraged representatives to contact ONAP with any concerns. ONAP officials also noted that they handle complaints from tribes regarding a lack of provider engagement and reach out to providers to address tribal concerns. ONAP officials stated that they have had internal discussions about whether the guidance is clear or needs revision, but

[63] *Office of Native Affairs and Policy, Wireless Telecommunications Bureau, and Wireline Competition Bureau Issue Further Guidance on Tribal Government Engagement Obligation Provisions of the Connect America Fund*, Public Notice, 27 FCC Rcd 8176 (2012).

this has not gone beyond internal discussions.[64] A few of the tribal stakeholders provided examples of the benefits of providers engaging with tribes to ensure tribal representatives have access to information regarding broadband availability on their lands. For example, one representative stated that this information could help the tribes plan deployments by focusing on areas that they know the provider does not plan to serve. Another representative stated that tribal engagement could help improve the accuracy of FCC's broadband maps. By obtaining feedback from both tribal stakeholders and providers on the effectiveness of FCC's tribal engagement guidance to determine whether changes are needed, FCC would be better positioned to ensure that tribal governments and providers are sharing information in a manner that will lead to improved services on tribal lands.

Conclusions

FCC has collected data and developed maps and reports depicting broadband on tribal lands and has noted the lower levels of broadband access on tribal lands, in comparison to other areas. However, limitations in FCC's existing process for collecting and reporting broadband data have led FCC to overstate broadband access on tribal lands. By taking steps to address these limitations and to collect data that more accurately and completely depict broadband access on tribal lands, FCC would have greater assurance that it is making progress on reducing the digital divide on tribal lands and targeting broadband funding to tribal lands most in need. Without taking these steps, FCC increases the risk that residents living on tribal lands will continue to lack broadband access.

Compounding the limitations in FCC's data collection process is FCC's lack of a formal process to obtain tribal input on the accuracy of provider-submitted broadband data for tribal lands. By developing a process to solicit tribal input and ensuring that tribes know about the process and are equipped with the technical skills and abilities necessary to provide this information, FCC would be better able to ensure the accuracy of its broadband data for tribal lands. Moreover, FCC would be able to obtain firsthand, locally specific information on broadband access that could inform FCC's policies and funding decisions and help FCC achieve its goal of increasing broadband access for all Americans, including those

[64] FCC officials also noted that industry stakeholders filed petitions for reconsideration of the tribal engagement obligation and FCC's 2012 guidance (these petitions cited concerns with FCC's process for developing the requirements, among others), but noted that these petitions remain pending.

living on tribal lands. Finally, by obtaining feedback from providers and tribal stakeholders on the effectiveness of FCC's tribal engagement guidance, FCC would be better positioned to assess whether its guidance is helping providers meet requirements and ultimately whether providers' engagement is fulling its intended purpose of fostering a dialogue between tribal governments and providers that would lead to improved services on tribal lands.

Recommendations

We are making the following three recommendations to the Chairman of the Federal Communications Commission.

- The Chairman of the Federal Communications Commission should develop and implement methods—such as a targeted data collection—for collecting and reporting accurate and complete data on broadband access specific to tribal lands. (Recommendation 1)
- The Chairman of the Federal Communications Commission should develop a formal process to obtain tribal input on the accuracy of provider-submitted broadband data that includes outreach and technical assistance to help tribes participate in the process. (Recommendation 2)
- The Chairman of the Federal Communications Commission should obtain feedback from tribal stakeholders and providers on the effectiveness of FCC's 2012 statement to providers on how to fulfill their tribal engagement requirements to determine whether FCC needs to clarify the agency's tribal engagement statement. (Recommendation 3)

Agency Comments

We provided a draft of this report to FCC for review and comment. In written comments provided by FCC (reproduced in appendix III), FCC agreed with our findings and recommendations. In its written comments, FCC described efforts, some of which are already under way, that it felt would address each recommendation and stated its intent to build upon those efforts. For example, FCC explained that it is exploring methods to collect more granular broadband deployment data and noted the need to balance the burden on Form 477 filers. FCC also noted that it is starting work to address a statutorily-required evaluation of broadband coverage on certain tribal lands. We agree that increasing the granularity of deployment data is helpful in addressing data accuracy issues, but we also note that it is important to collect data related to factors that affect broadband access on tribal lands.

FCC also described informal efforts to collect tribal feedback on providers' broadband data and stated it would explore options for a formal process to collect feedback. Regarding our recommendation related to providers' engagement efforts, FCC outlined its existing methods by which tribal stakeholders can provide feedback on providers' engagement efforts and agreed that seeking additional feedback from tribal stakeholders and providers would be desirable. We agree that improving feedback in these ways could help FCC determine whether it needs to clarify its tribal engagement statement. FCC also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Chairman of the Federal Communications Commission, and other interested parties. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or GoldsteinM@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

Mark L. Goldstein
Director, Physical Infrastructure Issues

Appendix I: List of Interviewees

Representatives from tribal governments or tribally owned broadband providers
Choctaw Nation of Oklahoma (OK)
Confederated Tribes of the Colville Reservation (WA)
Fond du Lac Band of Lake Superior Chippewa (MN)
Fort Belknap Indian Community (MT)
Gila River Telecommunications, Inc. (AZ)
Hopi Telecommunications, Inc. (AZ)
Jamestown S'Klallam Tribe (WA)
Karuk Tribe (CA)
Leech Lake Band of Ojibwe (MN)
Makah Tribe (WA)
Navajo Tribal Utility Authority (AZ, NM, UT)
Nez Perce Tribe (ID)
Osage Nation (OK)
Pueblo of Acoma (NM)
Pueblo of Pojoaque (NM)
Pueblo of San Ildefonso (NM)
Taos Pueblo (NM)
Red Spectrum Communications (Coeur d'Alene Tribe (ID))
Saint Regis Mohawk Tribe and Mohawk Networks, LLC (NY)
San Carlos Apache Telecommunications Utility, Inc. (AZ)
Southern California Tribal Chairmen's Association - Tribal Digital Village Network (CA)
Spokane Tribe of Indians and Spokane Tribe Telecom Exchange (WA)
Standing Rock Telecommunications, Inc. (ND, SD)
Warm Springs Telecommunications Co. (OR)
Yurok Tribe and Yurok Connect (CA)
Representatives from tribal associations/consortiums that include tribes
Affiliated Tribes of Northwest Indians
Middle Rio Grande Pueblo Consortium
National Congress of American Indians
National Tribal Telecommunications Association
Native American Finance Officers Association (NAFOA)
REDINet
Representatives from companies/academic groups that work with tribes
AMERIND Risk
Arizona State University, American Indian Policy Institute and School of Public Affairs

Mobius Legal Group PLLC
Turtle Island Communications
Representatives from providers/trade associations (non-tribally owned)
AT&T
CenturyLink
CTIA
Commnet
Frontier
Inland Cellular
King Street Wireless
Kit Carson Electric Cooperative
NTCA
Pine Telephone Company
Rural Wireless Association
Verizon
[a]
Representatives from companies that collect broadband data
Alexicon
Connected Nation
Government Agencies (non-tribal)
Census Bureau
U.S. Department of Agriculture's Rural Utilities Service
Federal Communications Commission
Department of Interior's Bureau of Indian Affairs
National Telecommunications and Information Administration
Housing and Urban Development
Indian Health Service
Minnesota Office of Broadband Development

Source: GAO. | GAO-18-630

[a]One broadband provider we interviewed did not want to be included in this appendix.

Appendix II: Objectives, Scope, and Methodology

This report discusses the extent to which: (1) the Federal Communications Commission's (FCC) approach to collecting broadband availability data accurately captures the ability of Americans living on tribal lands to access broadband Internet services and (2) FCC obtains tribal input on the accuracy of provider-submitted broadband data for tribal lands.

To address both objectives, we analyzed FCC's December 2016 fixed and mobile broadband availability data—the most recent data at the time of our review—to identify the speeds, technologies, and availability providers reported for federally recognized tribal lands.[1] Providers currently report this information to FCC by filing a "Form 477," twice a year. We also used 2010 U.S. Census data to identify census blocks completely or partially on tribal lands. To assess the reliability of FCC's data and 2010 U.S. Census data, we reviewed a previous GAO reliability assessment, and for FCC's data we conducted electronic testing and analysis of the data, reviewed FCC guidance and documentation, and interviewed FCC officials.[2] Based on the results of our analysis, we determined the data to be reliable for our purposes, which were: (1) to inform our selection of tribal governments and providers for interviews and visits, as described below, and (2) to develop maps depicting fixed and mobile broadband availability for the nine tribal lands we selected for visits, in order to obtain tribal representatives' feedback on the data. Specifically, we mapped;

- fixed broadband data according to speed and technology, and

[1] We defined federally recognized tribal lands consistent with FCC's definition in its 2018 Broadband Deployment Report. Specifically, we considered tribal lands to be: (1) Join Use Areas; (2) legal federally recognized American Indian area consisting of reservation and associated off-reservation trust land; (3) legal federally recognized American Indian area consisting of reservation only; (4) legal federally recognized American Indian area consisting of off-reservation trust land only; (5) Statistical American Indian area defined for a federally recognized tribe that does not have reservation or off-reservation trust land, specifically a Tribal Designated Statistical Area (TDSA) or Oklahoma Tribal Statistical Area (OTSA); (6) Alaskan Native village statistical area; and (7) Hawaiian Home Lands established by the Hawaiian Homes Commission Act of 1921. *See* 33 FCC Rcd 1660 ¶¶ 31-32 (2018).

[2] We reviewed the data reliability assessment from GAO, *Broadband: Additional Stakeholder Input Could Inform FCC Actions to Promote Competition*, GAO-17-742 (Washington, D.C.: Sept.19, 2017).

- mobile data for long-term evolution (LTE) services by provider for each tribal land.[3]

We used those maps during our visits to discuss the accuracy of the data with representatives for each tribal government or tribally owned provider. Though we analyzed all up and download speeds that providers reported in the Form 477, for the purposes of this report we defined "broadband" as fixed Internet service reaching at least 25 megabits per second (Mbps) download and 3 Mbps upload speeds, in accordance with FCC's advanced telecommunications capability benchmark in its 2018 Broadband Deployment Report.[4] We also report on the availability of mobile broadband, which, for the purposes of this report, does not have a speed threshold and refers to long-term evolution (LTE) services.

To address both objectives and obtain tribal government representatives' feedback on the accuracy of FCC's broadband data for their lands, we interviewed representatives from 25 tribal governments or tribally owned providers, including visits to 9 tribal lands. We considered a range of factors when we selected tribal governments and tribally owned providers for interviews, including our analysis of Form 477 data, recommendations from tribal, industry, or government stakeholders regarding tribal and non-tribal representatives familiar with broadband data issues, and demographic and geographic characteristics, among others. For example, we considered demographic characteristics such as unemployment rate from the 2011– 2015 American Community Survey data, and geographic characteristics such as rurality from the United States Department of Agriculture (USDA) Rural-Urban Commuting Area Codes data. The tribes included in our review vary with respect to location, level of broadband availability according to FCC, land mass, and population size and density. The results of our interviews are not generalizable to all tribal governments or tribally owned broadband providers. In addition to tribal governments and tribally owned providers, we interviewed six tribal organizations and four stakeholders who work with tribes on broadband issues. For reporting purposes, we developed the following series of indefinite quantifiers to describe the tribal responses from the 35 entities representing tribal stakeholders we interviewed:

- 3 to 7 is defined as "a few;"

[3] LTE is an industry standard that is part of the fourth generation of wireless telecommunications technology, which is currently in common use.

[4] 33 FCC Rcd 1660 ¶¶ 31-32 (2018).

- 8 to 15 is described as “some;”
- 16 to 20 is described as “about half;”
- 21 to 27 is described as “most;” and
- 28 to 34 is described as “almost all.”

A full list of the tribal stakeholders we interviewed can be found in appendix I.

Further, to obtain industry perspectives, we reviewed public comments submitted by providers and industry associations in FCC’s ongoing 2017 *Notice of Proposed Rulemaking on Modernizing the Form 477 Data Program*.[5] We also interviewed 10 non-tribally owned fixed and mobile broadband providers and three industry associations to understand providers’ views on the Form 477 and how providers interact with tribal governments. When selecting providers for interviews, we included providers that reported serving the lands of tribal governments we interviewed and selected providers that varied in the percentage of tribal lands they reported serving. The providers we interviewed represent large, nationwide carriers as well as small, local carriers, and offer broadband via a variety of technologies, including fiber optics, digital subscriber line (DSL), fixed wireless, and mobile LTE.[6] The results of our interviews with providers are not generalizable to all broadband providers. In addition, to address both objectives, we interviewed representatives from other government entities, as well as private companies that collect and report broadband data. A full list of the industry stakeholders we interviewed can be found in appendix I.

To identify the extent to which FCC’s approach to collecting broadband availability data reflects the ability of Americans living on tribal lands to actually access broadband Internet services, we reviewed documentation of the Form 477 process, including submission guidance, and FCC’s proposals and public comments in its 2017 *Notice of Proposed Rulemaking on Modernizing the Form 477 Data Program* and Mobility

[5] *Modernizing the FCC Form 477 Data Program*, Further Notice of Proposed Rulemaking, 32 FCC Rcd 6329 (2017).

[6] Digital subscriber line (DSL) service typically refers to Internet services delivered over traditional copper phone lines.

Fund Phase II proceedings.[7] We also interviewed FCC officials, industry stakeholders, and tribally owned broadband providers to understand FCC's current process for collecting broadband data. To understand the purpose of the Form 477 data collection process and FCC's strategic goals, we reviewed relevant statutes, and FCC documents, including FCC's *Strategic Plan 2018—2022*, the *National Broadband Plan*, and FCC's broadband deployment and progress reports.[8] Given the importance placed on broadband access in these documents, we interviewed tribal stakeholders, as described above and reviewed FCC documents to identify factors affecting the ability of Americans living on tribal lands to access broadband Internet services. We also reviewed previous GAO work that identified barriers to broadband access on tribal lands.[9] We compared the Form 477 process to FCC's strategic goals and to factors affecting broadband access to determine the extent to which the Form 477 was designed to collect information on those factors and to meet FCC's goals. We further evaluated this information against the *Government Performance and Results Act, as enhanced by the GPRA Modernization Act of 2010* and *Standards for Internal Control in the Federal Government*.[10] We also reviewed documentation for other FCC data collection programs, including the *Measuring Broadband America* program and the Urban Rate Survey, to determine the extent to which FCC collected data on factors affecting broadband access outside of the Form 477 process.

To determine the extent to which FCC obtains tribal input on the accuracy of provider-submitted broadband data for tribal lands, we interviewed FCC officials and analyzed FCC documents regarding the collection

[7] 32 FCC Rcd 6329 (2017); *Connect America Fund Universal Service Reform—Mobility Fund*, Order on Reconsideration and Second Report and Order, 32 FCC Rcd 6282 (2017); *Instructions for Filing 4G LTE Coverage Data to Determine Areas Presumptively Eligible for Mobility Fund II Support*, Public Notice, 32 FCC Rcd 7023 (2017).

[8] Communications Act of 1934, Pub. L. No. 73-416, 48 Stat. 1064 (1934), *as amended by Telecommunications Act of 1996,* Pub. L. No. 104-104, § 706, 110 Stat. 56, 153 (1996) (codified as amended at 47 U.S.C. § 151); FCC, *Strategic Plan 2018-2022* (Washington, D.C.); 33 FCC Rcd 1660 ¶¶ 31-32 (2018); 31 FCC Rcd 699 (2016).

[9] GAO, *Telecommunications: Additional Coordination and Performance Measurement Needed for High-Speed Internet Access Programs on Tribal Lands*, GAO-16-222 (Washington, D.C.: Jan. 29, 2016)

[10] Government Performance and Results Act, Pub. L. No. 103-62, 107 Stat. 285 (1993), as enhanced by GPRA Modernization Act of 2010, Pub. L. No. 111-352, 124 Stat. 3866, 3867 (2011). (codified at 31 U.S.C. § 1115(b)(2), (6)); GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: Sept. 2014).

procedures for the Form 477 data and FCC's policies for working with tribal governments, as well as Connect America Fund documents regarding requirements for providers to share information with tribal governments.[11] We also reviewed documents on past FCC Universal Service Fund processes to challenge broadband data and identified prior instances in which tribal governments or tribally owned providers challenged FCC's broadband data and the outcomes of those challenges. Additionally, we interviewed tribal stakeholders, as described above, to understand the extent to which: (1) FCC involves tribal governments and other stakeholders in the validation of Form 477 broadband data, (2) tribal governments can access broadband data from FCC or providers, and (3) FCC's Form 477 data accurately reflected broadband access on their lands. For the nine tribal lands we visited, we asked tribal governments or tribally owned providers to identify where the data do or do not accurately reflect broadband access on maps of FCC's data. Further, to identify how providers complied with FCC's tribal engagement requirement and obtain their perspectives, we interviewed providers and industry associations. We compared FCC's data validation procedures and tribal stakeholders' feedback on the process to FCC's policies for working with tribal governments, FCC recommendations from the *National Broadband Plan* and *Standards for Internal Control in the Federal Government*.[12] We also interviewed and received written comments from officials from other federal agencies that have broadband programs, including USDA Rural Utilities Service, the National Telecommunications and Information Administration (NTIA), and others, in addition to a state agency and three private companies that collect and report broadband data to understand how other entities collect and validate broadband data.[13]

We conducted this performance audit from June 2017 to September 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that

[11] *Statement of Policy on Establishing a Government-to-Government Relationship with Indian Tribes*, Policy Statement, 16 FCC Rcd 4078 (2000). 47 C.F.R. § 54.313 (a)(5); *Further Guidance on Tribal Government Engagement Obligation Provisions of the Connect America Fund*, Public Notice, 27 FCC Rcd 8176 (2012).

[12] *Connecting America: The National Broadband Plan*, Notice of Inquiry and Notice of Proposed Rulemaking, 25 FCC Rcd 6657 (2010); GAO-14-704G

[13] We received written comments from one company that collects broadband data.

the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix III: Comments from the Federal Communications Commission

Federal Communications Commission

Washington, D.C. 20554

August 22, 2018

Mark L. Goldstein, Ph.D.
Director, Physical Infrastructure Issues
Government Accountability Office
441 G Street, NW
Washington, D.C. 20548

Dear Director Goldstein:

Thank you for the opportunity to review GAO's draft report, "FCC's Data Overstate Access on Tribal Lands." The Commission has long recognized the particular challenges associated with providing telecommunications services on Tribal lands, and we agree with GAO that accurate, comprehensive data are vital to the Commission's efforts to bridge the digital divide, including on Tribal lands. As described below, we have efforts underway to ensure that we collect the best possible data and, indeed, we believe that we already have work in progress to address each of the three recommendations GAO advances. We will continue with the work underway and re-double our efforts to close the digital divide for all Americans, including those on Tribal lands.

Methods to Collect and Report Data on Broadband Access to Specific Tribal Lands. GAO's first recommendation is that the FCC Chairman "should develop and implement methods—such as targeted data collection—for collecting and reporting accurate and complete data on broadband access to specific tribal lands." The Commission agrees with the importance of having access to quality data. For this reason, the Commission has initiated a rulemaking proceeding to explore ways in which it could improve aspects of the Form 477 collection.[1] In that proceeding, the Commission sought comment on a wide variety of issues related to making the Form 477 collection as efficient and effective as possible. Among these issues is whether the Commission should revise the Form 477 to collect deployment data on a more granular level than it does currently. Given a better understanding of the Form 477 instructions, the issue of granularity appears to underlie many of GAO's concerns in the draft report about Form 477 deployment data—the issue that individual locations might not have network coverage in a Census block with some deployment. We are cognizant that increasing granularity in the collection would require the Commission to resolve significant technical issues and would

[1] *Modernizing the FCC Form 477 Data Program*; Further Notice of Proposed Rulemaking; WC Docket 11-10 (2017).

likely increase the burden on Form 477 filers. If an appropriate method for such a collection can be identified, however, this may address many of the concerns GAO raises in the draft report by providing the Commission with a more precise picture of broadband deployment. We are continuing to work on these issues in the context of WC Docket 11-10.

Also relevant to GAO's first recommendation is the requirement in the *Consolidated Appropriations Act of 2018* that the Commission conduct an assessment regarding the availability of broadband services in Indian country and to report on the results by March 23, 2019.[2] Based on the results of that assessment, the legislation directs the Commission to conduct a rulemaking proceeding to address the unserved areas identified in the report. We have initiated work on that effort and will work with Tribal and other stakeholders to develop a clear picture of broadband deployment on Tribal lands and address unserved areas.

The Commission recognizes that the digital divide is all too real, especially in Indian country. That's why the Commission has primarily relied on Form 477 data for a limited purpose—identifying the too-many census blocks where "no" Internet service provider has deployed broadband infrastructure, and thus the areas that unambiguously need federal funding through the Connect America Fund to get broadband. This divide is particularly stark on Tribal lands, as GAO recognizes, with more than 35% of Tribal residents lacking "any" chance to access broadband infrastructure.

And the Commission has recognized that more granular data will be needed in the future. As our policies bring broadband deployment into wholly unserved blocks, it will be more important to understand availability in partially served blocks. That's why the Commission opened a proceeding into this issue last year, and the Commission remains dedicated to moving forward with a proceeding that explores ways to collect more granular data without unnecessarily burdening those who are deploying on Tribal lands and often with few resources to spare.

Process to Obtain Tribal Input on Provider-Submitted Broadband Data. The draft report's second recommendation is that the Chairman of the FCC "develop a process to obtain tribal input on the accuracy of provider-submitted broadband data that includes outreach and technical assistance to help tribes participate in the process." The Commission agrees that tribal input on the accuracy of provider-submitted broadband data is important. Indeed, the FCC currently has in place a number of informal means by which Tribal and other stakeholders can raise any concerns. For example, Tribal stakeholders can, and do, raise concerns and questions about the data to the Commission's Office of

[2] *Consolidated Appropriations Act, 2018*, H.R. 1625, 115th Cong., Division P, *Ray Baum's Act*, § 508. (2018).

Native Affairs and Policy (ONAP), which shares them with the relevant bureaus. In addition, the Commission has given Tribes a direct role in evaluating and challenging providers' claims of service coverage in the ongoing Mobility Fund Phase II (MF-II) proceeding. ONAP and the Commission's Rural Broadband Auctions Task Force have cooperated on a number of initiatives to make Tribal leaders and others aware of the MF-II challenge process for the Mobility Fund II auction eligible areas and the importance of participating in that process. These efforts have included sending information in emails to the leaders and IT managers of all 573 federally recognized Tribes; conducting outreach, including conference calls and webinars open to all Tribes; formal presentations at multiple inter-tribal conferences around the country; and a session at a July 31 Tribal workshop conducted at the Lac du Flambeau Reservation in Wisconsin that was open to all Tribes. We agree that, in addition to these mechanisms, implementing a formal process for continuing Tribal engagement could have significant value in helping the FCC understand both the extent of, and the specific issues that drive or hinder, broadband deployment on Tribal lands. We will work with stakeholders to explore options for implementing such a formal process.

Feedback from Tribal Stakeholders and Providers on Providers' Tribal Engagement Requirements. Finally, the draft report recommends that the FCC Chairman "obtain feedback from tribal stakeholders and providers on the effectiveness of the FCC's 2012 statement to providers on how to fulfill their tribal engagement requirements to determine whether the Commission needs to clarify its tribal engagement statement." We agree that seeking additional feedback on the overall effectiveness of the Commission's Further Guidance Public Notice is desirable. We note that the Commission's ONAP solicits and receives feedback from Tribes on whether and how providers are fulfilling the requirements of the rule, the effectiveness of the Commission's guidance, and any problems encountered in the engagement process. ONAP regularly includes presentations on the Tribal engagement obligation at its Tribal workshops, which it conducts at different locations around the country throughout the year. Additionally, ONAP solicits and receives feedback on the engagement requirements from Tribes and other participants at inter-Tribal conferences and similar events. As a result of feedback concerning the availability of compliance reporting, the Commission has made changes to its filing requirements and Tribal Nations will soon be able to obtain providers' reports on their Tribal engagement efforts directly through a Universal Service Administrative Company online portal. We will continue to seek additional feedback from Tribal stakeholders, as

well as feedback from providers, regarding the effectiveness of the guidance provided by the Commission thus far on how providers may fulfill their Tribal engagement requirements.

Thank you for the opportunity to review GAO's recommendations. We look forward to working with GAO in the future.

Sincerely,

Kris Anne Monteith
Chief, Wireline Competition Bureau

Patrick Webre
Chief, Consumer and Governmental Affairs Bureau

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Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Mark L. Goldstein, (202) 512-2834 or GoldsteinM@gao.gov.

Staff Acknowledgments

In addition to the contact named above, Keith Cunningham (Assistant Director); Crystal Huggins (Analyst in Charge); Katherine Blair; Lilia Chaidez; Camilo Flores; Adam Gomez; Serena Lo; Jeffery Malcolm; John Mingus; Joshua Ormond; Jay Spaan; James Sweetman, Jr.; Elaine Vaurio; and Michelle Weathers made key contributions to this report.

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

In the Matter of	)	
	)	
Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion	)	GN Docket No. 19-285
	)	
	)	

2020 BROADBAND DEPLOYMENT REPORT

Adopted: April 20, 2020 **Released: April 24, 2020**

By the Commission: Commissioners O'Rielly and Carr issuing separate statements; Commissioners Rosenworcel and Starks dissenting, and issuing separate statements.

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I. INTRODUCTION

1. The Federal Communications is charged with "encourag[ing] the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans . . . by removing barriers to infrastructure investment and by promoting competition in the telecommunications market."[1] For the past three years, the Commission's top priority has been closing the digital divide, in recognition that high-speed broadband and the digital opportunity it brings can be essential to innovation, economic opportunity, healthcare, and civic engagement in today's modern society. We remain committed to ensuring that all Americans, including those in rural areas, Tribal lands, and disaster-affected areas, enjoy the benefits of a high-speed broadband connection.

2. Available evidence demonstrates that the digital divide continues to narrow as more Americans than ever before have access to high-speed broadband. The number of Americans lacking access to fixed terrestrial broadband service at 25/3 Mbps continues to decline, going down by more than 14% in 2018 and more than 30% between 2016 and 2018.[2] The number of Americans without access to 4G Long Term Evolution (LTE) mobile broadband with a median speed of 10/3 Mbps fell approximately 54% between 2017 and 2018.[3] The vast majority of Americans—surpassing 85%—now have access to fixed terrestrial broadband service at 250/25 Mbps, a 47% increase since 2017.[4] Over the same period, the number of Americans living in rural areas with access to such service increased by 85%.[5] This progress has been fueled in part by an approximately $80 billion investment in network infrastructure in 2018, the highest annual amount in at least the last decade.[6] In 2019 alone, fiber broadband networks became available to roughly 6.5 million additional unique homes, the largest one-year increase ever, with smaller providers accounting for 25% of these new fiber connections.[7] AT&T, Sprint, T-Mobile, and Verizon are also rapidly expanding their 5G capability, with 5G networks in aggregate now covering the majority of the country's population, especially in urban areas, and more live launches planned for 2020.[8]

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[1] 47 U.S.C. § 1302(a).

[2] *See infra* Fig. 1. When we provide broadband speed figures, we present both the download and upload speeds. In the case of 25/3 Mbps, for example, we refer to broadband service that has a download speed of 25 Mbps and an upload speed of 3 Mbps.

[3] *See infra* Fig. 2b. Consistent with our conclusion in the *2019 Report*, we consider both fixed and mobile services as capable of meeting the definition of "advanced telecommunications capability." *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 19-285, 2019 Broadband Deployment Report, 34 FCC Rcd 3857, 3860-61, para. 10 (2019) (*2019 Report*). We will continue to evaluate mobile deployment at speeds of 5/1 Mbps and 10/3 Mbps in this Report.

[4] *See infra* Fig. 4.

[5] *Id*.

[6] *See generally* Patrick Brogan, Vice President for Industry Analysis, USTelecom, U.S. Broadband Investment Continued Upswing in 2018, at 1 (2019), https://www.ustelecom.org/wp-content/uploads/2019/07/USTelecom-Research-Brief-Capex-2018-7-31-19.pdf

[7] Letter from Lisa R. Youngers, President and CEO, Fiber Broadband Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, at 1 n.1, 2 n.5 (Dec. 16, 2019) (Fiber Broadband Association Dec. 16, 2019 *Ex Parte* Letter).

[8] *See* AT&T, AT&T 5G Now Live for Consumers in 10 Markets (Dec. 13, 2019), https://about.att.com/story/2019/5g_launch.html (announcing live launch of AT&T 5G to consumers and businesses in the Birmingham, AL; Indianapolis; Los Angeles; Milwaukee; Pittsburgh; Providence, RI; Rochester, NY; San Diego, San Francisco, and San Jose, CA market areas, and plans to expand service availability to other markets

(continued….)

3. With this Report, the Commission fulfills the Congressional directive to report each year on the progress made in deploying advanced telecommunications capability to all Americans.[9] Given the compelling evidence before us, we find for the third consecutive year that advanced telecommunications capability is being deployed on a reasonable and timely basis. Despite this finding, our work to close the digital divide is not complete. The Commission will continue its efforts to ensure that all Americans have the ability to access broadband.

II. BACKGROUND

4. Section 706(b) of the Telecommunications Act of 1996 requires the Commission to annually "initiate a notice of inquiry concerning the availability of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) . . . ."[10] In conducting this inquiry, the Commission must "determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion."[11] If that determination is negative, the Commission "shall take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market."[12]

5. On May 29, 2019, the Commission released the *2019 Broadband Deployment Report* (*2019 Report*) in which we concluded that advanced telecommunications capability was being deployed to all Americans in a reasonable and timely fashion.[13] Consistent with the statute, the Commission focused its analysis in the *2019 Report* on the progress made in the deployment of fixed and mobile services.[14] Since the *2019 Report*, the Commission has continued to aggressively promote deployment of advanced telecommunications capability by taking a number of actions to improve the regulatory environment and advance broadband deployment.[15]

6. On October 23, 2019, the Commission released the *Fifteenth Broadband Deployment Report Notice of Inquiry* (*Notice*), seeking comment on how a range of factors may affect the deployment

(Continued from previous page)
soon, as it works toward offering nationwide coverage in the first half of 2020); Sprint, Sprint 5g Overview (Nov. 1, 2019), https://newsroom.sprint.com/sprint-5g-overview-1-2.htm (touting Sprint 5G availability in parts of 9 cities—Atlanta, Chicago, Dallas-Ft. Worth, Houston, Kansas City, Los Angeles, New York City, Phoenix, and Washington, DC—as well as Sprint partnerships with multiple U.S. cities on Smart City applications leveraging Sprint's 5G and IoT offerings); T-Mobile, T-Mobile 5G: It's On! (Dec. 2, 2019), https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2019/T-Mobile-5G-Its-On/default.aspx; Verizon, When Will Verizon Have 5G? (Dec. 5, 2019), https://www.verizon.com/about/our-company/5g/when-will-verizon-have-5g (discussing current availability of Verizon's 5G ultra-wideband service in parts of select cities, and plans for further rollouts in 2020).

[9] 47 U.S.C. § 1302(b).

[10] *Id*.

[11] *Id.* We note that the annual inquiry and determination continues to be required by section 706(b) despite Congress's enactment of the RAY BAUM'S Act of 2018, which requires an assessment on the state of deployment of communications capability, including advanced telecommunications capability, as that term is used in section 706(b), in the biennial Communications Marketplace Report now required by section 13 of the Communications Act of 1934, as amended (Communications Act). *See* Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, Div. P—RAY BAUM'S Act of 2018, §§ 401-402, 132 Stat. 348, 1087-90 (2018) (RAY BAUM'S Act of 2018); 47 U.S.C. § 163(b)(2) (added 2018); *see also Communications Marketplace Report et al.*, GN Docket No. 18-231 et al., Report, 33 FCC Rcd 12558, 12683-702, paras. 236-64 (Dec. 26, 2018) (*2018 Communications Marketplace Report*).

[12] 47 U.S.C. § 1302(b).

[13] *2019 Report*, 34 FCC Rcd at 3858, 3896-97, paras. 4, 76.

[14] *Id.* at 3859-60, paras. 8-9.

[15] *See infra* Section V.

and availability of advanced telecommunications capability, and on whether and how to incorporate those factors into our section 706(b) analysis for both fixed and mobile services.[16]

III. EVALUATING DEPLOYMENT OF ADVANCED TELECOMMUNICATIONS CAPABILITY TO ALL AMERICANS IN A REASONABLE AND TIMELY FASHION

7. Consistent with past *Broadband Deployment Reports* and our proposal in the *Notice*, we holistically evaluate progress in the deployment of advanced telecommunications capability and whether that progress is occurring in a reasonable and timely fashion.[17] Specifically, this Report will continue to evaluate deployment of fixed and mobile services over a five-year time period (2014-2018) using the same four categories presented in the *2018* and *2019 Reports*: (1) those with access to fixed services; (2) those with access to mobile LTE services; (3) those with access to both fixed *and* mobile LTE services; and (4) those with access to at least one of either fixed *or* mobile LTE services.[18]

8. We find substantial support in the record for continuing our use of a progress-based approach.[19] As the Commission has previously found:

> [A]nalyzing progress to determine whether deployment is occurring in a reasonable and timely fashion is the approach that is most consistent with the language of section 706, as the analysis of such progress enables the Commission to determine whether advanced telecommunications capability "is being deployed" in the manner that section 706 requires. The use of the present progressive tense—"is being deployed"—as well as the language requiring an evaluation of whether that deployment is "reasonable and timely" indicates that Congress intended that the Commission evaluate the current state of deployment to all Americans, not a rigid requirement that each and every American be served *at this moment*.[20]

Examining the progress of deployment therefore best effectuates Congress' charge to the Commission in section 706.

9. We agree with commenters that we must continue our efforts to close the digital divide and extend the reach of broadband deployment to all Americans.[21] Section 706(a) mandates that we

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[16] *See generally Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, Fifteenth Broadband Deployment Report Notice of Inquiry, GN Docket No. 19-285, 34 FCC Rcd 10092 (2019) (*Notice*).

[17] *2019 Report*, 33 FCC Rcd at 3859-60, para. 8; *Notice*, 34 FCC Rcd at 10094, para. 6; *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 17-199, 2018 Broadband Deployment Report, 33 FCC Rcd 1660, 1663-64, paras. 10-13 (*2018 Report*).

[18] *2019 Report*, 34 FCC Rcd at 3859, para. 8. *See infra* Section IV (discussing broadband deployment estimates and data sources for fixed and mobile services).

[19] *See, e.g.*, ACA Connects – America's Communications Association (ACA) Comments at 3; ADTRAN, Inc. (ADTRAN) Comments at ii; CTIA Comments at 6; Fiber Broadband Association (Fiber Broadband Association) Comments at 1; Free State Foundation Comments at 3; ITTA Comments at 10; NCTA – The Internet and Television Association (NCTA) Comments at 1; USTelecom Comments at 12; Wireless Internet Service Providers Association (WISPA) Comments at 6; ADTRAN Reply at 2; Utilities Technology Council Reply at 4-5.

[20] *2018 Report*, 33 FCC Rcd at 1663, para. 11; *see also 2019 Report*, 34 FCC Rcd at 3859-60, para. 8 (finding that use of a progress-based approach enables the Commission to conduct the section 706 inquiry in the manner the statute requires).

[21] ACA Comments at 6-7; ADTRAN Comments at 14-15; Colville Confederated Tribes Comments at 13; Free State Foundation Comments at 10-11; Internet Innovation Alliance Comments at 7-8; INCOMPAS Comments at 9-10; ITTA Comments at 1-2; Next Century Cities Comments at 2; NCTA Comments at 7-8; National Digital Inclusion Alliance Comments at 4; USTelecom Comments at 16-17; Viasat, Inc. (Viasat) Comments at 3-4; American Library Association Reply at 3-5; Public Knowledge, Common Cause, and Next Century Cities (Public Knowledge et al.) Reply at 12-13.

continue to promote deployment of advanced telecommunications capability to all Americans,[22] and even though "remarkable progress has been made[,]" it remains the case that "many people, particularly rural and Tribal areas, do not enjoy the fastest possible broadband speeds or even access to advanced telecommunications services."[23] We therefore remain committed to closing the digital divide and ensuring that all Americans can share in the benefits of access to advanced telecommunications capability, and we will continue to monitor progress toward that goal. We agree with ACA that the Commission "refin[ing] and improv[ing] its universal service programs that subsidize buildout in hard-to-serve areas" is helping fuel the growth in broadband investment.[24] We also agree with commenters that urge the Commission to continue its work to expand access to spectrum to facilitate broadband deployment and 5G services in the future.[25] And we agree with ADTRAN that continuing to work with "state and local governments through the [Broadband Deployment Advisory Committee (BDAC)] process to help accelerate broadband deployment" is vital to increase broadband investment and adoption across America.[26]

A. Defining Advanced Telecommunications Capability

10. Consistent with our conclusion in the *2019 Report*, we continue to consider both fixed and mobile services as capable of meeting the definition of "advanced telecommunications capability" under section 706.[27] This finding is consistent with the language of the statute, which defines advanced telecommunications capability "without regard to any transmission media or technology."[28]

11. The Commission concluded at the time of both the *2018 Report* and the *2019 Report* that mobile services were not full substitutes for fixed service, but that both services still independently met the statutory definition of advanced telecommunications capability.[29] The record before us provides some evidence that consumers increasingly rely on mobile broadband for accessing and sharing information, and they can substitute fixed and mobile broadband when accessing certain services and applications (such as e-mail or social media, for example).[30] Moreover, mobile wireless providers continue to improve their networks, notably through the deployment of 5G technology, which may have performance characteristics similar to fixed services in certain environments.[31] Mobile wireless providers also continue to offer new retail data plans that make mobile service an increasingly-attractive alternative to fixed services.[32]

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[22] 47 U.S.C. § 1302(a).

[23] Internet Innovation Alliance Comments at 7.

[24] ACA Comments at 5.

[25] *See* Colville Confederated Tribes Comments at 13; Free State Foundation Comments at 10-11; Public Knowledge et al. Comments at 35-37; WISPA Comments at 7-8; Consumer Technology Association (CTA) Reply at 7.

[26] ADTRAN Comments at 14-15.

[27] *2019 Report*, 34 FCC Rcd at 3860-61, para. 10.

[28] 47 U.S.C. § 1302(d)(1).

[29] *2019 Report*, 34 FCC Rcd at 3861-62, para. 11; *2018 Report*, 33 FCC Rcd at 1666-67, para. 18.

[30] CTIA Comments at 12-13 (citing Pew Research Center, Mobile Factsheet (June 12, 2019), https://www.pewresearch.org/internet/fact-sheet/mobile/), 19-20 (discussing the smartphone only trend)).

[31] ADTRAN Comments at 6-7; Free State Foundation Comments at 8, 10; Internet Innovation Alliance Comments at 3-4. *But see* Public Knowledge et al. Comments at 19-21 (arguing 5G is still years away from being a fully realized commercial service).

[32] *See, e.g.*, Verizon Wireless, Single Connected Home Plans, https://www.verizonwireless.com/plans/single-device-plan/ (last visited Mar. 26, 2020). AT&T has a mobile service that it optimizes for HD video streaming and offers 30GB mobile hotspot to connect other devices. AT&T Unlimited Elite, https://www.att.com/plans/unlimited-data-plans/ (last visited Mar. 26, 2020); *see also,* Xfinity Mobile Plan Details,

(continued….)

12. The record also provides substantial evidence, however, that fixed and mobile services often continue to be used in distinct ways, and that users tend to subscribe to both services concurrently and treat them as complements.[33] For example, a fixed broadband service subscriber cannot use this service while traveling. Similarly, in-home connected devices, such as smart lights, Internet-connected security devices, or smart thermostats, often include features that allow for their use outside of the home, and consumers are unlikely to be able to take full advantage of these remote monitoring capabilities without the benefit of a mobile broadband connection (in addition to their fixed broadband service).[34] Mobile broadband subscribers, meanwhile, may not be able to use their mobile devices as in-home hotspots to stream large quantities of high-definition video content (due to either plan restrictions or data limits).[35] While users may substitute between mobile and fixed broadband when accessing certain services and applications, the record indicates that they are not yet functional substitutes for all uses and customer groups.[36] Based on the record before us, we again find that fixed broadband and mobile wireless broadband services are not functional substitutes in all cases.[37] We also continue to conclude that both fixed and mobile services provide capabilities that satisfy the statutory definition of advanced telecommunications capability, and we will continue to examine the deployment of fixed and mobile wireless services, both individually and in conjunction with one another, for the purposes of this Report.

13. *Performance Benchmarks for Fixed Service.* We find that the current speed benchmark of 25/3 Mbps remains an appropriate measure by which to assess whether a fixed service is providing advanced telecommunications capability. We conclude that fixed services with speeds of 25/3 Mbps continue to meet the statutory definition of advanced telecommunications capability; that is, such services "enable[] users to originate and receive high-quality voice, data, graphics, and video telecommunications."[38] This finding follows the proposal in the *Notice*, and the record reflects significant support for maintaining the current fixed 25/3 Mbps speed benchmark.[39] ITTA, for example, explains

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https://www.xfinity.com/mobile/plan/details (last accessed Mar. 26, 2020) (offering Xfinity Mobile customers up to five lines for phones, watches, or tablets, mix and match data options, and the ability to access LTE networks and any of Xfinity's WiFi hotspots).

[33] New America Open Technology Institute and Access Now (Open Technology Institute & Access Now) Comments at 2-8; NTCA Comments at 2-8; Public Knowledge et al. Comments at 16-18; WISPA Comments at 2; *see also* Pew Research Center, Mobile Technology and Home Broadband 2019 at 21 (*available at* https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/) (27% of respondents that do not subscribe to broadband at home state that a smartphone is not sufficient to do everything online that they need to do.).

[34] *See*, *e.g.*, Krissy Rushing, *11 Smart Apps for Your Home*, https://www.hgtv.com/design/remodel/mechanical-systems/voice-control-in-the-home (last visited Mar. 26, 2020).

[35] *See* New America & Access Now Comments at 7-8; NCC Comments at 3-5; Public Knowledge et al. at 16-17; CWA Reply at 5-6; *see also* NTCA Comments at 2-5.

[36] Benton Foundation Comments at 9-10; Colville Confederated Tribes Comments at 3; INCOMPAS Comments at 5, 8-9; Next Century Cities Comments at 3-4; Open Technology Institute & Access Now Comments at 2-8; NTCA Comments at 1-3, 6; Public Knowledge et al. Comments at 18-21; WISPA Comments at 2; American Library Association Reply at 6; CWA Reply at 6-11; Public Knowledge et al. Reply at 8-9; USTelecom Reply at 8; Utilities Technology Council Reply at 5; WISPA Reply at 3-5; *see also* ITTA Comments at 7-8, 12 (asserting that Commission should continue to evaluate deployment of fixed and mobile services both individually and in conjunction with each other).

[37] *2019 Report*, 34 FCC Rcd at 3861-62, para. 11.

[38] 47 U.S.C. § 1302(d)(1); *see also* NCTA Reply at 2 (explaining that "the statutory definition of advanced telecommunications capability is a functional one").

[39] *See* ACA Comments at 2; ADTRAN Comments at 7-8; Free State Foundation Comments at 3; Internet Innovation Alliance Comments at 6; ITTA Comments at 3-6; NCTA Comments at 2; USTelecom Comments at 10; WISPA Comments at 4-5; ADTRAN Reply at 3-4; NCTA Reply at 1; USTelecom Reply at 6; WISPA Reply at 6-7.

that "[b]y any reasonable account, the features, functions, and applications enabled by 25/3 Mbps broadband still qualify as 'advanced' and 'high-quality.'"[40] We agree with WISPA that since the 2015 adoption of the 25/3 Mbps benchmark, "the speed required for the applications that most broadband consumers use has not changed substantially . . . and actual subscriptions have not yet consistently surpassed the benchmark level."[41]

14. We are cognizant of current market trends and the demand for robust networks, including 4K streaming, online gaming, and high definition (HD) video streaming. Some commenters submit that such factors should result in us increasing the speed benchmark.[42] Although we agree that there is an "increased appetite"[43] for a number of new devices and applications and "trends in the United States show that the average speeds are increasing every year,"[44] the definition of advanced telecommunications capability in section 706 does not suggest that "advanced" necessarily means the highest quality service possible.[45] Furthermore, we agree with NCTA that "the current demand for multiple 4K video streams in a household is minimal because the use of 4K is still nascent and the majority of households consist of only one or two people" and as such does not provide a sufficient rationale to change the current fixed speed benchmark.[46] We also agree with NCTA that "adopting a 'forward-looking' or 'aspirational' definition, as some recommend, distorts the purpose of the analysis Congress has required the Commission to perform and may prove to be counter-productive in terms of new investment."[47] Therefore, we will not determine our fixed speed benchmark based on the maximum speeds available to consumers, such as gigabit service, as some commenters suggest.[48] The Commission's data shows that in the areas where gigabit service is available, only 4% of Americans living in those areas are in fact subscribing to it.[49]

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[40] ITTA Comments at 4-5; *see also* Internet Innovation Alliance Comments at 6 ("[W]hat Congress sought to measure – the deployment of advanced telecommunications services in a reasonable and timely fashion – is captured by the current measure.").

[41] WISPA Comments at 4-5; *see also* USTelecom Comments at 10 (stating that even with new technologies, "current usage patterns do not require more bandwidth than 25/3 Mbps").

[42] Benton Foundation Comments at 10; Fiber Broadband Association Comments at 4-5; INCOMPAS Comments at 4; Next Century Cities Comments at 4-5; Open Technology Institute and Access Now Comments at 3-4; Public Knowledge et al. Comments at 1-4; CWA Reply at 4-5; Public Knowledge et al. Reply at 1-2; Utilities Technology Council Reply at 3-4; Letter from Lindsay Stern, Public Knowledge, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 19-285, at 1-2 (filed Jan. 21, 2020) (Public Knowledge et al. Jan. 21, 2020 *Ex Parte* Letter); Letter from Lindsay Stern, Public Knowledge, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 19-285, at 1-3 (filed Jan. 30, 2020); New Networks Institute, Statement and Refreshing the Record, GN Docket No. 19-285, at 3 (filed Feb. 20, 2020 (New Networks February 20, 2020 Statement).

[43] Next Century Cities Comments at 5.

[44] Open Technology Institute and Access Now Comments at 3-4.

[45] 47 U.S.C. § 1302(d)(1).

[46] NCTA Reply at 3-4; *see also* ADTRAN Comments at 7-8 ("While 4K TV purchases have been growing, they still do not comprise a majority of the new television set purchases and 4K TV content is still limited.").

[47] NCTA Reply at 3; *see also* WISPA Comments at 6 ("[T]he availability of advanced services is an incremental process that must be measured empirically based on year-over-year advancement rather than by setting artificial a priori goals that may be more aspirational than realistic."); ADTRAN Reply at 5 (explaining that the benchmark "is not intended as an aspirational goal"); NCTA Reply at 3 ("While Congress has in the past asked the Commission to develop a forward-looking broadband plan, that is not the purpose of this report."); USTelecom Reply at 6 ("There is no basis upon which the Commission could reasonably conclude that the time is ripe for a precipitous increase in the Section 706 speed benchmark.").

[48] *See, e.g.*, INCOMPAS Comments at 4, 6-7; Fiber Broadband Association Comments at 4 n.6.

[49] *See* FCC, Fixed Broadband Deployment Data from FCC Form 477, Data as of December 31, 2018.

15. Notably, while 25/3 Mbps remains our fixed speed benchmark for purposes of conducting our inquiry under section 706, we continue our practice of showing progress of fixed services at multiple speed thresholds, including three speeds above the benchmark (50/5 Mbps, 100/10 Mbps, and 250/25 Mbps), to enable the Commission and the public to monitor consumer usage trends and marketplace developments. We agree with Free State Foundation and NCTA that we should assess a wider range of speed tiers,[50] but we continue to find, consistent with the *2019 Report* and longstanding Commission precedent, that a "single fixed speed benchmark provides a useful and administrable way of conducting our inquiry."[51] Furthermore, we maintain that a single fixed benchmark allows us to more easily understand consumer usage trends and marketplace developments and to track progress over time. We evaluate progress using a variety of speed tier metrics and categories across technologies.[52]

16. *Performance Benchmarks for Mobile Service.* We again evaluate deployment of advanced telecommunications capability for mobile services using multiple metrics instead of relying on a single benchmark.[53] A single benchmark is unreliable in the mobile wireless context due to the inherent variability in the performance characteristics of mobile service both geographically and temporally, as we have noted in previous reports.[54] Accordingly, we first analyze provider-reported 4G LTE coverage based on the Commission's Form 477 data, where service providers claim a minimum advertised speed of 5/1

[50] Free State Foundation Comments at 3; NCTA Comments at 2.

[51] *See 2019 Report*, 34 FCC Rcd at 3863, para. 15; *2018 Report*, 33 FCC Rcd at 1669, para. 25; *see also Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 15-191, 2016 Broadband Deployment Report, 31 FCC Rcd 699, 707, para. 19 (*2016 Report*); *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 14-126, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, 30 FCC Rcd 1375, 1391, para. 23 (2015) (*2015 Report*).

[52] While some commenters urge the Commission to adopt a benchmark based on an alternative metric from speed, the proffered approaches fail to provide a methodology or reliable data sources to implement their suggestions. *See* Benton Foundation Comments at 10 (urging the Commission "to set a new benchmark that better represents marketplace realities"); CTIA Comments at 17 (suggesting that "rigid speed benchmarks are an inadequate way to measure whether deployment is reasonable and timely" and instead, "the Commission should consider a range of data that better reflect the innovative and growing mobile economy, and the diversity of use cases consumers increasingly adopt"); Fiber Broadband Association Comments at 4-5 (suggesting the Commission "increase its current speed benchmark from 25/3 Mbps to at least 100/10 Mbps, and preferably higher, to reflect current and near-term use"); INCOMPAS Comments at 4 (suggesting the Commission "adopt 1 Gbps as the fixed broadband benchmark"); Next Century Cities Comments at 5 ("A standard of at least 50/10 Mbps will help ensure that households are not limited by inadequate connections."); Open Technology Institute and Access Now Comments at 3-4 ("The Commission should increase the benchmark for advanced telecommunications capability to ensure that the definition adequately matches the average speed consumed by Americans."); Public Knowledge et al. Comments at 2 ("Technological innovation and consumer demand for faster broadband warrant the FCC to update its benchmark speed from 25 Mbps to 100 Mbps downstream."); CWA Reply at 5-6 ("The Commission should raise its broadband benchmark to 100/10 Mbps to encourage high-speed broadband deployment that will ensure the United States leads the world in Internet speeds and deployment instead of simply struggling to keep up with global speeds."). *But see* ADTRAN Reply at 3-4 (arguing that "in order to justify a higher benchmark, [Next Century Cities] relies on increased average monthly usage, while [Open Technology Institute] relies on increased average speeds . . . [and] [t]he statutory definition does not include any reference to average speeds that consumers use or purchase").

[53] *2019 Report*, 34 FCC Rcd at 3863-64, paras. 16-17; *2018 Report*, 33 FCC Rcd at 1672-74, paras. 30-34.

[54] *2019 Report*, 34 FCC Rcd at 3863, para. 16; *2018 Report*, 33 FCC Rcd at 1672, para. 30.

Mbps.[55] We do not assert that 5/1 Mbps is a mobile advanced telecommunications capability benchmark; rather, we use the 5/1 Mbps minimum advertised speed as a check to ensure that the 4G LTE deployed to an area has sufficient backhaul and other capabilities to offer LTE in a manner consistent with being an advanced telecommunications capability.[56] Second, in areas where providers claim to provide 4G LTE with a minimum 5/1 Mbps advertised speed, we supplement provider-reported data with Ookla speed-test data, which identify areas showing median speed tests of at least 10/3 Mbps. This supplemental approach attempts to address certain limitations of the current Form 477 mobile data, while helping the Commission understand the extent to which American consumers today are receiving speeds higher than 5/1 Mbps.[57] By continuing our prior approach, we also can more readily assess progress over time.[58]

17. We find, therefore, that retaining the current approach of using multiple metrics is appropriate for this Report at this time.[59] We agree with CTIA that this Report should continue to focus on the ongoing nature of advanced telecommunications service deployment.[60] We also agree that mobile wireless service capability should be assessed holistically, given the inherent variability of wireless service. Finally, we will also begin collecting 5G New Radio (NR) deployment data this year, to ensure that both the Commission and consumers have an accurate account of 5G deployment.[61]

[55] The Form 477 Instructions require each provider to indicate their minimum advertised speeds and where users should expect to receive those advertised speeds. For convenience, we refer to minimum advertised speeds throughout this Report. Form 477 Instructions at 25, available at https://us-fcc.app.box.com/v/Form477Instructions. The Commission has recognized certain limitations associated with its Form 477 data collection and recently amended that collection to require, among other things, that mobile providers report 5G technology deployments and submit broadband and subscriber data at the census-tract level. *Establishing the Digital Opportunity Data Collection; Modernizing the FCC Form 477 Data Program*, WC Docket Nos. 19-195, 11-10, Report and Order and Second Further Notice of Proposed Rulemaking, 34 FCC Rcd 7505, 7524, para. 44, 7530, para. 58 (2019) (*Digital Opportunity Data Collection Order*). The Commission also sought comment on steps to obtain more accurate and reliable mobile broadband deployment data, including the collection of crowdsourced and other on-the-ground data. *Id.* at 7549-59, paras. 112-34.

[56] *2019 Report*, 34 FCC Rcd at 3863, para. 16; *see also* 47 U.S.C. § 1302(d) (defining advanced telecommunications capability as capable of enabling "users to originate and receive high-quality voice, data, graphics, and video telecommunications"). In previous reports, the Commission has concluded that LTE at 5/1 Mbps is a starting point for the analysis that enables consumer use consistent with the requirements of 47 U.S.C. § 1302, and speeds of 5/1 Mbps or higher "are accepted by industry as consistent with an LTE network." *2019 Report*, 34 FCC Rcd at 3863, para. 16; *2018 Report*, 33 FCC Rcd at 1672-73, paras. 31-32.

[57] *2019 Report*, 34 FCC Rcd at 3864, para. 16; *2018 Report*, 33 FCC Rcd at 1672-73, paras. 31-32; *see also Digital Opportunity Data Collection Order*, 34 FCC Rcd at 7549-59, paras. 112-34 (seeking comment regarding how to obtain and verify more accurate mobile coverage data).

[58] *2019 Report*, 34 FCC Rcd at 3864, para. 16 ("Overall, retaining this methodology allows consistent metrics by which we can evaluate whether mobile advanced telecommunications capability is improving for American consumers."); CTIA Comments at 5; Free State Foundation Comments at 1-2.

[59] 47 U.S.C. § 1302(d)(1); *2019 Report*, 34 FCC Rcd at 3863-64, paras. 16-17. The record does not justify altering the Commission's approach of analyzing both Form 477 data and Ookla data at speeds of 5/1 Mbps and 10/3 Mbps, respectively. *See* Free State Foundation Comments at 1-3, 6, 8 (agreeing with the 5/1 Mbps, 10/3 Mbps approach although also advocating for a wider range of speed tiers to be analyzed if available); CTIA Comments at 17-24 (arguing that the Commission should adopt a more "holistic approach" that assesses factors related to consumers wireless experience beyond speeds and coverage data); *see also 2019 Report*, 34 FCC Rcd at 3864, para. 17 (rejecting CTIA's alternative methodology proposal for assessing the mobile experience).

[60] *See* CTIA Comments at 5-6.

[61] *Digital Opportunity Data Collection Order*, 34 FCC Rcd at 7524, para. 44; *cf.* ADTRAN Comments at 6-7 (advising the Commission to collect "any information it can on 5G deployments" to accurately reflect 5G deployment in future assessments). *But see* INCOMPAS Comments at 3 (arguing that now is the time to reassess

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18. *Other Benchmarks.* We decline suggestions of some commenters to adopt additional benchmarks. While several commenters suggest adoption of a latency benchmark,[62] they do not offer a reliable and sufficiently comprehensive data source for such analysis.[63] As we concluded in last year's Report, we decline to incorporate latency into our section 706 analysis.[64] We therefore disagree with FBA's assertion that the Commission should use "a broadband experience metric [based on reliability, bandwidth, and latency, which] would better reflect how consumers are increasingly examining broadband service."[65]

19. Additionally, we decline the requests of some commenters to consider data allowances and affordability.[66] For purposes of this Report, such metrics fall outside the scope of our section 706 inquiry.[67] We reiterate our finding in the *2019 Report* that "[w]hile factors such as data allowances or pricing may affect consumers' use of advanced telecommunications capabilities or influence decisions concerning the purchase of these services in the first instance, such considerations do not affect the underlying determination of whether advanced telecommunications capability has been deployed and made available to customers in a given area."[68] Notably, commenters in support of including non-

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performance benchmarks due to carriers' beginning deployment of 5G-capable networks); NCC Comments at 5-6 (advocating switching from LTE to a 5G standard for this report).

[62] American Library Association Reply at 3; Benton Foundation Comments at 6; Public Knowledge et al. Comments at 12-13; *see also* Fiber Broadband Association Comments at 2-3 (advocating adoption of a "broadband experience metric" based on reliability, bandwidth, and latency).

[63] We also reached this conclusion based on the records in the two most recent reports, as well. *See 2019 Report*, 34 FCC Rcd at 3865, para. 19; *2018 Report*, 33 FCC Rcd at 1674-75, para. 36.

[64] *2019 Report*, 34 FCC Rcd at 3865, para. 19 (finding that "[a]pplying a latency benchmark for all broadband services, whether fixed terrestrial, satellite, or mobile broadband, that would exclude from our section 706 analysis any consideration of broadband services that, on their face, would appear to provide consumers with the relevant capabilities articulated in section 706(d)(1), would prevent a reliable or complete assessment of the deployment of advanced telecommunications capability"); *see also* WISPA Reply at 7 ("And while latency may have some minor impacts on the user experience for such activities as gaming and video conferencing, it does not render broadband capability 'unavailable' as a general matter even for users interested in these discrete capabilities.").

[65] Fiber Broadband Association Comments at 2-3.

[66] *See* Benton Foundation Comments at 4; National Digital Inclusion Alliance Comments at 1-2; Open Technology Institute & Access Now Comments at 3; Next Century Cities Comments at 1-2; CWA Reply at 3; Letter from Access Now, Benton Institute for Broadband & Society, Common Cause, MediaJustice, National Hispanic Media Coalition, New America's Open Technology Institute, and Public Knowledge, to Marlene H. Dortch, Secretary, Federal Communications Commission at 3 (Dec. 19, 2019); Letter from the Leadership Conference on Civil and Human Rights, American Civil Liberties Union, Asian Americans Advancing Justice, Common Cause, Communications Workers of America, National Consumer Law Center, on behalf of its low-income clients, National Hispanic Media Coalition, United Church of Christ, and OC Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission (Feb. 4, 2020); Public Knowledge et al. Jan. 21, 2020 *Ex Parte* Letter at 5. *But see* WISPA Reply at 8-9 ("Like variations in latency, price differentials for broadband service in the real world are incremental not vast and therefore do not suggest that service is unobtainable at a reasonable cost in areas where it is available for purchase.")

[67] ADTRAN Reply at 5 (explaining that the benchmark "is not intended as an aspirational goal"); NCTA Reply at 3 ("[A]dopting a 'forward-looking' or 'aspirational' definition, as some recommend, distorts the purpose of the analysis Congress has required the Commission to perform and may prove to be counter-productive in terms of new investment."); WISPA Reply at 8-9 (explaining that latency and pricing information "falls outside the scope of data subject to [s]ection 706 analysis").

[68] *2019 Report*, 34 FCC Rcd at 3866, para. 19.

performance metrics fail to cite reliable, comprehensive data sources that we could use, or offer sound methodologies for incorporating these metrics into the section 706 inquiry.[69]

B. Demographic Information

20. Section 706(c) directs the Commission to compile a list of geographical areas that are not served by any provider of advanced telecommunications capability and, to the extent that data from the Census Bureau are available, to determine, for each unserved area, the population, the population density, and the average per capita income.[70] We include a demographic data analysis below in Section IV.C.[71] and show the availability of advanced telecommunications capability on a county-by-county basis with demographic information in Appendix 4.[72]

C. Schools and Classrooms

21. Section 706(b) also specifies that our annual inquiry concerning the availability of advanced telecommunications capability to all Americans must include "elementary and secondary schools and classrooms."[73] As in the *2019 Report*, we continue to assess the current state of deployment in elementary and secondary schools in Section IV.F. below, using a short-term and long-term goal for broadband connectivity to schools of 100 Mbps per 1,000 students and staff, and 1 Gbps per 1,000 students and staff, respectively.[74]

D. Tribal Lands

22. We find that Tribal lands continue to face significant obstacles to broadband deployment. As reflected in both the *2018 Report* and *2019 Report*, deployment of advanced telecommunications capability on certain Tribal lands, particularly rural Tribal lands, lags behind deployment in other, non-Tribal areas.[75] Accordingly, the *Notice* sought comment on whether deployment on Tribal lands still falls behind other areas and on additional considerations, such as difficulties involving rights-of-way, that could be preventing deployment that would otherwise occur.[76] We recognize the need to promote and encourage the availability of broadband on Tribal lands as many of these lands are located disproportionately in rural areas, which tend to be less densely populated than rural non-Tribal areas. Further, the remote, isolated nature of these areas combined with challenging terrain and lower incomes

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[69] *See, e.g.*, Benton Foundation Comments at 4; National Digital Inclusion Alliance Comments at 1-2; Open Technology Institute & Access Now Comments at 3; Next Century Cities Comments at 1-2; CWA Reply at 3. *But see* NCTA Reply at 2 ("None of the parties seeking to change the threshold offers any evidence that 25/3 Mbps services no longer meet the statutory definition of advanced telecommunications capability or that such connections are incapable of handling the important functions they identify, such as finding employment or conducting research for homework."); USTelecom Reply at 6-7 (submitting that while quality of service and affordability "are important issues that the Commission addresses in other proceedings, they are not related to whether a consumer has access to broadband, the focus of this inquiry"); WISPA Reply at 7-9 (explaining that the record does not support including additional metrics that are not directly relevant to the section 706 inquiry). We similarly decline to evaluate provider conformance with state-level deployment commitments. *See* New Networks February 20, 2020 Statement at 7-9.

[70] 47 U.S.C. § 1302(c).

[71] *See infra* Section IV.C.

[72] *See infra* Appx. 4; *see also* Benton Foundation Comments at 7 (supporting use of demographic information).

[73] 47 U.S.C. § 1302(b).

[74] *See infra* Section IV.F; *see also* ADTRAN Comments at 8-9 (supporting use of the short and long term goals); Colville Confederated Tribes Comments at 5 (supporting use of "1 Gbps per 1,000 students and staff").

[75] *2019 Report*, 34 FCC Rcd at 3866, para. 22, 3883-85, paras. 44-46, Figs. 10 and 11; *2018 Report*, 33 FCC Rcd at 1681-86, paras. 50-57.

[76] *Notice*, 34 FCC Rcd at 10097, para. 15.

increase the cost of network deployment and entry, thereby reducing the profitability of providing service.[77] Although the record here is limited, it confirms that broadband deployment on Tribal lands continues to lag behind compared to other rural areas.[78] The Benton Foundation explains that "[t]he challenge of deploying broadband to tribal lands is exacerbated by poverty and low population density as well as tough terrain that increases construction and operating costs;" and "on Navajo lands in the Southwest, many people live in buildings, like converted tool sheds and traditional Navajo hogans, that the federal government does not recognize as dwelling units."[79] Colville Confederated Tribes contends that "[t]he digital divide has only grown larger over the last decade as other rural areas have seen significant increases in broadband access availability while Rural Native communities lack access."[80]

23. Because of challenges in accounting for all types of Tribal homes and Tribal lands and obstacles to infrastructure investment, we agree with commenters that more work is needed to spur broadband deployment in these areas.[81] We therefore find it critical to continue our efforts to collect, monitor, and analyze any relevant data on Tribal lands. Below, in Section IV.D., we present our measurement of deployment data on Tribal lands, acknowledging the challenges to increasing broadband services in these areas.

IV. BROADBAND DEPLOYMENT AND AVAILABILITY

A. Data Sources and Methodologies

24. We continue to rely primarily on the Commission's Form 477 deployment data to evaluate consumers' broadband options for fixed terrestrial and mobile services.[82] We agree with commenters that the Form 477 data "remains the most comprehensive data" available to complete our section 706 inquiry.[83] The Form 477 deployment data is also available to the public, which increases the transparency of our analysis and permits the public to independently assess our broadband service deployment data.[84] The Commission has been collecting Form 477 deployment data for several years,

[77] *Id.* at 10096-97, paras. 14-15; *see also* FCC, *Report on Broadband Deployment in Indian Country, Pursuant to the Repack Airwaves Yielding Better Access for Users of Modern Services Act of 2018*, at 2, 19, submitted to the Senate Committee on Commerce, Science, and Transportation; House of Representatives Committee on Energy and Commerce (May 1, 2019): https://docs.fcc.gov/public/attachments/DOC-357269A1.pdf; *Rural Digital Opportunity Fund; Connect America Fund*, WC Docket Nos. 10-90, 19-126, Report and Order, 35 FCC Rcd 686 (2020) (*Rural Digital Opportunity Fund Order*) (creating a Rural Digital Opportunity Fund to target support to areas that lack access to 25/3 Mbps broadband service, including prioritizing bids to serve Tribal lands).

[78] Benton Foundation Comments at 12-13; Colville Confederated Tribes Comments at 6; Public Knowledge et al. Reply at 13.

[79] Benton Foundation Comments at 13-14.

[80] Colville Confederated Tribes Comments at 6.

[81] Public Knowledge et al. Reply at 13; Colville Confederated Tribes Comments at 13.

[82] Some estimates for years prior to 2018 may differ from last year's *Report* because some filers have revised their Form 477 data since the *2019 Report*. For this year's Report, we also exclude deployment data for one service provider due to ongoing concerns about the reliability of this filer's data.

[83] *See, e.g.*, ADTRAN Comments at 9; NCTA Comments at 4; USTelecom Comments at 12-13; USTelecom Reply at 7; WISPA Reply at 9-10; *see also 2019 Report*, 34 FCC Rcd at 3868, para. 25; *2018 Report*, 33 FCC Rcd at 1677, para. 43 (concluding the Form 477 data remains the most thorough and accurate data available to the Commission for the section 706 analysis).

[84] FCC, Form 477 Resources, https://www.fcc.gov/economics-analytics/industry-analysis-division/form-477-resources. All Form 477 data used in this Report has been certified as accurate by the filers. We note that the Report's analysis may understate or overstate consumers' options for services to the extent that broadband providers fail to report data or misreport data. *See* FCC, *Explanation of Broadband Deployment Data* (Nov. 20, 2017), https://www.fcc.gov/general/explanation-broadband-deployment-data (describing quality and consistency checks performed on providers' submitted data and explaining any adjustments made to the Form 477 data as filed).

and so it provides a consistent yardstick against which to measure year-over-year progress of broadband deployment.

25. We have acknowledged that the Form 477 data collection is imperfect—which is why the Commission established the new Digital Opportunity Data Collection that will ultimately collect more precise fixed terrestrial, and has proposed to collect more precise mobile wireless, data than the Form 477 broadband deployment data.[85] While many commenters offer criticism of the Form 477 data,[86] as well as recommendations for how to improve the Commission's data,[87] this Report is not the appropriate vehicle for the Commission to make changes to the data collection.[88]

26. Form 477 deployment data report service at the census block level.[89] For purposes of this Report, a census block is classified as served if the Form 477 data indicate that service is available anywhere in the census block, which has been the case since the Commission began collecting broadband deployment data in 2014.[90] Therefore, it is not necessarily the case that every household, housing unit, or person will have coverage from a given service in a census block that this Report indicates is served. Therefore, as the Commission has previously explained, this analysis likely overstates the coverage experienced by some consumers, especially in large or irregularly-shaped census blocks.[91] We therefore acknowledge that this analysis may overstate the deployment of fixed and mobile services. Nonetheless, we continue to find that using a consistent unit of measurement (the census block), as well as our threshold for considering service to be deployed in a census block, is an effective tool for measuring progress over time. We report an analysis of deployment for fixed and mobile LTE services using 2010

[85] *See generally Digital Opportunity Data Collection Order*. In the *Digital Opportunity Data Collection Order*, the Commission also took the important immediate step of requiring facilities-based mobile-broadband and voice providers to submit their subscriber data by census tract rather than by state. *Digital Opportunity Data Collection Order,* 34 FCC Rcd at 7529-33, paras. 57-65.

[86] *See, e.g.*, American Library Association Reply at 2; Benton Foundation Comments at 3, 8; Colville Confederated Tribes Comments at 8, Public Knowledge et al. Comments at 8-10; Open Technology Institute & Access Now Comments at 3; CWA Reply at 11-12; Public Knowledge et al. Reply at 4.

[87] *See, e.g.*, CWA Reply at 11; Public Knowledge et al. Reply at 5-7; Letter from Cat Blake, Senior Program Manager, Next Century Cities, to Marlene H. Dortch, Secretary, FCC, at 2 (Nov. 27, 2019).

[88] *Notice*, 34 FCC Rcd at 10099, para. 20.

[89] The Commission's instructions for completing Form 477 state the following in this regard: "For purposes of this form, fixed broadband connections are available in a census block if the provider does, or could, within a service interval that is typical for that type of connection—that is, without an extraordinary commitment of resources—provision two-way data transmission to and from the Internet with advertised speeds exceeding 200 kbps in at least one direction to end-user premises in the census block." FCC, FCC Form 477 Local Telephone Competition and Broadband Report Instructions at 17 (2016) (pertinent to the data on which this Report is based), https://us-fcc.box.com/v/Form477InstThruJune19 (2018 Form 477 Instructions); FCC, FCC Form 477 Local Telephone Competition and Broadband Report Instructions at 18 (2019) (2019 Form 477 Instructions) (current version), https://transition.fcc.gov/form477/477inst.pdf.

[90] For the purposes of Form 477, fixed broadband connections are "available" in a census block "if the provider, does, or could, within a service interval that is typical for that type of connection–that is, without an extraordinary commitment of resources–provision two-way data transmission . . . in at least one direction to end-user premises in the census block." *See* Glossary of Terms Used in FCC Form 477 (for filings through June 30, 2019), https://us-fcc.app.box.com/v/Form477GlossaryThruJune19. We reject Utilities Technology Council's argument that our methodology should evaluate individual technologies at the census block level. Utilities Technology Council Reply at 2, 6. It is unclear how this would better inform our analysis of the deployment of services to residents in a specific census block.

[91] *See 2019 Report*, 34 FCC Rcd at 3869, para. 25 n.92; *2018 Report*, 33 FCC Rcd at 1677, para. 43.

census block population data that the Commission staff has updated to account for population growth and economic development.[92]

27. We note that the Commission recently released the Form 477 data for June 2019.[93] This Report maintains our practice of analyzing the most recent year-end data, which in this case is for 2018. We note that the June 2019 data demonstrate continuing progress in deployment.[94]

28. *U.S. Territories.* We believe the Form 477 deployment data, as of December 31, 2018, provide the most reliable and comprehensive available data that is currently available regarding the current deployment of broadband services in the U.S. Territories. Neither the *2018 Report* nor the *2019 Report* included data from the U.S. Territories in overall national deployment figures for the United States, including in the figures showing the five-year progression of deployment, because of anomalies in the historical deployment data for Puerto Rico and the U.S. Virgin Islands.[95] Puerto Rico and the U.S. Virgin Islands account for over 92% of the total combined population of the U.S. Territories; therefore, presenting historical data for the U.S. Territories would likely misrepresent the progress in deployment that has occurred in these areas from 2014 to 2018. Thus, figures that present deployment data from 2014-2018 do not include U.S. Territories data. Nevertheless, we do include data from the U.S. Territories in the national deployment figures wherever possible,[96] including in Figure 3e, where we present the overall state of fixed and mobile deployment data for the full United States.[97]

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[92] Commission staff developed population estimates for 2011-18 by updating the 2010 census block population estimates. These estimates are based upon annual U.S. Census mid-year county (or county-equivalent) level population and housing unit estimates for the fifty states, the District of Columbia, and Puerto Rico. These data are used in conjunction with U.S. Census Bureau TIGER data to indicate new roads, that is, new housing development, to distribute population amongst the census blocks comprising each county (or county-equivalent). Federal Communications Commission, Staff Block Estimates, https://www.fcc.gov/reports-research/data/staff-block-estimates. Next Century Cities argues that overstatement may be over 100% in rural counties based upon a landmass analysis. Next Century Cities Comments at 6. We measure deployment by population rather than land area because providers of fixed services likely build their networks where people live not where there is land. For example, there are 3.5 million square miles of land area encompassed in the 11.1 million census blocks in the United States but only 7.4 million of the census blocks are populated and these census blocks only account for 2.4 million of the 3.5 million square miles of land area in the United States.

[93] *FCC Releases Form 477 Data on Broadband Deployment as of June 30, 2019*, WC Docket No. 11-10, Public Notice, DA 20-262 (Mar. 12, 2020).

[94] Form 477 Data as of June 30, 2019 is available at https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477.

[95] *See 2019 Report*, 34 FCC Rcd at 23, para. 3867; *2018 Report*, 33 FCC Rcd at 1678, para. 44. The historical data suggests a 20.9 percentage point reduction in the deployment in the U.S. Territories between 2014 and 2015, and a 21.7 percentage point increase in deployment between 2015 and 2016. *2019* Report, 34 FCC Rcd at 3878, para. 39, Fig. 5. In addition, the year-end 2017 deployment data most likely significantly overstates deployment in Puerto Rico and the U.S. Virgin Islands at that time, because the data do not reflect infrastructure damage caused by Hurricanes Maria and Irma, even though these data postdate the hurricanes and should reflect such damage. *See 2019 Report*, 34 FCC Rcd at 3869, para. 26 and 3877-78, para. 39. We agree with Colville Confederate Tribes that we should include "all data from every state and territory." Colville Confederated Tribes Comments at 13. While the *2018 Report* and *2019 Report* did not include data from the U.S. Territories in the overall deployment figures for the United States, data from the U.S. Territories was reported separately. *See 2019 Report*, 34 FCC Rcd at 3878, para. 39, Fig. 5; *2018 Report*, 33 FCC Rcd at 1688-89, para. 59, Tbl. 6.

[96] Ookla data is unavailable for the U.S. Territories, and thus figures and appendices presenting 10/3 Mbps mobile figures based on Ookla data will not include the U.S. Territories, even for 2018.

[97] We also include data for Puerto Rico in our presentation of demographic data. *See* Figs. 5, 6, 7, 8. Further, Appendices 1-6 include data for the U.S. Territories.

29. *Fixed Terrestrial Services.* We find that our Form 477 deployment data for fixed terrestrial services remain the most reliable and comprehensive data to assess the availability of fixed terrestrial services to American consumers. We evaluate the deployment of fixed terrestrial services with minimum advertised speeds of 10/1 Mbps, 25/3 Mbps, 50/5 Mbps, 100/10 Mbps, and 250/25 Mbps. We use Form 477 subscribership data to calculate adoption rates for fixed terrestrial services.

30. *Satellite Services.* We find that Form 477 deployment data for satellite broadband service may overstate the extent to which satellite broadband is available. The Form 477 deployment data for satellite broadband indicate that satellite service offering 25/3 Mbps speeds is available to nearly all of the population.[98] However, other Form 477 data indicate that satellite services have a relatively low subscription rate despite their apparent widespread availability.[99] In Appendix 8, we provide deployment estimates for all fixed services, including satellite, from 2014 to 2018.[100] Unless stated otherwise, our analysis is based on all fixed terrestrial services, which do not include satellite.

31. *Fixed Wireless Services.* We note that the Form 477 data for fixed wireless services appear to show that these services are widely available. However, these services have a sufficiently low subscription rate[101] to potentially support a conclusion that the Form 477 deployment data may overstate the extent to which fixed wireless services are available. In Appendix 9, we provide deployment estimates for fixed wired services, that is, fixed services excluding fixed wireless and satellite services, for 2014 to 2018.[102]

32. *Mobile Services.* We continue to conclude that the best way to evaluate mobile broadband deployment and availability is to rely on available coverage data supplemented with Ookla's speed test data. These data sets serve as a proxy for the likely consumer experience in a given area while providing objective data to assess deployment progress. While acknowledging certain limitations of the Form 477 data, we nonetheless elect to employ the Form 477 LTE technology coverage data in this Report because they are the most comprehensive data that we currently have on a nationwide basis over time to assess the availability of mobile LTE to American consumers.[103] We use the Form 477 LTE deployment shapefiles with a minimum advertised speed of 5/1 Mbps.[104] As the Commission has done in

[98] More specifically, the data indicate that satellite service offering 25/3 Mbps speeds is available to 326.979 million of the 327.167 million Americans, or approximately 100% of the U.S. population. FCC Form 477 Data as of December 31, 2018.

[99] Form 477 data shows that 1.7 million households currently subscribe to satellite services of at least 10/1 Mbps. FCC Form 477 Data as of December 31, 2018. While satellite signal coverage may enable operators to offer services to wide swaths of the country, overall satellite capacity may limit the number of consumers that can actually subscribe to satellite service at any one time. *Notice*, 34 FCC Rcd at 10099, para. 19; *2019 Report*, 34 FCC Rcd at 3870, para. 28 n.98; *2018 Report*, 33 FCC Rcd at 1681, para. 51 n.148. For this reason, we will continue to report satellite broadband deployment data separately.

[100] *See infra* Appx. 8 (Deployment (Millions) of Fixed Services (Including Satellite) at Different Speed Tiers).

[101] For example, as of December 31, 2018, the adoption rate for fixed wireless services of at least 10/1 Mbps is 1%. FCC Form 477 Data as of December 31, 2018. This contrasts with the 57% adoption rate for cable and the 30% adoption rate for fiber-based services at the same speeds where these services are available in the United States. *Id.*

[102] *See infra* Appx. 9 (Deployment (Millions) of Fixed Wired Services at Different Speed Tiers).

[103] We continue to explore ways of improving data on mobile coverage. *Digital Opportunity Data Collection Order*, 34 FCC Rcd at 7549-59, paras. 112-34 (seeking comment about how to obtain and verify more accurate mobile coverage data).

[104] For fixed services, the Commission has been able to rely upon Form 477 reported maximum advertised speeds to track actual speeds. However, we note that the relationship between actual speeds and the advertised speed reported in the Form 477 for mobile services is more complex, because minimum advertised speed is reported by the mobile providers, and different mobile providers estimate their minimum advertised speed based on various points of their

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previous *Reports*, we employ the centroid methodology in evaluating the Form 477 deployment data for LTE.[105] We apply the same methodology as we use for fixed services, and consider a census block to be covered by LTE services if there is at least one service provider serving that census block that reports 5/1 Mbps as the minimum advertised speed, based on their Form 477 submission.[106]

33. We recognize, however, that actual speeds tend to be much faster than the minimum advertised speed. Therefore, we also present estimates based on Ookla speed test data to evaluate the availability of LTE with a median actual speed of 10/3 Mbps or higher.[107] We rely on the Ookla data[108] to supplement our Form 477 analysis primarily because they allow us to evaluate the extent to which the typical consumer receives speeds of 10/3 Mbps or higher, and they provide us with the greatest number of observations of actual speeds that customers receive.[109] As the Commission has done previously, our analysis of the availability of mobile LTE services with a median speed of 10/3 Mbps includes actual speed test data in counties[110] with at least 300 test observations in each time frame.[111] The more densely

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actual speed distribution. *2019 Report*, 34 FCC Rcd at 3870, para. 29 & n.100. By contrast, the Ookla data provide us with the actual speeds that consumers experience.

[105] *See, e.g.*, *2019 Report*, 34 FCC Rcd at 3870, para. 29.

[106] We note that questions have arisen in various contexts regarding the bases for certain filings. For example, in the context of the Mobility Fund Phase II (MF-II) proceeding, the Commission determined that a separate, one-time data collection was necessary to ensure that all mobile LTE providers were using the same standard when generating coverage maps of their 5 Mbps downstream 4G LTE deployment. *Connect America Fund, Universal Service Reform—Mobility Fund*, Order on Reconsideration and Second Report and Order, 32 FCC Rcd 6282, 6286, para. 7, 6287, para. 10, 6298, para. 34 (2017) (*Mobility Fund Phase II Challenge Process Order*). However, a 2019 staff report investigating potential violations of the MF-II mapping rules concluded, among other things, that the MF-II coverage maps submitted by several providers are not a sufficiently reliable or accurate basis upon which to complete the MF-II challenge process (used to determine areas eligible for funding) as it was designed. FCC, Mobility Fund Phase II Coverage Maps Investigation, GN Docket No. 19-367, Staff Report (Dec. 4, 2019), https://docs.fcc.gov/public/attachments/DOC-361165A1.pdf. We note the Commission has begun to implement improvements in our data collection process and has sought comment on other steps to obtain more accurate and reliable mobile deployment data. *Digital Opportunity Data Collection Order*, 34 FCC Rcd at 7549-7559, paras. 112-34; FCC, Changes to Form 477 in 2019 and 2020 at 2 (Jan. 8, 2020), https://us-fcc.app.box.com/v/ChangesFor2019and2020.

[107] The data collected by the Ookla Speedtest mobile app include test results for download speed, upload speed, and latency, as well as other information, such as the location of the test and operating system of the handset. *See 2019 Report*, 34 FCC Rcd at 3871, para. 20 n.105; *see also* https://www.speedtest.net/about.

[108] The Ookla results presented in this Report are based on tests that were executed in the second half of the year for 2014, 2015, 2016, 2017, and 2018 on the smartphone's cellular connection, and using LTE technology. Test data were excluded if they had missing GPS location data or if the reported download or upload speed was less than zero or greater than 100 Mbps. Multiple tests by a single phone in the same locality and in the same day were averaged (using the median). All Ookla speed tests are user-initiated.

[109] We note that, in general, crowd-sourced data can offer the advantage of generating a large volume of data at a very low cost and of measuring actual consumer experience on a network in a wide variety of locations, indoor and outdoor. Crowd-sourced data, however, often are not collected pursuant to statistical sampling techniques, and may require adjustments to construct a representative sample from the raw data. For instance, crowd-sourced mobile data come from a self-selected group of users, and there often is little control for most tests regarding such parameters as when people implement the test, whether the test is performed indoors or outdoors, the geographic location of the tester, and the vintage of the consumer's device. *2019 Report*, 34 FCC Rcd at 3871, para. 30 n.104.

[110] Wireless mobile speeds vary over even small local areas. Therefore, ascribing the median county Ookla speed to an entire county will sometimes overestimate or underestimate realized local speeds. *See* Colville Confederated Tribes Comments at 4. Use of Ookla data alone would overestimate coverage as counties with only partial coverage would be represented as having 100% coverage. Use of Form 477 data alone would necessitate reliance on the 5/1 Mbps reporting standard.

populated counties have a higher likelihood of being included in this analysis because there generally are more observations in those geographical areas with a higher population density. Although we do not have reliable on-the-ground speed data for every county in the United States, the Ookla data cover approximately 93% of the population of the United States, excluding the U.S. Territories, for which we do not have data.[112] Using the existing Form 477 data combined with on-the-ground speed testing data provides the most reliable and comprehensive available data that is currently available on the extent of mobile coverage,[113] and its continued use allows for a consistent measure of progress over time.

34. *Schools.* For purposes of this Report, we assess deployment in elementary and secondary schools based upon the best publicly available data, specifically that analyzed in EducationSuperHighway's *2019 State of the States Report*.[114] The *2019 State of the States Report* tracks public schools' progress toward the Commission's goals for K-12 connectivity using the Commission's Form 471 data and additional outreach efforts to E-Rate applicants for clarifications on their broadband purchases.[115] The *2019 State of the States Report* provides an analysis of schools meeting the connectivity goals using fiber and other scalable broadband connections, using a sample of public school districts in each state.

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[111] *2019 Report*, 34 FCC Rcd at 3871, para. 30. This sample size threshold applies to each county for each time frame (2H2014, 2H2015, 2H2016, 2H2017, and 2H2018). If a county does not have at least 300 observations during any of these time frames, it is not included in the actual speed analysis. The 300 observations threshold is a conservative threshold and is based on a general mean and median sample size analysis. We consider a county to have a sufficient sample size if there are at least 300 total observations in each of the five years after the cleaning and trimming rules have been applied. County geography is assigned using the latitude and longitude coordinates that are collected during each Ookla speed test, via the device's GPS. This allows us to evaluate actual median upload and download speeds at the county level, in each year of the five-year time period, for counties in which approximately 93% of the U.S. population live (not including the U.S. Territories). If a census block has LTE coverage of at least 5/1 Mbps based on the Form 477 minimum advertised speeds, it is assigned the median upload and download speeds that are calculated for the county in which it is located, which allows us to evaluate the mobile broadband speeds for each census block within the United States.

[112] The percentage of the population in our analysis is based on the total U.S. population, not including the U.S. Territories, for which we separately report our results. The Ookla speed data population in Figure 2b is a subset of the total U.S. population evaluated in Figure 2a and refers to the population in the counties for which we believe there are a statistically significant number of on-the-ground speed test observations. We do not have Ookla speed data for the U.S. Territories. In 2018, for example, the U.S. population, not including the U.S. Territories, was 325.167 million, whereas in Figure 2b, we use 304.288 million as the basis for our 2018 calculations. The population evaluated figure, 304.288 million, is the population for the U.S., excluding the U.S. Territories and the population in the counties without a sufficient number of reliable on-the-ground speed test data observations.

[113] *2018 Report*, 33 FCC Rcd at 1672-74, paras. 31-34 (discussing use of Form 477 combined with Ookla data to account for limitations in both data sets). We note that no commenter has proposed alternative data sets for the specific analysis in this report.

[114] *See* EducationSuperHighway, *2019 State of the States Report* (Oct. 2019) (*2019 State of the States Report*), https://s3-us-west-1.amazonaws.com/esh-sots-pdfs/2019%20State%20of%20the%20States.pdf. In the *2019 Report*, we also evaluated information provided by the Consortium for School Networking (CoSN), specifically the *CoSN's 2018-2019 Annual Infrastructure Report*, a report published in January 2019. *See 2019 Report*, 34 FCC Rcd at 3887-88, para. 51. Because the *CoSN's 2018-2019 Annual Infrastructure Report* does not provide data for 2019 and no subsequent report has been issued, we do not rely on any COSN Annual Infrastructure Report in this Report.

[115] *See* EducationSuperHighway, *2019 State of the States Report* at 21-22; *see also* EducationSuperHighway: 2019 State of the States FAQ (Oct. 2019), https://stateofthestates.educationsuperhighway.org/faq.html (*2019 State of the States Report FAQ*). EducationSuperHighway uses a sample of public school districts receiving broadband services–including, but not limited to, fiber services–in funding year 2019 in its dataset. *See id*.

B. Broadband Deployment Estimates

35. In Figures 1 through 3 below, we present our measurement of deployment, evaluating progress by comparing deployment in the present year to deployment in the previous four years.[116] Our released deployment data are periodically updated as filers revise their data. For purposes of this Report, we also report results for federally-recognized Tribal lands. We aggregate federally-recognized Tribal lands into four Tribal lands categories (the Lower 48 States,[117] Tribal Statistical Areas,[118] Alaskan Villages,[119] and Hawaiian Homelands)[120] and report deployment for each of these four geographic categories separately, as well as together.[121]

1. Deployment of Fixed Advanced Telecommunications Capability

36. Figure 1 shows the deployment of fixed terrestrial broadband at speeds of 25/3 Mbps, the Commission's current benchmark for fixed advanced telecommunications capability.[122] As of year-end 2018, 94.4% of the overall population had coverage of such services, up from 93.5% in 2017. Nonetheless, the gap in rural and Tribal America remains notable: 22.3% of Americans in rural areas and 27.7% of Americans in Tribal lands lack coverage from fixed terrestrial 25/3 Mbps broadband, as compared to only 1.5% of Americans in urban areas.[123] The data demonstrate, however, that the gap between urban and rural or Tribal areas has narrowed each year over the last five years. Indeed, while the gap between urban and rural areas was 30 percentage points as of year-end 2016, it was only 20.8 percentage points as of year-end 2018. In 2016, 25/3 Mbps satellite service was reported for the first time in the Form 477 data collection.[124] If we include satellite service in our estimate, the December 2018 data shows that fixed 25/3 Mbps service is deployed to nearly every American.[125]

[116] Unless otherwise noted, the deployment percentage estimate for fixed terrestrial services and/or mobile services is the population in the census blocks with coverage for the service divided by the total population in the area being considered (e.g., United States, all rural areas, all urban areas).

[117] These areas include: (1) Joint Use Areas; (2) legal, federally-recognized American Indian area consisting of reservation and associated off-reservation trust land; (3) legal, federally-recognized American Indian area consisting of reservation only; and (4) legal, federally-recognized American Indian area consisting of off-reservation trust land only.

[118] Tribal statistical areas are statistical American Indian areas. These are defined for a federally-recognized Tribe that does not have reservation or off-reservation trust land, specifically a Tribal designated statistical area (TDSA) or Oklahoma Tribal statistical area (OTSA).

[119] Alaskan Native village statistical area.

[120] Hawaiian Home Lands established by the Hawaiian Homes Commission Act of 1921.

[121] *See infra* Fig. 10.

[122] In all instances in which we refer in this Report to data for the United States, unless stated otherwise, we refer to the fifty States and the District of Columbia, but not the U.S. Territories.

[123] For purposes of presenting estimates for rural and urban areas, we aggregate all similarly categorized areas. The designation of a census block as urban is based upon the 2010 Census. An urban census block encompasses all population, housing, and territory included within a census block categorized as in an urban area or urban cluster. A rural census block encompasses all population, housing, and territory not included within an urban census blocks.

[124] *2018 Report*, 32 FCC Rcd at 1681, para. 51.

[125] *See also infra* Appx. 8 (Deployment (Millions) of Fixed Services (Including Satellite) at Different Speed Tiers in the United States). We also present estimates for fixed wired services, excluding satellite and fixed wireless services. *See infra* Appx. 9 (Deployment (Millions) of Fixed Wired Services (Including Satellite) at Different Speed Tiers in the United States).

Fig. 1
Deployment (Millions) of Fixed Terrestrial 25/3 Mbps Services

	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
United States	284.246	89.4%	287.853	89.9%	296.320	91.9%	304.473	93.5%	308.913	94.4%
Rural Areas	37.174	60.3%	38.271	61.5%	42.628	67.7%	46.982	73.7%	50.099	77.7%
Urban Areas	247.072	96.4%	249.582	96.7%	253.692	97.7%	257.491	98.3%	258.814	98.5%
Tribal Lands	2.245	57.1%	2.290	57.8%	2.520	63.1%	2.734	68.1%	2.921	72.3%
Pop. Evaluated	317.954	100.0%	320.289	100.0%	322.518	100.0%	325.716	100.0%	327.167	100.0%

2. Deployment of Mobile LTE

37. Figure 2a shows that approximately all of the American population lives in geographical areas covered by mobile LTE with a minimum advertised speed of at least 5/1 Mbps.[126] Further, from 2014 to 2018, the percentage of Americans living in rural areas with coverage of LTE at 5/1 Mbps increased from 96.5% to 99.4%. Figure 2b also shows significant improvement since 2017 in the deployment of mobile LTE services at median speeds of at least 10/3 Mbps for the United States, urban areas, and rural areas. Figure 2b shows that between 2017 and 2018, the percentage of Americans living in the United States with mobile LTE services coverage at median speeds of 10/3 Mbps increased from 89.0% to 94.9%. In addition, gains have been made in rural areas, where coverage increased from 69.3% to 83.3% between 2017 and 2018, after being relatively stagnant between 2014 and 2017.[127]

[126] Questions have arisen in various contexts regarding the reliability of mobile coverage data. *See, e.g.*, *Mobility Fund Phase II Challenge Process Order*, 32 FCC Rcd at 6286, para. 7, 6287, para. 10, 6298, para. 34. The Commission has begun to implement improvements in our data collection process and has sought comment on other steps to obtain more accurate and reliable mobile deployment data. *Digital Opportunity Data Collection Order*, 34 FCC Rcd at 7549-59, paras. 112-34. *See supra* n.106.

[127] We present additional deployment data for mobile LTE services for each state, the District of Columbia, U.S. Territory, and each category of Tribal land in the appendices. *See infra* Appxs. 1, 2, and 3 (reporting figures by state, the District of Columbia, and U.S. Territory), Appx. 4 (reporting figures by county and county equivalent), and Appx. 6 (reporting figures for Tribal lands and states).

Fig. 2a
Deployment (Millions) of Mobile LTE with a Minimum Advertised Speed of 5/1 Mbps

Area	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
United States	315.506	99.2%	318.923	99.6%	321.347	99.6%	325.117	99.8%	326.727	99.9%
Rural Areas	59.463	96.5%	60.969	97.9%	61.802	98.2%	63.204	99.1%	64.097	99.4%
Urban Areas	256.043	99.9%	257.954	100.0%	259.545	100.0%	261.912	100.0%	262.630	100.0%
Tribal Lands	3.626	92.2%	3.722	93.9%	3.788	94.9%	3.896	97.0%	3.937	97.5%
Pop. Evaluated	317.954	100.0%	320.289	100.0%	322.518	100.0%	325.716	100.0%	327.167	100.0%

Fig. 2b
Deployment (Millions) of Mobile LTE with a Median Speed of 10/3 Mbps[128]

Area	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
United States	237.210	80.1%	245.843	82.5%	261.898	87.3%	269.494	89.0%	288.809	94.9%
Rural Areas	32.638	70.3%	32.193	69.3%	32.962	70.1%	32.966	69.3%	40.103	83.3%
Urban Areas	204.573	81.9%	213.650	85.0%	228.936	90.5%	236.528	92.6%	248.706	97.1%
Pop. Evaluated	296.204	93.2%	297.899	93.0%	300.036	93.0%	302.940	93.0%	304.288	93.0%

3. Deployment of Fixed Services and Mobile LTE

38. Figure 3a shows deployment across all geographic areas for both fixed terrestrial 25/3 Mbps services *and* 5/1 Mbps mobile LTE.[129] Overall, as of year-end 2018, approximately 309 million Americans, or 94.4% of the population, are covered by both 25/3 Mbps fixed terrestrial service and mobile LTE with a minimum advertised speed of 5/1 Mbps. In rural areas, 77.4% of Americans are covered by both services, as opposed to 98.5% of Americans in urban areas, up from 73.3% and 98.3%, respectively, in 2017. On Tribal lands, 72.1% of Americans have coverage from both services, up from 67.8% in 2017. Figure 3b shows deployment of fixed terrestrial speeds of 25/3 Mbps and mobile LTE with median speed of 10/3 Mbps. As of December 31, 2018, 91.7% of Americans live in geographic areas covered by both services, an increase of 5.9 percentage points since 2017. Further, these data

[128] The analyses in Figures 2a, 3a, and 3c include all areas of the United States (besides the U.S. Territories) and are based on Form 477 data. In contrast, the analyses in Figures 2b, 3b, and 3d are based on Ookla data, and exclude any county (and its associated census blocks) for which there is insufficient Ookla data. In addition, we do not report results for Tribal lands in Figures 2b, 3b, and 3d because we have concerns with the reliability of the Ookla data for these areas. Tribal areas not only typically have fewer speed tests, but there are also fewer of these areas relative to urban and rural areas. Thus, deployment estimates for tribal areas are more sensitive to sample variance. The population figure reported in the bottom row of these figures is the population evaluated for the reported time period and the percentage is the percentage of the U.S. population evaluated. Accordingly, the 304.288 million population evaluated figure for 2018 in Figure 2b represents 93% of the overall population in the 50 U.S. states plus the District of Columbia (304.288/327.167 = 0.93). Regardless of our deployment estimates for mobile LTE with a median speed of 10/3 Mbps, Americans residing in the counties without sufficient Ookla data to create a statistically significant county sample to be included in Figures 2b, 3b, and 3d, receive minimum advertised speeds of 5/1 Mbps, and likely receive mobile services with speeds higher than 5/1 Mbps.

[129] We present additional deployment data for fixed terrestrial 25/3 Mbps and/or mobile LTE services in the appendices. *See infra* Appxs. 1, 2 and 3 (reporting figures by state, District of Columbia, and U.S. Territory), Appx. 4 (reporting figures by county and county equivalent), Appx. 5 (reporting figures by urban and rural areas within each county or county equivalent), and Appx. 6 (reporting figures for Tribal lands).

indicate that, between 2017 and 2018, deployment increased from 56.3% to 69.8% for Americans living in rural areas, a larger increase that occurred between 2014 and 2017.

Fig. 3a
Deployment (Millions) of Fixed Terrestrial 25/3 Mbps and Mobile LTE with a Minimum Advertised Speed of 5/1 Mbps

Area	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
United States	283.386	89.1%	287.387	89.7%	295.853	91.7%	304.216	93.4%	308.722	94.4%
Rural Areas	36.489	59.2%	37.840	60.8%	42.182	67.0%	46.731	73.3%	49.932	77.4%
Urban Areas	246.897	96.3%	249.547	96.7%	253.671	97.7%	257.485	98.3%	258.790	98.5%
Tribal Lands	2.206	56.1%	2.258	57.0%	2.491	62.4%	2.722	67.8%	2.914	72.1%
Pop. Evaluated	317.954	100.0%	320.289	100.0%	322.518	100.0%	325.716	100.0%	327.167	100.0%

Fig. 3b
Deployment (Millions) of Fixed Terrestrial 25/3 Mbps and Mobile LTE with a Median Speed of 10/3 Mbps

Area	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
United States	221.249	74.7%	230.561	77.4%	249.802	83.3%	259.998	85.8%	279.162	91.7%
Rural Areas	22.634	48.8%	22.554	48.5%	24.947	53.1%	26.754	56.3%	33.595	69.8%
Urban Areas	198.615	79.5%	208.007	82.7%	224.855	88.9%	233.244	91.3%	245.568	95.9%
Pop. Evaluated	296.204	93.2%	297.899	93.0%	300.036	93.0%	302.940	93.0%	304.288	93.0%

39. Figure 3c reports deployment of fixed terrestrial 25/3 Mbps service *or* mobile LTE with a minimum advertised speed of 5/1 Mbps, and shows that services have been deployed to over 99.5% of the American population since 2014. Figure 3d shows that approximately 99.1% of the population in the evaluated areas are covered by either 25/3 Mbps fixed terrestrial service or mobile LTE with a median speed of at least 10/3 Mbps.

Fig. 3c
Deployment (Millions) of Fixed Terrestrial 25/3 Mbps or Mobile LTE with a Minimum Advertised Speed of 5/1 Mbps

Area	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
United States	316.366	99.5%	319.389	99.7%	321.814	99.8%	325.373	99.9%	326.918	99.9%
Rural Areas	60.148	97.6%	61.400	98.6%	62.248	98.9%	63.455	99.5%	64.264	99.6%
Urban Areas	256.218	100.0%	257.989	100.0%	259.567	100.0%	261.919	100.0%	262.653	100.0%
Tribal Lands	3.664	93.2%	3.753	94.7%	3.817	95.6%	3.907	97.3%	3.944	97.7%
Pop. Evaluated	317.954	100.0%	320.289	100.0%	322.518	100.0%	325.716	100.0%	327.167	100.0%

Fig. 3d
Deployment (Millions) of Fixed Terrestrial 25/3 Mbps or Mobile LTE with a Median Speed of 10/3 Mbps

Area	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
United States	288.119	97.3%	290.355	97.5%	293.855	97.9%	297.944	98.4%	301.608	99.1%
Rural Areas	40.331	86.9%	40.660	87.5%	41.888	89.1%	43.181	90.8%	45.710	94.9%
Urban Areas	247.787	99.2%	249.695	99.3%	251.967	99.6%	254.763	99.8%	255.897	99.9%
Pop. Evaluated	296.204	93.2%	297.899	93.0%	300.036	93.0%	302.940	93.0%	304.288	93.0%

40. Figure 3e reports deployment over the entire United States, including all U.S. Territories, for both fixed terrestrial 25/3 Mbps services *and* 5/1 Mbps mobile LTE as of December 31, 2018.[130] This data shows year end 2018 deployment rates comparable to those presented in Figure 1, in which the U.S. Territories are excluded.[131]

Fig. 3e
Deployment (Millions) of Fixed Terrestrial 25/3 Mbps and Mobile LTE with a Minimum Advertised Speed of 5/1 Mbps for the United States, Including U.S. Territories (As of December 31, 2018)

	Fixed Terrestrial 25/3 Mbps		Mobile LTE 5/1 Mbps		Fixed Terrestrial 25/3 Mbps and Mobile LTE 5/1 Mbps		Fixed Terrestrial 25/3 Mbps or Mobile LTE 5/1 Mbps	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%
United States	312.079	94.4%	330.245	99.9%	311.834	94.3%	330.489	99.9%
Rural Areas	50.254	77.6%	64.326	99.4%	50.079	77.4%	64.502	99.6%
Urban Areas	261.825	98.4%	265.918	100.0%	261.755	98.4%	265.988	100.0%
Pop. Evaluated	330.740	100.0%	330.740	100.0%	330.740	100.0%	330.740	100.0%

4. Additional Deployment Estimates

41. Figure 4 shows deployment of fixed terrestrial services at various speed tiers from year-end 2014 through 2018.[132] As of December 2018, fixed terrestrial service of 50/5 Mbps service is deployed to 92.7% of the population, up from 91.6% in 2017. Between 2017 and 2018, the deployment of 100/10 Mbps increased from 88.6% to 90.5% of the population, and the deployment of 250/25 Mbps dramatically increased from 58.3% to 85.6% of the population. While deployment in rural areas and on Tribal lands lags behind deployment in urban areas at all five speed tiers, but the data show year-over-year improvements for all speeds in these areas. For example, the deployment of 250/25 Mbps increased from 28.2% to 51.6% of the rural population.

[130] Data presented in 3e includes Tribal Lands.

[131] Appendices 1-5 include data for the U.S. Territories.

[132] We present deployment estimates for all fixed services, including satellite broadband, in Appendix 8, and deployment estimates for all fixed wired services, excluding satellite and fixed wireless services, in Appendix 9. *See infra* Appx. 8 (Deployment (Millions) of Fixed Services (Including Satellite) at Different Speed Tiers), Appx. 9 (Deployment (Millions) of Fixed Wired Services at Different Speed Tiers). The data in Figure 4 and Appendices 8 and 9 exclude the U.S. Territories.

Fig. 4
Deployment (Millions) of Fixed Terrestrial Services at Different Speed Tiers

Area	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
10/1 Mbps										
United States	297.873	93.7%	302.138	94.3%	309.095	95.8%	315.656	96.9%	318.795	97.4%
Rural Areas	46.263	75.1%	48.361	77.7%	52.424	83.3%	56.169	88.1%	58.450	90.6%
Urban Areas	251.609	98.2%	253.777	98.4%	256.671	98.9%	259.487	99.1%	260.345	99.1%
Tribal Lands	2.701	68.7%	2.886	72.8%	3.201	80.2%	3.348	83.3%	3.510	86.9%
25/3 Mbps										
United States	284.246	89.4%	287.853	89.9%	296.320	91.9%	304.473	93.5%	308.913	94.4%
Rural Areas	37.174	60.3%	38.271	61.5%	42.628	67.7%	46.982	73.7%	50.099	77.7%
Urban Areas	247.072	96.4%	249.582	96.7%	253.692	97.7%	257.491	98.3%	258.814	98.5%
Tribal Lands	2.245	57.1%	2.290	57.8%	2.520	63.1%	2.734	68.1%	2.921	72.3%
50/5 Mbps										
United States	270.740	85.2%	283.329	88.5%	291.260	90.3%	298.242	91.6%	303.182	92.7%
Rural Areas	32.100	52.1%	35.316	56.7%	39.147	62.2%	42.312	66.3%	45.530	70.6%
Urban Areas	238.640	93.1%	248.013	96.1%	252.114	97.1%	255.930	97.7%	257.652	98.1%
Tribal Lands	1.913	48.6%	2.116	53.4%	2.269	56.9%	2.462	61.3%	2.639	65.3%
100/10 Mbps										
United States	201.894	63.5%	215.582	67.3%	244.110	75.7%	288.497	88.6%	296.243	90.5%
Rural Areas	16.472	26.7%	20.481	32.9%	25.781	41.0%	37.223	58.4%	40.388	62.6%
Urban Areas	185.423	72.3%	195.101	75.6%	218.329	84.1%	251.275	95.9%	255.855	97.4%
Tribal Lands	1.315	33.4%	1.669	42.1%	1.875	47.0%	2.198	54.7%	2.420	59.9%
250/25 Mbps										
United States	15.692	4.9%	67.912	21.2%	140.577	43.6%	190.041	58.3%	280.143	85.6%
Rural Areas	2.031	3.3%	5.460	8.8%	9.871	15.7%	17.991	28.2%	33.274	51.6%
Urban Areas	13.662	5.3%	62.452	24.2%	130.707	50.4%	172.050	65.7%	246.869	94.0%
Tribal Lands	0.048	1.2%	0.276	7.0%	1.330	33.3%	1.604	39.9%	1.837	45.5%
Pop. Evaluated	317.954	100.0%	320.289	100.0%	322.518	100.0%	325.716	100.0%	327.167	100.0%

C. Demographic Data

42. In Figures 5, 6, 7, and 8, we present demographic data with our deployment analysis.[133] Figures 5 and 6 compare the available demographic data for Americans with and without coverage by

[133] To present demographic data and compare the demographic data between areas where services are and are not deployed, we aggregate the census block data up to the census block group level, the lowest aggregation level for which demographic information is available. This unavoidable aggregation leads to census blocks with differing characteristics being grouped together. In the case of differing levels of deployment, we designate a census block group as without deployment if more than 5% of the population in the census block group is without services, regardless of the level of deployment in any particular census block in the group. Further, some census block groups are a mix of census blocks that are designated as rural and urban. In such instances, we designate a census block group as rural if more than 50% of the population in the census block group resides in census blocks designated as rural. Finally, we designate a census block group as Tribal lands if more than 50% of the land area in the census block group is designated as Tribal lands. We use the Census Bureau's American Community Survey (ACS) Five-Year Estimates 2014-2018 for income and poverty measures for the states, District of Columbia and Puerto Rico; (continued….)

fixed terrestrial 25/3 Mbps service and mobile LTE. Figure 5 presents this analysis for the United States (excluding U.S. Territories other than Puerto Rico) as a whole, urban and non-urban core areas, and Tribal lands for fixed terrestrial 25/3 Mbps service and mobile LTE with a minimum advertised speed of 5/1 Mbps in 2018.[134] The data show that, generally, Americans living in areas where these services are deployed typically live in census block groups with a lower percentage of households living in poverty, and with higher average populations, population densities, per capita incomes, and median household incomes than Americans living in areas without coverage by these services.

(Continued from previous page)
income measures are not available for the other U.S. Territories. Per capita income and median household income in the past twelve months are measured in 2018 Inflation-Adjusted Dollars. The household poverty rate is the proportion of households living below the poverty level. Population Density is the total population residing in the census block group as of 2018 divided by the square miles of land in the census block group, with the estimate of land area is based upon the 2010 Census.

[134] Demographic data is not available for U.S. Territories other than Puerto Rico. We provide state-by-state and county-by-county demographic deployment information (including for Puerto Rico) in Appendices 4 and 5, *infra*.

Fig. 5
Comparison of Demographic Data Between Areas Where Fixed Terrestrial 25/3 Mbps and Mobile LTE with a Minimum Advertised Speed of 5/1 Mbps Have Been Deployed and Where These Services Have Not Been Deployed (As of December 31, 2018)

	Average Population	Average Population Density	Average Per Capita Income ($2018)	Average Median Household Income ($2018)	Average Household Poverty Rate
United States[135]					
With Deployment	1,513.0***	7,387.3***	$33,234.04***	$67,773.48***	14.6%***
Without Deployment	1,421.7	1,075.2	$27,355.32	$54,201.49	15.6%
Rural Areas					
With Deployment	1,444.3***	198.2***	$32,005.61***	$64,942.67***	11.2%***
Without Deployment	1,339.2	75.1	$27,289.10	$54,209.97	14.1%
Urban Areas					
With Deployment	1,521.0***	8,232.7***	$33,378.27***	$68,110.57***	15.1%***
Without Deployment	1,612.2	3,383.3	$27,509.74	$54,181.11	19.2%
Tribal Lands (Rural and Urban Areas)					
With Deployment	1,384.1	2,088.4***	$27,103.51***	$52,981.74***	16.5%***
Without Deployment	1,344.4	219.0	$22,483.97	$46,094.31	21.1%
Tribal Rural Areas					
With Deployment	1,409.4*	179.4***	$25,866.22***	$53,302.74***	16.0%***
Without Deployment	1,337.9	72.3	$22,849.44	$46,721.15	20.5%
Tribal Urban Areas					
With Deployment	1,377.2	2,605.3***	$27,437.28***	$52,894.91***	16.7%***
Without Deployment	1,372.5	849.1	$20,925.28	$43,389.77	23.3%

We test for a statistical difference in the reported means between areas with and without deployment of these services. The level of statistical significance is indicated by the number of stars. The absence of a star indicates no statistical difference between the reported figures. * signifies statistical significance at a 90% level of confidence, ** signifies statistical significance at a 95% level of confidence, and *** signifies statistical significance at a 99% level of confidence.

43. Figure 6 compares the available demographic data across urban and rural areas for Americans in the 50 states and District of Columbia with and without coverage by both fixed terrestrial 25/3 Mbps service and mobile LTE service with a median speed of 10/3 Mbps in 2018.[136] Like Figure 5, Figure 6 shows that Americans living in areas where these services are deployed typically live in census block groups where there is a lower percentage of households living in poverty, and where there are higher average populations, population densities, per capita incomes, and median household incomes.

[135] Data excludes U.S. Territories other than Puerto Rico.

[136] As is the case with the presentation of results based upon 10/3 Mbps Ookla data, we exclude the U.S. Territories from this analysis due to a lack of Ookla data for these areas, and we do not report separately for Tribal lands because of concerns with the representativeness of the Ookla data for these areas. *See supra* Sections IV.B.2 and IV.B.3.

Fig. 6
Comparison of Demographic Data Between Areas Where Fixed Terrestrial 25/3 Mbps and Mobile LTE with a Median Speed of 10/3 Mbps Have Been Deployed and Where These Services Have Not Been Deployed (As of December 31, 2018)

	Average Population	Average Population Density	Average Per Capita Income ($2018)	Average Median Household Income ($2018)	Average Household Poverty Rate
United States[137]					
With Deployment	1,544.5***	7,940.4***	$34,174.45***	$69,911.65***	14.0%***
Without	1,502.4	1,497.4	$28,194.59	$56,344.62	15.0%
Rural Areas					
With Deployment	1,533.0***	196.4***	$33,855.27***	$69,510.34***	10.0%***
Without	1,446.0	90.1	$28,489.00	$57,330.60	13.0%
Urban Areas					
With Deployment	1,545.6***	8,643.9***	$34,203.40***	$69,948.42***	14.4%***
Without	1,577.0	3,357.1	$27,802.86	$54,998.17	17.6%

We test for a statistical difference in the reported means between areas with and without deployment of these services. The level of statistical significance is indicated by the number of stars. The absence of a star indicates no statistical difference between the reported figures. * signifies statistical significance at a 90% level of confidence, ** signifies statistical significance at a 95% level of confidence, and *** signifies statistical significance at a 99% level of confidence.

44. Figure 7 shows, for 2018, how the average proportion of the population with coverage by fixed terrestrial 25/3 Mbps service and mobile LTE service with a minimum advertised speed of 5/1 Mbps varies with census block group-level median household income, census block group-level population density, and census block group-level poverty rate.[138] On average, deployment is highest in census block groups with the highest median household income, the highest population density, and the lowest poverty rate.

[137] Data excludes U.S. Territories other than Puerto Rico.

[138] We present these results at the census block group, the smallest geographic areas for which income data is available, to accurately examine how the deployment rate varies with income measures in the geographic area.

Fig. 7
Average Percentage of Population with Fixed Terrestrial 25/3 Mbps and Mobile LTE with a Minimum Advertised Speed of 5/1 Mbps by Census Block Group Level Demographic Variable (As of December 31, 2018)[139]

	Fixed Terrestrial 25/ 3 Mbps	Mobile LTE 5/ 3 Mbps	Both Fixed and Mobile LTE
Median Household Income ($2018)			
First Quartile (Lowest Median Household Income)	92.2%	99.6%	92.0%
Second Quartile	91.0%	99.8%	90.9%
Third Quartile	93.8%	99.9%	93.7%
Fourth Quartile (Highest Median Household Income)	98.1%	100.0%	98.0%
Population Density			
First Quartile (Lowest Pop. Density)	78.6%	99.3%	78.3%
Second Quartile	97.7%	100.0%	97.6%
Third Quartile	99.0%	100.0%	99.0%
Fourth Quartile (Highest Pop. Density)	99.2%	100.0%	99.2%
Household Poverty Rate			
First Quartile (Lowest Household Poverty Rate)	96.4%	99.9%	96.4%
Second Quartile	93.6%	99.9%	93.5%
Third Quartile	91.8%	99.8%	91.7%
Fourth Quartile (Highest Household Poverty Rate)	93.2%	99.7%	93.0%

45. Figure 8 depicts how the average proportion of the population with coverage by fixed terrestrial services by speed tier varies with census block-level median household income, census block-level population density, and census block-level household poverty rate. On average, deployment is highest in census block groups with the highest median household income, the highest population density and the lowest household poverty rate.

[139] Data excludes U.S. Territories other than Puerto Rico.

Fig. 8
Average Percentage of Population with Fixed Terrestrial Services by Census Block Group Level Demographic Variable (As of December 31, 2018)[140]

	10/ 1 Mbps	25/ 3 Mbps	50/ 5 Mbps	100/ 10 Mbps	250/ 25 Mbps
Median Household Income ($2018)					
First Quartile (Lowest Median Household Income)	96.6%	92.2%	87.2%	84.9%	78.1%
Second Quartile	96.3%	91.0%	88.2%	85.2%	78.3%
Third Quartile	97.4%	93.8%	91.1%	88.6%	83.5%
Fourth Quartile (Highest Median Household Income)	99.0%	98.1%	97.2%	96.4%	94.0%
Population Density					
First Quartile (Lowest Pop. Density)	91.0%	78.6%	71.9%	64.8%	53.7%
Second Quartile	98.9%	97.7%	95.6%	94.3%	88.1%
Third Quartile	99.4%	99.0%	98.1%	97.7%	94.7%
Fourth Quartile (Highest Pop. Density)	99.4%	99.2%	97.7%	97.5%	96.6%
Household Poverty Rate					
First Quartile (Lowest Household Poverty Rate)	98.3%	96.4%	94.9%	93.4%	89.8%
Second Quartile	97.3%	93.6%	91.3%	88.8%	83.5%
Third Quartile	96.5%	91.8%	89.1%	86.3%	80.0%
Fourth Quartile (Highest Household Poverty Rate)	96.9%	93.2%	88.3%	86.3%	80.4%

D. Tribal Lands Data

46. In Figures 9 and 10, we present additional deployment estimates for Americans living on Tribal lands for each Tribal lands category.[141] The Commission's data indicate that deployment in rural Tribal lands continue to lag deployment in urban Tribal lands.

47. Figure 9 presents deployment on Tribal lands from 2014 to 2018 of fixed terrestrial 25/3 Mbps services and mobile LTE service with a speed of at least 5/1 Mbps. Overall, in 2018, 72.1% of Tribal lands are covered by fixed terrestrial 25/3 Mbps services and mobile LTE with a speed of 5/1 Mbps, based on Form 477 data, an increase from 67.8% in 2017 and 62.4% in 2016. Rural Tribal lands continue to lag behind urban Tribal lands, with only 52.9% of all Tribal lands in rural areas having deployment of both services, as compared to 93.1% of Tribal lands in urban areas. But that 52.9% figure for 2018 is up from 45.7% in 2017 and 37.8% in 2016.

[140] Data excludes U.S. Territories other than Puerto Rico.

[141] We group Tribal lands as designated by their 2010 census block delineations. Alaskan Villages include census blocks that are designated as Alaskan Native village statistical areas. Hawaiian Home Lands include census blocks that were established by the Hawaiian Homes Commission Act of 1921. Tribal statistical areas are statistical American Indian areas. These are defined for a federally-recognized Tribe that does not have reservation or off-reservation trust land; specifically, a Tribal-designated statistical area (TDSA) or Oklahoma Tribal statistical area (OTSA). The Lower 48 States category of includes census blocks designated as: (1) Joint Use Areas; (2) legal, federally-recognized American Indian area consisting of reservation and associated off-reservation trust land; (3) legal, federally-recognized American Indian area consisting of reservation only; and (4) legal, federally-recognized American Indian area consisting of off-reservation trust land only. We present more granular state-by-state Tribal lands data in Appx. 6 (Deployment of Fixed Terrestrial 25/3 Mbps Services and/or mobile LTE with a Minimum Advertised Speed of 5/1 Mbps by Tribal Lands and State).

Fig. 9
Deployment (Millions) on Tribal Lands of Fixed Terrestrial 25/3 Mbps and Mobile LTE with a Minimum Advertised Speed of 5/1 Mbps

	2014		2015		2016		2017		2018	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
Tribal Lands	2.206	56.1%	2.258	57.0%	2.491	62.4%	2.722	67.8%	2.914	72.1%
Rural Areas	0.592	29.3%	0.614	30.1%	0.780	37.8%	0.954	45.7%	1.114	52.9%
Urban Areas	1.614	84.5%	1.644	85.6%	1.711	88.8%	1.768	91.6%	1.799	93.1%
Alaskan Villages	0.110	42.9%	0.110	42.7%	0.135	51.5%	0.151	57.0%	0.176	65.9%
Rural Areas	0.039	23.7%	0.039	23.7%	0.061	36.2%	0.073	42.4%	0.093	54.1%
Urban Areas	0.071	77.0%	0.071	76.7%	0.074	79.0%	0.079	83.3%	0.083	87.3%
Hawaiian Homelands	0.032	96.9%	0.030	88.9%	0.030	88.6%	0.030	89.4%	0.030	89.1%
Rural Areas	0.005	83.0%	0.002	43.9%	0.002	43.5%	0.003	47.7%	0.003	47.8%
Urban Areas	0.027	99.8%	0.027	98.0%	0.027	98.0%	0.027	98.2%	0.027	98.2%
Lower 48 States	0.417	38.7%	0.452	41.5%	0.508	46.1%	0.595	53.3%	0.638	56.5%
Rural Areas	0.184	25.6%	0.207	28.4%	0.239	32.3%	0.311	41.3%	0.344	45.1%
Urban Areas	0.233	64.6%	0.245	67.8%	0.270	74.1%	0.284	78.1%	0.293	80.2%
Statistical Areas	1.648	64.2%	1.666	64.5%	1.818	70.2%	1.946	74.8%	2.070	79.4%
Rural Areas	0.365	32.1%	0.365	32.0%	0.478	41.5%	0.567	49.0%	0.674	57.9%
Urban Areas	1.283	89.7%	1.301	90.3%	1.341	93.0%	1.378	95.4%	1.396	96.6%
Pop. Evaluated	3.933	100.0%	3.964	100.0%	3.991	100.0%	4.017	100.0%	4.039	100.0%

48. In Figure 10, we present deployment estimates for fixed terrestrial 25/3 Mbps service and mobile LTE service with a speed of at least 5/1 Mbps on Tribal lands. As of December 31, 2018, fixed terrestrial 25/3 Mbps services is deployed to 72.3% of Americans on Tribal lands, 97.5% are covered by mobile LTE at speeds of at least 5/1 Mbps, and 72.1% are covered by both services. The figures show variability in deployment across the Tribal lands categories, with the least deployment occurring in Alaskan Villages.

Fig. 10
Deployment (Millions) of Fixed Terrestrial 25/3 Mbps and/or Mobile LTE with a Minimum Advertised Speed of 5/1 Mbps on Tribal Lands (As of December 31, 2018)

	Pop. Evaluated	Fixed 25/3 Mbps		Mobile LTE 5/1 Mbps		Fixed 25/3 Mbps and Mobile LTE 5/1 Mbps		Fixed 25/3 Mbps or Mobile LTE 5/1 Mbps	
		Pop.	% of Pop.	Pop.	% of Pop.	Pop.	% of Pop.	Pop.	% of Pop.
All Tribal Lands	4.039	2.921	72.3%	3.937	97.5%	2.914	72.1%	3.944	97.7%
Alaskan Villages	0.267	0.177	66.5%	0.205	77.0%	0.176	65.9%	0.207	77.6%
Hawaiian Homelands	0.034	0.030	89.1%	0.034	99.9%	0.030	89.1%	0.034	99.9%
Lower 48 States	1.129	0.643	56.9%	1.092	96.7%	0.638	56.5%	1.097	97.2%
Tribal Statistical Areas	2.609	2.072	79.4%	2.605	99.9%	2.070	79.4%	2.606	99.9%

E. Adoption Data

49. We also assess the adoption of fixed broadband service[142] and report adoption rates based upon year-end data from 2014 to 2018. The reported adoption rates are the ratio of residential Form 477 data subscriptions to fixed terrestrial services of at least the designated speed divided by the total number of households in the area where our Form 477 deployment data indicate that fixed terrestrial services of at least the designated speed are deployed.[143]

50. Using Form 477 subscribership data, Figure 11 shows the overall adoption rates[144] from 2014 through 2018 for fixed terrestrial services for the United States (excluding U.S. Territories) as a whole, urban and non-urban core areas, and Tribal lands.[145] The data show year-to-year increases in the adoption of broadband services across the vast majority of areas, including Tribal lands.

[142] We present adoption data for each state and the District of Columbia in an Appendix. *See infra* Appx. 7 (Adoption Rate for Fixed Terrestrial Services in the United States, Including the U.S. Territories (As of December 2018)).

[143] The subscriber data is reported for the census tract rather than census block. Thus, we aggregate the deployment data up to the census tract. We calculate adoption rates for the following geographic areas: the U.S. as a whole, all urban core census tracts, all non-urban core census tracts, the county (or county equivalent), and for each state and the District of Columbia. A census tract is designated as "Urban Core" if it has a land area less than three square miles and a population density of at least 1,000 people per square mile. A census tract is designated as "Non-Urban Core" if we have not designated the census tract as Urban Core. A census tract is designated Tribal lands if more than 50% of the land area is Tribal land.

[144] The reported adoption rates for 2014 to 2018 are based upon the Form 477 deployment data and subscriber data as of December 31, 2014, December 31, 2015, December 31, 2016, December 31, 2017, and December 31, 2018.

[145] As noted above, figures that include deployment data from 2014-2018 do not include U.S. Territories data. Accordingly, we do not include the U.S. Territories in Figure 11. We report adoption rates, as of December 31, 2018, for each State and U.S. Territory in Appendix 7.

Fig. 11
Overall Adoption Rate for Fixed Terrestrial Services at Different Speed Tiers

	2014	2015	2016	2017	2018
10/1 Mbps					
United States[146]	56.0%	62.2%	66.3%	69.7%	73.3%
Non-Urban Core Areas	49.7%	55.8%	60.3%	63.4%	67.4%
Urban Core Areas	60.7%	67.0%	71.0%	74.7%	78.1%
Tribal Lands	35.5%	42.4%	43.1%	46.3%	51.2%
Non-Urban Core Areas	30.6%	36.1%	36.9%	40.4%	45.3%
Urban Core Areas	46.0%	56.8%	59.1%	62.3%	68.1%
25/3 Mbps					
United States	38.5%	48.1%	53.5%	60.2%	65.1%
Non-Urban Core Areas	34.4%	43.2%	48.9%	55.1%	59.9%
Urban Core Areas	41.3%	51.5%	56.9%	64.0%	69.2%
Tribal Lands	27.3%	31.7%	33.4%	37.9%	44.0%
Non-Urban Core Areas	23.3%	28.5%	30.3%	34.5%	38.7%
Urban Core Areas	33.9%	37.1%	39.4%	45.1%	56.1%
50/5 Mbps					
United States	24.8%	33.9%	44.4%	54.8%	60.6%
Non-Urban Core Areas	19.9%	27.8%	41.2%	50.8%	56.4%
Urban Core Areas	28.0%	38.0%	46.7%	57.7%	63.8%
Tribal Lands	22.7%	25.0%	28.9%	34.2%	37.8%
Non-Urban Core Areas	18.0%	20.4%	25.3%	30.9%	34.0%
Urban Core Areas	28.9%	32.0%	34.9%	40.5%	45.6%
100/10 Mbps					
United States	11.2%	16.7%	19.2%	29.6%	45.7%
Non-Urban Core Areas	11.7%	16.4%	17.9%	27.0%	44.3%
Urban Core Areas	11.0%	16.9%	20.0%	31.4%	46.6%
Tribal Lands	7.1%	7.4%	10.5%	18.3%	30.2%
Non-Urban Core Areas	7.4%	6.4%	9.8%	17.0%	26.4%
Urban Core Areas	6.8%	8.7%	11.6%	20.4%	37.3%
250/25 Mbps					
United States	2.5%	4.2%	1.8%	4.1%	5.5%
Non-Urban Core Areas	3.0%	6.7%	2.3%	4.1%	5.0%
Urban Core Areas	2.3%	3.1%	1.6%	4.1%	5.8%
Tribal Lands	0.1%	1.4%	1.8%	4.4%	7.5%
Non-Urban Core Areas	0.2%	1.7%	2.1%	4.5%	8.0%
Urban Core Areas	0.0%	0.2%	1.5%	4.3%	6.7%

51. Figure 12 reports average county-level overall adoption rates for fixed terrestrial services by speed tier against the quartile ranking for median household income, population density, the poverty

[146] All data presented for the United States in Figure 11 excludes U.S. Territories.

rate, and the proportion of the population that resides in a rural area. These data suggest that the average household adoption rate increases with median household income and population density, and the adoption rate decreases as the poverty rate and rural population rate increase.

Fig. 12
Average County Overall Adoption Rate for Fixed Terrestrial Services by County Level Demographic Variable (As of December 31, 2018)[147]

	10/ 1 Mbps	25/ 3 Mbps	50/ 5 Mbps	100/ 10 Mbps	250/ 25 Mbps
Median Household Income ($2018)					
First Quartile (Lowest Median Household Income)	33.5%	23.4%	22.6%	18.1%	3.7%
Second Quartile	46.7%	37.2%	32.9%	27.4%	3.7%
Third Quartile	53.9%	43.3%	37.9%	30.4%	3.9%
Fourth Quartile (Highest Median Household Income)	67.0%	57.2%	53.0%	39.2%	5.2%
Population Density					
First Quartile (Lowest Median Population Density)	43.5%	30.2%	23.6%	19.3%	5.9%
Second Quartile	39.5%	29.9%	26.4%	20.9%	2.9%
Third Quartile	50.2%	41.8%	38.4%	30.8%	3.1%
Fourth Quartile (Highest Median Population Density)	67.8%	58.9%	59.4%	45.1%	5.1%
Household Poverty Rate					
First Quartile (Lowest Median Poverty Rate)	62.6%	51.6%	47.0%	35.5%	4.9%
Second Quartile	54.1%	44.1%	39.2%	31.4%	4.2%
Third Quartile	48.3%	39.1%	35.1%	28.7%	4.0%
Fourth Quartile (Highest Median Poverty Rate)	36.1%	26.2%	25.2%	19.8%	3.3%
Rural Population Rate					
First Quartile (Lowest Rural Population Rate)	66.8%	58.4%	57.8%	43.6%	5.6%
Second Quartile	52.9%	43.2%	39.7%	31.9%	3.3%
Third Quartile	41.7%	32.3%	28.8%	23.3%	3.2%
Fourth Quartile (Highest Rural Population Rate)	39.5%	26.9%	21.3%	17.1%	4.6%

F. Schools and Classrooms Data

52. We continue to measure availability of advanced telecommunications capability in "elementary and secondary schools and classrooms"[148] using a short-term and long-term goal for broadband connectivity to schools of 100 Mbps per 1,000 students and staff, and 1 Gbps per 1,000 students and staff, respectively.[149] According to the *2019 State of the States Report*, 99% of school

[147] All data presented for the United States in Figure 12 excludes U.S. Territories other than Puerto Rico.

[148] 47 U.S.C. § 1302(b).

[149] *See Modernizing the E-rate Program for Schools and Libraries*, WC Docket No. 13-184, Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8870, 8885, para. 34 (2014) (*2014 First E-rate Order*). We use this as the current method of measuring school and classroom connectivity and will address any future needs at (continued….)

districts, or 46.3 million students, now meet the Commission's short-term connectivity goal of 100 Mbps per 1,000 users, up from 44.7 million students in 2018.[150] This means that approximately 750,000 students are not receiving broadband service that meets the short-term connectivity goal.[151]

53. Regarding the long-term connectivity goal for schools of 1 Gbps per 1,000 users, the *2019 State of the States Report* estimates that, based on the most recent data, 38% of school districts currently meet the goal, which is up from 28% in 2018.[152] The *2019 State of the States Report* also finds that 57% of the smallest rural schools districts and 23% of the 1,000 largest school districts meet the long-term goal.[153] EducationSuperHighway estimates that 743 schools still need access to fiber to meet the short- and long-term connectivity goals, down 45% from the 1,356 schools without access to fiber in 2018.[154]

V. COMMISSION EFFORTS TO CLOSE THE DIGITAL DIVIDE

54. Since the *2019 Report*, the Commission has continued its efforts to accelerate deployment of advanced telecommunications ability and close the digital divide by removing barriers to wireline and wireless investment, modernizing its universal service programs, and making more spectrum available for the commercial marketplace. We discuss highlights of this work, much of which remains ongoing as we continue to work towards ensuring that all Americans, including those in rural areas, Tribal lands, and disaster-affected areas, have the benefits of high-speed broadband.

A. Removing Barriers to Investment

55. Section 706 of the Telecommunications Act of 1996 exhorts the Commission to encourage deployment of advanced communications capability by "remov[ing] barriers to infrastructure investment."[155] Encouraging investment in broadband deployment is essential to closing the digital divide, and the Commission has continued its efforts in this area.

56. *Wireline Infrastructure*. In July 2019, the Commission adopted a *Notice of Proposed Rulemaking and Declaratory Ruling* to improve broadband deployment and competition in the nation's apartment buildings, condominium complexes, and office buildings, known as multiple tenant environments, or MTEs.[156] Nearly 30% of the U.S. population lives in condominiums or apartments, and

(Continued from previous page)
the appropriate time. *See* Benton Foundation Comments at 12 (urging the Commission to establish connectivity goals "fit for the rising demands of the next decade").

[150] *See 2019 State of the States Report* at 7-8. EducationSuperHighway reports the Commission's short-term goal in terms of 100 kbps per user, rather than 100 Mbps per 1,000 users, and reports the long-term goal in terms of 1 Mbps per user, rather than 1 Gbps per 1,000 users. *2019 State of the States Report FAQ*; *2014 First E-rate Order*, 29 FCC Rcd at 8885, para. 34. We acknowledge that ADTRAN argues that "EducationSuperHighway data will undercount schools that have access to broadband meeting the short-term and long-term benchmarks," and that American Library Association claims that the Commission "does not have adequate information about the availability of or quality of broadband offered to community anchor institutions." ADTRAN Comments at 9; American Library Association Reply at 1-1. Neither proposes an alternative source of data currently available to the Commission.

[151] *2019 State of the States Report* at 7.

[152] *Id.* at 13-14; EducationSuperHighway, *2018 State of the States Report* at 19 (Oct. 2018) (*2018 State of the States Report*) https://s3-us-west-1.amazonaws.com/esh-sots-pdfs/2018%20State%20of%20the%20States.pdf.

[153] *2019 State of the States Report* at 13.

[154] *Id.* at 7.

[155] 47 U.S.C. § 1302(a).

[156] *Improving Competitive Access to Multiple Tenant Environments, Petition for Preemption of Article 52 of the San Francisco Police Code Filed by the Multiple Family Broadband Council*, GN Docket No. 17-142, MB Docket No. 17-91, Notice of Proposed Rulemaking and Declaratory Ruling, 34 FCC Rcd 5702 (2019), *appeal pending in City & County of San Francisco v. FCC et al*, Docket No. 19-71832 (9th Cir.).

millions more work in office buildings.[157] To address the unique challenges associated with broadband deployment in MTEs, the Commission took a number of steps, including seeking input on additional actions it could take to accelerate the deployment of next-generation networks and services within MTEs. In particular, the Commission sought comment on the effect that revenue sharing agreements between building owners and broadband providers, exclusivity agreements regarding rooftop facilities, and exclusive wiring arrangements have on broadband competition and deployment.[158] The Commission also clarified that it welcomes state and local experimentation to increase access to MTEs—so long as those actions are consistent with federal law and policy.[159] Finally, the Commission preempted part of an outlier San Francisco ordinance to the extent it required the sharing of in-use wiring in MTEs, as requiring sharing of in-use wiring deters broadband deployment, undercuts the Commission's rules regarding control of cable wiring in residential MTEs, and threatens the Commission's framework to protect the technical integrity of cable systems for the benefit of viewers.[160]

57. *Wireless Infrastructure*. In April 2019, the Commission proposed to update its rule for over-the-air reception devices (OTARD) to help spur 5G deployment by eliminating the restriction that currently excludes hub and relay antennas from the scope of the rule.[161] This proposal is intended to allow fixed wireless providers to deploy these antennas more quickly and efficiently, spurring investment in and deployment of needed infrastructure in a manner that is consistent with the public interest.[162]

58. *Cable Franchising.* In August 2019, the Commission took actions to promote broadband deployment by cable operators through updates to the cable franchising rules.[163] To facilitate the deployment of broadband infrastructure, the Commission concluded that under the Communications Act, cable-related, non-monetary contributions required by a local franchise are franchise fees subject to the statutory five percent cap, with limited exceptions.[164] The Commission also prohibited local franchising authorities from regulating under Title VI the provision of most non-cable services offered over franchised cable systems, including broadband Internet access service and preempted any state or local regulation of a cable operator's non-cable services that imposes obligations on franchised cable operators beyond what is permissible under Title VI the Act.[165]

59. *Broadband Deployment Advisory Committee*. The Broadband Deployment Advisory Committee (BDAC), a federal advisory committee originally chartered in March 2017, was re-chartered on March 1, 2019. In its second term, the BDAC is continuing its work to craft recommendations for the Commission on ways to accelerate the deployment of broadband by reducing and/or removing regulatory barriers to infrastructure investment and strengthening existing broadband networks in communities

[157] *Id*. at 5703, para. 1.

[158] *Id*. at 5710-20, paras. 14-31.

[159] *Id*. at 5724, paras. 40-41.

[160] *Id*. at 5724-45.

[161] *See Updating the Commission's Rule for Over-the-Air Reception Devices*, WT Docket No. 19-71, Notice of Proposed Rulemaking, 34 FCC Rcd 2695 (2019).

[162] *Id.* at 2697, para. 7.

[163] *Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as Amended by the Cable Television Consumer Protection and Competition Act of 1992*, MB Docket No. 05-311, Third Report and Order, 34 FCC Rcd 6844 (2019).

[164] *See id.* at 6849-78, paras. 8-63.

[165] *See id.* at 6879-903, paras. 64-110. The Commission also concluded that requirement concerning local franchising authority regulation of cable operators should apply to state-level franchising actions and state regulations related to local franchising. *See id.* at 6904-07, paras. 111-19.

across the country.[166] The BDAC continues to be a forum for interested stakeholders to exchange ideas and develop recommendations to the Commission on broadband deployment, which in turn enhances the Commission's ability to carry out its statutory responsibility to encourage the deployment of broadband to all Americans.[167]

60. The re-chartered BDAC is organized into three working groups, each with a distinct purpose.[168] The Disaster Response and Recovery Working Group is charged with recommending measures to improve resiliency of broadband infrastructure before a disaster occurs, and strategies that can be used during and after the response to a disaster to minimize broadband network downtime.[169] The Broadband Infrastructure Deployment Job Skills and Training Opportunities Working Group is charged with making recommendations on ways to make job skills training more widely available and improve development opportunities for the broadband infrastructure deployment workforce.[170] The Increasing Broadband Investment in Low-Income Communities Working Group is tasked with identifying new ways to encourage the deployment of high-speed broadband infrastructure and services to low-income communities.[171]

61. This term, the BDAC has worked diligently to fulfill the charges given to it by the Commission. Since the Commission released the *2019 Report*, the BDAC has met three times, on June 13, 2019, September 19, 2019, and December 3, 2019, during which the BDAC members have discussed their charges and the progress being made by the working groups toward developing final reports for consideration and approval by the full BDAC.[172] The BDAC has three meetings scheduled for 2020 where the working groups are expected to present their recommendations.

62. *Precision Agriculture Connectivity Task Force*. The Agriculture Improvement Act of 2018 directed the Commission to establish a task force to examine and promote broadband service on agricultural land.[173] Chairman Pai chartered the Precision Agriculture Connectivity Task Force under the Federal Advisory Committee Act for a two-year term to make policy recommendations on how to

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[166] *FCC Announces Re-Chartered BDAC Membership and First Meeting*, GN Docket No. 17-83, Public Notice, 34 FCC Rcd 3251 (2019), at 1 (*2019 Re-Chartered BDAC PN*).

[167] *Id.*

[168] On July 1, 2019, Chairman Pai appointed members to serve on two new working groups of the BDAC: the Broadband Infrastructure Deployment Job Skills and Training Opportunities Working Group, and the Increasing Broadband Investment in Low-Income Communities Working Group. *FCC Announces the Membership of Two Broadband Deployment Advisory Committee Working Groups*, GN Docket No. 17-83, Public Notice, 34 FCC Rcd 5226 (2019). This followed the 2018 appointment of members to the Disaster Response and Recovery Working Group during the first BDAC. The Disaster Response and Recovery Working Group was re-chartered to continue its work during the current term. *See FCC Seeks Applicants for BDAC Disaster Response and Recovery Group,* Public Notice, DA 18-837 (WCB Aug. 9, 2018).

[169] *2019 Re-Chartered BDAC PN*, 34 FCC Rcd 3251, at 1.

[170] *Id*. at 2.

[171] *Id.* at 1.

[172] *See 2019 Re-Chartered BDAC PN*, 34 FCC Rcd 3251, at 1; *FCC Announces the Next Meeting of the Broadband Deployment Advisory Committee*, GN Docket No. 17-83, Public Notice, 34 FCC Rcd 7714 (2019); *FCC Announces the Next Meeting of the Broadband Deployment Advisory Committee*, GN Docket No. 17-83, Public Notice, 34 FCC Rcd 9557 (2019). Video from each of the 2019 BDAC meetings and links to related materials can be found on the Commission's BDAC page: https://www.fcc.gov/broadband-deployment-advisory-committee.

[173] Agriculture Improvement Act of 2018, Pub. L. No. 115-334, 132 Stat. 4490, § 12511(b)(2) (2018 Farm Bill). The Precision Agriculture Connectivity Task Force will perform duties and submit reports consistent with Section 12511 of the 2018 Farm Bill and in consultation with the Department of Agriculture in successive terms until the Task Force ends on January 1, 2025.

accelerate broadband deployment on agricultural lands.[174] The Task Force will examine policy, regulatory, and technical solutions to encourage the adoption of broadband on farms and ranches and promote the advancement of precision agriculture in the United States.[175] In November 2019, Chairman Pai, in consultation with Secretary of Agriculture Sonny Perdue, appointed fifteen members of the Task Force including agricultural producers representing diverse geographic regions and farm sizes, equipment manufacturers, and industry representatives, as well as Tribal, state and local government representatives.[176] The Precision Agriculture Task Force held its first meeting in December 2019. Four working groups will assist the Task Force in carrying out its work: (1) mapping and analyzing connectivity on agricultural lands; (2) examining current and future connectivity demand for precision agriculture; (3) encouraging adoption of precision agriculture and availability of high-quality jobs on connected farms; and (4) accelerating broadband deployment on unserved agricultural lands.[177] The Precision Agriculture Connectivity Task Force will begin to present recommendations later this year.

B. Universal Service Fund

63. Universal service plays an essential role in deploying broadband networks and encouraging competition. The Commission's Universal Service Fund (USF) provides funding to increase the availability of fixed and mobile broadband services in unserved rural areas.[178] The Fund targets support to these areas and, as part of its oversight responsibilities, the Commission routinely considers ways to maximize the effect of available USF funding to support broadband deployment.[179]

64. *High-Cost Reforms.* The Commission has successfully conducted the Connect America Fund Phase II auction to award funding to service providers that commit to offer voice and broadband services to fixed locations in unserved high-cost areas. In 2018, the Phase II auction awarded more than $1.488 billion over ten years to 103 winning bidders to serve more than 713,000 rural homes and businesses.[180] The Commission began authorizing Phase II Auction funding in May 2019,[181] authorizing a

[174] *FCC Announces the Establishment of the Task Force for Reviewing Connectivity and Technology Needs of Precision Agriculture in the United States and Seeks Nominations for Membership,* Public Notice, 34 FCC Rcd 5057 (2019) (*Precision Agriculture Task Force Public Notice*); Precision Agriculture Advisory Committee Charter (December 2019), https://www.fcc.gov/sites/default/files/precision-ag-task-force-charter-12042019.pdf.

[175] *Precision Agriculture Task Force Public Notice*, 34 FCC Rcd at 5057.

[176] *FCC Announces the Membership of and First Meeting of the Task Force for Reviewing the Connectivity and Technology Needs of Precision Agriculture in the United States*, GN Docket No. 19-329, Public Notice, 34 FCC Rcd 10493 (2019) (*Precision Agriculture Task Force Membership Public Notice*).

[177] *Precision Agriculture Task Force Membership Public Notice*, 34 FCC Rcd at 10493; *FCC Announces the Membership of the Working Groups of the Task Force for Reviewing the Connectivity and Technology Needs of Precision Agriculture in the United States*, GN Docket No. 19-329, Public Notice, DA 20-260 (Mar. 13, 2020).

[178] *Connect America Fund et al*., Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 17668-69, paras. 1-5 (2011) (*USF/ICC Transformation Order), aff'd sub nom. In re: FCC 11-161*, 753 F.3d 1015 (10th Cir. 2014).

[179] *Connect America Fund; ETC Annual Reports and Certifications; Establishing Just and Reasonable Rates for Local Exchange Carriers; Developing a Unified Intercarrier Compensation Regime*; WC Docket Nos. 10-90, 14-58, and 07-135, CC Docket No. 01-92; Report and Order, Third Order on Reconsideration, and Notice of Proposed Rulemaking, 33 FCC Rcd 2990, 2992, para. 4 (2018) (taking several steps to increase broadband deployment in rural areas through the High Cost program, including maximizing available funding for broadband networks); *Promoting Telehealth in Rural America*, WC Docket No. 17-310, Report and Order, 33 FCC Rcd 6574, para. 1 (2018) (*Telehealth Report and Order*) (increasing the funding cap for the Rural Healthcare program to $571 million to prevent pro-rata funding reductions that could have disproportionally affected rural health care providers, especially those in Alaska).

[180] *Connect America Fund Phase II Auction Scheduled for July 24, 2018 Notice and Filing Requirements and Other Procedures for Auction* 903, AU Docket No. 17-182, WC Docket No. 10-90, Public Notice, 33 FCC Rcd 1428 (2018); *220 Applicants Qualified to Bid in the Connect America Fund Phase II Auction (Auction 903); Bidding to*

(continued….)

total of ten waves of support through March 2020.[182] As of March 2020, the Commission has authorized a total of nearly $1.4 billion in Phase II auction funding, which is expanding connectivity to 627,000 homes and small businesses nationwide.[183] Funding rounds will continue until the authorization process is complete.

65. Building on the success of the CAF Phase II auction, this past January the Commission established the Rural Digital Opportunity Fund, as it had proposed to do in an August 2019 Notice of Proposed Rulemaking.[184] The Rural Digital Opportunity Fund will provide up to $20.4 billion to expand broadband in unserved rural areas, representing the Commission's biggest single step to date toward closing the rural digital divide.[185] Phase I of the Rural Digital Opportunity Fund will allocate up to $16 billion in funding over the next decade targeting areas that current data show are wholly unserved by 25/3 Mbps broadband and voice.[186] The Phase I auction will use a multi-round, reverse auction that favors bids offering faster services with lower latency and encourages intermodal competition to ensure that the greatest possible number of Americans will be connected to the best possible networks, all at a competitive cost.[187] Phase II of the Rural Digital Opportunity Fund will use granular, precise broadband availability maps being developed in the Commission's *Digital Opportunity Data Collection* proceeding to allocate at least $4.4 billion to target unserved locations within partially served areas, as well as any areas not won in Phase I.[188]

66. In addition, the Commission continues to work to close the digital divide through other initiatives focused on small, rural carriers serving high-cost areas, known as rate-of-return carriers. Most recently, in August 2019, the Commission authorized over $4.9 billion in support for rate-of-return carriers for maintaining, improving, and expanding broadband in rural areas over the next decade.[189] This support will ensure broadband access for approximately 455,000 homes and businesses served by 171 carriers in 40 states and territories, including more than 44,000 locations on Tribal lands.[190]

67. In May 2018, in an effort to make additional universal service support available to rebuild fixed and mobile voice and broadband networks damaged in the 2017 hurricane season, the

(Continued from previous page)
Begin on July 24, 2018, AU Docket No. 17-182, WC Docket No. 10-90, Public Notice, 33 FCC Rcd 6171 (2018) (announcing the qualified bidders for the auction and confirming timing); *Connect America Fund Phase II Auction (Auction 903) Closes; Winning Bidders Announced*, AU Docket No. 17-182, WC Docket No. 10-90, Public Notice, 33 FCC Rcd 8257 (2018).

[181] News Release, FCC, FCC Authorizes $521,000 to Tribal Provider to Bring Broadband to Rural Idaho (Mar. 16, 2020), https://docs.fcc.gov/public/attachments/DOC-363069A1.pdf.

[182] News Release, FCC, FCC Authorizes Nearly $89.2 Million in Funding for Rural Broadband (Dec. 16, 2019), https://docs.fcc.gov/public/attachments/DOC-361387A1.pdf.

[183] *Id*.

[184] *Rural Digital Opportunity Fund Order*, 35 FCC Rcd at 687, para. 2;; *Rural Digital Opportunity Connect America Fund*, WC Dockets No. 19-126, 10-90, Notice of Proposed Rulemaking, 34 FCC Rcd 6778 (2019) (*Rural Digital Opportunity Fund NPRM)*.

[185] *Rural Digital Opportunity Fund Order*, 35 FCC Rcd at 687, para. 2.

[186] *Id.* at 689-90, para. 8.

[187] *Id*. at 688, para. 5, 694-95, paras. 17-18.

[188] *Id*. at 688, para. 5, 690, para. 9.

[189] *See Wireline Competition Bureau Authorizes 171 Rate-of-Return Companies to Receive $491 Million Annually in Alternative Connect America Cost Model II Support to Expand Rural Broadband*, WC Docket No. 10-90, Public Notice, 34 FCC Rcd 7271 (WCB 2019).

[190] News Release, FCC, FCC Authorizes Support for Broadband in Over 44,000 Tribal Homes and Businesses Nationwide (Aug. 22, 2019), https://docs.fcc.gov/public/attachments/DOC-359226A1.pdf.

Commission established the Uniendo a Puerto Rico Fund ("Bringing Puerto Rico Together") and the Connect USVI Fund.[191] In September 2019, the Commission approved nearly $950 million in Stage 2 funding to improve, expand, and harden communications networks in Puerto Rico and the U.S. Virgin Islands.[192] To accomplish these goals in Puerto Rico, the Commission will allocate more than $500 million over ten years in fixed broadband support and more than $250 million over three years in mobile broadband support.[193] In the U.S. Virgin Islands, the Commission allocated more than $180 million over ten years in support for fixed networks, more than $4 million over three years for mobile networks.[194] Fixed broadband support will be awarded through a competitive process, in which service providers will bid to serve every location in each covered area with storm-hardened networks at up to gigabit speeds.[195] Support for mobile services is allocated to providers that were offering mobile services in Puerto Rico and the U.S. Virgin Islands prior to the hurricanes to expand and harden 4G LTE networks and deploy next-generation 5G networks.[196]

68. In October 2019, the Commission approved performance testing procedures for all carriers receiving high-cost support to deploy fixed broadband networks to unserved Americans living in rural areas.[197] The Commission maintained an existing requirement that carriers conduct quarterly speed and latency tests between specified numbers of active subscribers' homes and the Internet and made targeted modifications to the testing procedures.[198] These procedures will help to ensure that rural Americans have access to the same high-quality networks as Americans in urban areas, while also ensuring that carriers remain accountable to consumers, taxpayers, and the Commission, and are delivering the network performance they have committed to provide.

69. *Rural Health Care Reforms*. The Commission's Rural Health Care (RHC) Program has long supported vital telehealth services and helps rural communities overcome obstacles to accessing healthcare. As the demand for telemedicine has increased, the RHC Program has witnessed a dramatic increase in health care provider participation, which in turn has put extreme demands on limited Program funding. Following on reforms to the RHC Program that the Commission adopted in 2017 and 2018,[199] the Commission adopted a *Report and Order* on August 1, 2019 reforming the distribution of RHC funding.[200] In the *Rural Health Care Reform Order*, the Commission revised the rules governing the

[191] *Connect America Fund*, WC Docket No. 10-90, Order, 32 FCC Rcd 7981 (2017); *The Uniendo a Puerto Rico Fund and the Connect USVI Fund*, Order and Notice of Proposed Rulemaking, WC Docket No. 18-143, 33 FCC Rcd 5404 (2018); *Connect America Fund*, WC Docket No. 10-90, Order, 32 FCC Rcd 7981 (2017).

[192] *The Uniendo a Puerto Rico Fund and the Connect USVI Fund; Connect America Fund; ETC Annual Reports and Certifications*, WC Docket Nos. 18-143 et al., Report and Order and Order on Reconsideration, 34 FCC Rcd 9109, 9110, para. 3 (2019).

[193] *Id.* at 9146, para. 67.

[194] *Id.* at 9163, para. 102.

[195] *Id.* at 9114-43, paras. 11-66.

[196] *Id.* at 9162-34, paras. 101-32.

[197] *See* News Release, FCC, FCC Takes Steps to Enforce Quality Standards for Rural Broadband Networks (Oct. 25, 2019), https://docs.fcc.gov/public/attachments/DOC-360424A1.pdf; *Connect America Fund*, WC Docket No. 10-90, Order on Reconsideration, 34 FCC Rcd 10109 (2019) (*CAF Performance Standards Order on Reconsideration*).

[198] *CAF Performance Standards Order on Reconsideration*, 34 FCC Rcd at 10112-16, paras. 12-19, 10124-26, paras. 18-19, 10139-49, paras. 39-49, 10156-94, paras. 130-44.

[199] *See Promoting Telehealth in Rural America*, WC Docket No. 17-310, Notice of Proposed Rulemaking and Order, 32 FCC Rcd 10631, 10639-71, paras. 15-117 (2017); *Promoting Telehealth in Rural America*, WC Docket No. 17-310, Report and Order, 33 FCC Rcd 6574, 6578-85, paras. 10-28 (2018).

[200] *Promoting Telehealth in Rural America*, WC Docket No. 17-310, Report and Order, 34 FCC Rcd 7335 (2019) (*Rural Health Care Reform Order*).

Telecom Program to simplify calculation of the urban rate (the amount health care providers pay) and the rural rate (the rate provided to customers in comparable rural areas),[201] and adjust the Telecom Program's $150 million annual cap on multi-year and upfront payment requests annually for inflation.[202] Other reforms outlined in the *Rural Health Care Reform Order* include targeting funding to rural areas in the most need of health care services funding by prioritizing support based on rurality and whether the area is medically underserved when demand exceeds available funding, increasing the effectiveness of competitive bidding, and streamlining program administration.[203]

70. In addition, on March 13, 2020, in an effort to help ensure that healthcare providers have the resources they need to promote telehealth solutions, the Commission adopted an Order to fully fund all eligible Rural Health Care Program services for Funding Year 2019 with an additional $42.19 million in funding.[204] The Order permits USAC to carry forward additional unused funds from prior years to cover a funding gap between demand and available funding, and waives the cap on multi-year commitments and upfront payments that would have resulted in unnecessary reductions in support for rural health care providers and their patients.[205]

71. *Connected Care Pilot Program.* On March 31, 2020, the Commission adopted a Report and Order establishing a three-year, $100 million Connected Care Pilot Program to help defray the cost of bringing telehealth services directly to low-income patients and veterans.[206] The Connected Care Pilot Program will provide an 85% discount on qualifying broadband connectivity for broadband-enabled telehealth services that connect patients directly to their health care providers and are used to treat a wide range of health conditions.[207] These services can facilitate the effective treatment of chronic conditions outside of the health care provider's office at significant cost savings for patients and health care providers. Data gathered through the Pilot Program will be used to analyze how USF funds can support health care provider and patient use of connected care services and the possible benefits that support of broadband service for connected care may bring.[208]

72. At the same time that we adopted the Connected Care Pilot Program, we also established the COVID-19 Telehealth Program in response to the Coronavirus Aid, Relief, and Economic Security (CARES) Act, signed into law on March 27, 2020 in response to the COVID-19 outbreak.[209] Under this standalone initiative the Commission will provide $200 million "to support health care providers in the fight against the ongoing pandemic."[210]

73. *E-Rate*. The Commission's E-Rate program is a vital source of support for connectivity to, and within, schools and libraries. In December 2019, the Commission released a *Report and Order* making permanent the "category two budget" approach for funding internal connections in schools and libraries, which consists of five-year budgets that provide a set amount of funding to support these

[201] *Id*. at 7354-72, paras. 38-75. The Telecom Program provides a discount to service providers equal to the difference between the urban and rural rates. *See id.* at 7341, para. 10; *see also* 47 U.S.C. § 254(h)(1)(A).

[202] *Rural Health Care Reform Order*, 34 FCC Rcd at 7400-02, paras. 138-40.

[203] *Id*. at 7385-430, paras. 107-202.

[204] *Rural Health Care Support Mechanism*, WC Docket No. 02-60, Order, FCC 20-30, paras. 8-9 (Mar. 13, 2020).

[205] *Id.*

[206] *Promoting Telehealth for Low-Income Consumers; COVID-19 Telehealth Program*, WC Docket No. 18-213, WC Docket No. 20-89, Report and Order, FCC 20-44, at para. 5 (rel. Apr. 2, 2020).

[207] *Id*. at para. 38.

[208] *Id*. at para. 5.

[209] *Id.* at para. 2.

[210] *Id.*

internal connections.[211] Following a five-year test period,[212] the Commission concluded that the category two budget approach has provided broader, more equitable, and more predictable funding for schools and libraries than under the prior rules.[213] The budget amount provided to schools and libraries during the test period also proved to be successful, and, the Commission intends to generally remain within those parameters of support going forward.[214]

74. To further promote the deployment of high-speed networks to unserved and underserved schools and libraries, in January 2020, the Commission voted to permanently eliminate the requirement that E-Rate applicants amortize over three years upfront, non-recurring category one charges of $500,000 or more, including charges for special construction projects.[215] The Commission determined that suspension of the amortization requirement had created a more certain path for reimbursement, which made applicants and service providers more willing to invest in new broadband infrastructure, resulting in lower costs to both applicants and the USF.[216]

75. *Improving Broadband Deployment Data*. On August 1, 2019, the Commission adopted the *Digital Opportunity Data Collection Order*, in which we initiated a new data collection, the Digital Opportunity Data Collection, for collecting fixed broadband data to better pinpoint where broadband is available to consumers and where service is lacking.[217] The Digital Opportunity Data Collection will collect geospatial broadband coverage maps from fixed and mobile broadband Internet service providers depicting the areas where they make fixed service available.[218] This geospatial data will facilitate development of granular, high-quality fixed broadband deployment maps, which will improve the Commission's ability to target support for broadband expansion through the agency's Universal Service Fund programs.[219] The Commission also adopted a process to collect public input on the accuracy of

[211] *Modernizing the E-Rate Program for Schools and Libraries*, WC Docket No. 13-184, Report and Order, 34 FCC Rcd 11219, 11219-20, para. 1 (2019).

[212] *See Modernizing the E-Rate Program for Schools and Libraries*, WC Docket No. 13-184, Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8870, 8898-922, Section IV.B. (2014); *Modernizing the E-Rate Program for Schools and Libraries*; *Connect America Fund*, WC Docket Nos. 13-184, 10-90, Second Report and Order and Order on Reconsideration, 29 FCC Rcd 15538, 15571-78, Section III.A. (2014).

[213] *Modernizing the E-Rate Program for Schools and Libraries*, 34 FCC Rcd at 11220, para. 2.

[214] *Id*.

[215] *E-Rate Program Amortization Requirement, Modernizing the E-Rate Program for Schools and Libraries*, WC Docket Nos. 19-2, 13-184, Report and Order, 35 FCC Rcd 672, 672-73, para. 2 (2020) (*E-Rate Amortization Elimination Order*); *see also E-Rate Program Amortization Requirement, Modernizing the E-Rate Program for Schools and Libraries*, WC Docket Nos. 19-2, 13-184, Notice of Proposed Rulemaking and Order, 34 FCC Rcd 785 (2019). The components of special construction costs eligible for E-Rate discounts include costs for design and engineering, project management, digging trenches, and laying fiber. *See Modernizing the E-rate Program for Schools and Libraries*, WC Docket No. 13-184, Order, 31 FCC Rcd 9767, 9775 (2016); *Schools and Libraries Universal Service Support Mechanism, A National Broadband Plan for our Future*, CC Docket No. 02-6, GN Docket No. 09-51, Order, 25 FCC Rcd 18762, 18773 n.54 (2010).

[216] *E-Rate Amortization Elimination Order*, 35 FCC Rcd at 674-75, paras. 8-9.

[217] *Digital Opportunity Data Collection Order*, 34 FCC Rcd 7505. In a Second Further Notice of Proposed Rulemaking, the Commission also sought comment on how best to incorporate mobile wireless voice and broadband coverage into the Digital Opportunity Data Collection, and on how to implement a database of broadband-serviceable structures. *Id.* at 7549, para. 112.

[218] *Id*. at 7506, para. 2.

[219] *Id*. at 7509, paras. 10-11.

service providers' broadband maps, facilitated by a crowd-sourcing portal that will gather input from consumers as well as from state, local, and Tribal governments.[220]

76. *Promoting Broadband Access for Veterans*. In May 2019, the Wireline Competition Bureau submitted a report to Congress examining the current state of broadband access and adoption by veterans, and providing recommendations on how to promote their access to broadband, so that they may fully participate in the digital economy.[221] In the *Veterans Broadband Access Report*, the Bureau found that, while many veterans have access to both fixed and mobile broadband options, a significant number still lack access to fixed broadband, mobile broadband, or both.[222] Additionally, the Bureau found that households with veterans subscribe to mobile broadband services at lower rates than households without veterans, and that barriers to broadband adoption for veterans may include lack of deployment where they live, price, and digital illiteracy or perceived irrelevance.[223]

77. *Tribal Lands.* In May 2019, the Consumer and Governmental Affairs Bureau, Wireless Telecommunications Bureau, and Wireline Competition Bureau submitted a report to Congress providing an analysis of broadband deployment on Tribal lands.[224] The *Tribal Lands Broadband Access Deployment Report* shows that, while deployment to Tribal lands has increased in recent years, Tribal lands experience lower rates of both fixed and mobile broadband deployment as compared to non-Tribal areas of the United States, particularly in rural areas.[225] The *Tribal Lands Broadband Access Deployment Report* also describes in detail the Commission's efforts to leverage its available programs to increase the availability of broadband on Tribal lands, including universal service program reforms, expanded direct consultation with Tribes, and making available additional, valuable spectrum resources.[226] The Commission took steps in the *Rural Digital Opportunity Fund Order* to specifically target broadband deployment in census blocks on rural Tribal lands. Specifically, we adopted a policy that has the effect of increasing the auction reserve price for serving such census blocks compared to the typical census blocks eligible for the auction, which we expect will encourage deployment on Tribal lands.[227]

C. Access to Spectrum

78. Since release of the *2019 Report,* the Commission has continued efforts to expand access to spectrum to support 5G and other advanced wireless services. With respect to high-band spectrum, the Commission, in March of 2019, concluded the first of its *Spectrum Frontiers* auctions. Auction 101 made a total of 850 megahertz of 28 GHz band spectrum available and raised over $700 million dollars for the U.S. Treasury.[228] Shortly thereafter Auction 102 made 700 megahertz of 24 GHz band spectrum

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[220] *Id*. at 7506, para. 3, 7521-37, paras. 35-75.

[221] FCC, WCB, Report on Promoting Broadband Internet Access Service for Veterans, Pursuant to the Repack Airwaves Yielding Better Access for Users of Modern Services Act of 2018 (WCB 2019), https://docs.fcc.gov/public/attachments/DOC-357270A1.pdf (*Veterans Broadband Access Report*).

[222] *Id.* at 5-11.

[223] *Id*. at 10, 12-13.

[224] FCC, CGB, WTB, and WCB, Report on Broadband Deployment in Indian Country, Pursuant to the Repack Airwaves Yielding Better Access for Users of Modern Services Act of 2018 (2019), https://docs.fcc.gov/public/attachments/DOC-357269A1.pdf (*Tribal Lands Broadband Access Deployment Report*).

[225] *Id*. at 1.

[226] *Id.* at 9-18.

[227] *Rural Digital Opportunity Fund Order*, 35 FCC Rcd at 694, para. 16.

[228] *Auction of 28 GHz Upper Microwave Flexible Use Service Licenses for Next-Generation Wireless Services Closes; Gross Winning Bids Amounts Announced for Auction 101*, AU Docket No. 18-85, Public Notice, 34 FCC Rcd 75, 75, para. 1 (2019).

available and raised over $2 billion dollars for the U.S. Treasury.[229] On December 10, 2019, the Commission began auctioning spectrum in the Upper 37 GHz, 39 GHz, and 47 GHz bands that collectively will make 3,400 megahertz of spectrum available.[230] This auction, Auction 103, concluded on March 5, 2020 and raised $7.6 billion in gross auction proceeds.[231]

79. The Commission also has improved access to mid-band spectrum. First, the Commission took several steps to open the 3.5 GHz band for commercial use. The 3.5 GHz band will allow access to up to 150 megahertz of spectrum for shared federal and non-federal use of the band among and between users, classified into one of three tiers of authorization: Incumbent Access (most protected), Priority Access, and General Authorized Access (least protected).[232] This three-tiered, dynamic sharing framework is facilitated by an automated frequency coordinator, known as a Spectrum Access System (SAS).[233] The Commission recently certified the first group of SAS Administrators for full commercial deployments,[234] and it adopted procedures for an auction of up to seven, 10-megahertz Priority Access Licenses (PALs) in the 3550-3650 MHz band, which is scheduled to begin on July 23, 2020.[235]

80. Second, the Commission reformed the regulatory framework for a portion of the 2.5 GHz band (2496-2690 MHz), which is the largest band of contiguous spectrum below 3 gigahertz, to make this spectrum more available for advanced wireless services, including 5G.[236] As part of this effort, the

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[229] *Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services et al.*, AU Docket No. 18-85, Public Notice, 33 FCC Rcd 4103, 4105, paras. 2-3 (2018); Press Release, FCC, FCC Concludes First High-Band 5G Airwaves Auctions (rel. May 28, 2019), https://docs.fcc.gov/public/attachments/DOC-357702A1.pdf.

[230] *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, GN Docket No. 14-177, Fourth Report and Order, 33 FCC Rcd 12168, 12169, para. 2 (2018); Press Release, FCC, FCC's Next 5G Spectrum Auction Is Underway (Dec. 10, 2019), https://docs.fcc.gov/public/attachments/DOC-361255A1.pdf.

[231] *Incentive Auction of Upper Microwave Flexible Use Service Licenses in the Upper 37 GHz, 39 GHz, and 47 GHz Bands for Next-Generation Wireless Services Closes; Winning Bidders Announced for Auction 103*, AU Docket No. 19-59, Public Notice, DA 20-253, para. 2 (rel. Mar. 12, 2020).

[232] *See Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, 3961, para. 4 (2015) (*3.5 GHz Order and Second FNPRM*); *Auction of Priority Access Licenses for the 3550-3650 MHz Band; Comment Sought on Competitive Bidding Procedures for Auction 105*, AU Docket No. 19-244, Public Notice, 34 FCC Rcd 9215, 9217, para. 5 (2019) (*Auction 105 Comment Notice*); *Auction 105: 3.5 GHz*, https://www.fcc.gov/auction/105 (last visited Mar. 2, 2020).

[233] *See 3.5 GHz Order and Second FNPRM*, 30 FCC Rcd at 3985-87, paras. 80-86; *Auction 105 Comment Notice*, 34 FCC Rcd at 9216-17, para. 3.

[234] *Wireless Telecommunications Bureau and Office of Engineering and Technology Approve Four Spectrum Access System Administrators for Full Scale Commercial Deployment in the 3.5 GHz Band and Emphasize Licensee Compliance Obligations in the 3650-3700 MHz Band Under Part 96*, GN Docket No. 15-319, Public Notice, DA 20-110 (WTB Jan. 27, 2020); *3.5 GHz Band Overview*, FCC.gov, https://www.fcc.gov/wireless/bureau-divisions/mobility-division/35-ghz-band/35-ghz-band-overview (last visited Mar. 2, 2020).

[235] *See Auction of Priority Access Licenses for the 3550-3650 MHz Band Rescheduled to Begin July 23, 2020; Auction 105 Short-Form Application Deadline Postponed to May 7, 2020*, AU Docket No. 19-244, Public Notice, DA 20-330 (OEA-WTB Mar. 25, 2020); *see also Auction of Priority Access Licenses for the 3550-3650 MHz Band; Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 105; Bidding in Auction 105 Scheduled to Begin June 25, 2020*, AU Docket No. 19-244, Public Notice, FCC 20-18 (Mar. 2, 2020).

[236] *Transforming the 2.5 GHz Band*, WT Docket No. 18-120, Report and Order, 34 FCC Rcd 5446, 5447, 5450, paras. 3, 13 (2019) (*2.5 GHz Order*). (In this Report and Order, the Commission replaced the regulatory framework for the Educational Broadband Service, which is comprised of twenty channels (for a total of 112.5 megahertz), with one of flexible use). *See id.* at 5447, 5450, paras. 4, 13.

Commission allowed for more efficient and effective use of the spectrum by incumbent licensees, adopted a rural Tribal priority filing window to give Tribal entities the opportunity to license unassigned spectrum for the deployment of advanced wireless services on rural Tribal lands, and announced that it would make any remaining unassigned spectrum available for commercial use via competitive bidding.[237] The rural Tribal priority window opened on February 3, 2020, and will remain open until August 3, 2020.[238] Commission staff have conducted extensive outreach following adoption of the 2019 *2.5 GHz Order* to provide interested, eligible Tribes with information and assistance on how to apply for spectrum during the window.[239]

81. Third, the Commission adopted an order to make 280 megahertz of the 3.7-4.2 GHz band available for 5G services while relocating existing satellite operations to the upper part of the band.[240] The 3.7-4.2 GHz band is immediately adjacent to the 3.5 GHz band, which the Commission also made available for expanded deployment of advanced wireless services.[241] Moreover, several international governing bodies are reviewing the suitability of the 3.7-4.2 GHz band for next-generation 5G wireless services.[242] In its *Report and Order and Order of Proposed Modification*, the Commission found that licensing 280 megahertz of the 3.7-4.2 GHz band for flexible use would "lead to substantial economic gains, with some economists estimating billions of dollars in increases on spending, new jobs, and America's economy."[243] At the same time the Commission adopted the *Report and Order and Order of Proposed Modification*, the agency sought comment on bidding procedures for an auction beginning in December 8, 2020 of new, flexible-use overlay licenses in the 3.7-3.98 GHz band.[244]

82. Fourth, the Commission recently proposed to reallocate all or a portion of spectrum in the 5.9 GHz band (5.850-5.925) to new advanced uses.[245] Over the past two decades, the Commission reserved this 75 megahertz of spectrum for use by Dedicated Short-Range Communications (DSRC), a service whose rules and protocols were designed to enable transportation and vehicle safety-related communications.[246] Since that time, the DSRC service has not been widely deployed within the consumer

[237] *See id.* at 5450, 5463, 5472, paras. 14, 47, 75; *see also Federal Communications Commission Announces 2.5 GHz Rural Tribal Window and Technical Workshop*, WT Docket No. 18-120, Public Notice, 34 FCC Rcd 11138 (WTB 2019) (*2.5 GHz Rural Tribal Window Public Notice*); *Wireless Telecommunications Bureau Announces Procedures for 2.5 GHz Rural Tribal Priority Window*, WT Docket No. 18-120, Public Notice, DA 20-18 (WTB Jan. 6, 2020).

[238] *See 2.5 GHz Rural Tribal Window Public Notice*.

[239] The Commission has established a dedicated website that provides access to information regarding the window, including the location and dates of outreach and education opportunities. 2.5 GHz Rural Tribal Window. | Federal Communications Commission, https://www.fcc.gov/RuralTribalWindow (last visited Mar. 25, 2020). The Commission has also created a dedicated mapping tool to assist Tribes in assessing their eligibility and the amount of unassigned 2.5 GHz spectrum over their Rural Tribal Lands. 2.5 GHz Rural Tribal Maps. | Federal Communications Commission, https://www.fcc.gov/25-ghz-rural-tribal-maps (last visited Mar. 25, 2020). The FCC took part in at least 28 educational events between July 2019 and March 2020.

[240] *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, FCC 20-22 (Mar. 3, 2020).

[241] *Id*. at para. 12.

[242] *Id.* at para. 7.

[243] *Id.* at para. 20.

[244] *See Auction of Flexible-Use Service Licenses in the 3.7-3.95 GHz Band for Next-Generation Wireless Services; Comment Sought on Competitive Bidding Procedures for Auction 107*, AU Docket No. 20-25, Public Notice, FCC 20-23, at para. 1 (Mar. 3, 2020).

[245] *See Use of the 5.850-5.925 GHz Band*, ET Docket No. 19-138, Notice of Proposed Rulemaking, 34 FCC Rcd 12603 (2019).

[246] *Id.* at 12604, para. 3.

automobile market.[247] At the same time, growth in unlicensed services, such as Wi-Fi, have grown exponentially, and these devices rely significantly on spectrum in neighboring segments of the 5 GHz band.[248] In the NPRM, the Commission proposed to designate the lower 45 megahertz of the 5.9 GHz band for unlicensed use, while the remaining 30 megahertz would continue to be used for transportation and safety-related communication services like the next-generation cellular vehicle to everything (CV2X) service.[249]

83. Fifth, the Commission proposed changes to the rules governing the 3.1-3.55 GHz band, which would be the first step to making spectrum in this band potentially available for advanced commercial service, including 5G.[250] Specifically, the Commission proposed to reallocate the 3.3-3.55 GHz band and relocate incumbent non-federal operations out of the band, in order to prepare the band for possible expanded commercial wireless use.[251] The Commission took this step in furtherance of Congress's direction in the MOBILE NOW Act to identify spectrum for new mobile and fixed wireless use and, specifically, to work in consultation with NTIA to evaluate the feasibility of allowing commercial wireless services to share use of spectrum between 3.1 and 3.55 GHz.[252]

84. In addition, the Commission also has taken action to use below-1 GHz spectrum more efficiently. In 2017, the Commission concluded an incentive auction repurposing 70 megahertz of spectrum in the 600 MHz band from broadcast to other wireless uses, such as for mobile broadband.[253] The multi-year transition period for this spectrum band is ongoing and is expected to be completed later this year.[254] Spectrum from this auction is already being used to deliver services, including 5G, in large parts of the country.[255] As part of its recently approved transaction, T-Mobile has committed, post-consummation, to deploying 5G service on both low-band and mid-band spectrum to 99% of Americans within six years, including covering 90% of those living in rural America within the same timeframe.[256] Furthermore, the Commission approved certain extensions and conditions related to DISH, the contingent purchaser of the divested Boost Mobile.[257] Specifically, DISH committed, among other things, to

[247] *Id.* at 12604-05, para. 4.

[248] *Id.* at 12606, para 6.

[249] *See generally id*.

[250] *Facilitating Shared Use in the 3.1-3.55 GHz Band*, WT Docket No. 19-348, Notice of Proposed Rulemaking, 34 FCC Rcd 12662, 12662, para. 1 (2019).

[251] *Id.*

[252] *Id*.

[253] *Incentive Auction Closing and Channel Reassignment et al.*, AU Docket No. 14-252 et al., Public Notice, 32 FCC Rcd 2786, 2793, para. 15 (2017).

[254] *Id.* at 2788, 2805, paras. 1, 60.

[255] *See* Press Release, FCC, FCC Announces Results of World's First Broadcast Incentive Auction (Apr. 13, 2017); Press Release, T-Mobile, T-Mobile's Spectrum Haul is a Game Changer for Wireless Consumers (Apr. 12, 2017), https://www.t-mobile.com/news/tmobile-spectrum-auction-win; Press Release, T-Mobile, T-Mobile 5G: It's On! (Dec. 2, 2019), https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2019/T-Mobile-5G-Its-On/default.aspx.

[256] *Applications of T-Mobile US, Inc., and Sprint Corporation For Consent to Transfer Control of Licenses and Authorizations; Applications of American H Block Wireless L.L.C, DBSD Corporation, Gamma Acquisition L.L.C., and Manifest Wireless L.L.C. for Extension of Time*, WT Docket No. 18-197, Memorandum Opinion and Order, Declaratory Ruling, and Order of Proposed Modification, 34 FCC Rcd 10578, 10589-91, paras. 26-32 (2019).

[257] *Id.* at 10583, para. 12.

accelerate its construction deadlines for its 600 MHz licenses and ensure that this spectrum is used to deploy 5G broadband service.[258]

85. The Commission also proposed rules to reconfigure the 900 MHz band to facilitate the development of broadband technologies and services.[259] The proposal seeks to realign the 900 MHz band to create a broadband segment and reserve the remainder for incumbent narrowband operations.[260]

86. The Commission has similarly proposed to reallocate spectrum in the 1675-1680 MHz band for shared use between incumbent federal operations and new, non-federal flexible-use wireless operations, including for advanced telecommunications capability.[261]

87. Further, the Commission continues to seek ways to enhance broadband and other innovative uses through use of unlicensed operations. For example, the Commission has proposed targeted changes to its rules to provide additional opportunities for unlicensed white space devices operating in the broadcast television bands to deliver wireless broadband services in rural areas and applications associated with the Internet of Things.[262] This region of the spectrum has excellent propagation characteristics that make it particularly attractive for delivering communications services over long distances, coping with variations in terrain, as well as providing coverage into and within buildings.[263] The Commission's proposals are intended to spur continued growth of the white space device ecosystem, especially for providing affordable broadband service to rural and underserved communities.[264]

88. With respect to satellite services, there is significant industry interest in developing and deploying large constellations of non-geostationary (NGSO) satellites with robust capabilities to be used for global broadband connectivity. Over the last several years, the Commission has granted applications for a number of established operators and new entrants to provide broadband services using a new generation of low-Earth orbit (LEO) satellite technologies in the Ku-, Ka-, and V-band frequencies.[265]

89. In 2019, the Commission took action on several applications that promise to speed the deployment of high-speed satellite broadband to unserved and underserved portions of the United

[258] *Id.* at 10742, 10745, paras. 369, 375, 382.

[259] *See Review of the Commission's Rules Governing the 896-901/935-940 MHz Band*, WT Docket No. 17-200, Notice of Proposed Rulemaking, 34 FCC Rcd 1550 (2019).

[260] *Id.* at 1553, para. 9.

[261] *Allocation and Service Rules for the 1675-1680 MHz Band*, WT Docket No. 19-116, Notice of Proposed Rulemaking and Order, 34 FCC Rcd 3552 (2019).

[262] *Unlicensed White Space Device Operations in the Television Bands*, ET Docket No. 20-36, Notice of Proposed Rulemaking, FCC 20-17, at para. 1 (Mar. 2, 2020).

[263] *Id*.

[264] *Id.*

[265] *Space Exploration Holdings, LLC*; *Application For Approval for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System*; *Application For Approval For Orbital Deployment And Operating Authority for the SpaceX NGSO Satellite System Supplement, Memorandum Opinion, Order and Authorization*, 33 FCC Rcd 3391 (2018); *see also Space Norway AS*; *Petition for a Declaratory Ruling Granting Access to the U.S. Market for the Arctic Satellite Broadband Mission*, Order and Declaratory Ruling, 32 FCC Rcd 9649 (2017); *Telesat Canada*; *Petition for Declaratory Ruling to Grant Access to the U.S. Market for Telesat's NGSO Constellation*, Order and Declaratory Ruling, 32 FCC Rcd 9663 (2017); *O3b Limited*; *Request for Modification of U.S. Market Access for O3b Limited's Non-Geostationary Satellite Orbit System in the Fixed-Satellite Service and in the Mobile-Satellite Service*, Order and Declaratory Ruling, 33 FCC Rcd 5508 (2018); *Space Exploration Holdings, LLC*; *Application for Approval for Orbital Deployment and Operating Authority for the SpaceX V-band NGSO Satellite System*, Memorandum Opinion, Order and Authorization, FCC 18-161 (Nov. 19, 2018).

States.[266] For instance, the Commission approved two applications allowing SpaceX to modify its Ku- and Ka-band NGSO Starlink constellation to accelerate its deployment of broadband services to areas underserved or unserved by terrestrial systems.[267] In addition, it granted a modification application that will enable Hughes Network Systems, LLC, to use additional frequencies in the Ka-band for the planned high-throughput Jupiter 3 satellite to provide broadband service to consumers.[268]

VI. SECTION 706 FINDING

90. Based on the extensive evidence above, we conclude that advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion. The available data clearly demonstrate progress in the deployment of "advanced telecommunications capability" from 2017 to 2018. For example, the number of Americans without access to fixed terrestrial broadband deployment decreased by 14% in 2018, with decreases in urban, rural, and Tribal areas.[269] More Americans—94.9%—have access to mobile LTE with median speeds of 10/3 Mbps, up from 89.0% in 2017.[270] Indeed, there were deployment increases in both fixed and mobile services, both apart and when combined.[271] We also are encouraged by the significant year-over-year increases in fixed terrestrial services at every speed examined in this Report—10/1 Mbps mobile broadband, and 25/3 Mbps, 50/5 Mbps, 100/10 Mbps, and 250/25 Mbps fixed broadband.[272] Moreover, some of the Commission's more recent actions undertaken to speed broadband deployment likely are not yet fully reflected by the data used in our analysis here, as those data only provide the extent of U.S. broadband deployment through December 2018.

91. Indeed, recent broadband investment throughout the country demonstrates that the Commission's actions to date to encourage and stimulate broadband deployment and innovation are working as intended. U.S. broadband providers invested approximately $80 billion in network infrastructure in 2018, up more than $3.1 billion from 2017.[273] Broadband providers, both small and large, built and upgraded networks across the country, with fiber deployment in the United States now passing 46.5 million unique homes, a 16% increase in homes passed by fiber since 2018.[274] In 2019

[266] *Space Exploration Holdings, LLC*; *Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, Order and Authorization, 34 FCC Rcd 2526 (IB 2019); *Space Exploration Holdings, LLC, Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, Order and Authorization, 34 FCC Rcd 12307, 12307, para. 1 (IB 2019) (*SpaceX NGSO Authorization*). (SpaceX has been conducting launches of Starlink satellites since May 2019). Space Exploration Holdings, *Starlink Mission* (May 24, 2019), https://www.spacex.com/news/2019/05/24/starlink-mission; *see also* Space Exploration Holdings, LLC, *Starlink Mission* (Feb. 17, 2020), https://www.spacex.com/news/2020/02/17/starlink-mission.

[267] *SpaceX NGSO Authorization*, 34 FCC Rcd 12307.

[268] *See* Satellite Policy Branch Information, Actions Taken, Public Notice, Report No. SAT-01396 (IB Sat. Div. June 14, 2019); *see also* Hughes Network Systems, LLC, Request for Modification of the Authorization to Launch and Operate EchoStar XXIV, IBFS File No. SAT-MOD-20190212-00011 (granted June 13, 2019). Similarly, the Commission authorized a number of gateway earth stations necessary to operate satellite constellations that offer or will offer broadband services consumers. *See* Satellite Communications Services Information, Actions Taken, Public Notice, SES-02217 (IB Sat. Div., Nov. 13, 2019); Satellite Communications Services Information, Actions Taken, Public Notice, Report No. SES-02134 (IB Sat. Div., Feb. 6, 2019).

[269] *See supra* Fig. 1.

[270] *See supra* Fig. 2b.

[271] *See supra* Figs. 1, 2b, 3a, and 3b.

[272] *See supra* Fig. 4.

[273] *See generally* Patrick Brogan, Vice President for Industry Analysis, USTelecom, U.S. Broadband Investment Continued upswing in 2018 (2019), https://www.ustelecom.org/wp-content/uploads/2019/07/USTelecom-Research-Brief-Capex-2018-7-31-19.pdf.

[274] *See* Fiber Broadband Association Dec. 16, 2019 *Ex Parte* Letter, at 1 n.1.

alone, fiber broadband networks became available to roughly 6.5 million additional unique homes, the largest one-year increase ever, with smaller providers accounting for 25% of these new fiber connections.[275] AT&T, T-Mobile, Sprint, and Verizon are also rapidly expanding their 5G deployment, with 5G networks in aggregate now covering more than 200 million consumers across the country, especially in urban areas, with more live launches planned for 2020.[276]

92. Both commenters and industry reports indicate that our policy efforts are making a difference. For example, recent Fiber Broadband Association research shows that the industry is currently on pace to deploy all-fiber networks to about 50% of U.S. households by 2025, in part due to our efforts to spur deployment.[277] Commenters also predict that the positive trends in deployment of advanced telecommunications capability reported in recent years will continue, due in part to Commission policies that promote investment.[278]

93. We disagree with commenters that contend that the section 706 requirements have not been met.[279] In particular, we reject the arguments of commenters that urge us to conduct our section 706

[275] *Id.*

[276] *See* AT&T, AT&T 5G Now Live for Consumers in 10 Markets (Dec. 13, 2019), https://about.att.com/story/2019/5g_launch.html (announcing live launch of AT&T 5G to consumers and businesses in the Birmingham, AL; Indianapolis; Los Angeles; Milwaukee; Pittsburgh; Providence, RI; Rochester, NY; San Diego, San Francisco, and San Jose, CA market areas, and plans to expand service availability to other markets soon as it works toward offering nationwide coverage in the first half of 2020); T-Mobile, T-Mobile 5G: It's On! (Dec. 2, 2019), https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2019/T-Mobile-5G-Its-On/default.aspx; Sprint, Sprint 5g Overview (Nov. 1, 2019), https://newsroom.sprint.com/sprint-5g-overview-1-2.htm (touting Sprint 5G availability in parts of 9 cities – Atlanta, Chicago, Dallas-Ft. Worth, Houston, Kansas City, Los Angeles, New York City, Phoenix, and Washington, DC – as well as Sprint partnerships with multiple U.S. cities on Smart City applications leveraging Sprint's 5G and IoT offerings); Verizon, When Will Verizon Have 5G? (Dec. 5, 2019), https://www.verizon.com/about/our-company/5g/when-will-verizon-have-5g (discussing current availability of Verizon's 5G ultra-wideband service in parts of select cities, and plans for further rollouts in 2020).

[277] Press Release, Fiber Broadband Association, New Study Finds All-Fiber Deployments to 90% of Households Achievable in Next Decade (Sept. 10, 2019), https://www.fiberbroadband.org/blog/new-study-finds-all-fiber-deployments-to-90-of-households-achievable-in-next-decade ("These accelerated all-fiber builds are driven by increasing consumer demand for higher performance broadband, . . . and government efforts to lower barriers to deployment costs and provide targeted subsidies.").

[278] *See, e.g.*, Internet Innovation Alliance Comments at 6-7 ("In 2019, as they have for years, broadband providers are constantly increasing speeds in response to competitive pressures and as a result of new deployments thanks to policies that promote investment . . . We expect this positive trend to continue and indeed accelerate as the Nation transitions to 5G wireless broadband . . . ."); *id.* at 7-8 ("Thanks to policies that reward investment and promote innovation and the pressures of a competitive broadband marketplace, we expect that the 2020 Broadband Deployment Report and those in future years will continue to show a story of progress in the important task of ensuring that all Americans have access to fast, reliable broadband, no matter how they access the broadband internet."); ITTA Comments at 10 ("[T]he Commission has ample grounds to once again find that its 'policymaking efforts . . . are promoting broadband deployment, and that [Internet Service Providers] are making strong progress in deploying advanced telecommunications capability to more and more Americans.'").

[279] *See, e.g.*, Benton Foundation Comments at 2 (coupled with continued reliance on Form 477, Commission's "progress-based approach" misrepresents the true reach of broadband in the U.S.); INCOMPAS Comments at 7 n.11 ("[T]he Commission cannot retain a baseline benchmark for fixed service that is adequate for purposes of finding that broadband is being deployed in a timely and reasonable manner, but is by no means 'advanced' given our current understanding of broadband services available to the typical consumer."); CWA Reply Comments at 13 ("The Commission should find that advanced telecommunications services are not being deployed in a reasonable and timely fashion, . . . and condition the 2020 Broadband Deployment Report with the understanding that the underlying Form 477 data is flawed."); Public Knowledge et al. Reply Comments at 9-10 ("The Commission's two prior Broadband Deployment Reports departed significantly from nearly a decade of precedent since the Broadband

(continued….)

assessment based only on the number of Americans with access to broadband instead of measuring year-over-year progress. As the Commission has previously stated, the statute requires that we determine whether advanced telecommunications capability "*is being deployed* to all Americans"—not whether it has already been deployed to all Americans—and reading section 706(b) to require universal availability as a prerequisite for a positive finding would disregard the statute's "reasonable and timely" language.[280] With respect to those that contend that the inaccuracies inherent in our current data render it impossible for us to come to any conclusion under section 706, we reiterate both our recognition of the problems with the Form 477 data, and that the Commission's efforts to improve our data collection are already underway.[281] In the interim, however, we are still obligated to conduct our annual section 706 inquiry, and, it remains the case that, despite its deficiencies, Form 477 data remains the most comprehensive, reliable data available to us to meet our statutory obligation.[282] The Form 477 data also provides a consistent means to measure progress in deployment from year-to-year and over the course of several years. Our policymaking efforts over the last few years are promoting broadband deployment,[283] and we are confident that even a perfectly designed and implemented data collection, if such a thing were possible, would still show that ISPs are making strong progress in deploying advanced telecommunications capability to more and more Americans.[284] The across-the-board progress demonstrated by the deployment data is consistent with the evidence in the record showing substantial levels of network investment in 2018.[285] Thus, we find that the data we do have is sufficiently indicative

(Continued from previous page)
Data Improvement Act by concluding that broadband is being deployed to the U.S. in a timely and reasonable manner. . . . [C]ongressional reports show that it was Congress' intent to look at current broadband deployment rather than come to its conclusion based on the progress from the prior year.").

[280] *See 2019 Report*, 34 FCC Rcd at 3859-60, para. 8, 3898-99, para. 78; *2018 Report*, 33 FCC Rcd at 1663-64, paras. 10-13; *see also* ADTRAN Reply Comments at 2 ("Public Knowledge et al. contends that the Commission should abandon its progress-based approach and revert back to a more simplistic assessment of whether or not all Americans have access to advanced telecommunications capabilities. . . . . Their assertion is based on a misreading of the Senate Report for the Broadband Data Improvement Act, which was addressing the quality of the data collected, not how to interpret Section 706. The Commission correctly interprets the Section 706 language . . . as supporting a progress-based standard.").

[281] *See supra* Section IV.A; *2019 Report*, 34 FCC Rcd at 3868, para. 24; *Establishing the Digital Opportunity Data Collection, Modernizing the FCC Form 477 Data Program*, WC Docket No. 19-195, Docket No. 11-10, Report and Order and Second Further Notice of Proposed Rulemaking, 34 FCC Rcd 7505 (2019).

[282] *See, e.g.*, *2019 Report*, 34 FCC Rcd at 3868-69, paras. 24-26; ADTRAN Comments at 9 ("ADTRAN recognizes that the current Form 477 data has flaws, and the Commission is in the process of improving that broadband deployment data. Notwithstanding the potential for Form 477 to overstate broadband deployment, it remains the most comprehensive data available."); Colville Confederated Tribes Comments at 6 ("CCT recognizes that the FCC form 477 data is the most reliable data available, but it is far from comprehensive. The fact of the matter is there are no other options available to use as of now . . ."); Next Century Cities Comments at 6 ("The Commission is aware that its reliance on the 477 data collection overstates the number of households with broadband coverage . . . . We support the Commission's effort to establish a more accurate data collection via the Digital Opportunity Data Collection."); UST Comments at 12 ("USTelecom agrees with the Commission that Form 477 deployment data for fixed technologies is currently the most reliable and comprehensive dataset with which to assess availability of fixed services.").

[283] *See supra* Section V.

[284] As NCTA notes, "the explosion of new video streaming services is premised on the widespread deployment of networks that are capable of handling the streaming demands of millions of American households. If deployment were not occurring in a reasonable and timely fashion, there would be no streaming wars." NCTA Reply Comments at 3.

[285] Moreover, there is no documented evidence in the record suggesting that the progress in deployment shown in the data is a function of data deficiencies.

to give us reasonable confidence that advanced telecommunications capability is being deployed in a reasonable and timely manner. These circumstances warrant a positive finding.

94. Once again, we recognize that, despite our positive finding today, our work to close the digital divide is not complete. For instance, the 2018 data demonstrate that 5.6% of Americans, nearly 18.3 million people, lack access to fixed terrestrial advanced telecommunications capability.[286] While deployment is improving in all geographic areas, we recognize that there is still significant work to do to encourage deployment to rural areas, where 22.3% of Americans lack access, and Tribal lands, where 27.7% of Americans lack access.[287] We agree with the Free State Foundation that, notwithstanding our finding that advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion, "the imperative to proactively identify and remove regulatory barriers to broadband infrastructure investment remains."[288] Thus, the further deployment of advanced telecommunications capability to close the digital divide will remain a top priority of the Commission as we continue our efforts to deliver the benefits of broadband to all Americans.

VII. ORDERING CLAUSE

95. Accordingly, IT IS ORDERED that, pursuant to section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. § 1302, this Report IS ADOPTED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

[286] *See supra* Fig. 1.

[287] *Id*.

[288] Free State Foundation Comments at 10.

STATEMENT OF
COMMISSIONER MICHAEL O'RIELLY

Re: *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket 19-285, 2020 Broadband Deployment Report.

The finding in this year's report—that advanced telecommunications capability *is being deployed* to all Americans in a reasonable and timely fashion—is undoubtedly accurate. Nonetheless, it bears repeating (for the third year in a row) that this finding does not suggest that we have succeeded in our mission to bring broadband access to all Americans, and I personally will not rest until that work is done. Nor does it suggest that the dataset we rely on is perfect or even satisfactory. Form 477 data is obviously extremely flawed and problematically applied as a basis for distributing USF funding, as recognized by Congress in the Broadband DATA Act, and this point is especially clear in light of the huge discrepancies between this item's charts and the entire premise underlying the Rural 5G Fund Notice concurrently under the Commission's consideration. However, we should be crystal clear that Form 477 data is being used here for the limited purpose of tracking progress from year-to-year, per our statutory obligation. Otherwise, we risk unfairly conflating two very separate issues.

While I am pleased that we continue to rely on a realistic and text-based reading of section 706, I wish we would have extended that pragmatism to our evaluation framework. It's obvious that mobile and fixed broadband are increasingly converging into a single market, and I am dismayed that for yet another year, we have opted to rehash our tired, siloed approach rather than pursue a technology neutral analysis. Especially given recent calls for the FCC to support wireless hotspots to improve access for distance-learning during the COVID-19 pandemic, including to provide two-way video-based applications, it does seem that there's broad recognition of the services' substitutability, even among the most die-hard proponents of universal fiber-to-the-home. And, that's not to mention the characteristics of 5G service, which obliterate any basis for maintaining our outdated approach.

Nonetheless, I do appreciate that the item makes a sincere effort to discuss the substitutability issue more comprehensively than previous iterations of this report, and more evenhandedly compares mobile to fixed, rather than exclusively focusing on the shortcomings of the former compared to the latter. While I think we are still unnecessarily preoccupied with whether the two technologies are interchangeable for every potential use and function, this language at least moves the needle in the right direction.

Finally, I would have preferred to include data from the satellite industry in our main report, rather than relegate it to the appendices. While I appreciate that satellite providers face capacity constraints, limited capacity is by no means unique to satellite technology. Here, again, I would have preferred to take a technology neutral approach rather than engage in a somewhat arbitrary line-drawing process.

Despite the concerns I have identified, I support our overall effort and vote to approve.

STATEMENT OF
COMMISSIONER BRENDAN CARR

Re: *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket 19-285, 2020 Broadband Deployment Report.

The momentum behind America's 5G leadership is now unmistakable. As this report shows, we have turned the page on the failed broadband policies of the previous administration, and the private sector has responded. America's broadband builders are now trenching conduit, pulling fiber, and installing new high-speed cell sites at an unprecedented clip. While we are far from the finish line, the significant progress we're making in closing the digital divide is welcome news.

Regulations matter. And for years, the FCC pursued partisan policies that only made it harder for the private sector to bring more broadband to more Americans. From 2014 to 2107, for instance, the deployment of high-speed mobile wireless services in rural communities stagnated.[289] Our pro-deployment policies have enabled the private sector to turn that around, and new builds are once again on the rise.

Internet speeds are also increasing. Since the end of 2016, the percentage of Americans with access to 250/25 Mbps has nearly doubled, from 43.6% to 85.6% at the end of 2018.[290] Data from third-party monitors show that Internet speeds are up roughly 85% since year-end 2016. Internet providers have also built out more miles of high-speed fiber in 2019 than ever before—smashing prior records. The digital divide has narrowed substantially—closing by about 30% between year-end 2016 and 2018. Competition has also increased, with the percentage of Americans having more than two options for 25/3 Mbps high-speed services increasing 52% over that same time period.

Results like these should put the partisan effort to seize greater government control of the Internet in the rear view window. Indeed, it is more clear than ever before that the prior FCC's years-long effort to apply heavy-handed utility-style regulation to the Internet elevated politics over policy. It slowed down the important work needed to close the digital divide and held back competition. As the current pandemic highlights, we should all come together around policies that will encourage the accelerated buildout of high-speed networks in every community in this country.

[289] Figure 2b.

[290] Figure 4.

STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL,
DISSENTING

Re: *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket 19-285, 2020 Broadband Deployment Report.

This report is baffling.

We are in the middle of a pandemic. So much of modern life has migrated online. As a result, it has become painfully clear there are too many people in the United States who lack access to broadband. In fact, if this crisis has revealed anything, it is the hard truth that the digital divide is very real and very big.

But you'll find no evidence acknowledging that in today's Broadband Progress Report from the Federal Communications Commission. Instead, you'll find a glowing assessment that all is well. According to this rosy report the nation's broadband efforts are all good. They are proceeding in a reasonable and timely fashion and they are reaching all Americans.

This is just not right.

Check the headlines decrying the lack of broadband in this country. Look at Congress constantly pressing for new programs to extend the reach of internet access in the United States. See governors establishing committees and support systems to expand broadband to those who are not connected. Take note of mayors everywhere clamoring for better broadband so their communities have a fair shot at digital age success.

Then look all around us. Because this crisis is exposing what has long been obvious: too many Americans across the country do not have access to broadband.

In this disaster, Parking-Lot Wi-Fi has become a thing. So many people in so many cars sitting in front of shuttered libraries and coffee shops, just to pick up a free wi-fi signal. It is the only way they have to connect.

Schools have shuttered and more than 50 million students have been told to head online for class. But millions of them can't get there because they fall into the Homework Gap and lack internet access at home. It's not just a problem in rural America, it's a challenge in urban America too, where in cities like Detroit more than half of the students live in homes without broadband.

The use of telemedicine has exploded as doctors and patients seek safe ways to deliver and secure care without the risk of viral transmission. But in rural communities this is often not possible. Changes to laws in Iowa, for instance, recently expanded telehealth in the state but also demonstrated that one in five Iowans lack the bandwidth required for video consultations.

Businesses everywhere are trying to hold on in this economy. But if connectivity is limited so are revenue opportunities. With more than seven million small businesses at risk of closing during this crisis, we need to ensure they have every tool at their disposal to reach consumers safely and effectively.

All of this adds up. It means this report ignores the lived experiences of so many people struggling to get access to the broadband in they need right now for work, education, healthcare, and more. On top of this, the agency's methods for concluding that broadband deployment is reasonable are seriously flawed.

For starters, the FCC concludes that there are only 18 million people in the United States without access to broadband. This number wildly understates the extent of the digital divide in this country. That's because if a broadband provider tells the FCC that it can offer service to a single customer in a census block, the agency assumes that service is available throughout. The result is data that

systematically overstates service across the country. Other studies have shown that the true number of people without broadband access is 42 million or even as high as 162 million.

Making matters worse, the FCC relies on information submitted by providers without a system to independently verify the data. Last year, this allowed one company overstate its service coverage by tens of millions of people. This year, one of the country's largest providers found that it too had overstated its coverage in thousands of areas.

So it's no wonder the FCC's broadband data has been the subject of nonstop criticism from consumers and Congress. In fact, just last month Congress passed the Broadband DATA Act directing the FCC to clean up its act and develop data and maps that reflect the true state of broadband access in the United States. But you'll find no evidence of that effort in this report. Instead, the FCC ignores this mandate from Congress and presses forward with data that have repeatedly been shown to be wrong.

The FCC is also using a broadband standard that is too low for a nation that has moved so much of life online. Many households with multiple users are video calling, streaming entertainment, and searching online at the same time. Yet the FCC's report uses a download standard of 25 megabits per second that it adopted more than five years ago. We need to set audacious goals if we want to do big things. With so many of our nation's providers rolling out gigabit service, it's time for the FCC to adjust its baseline upward, too. We need to reset this standard to 100 megabits per second. While we're at it we need to revisit our thinking about upload speeds. At present, our standard is 3 megabits per second. But this asymmetrical approach is dated. We need to recognize that with extraordinary changes in data processing and cloud storage, upload speeds should be rethought.

Last but not least, the FCC fails to meaningfully discuss big issues that contribute to the digital divide. It refuses to consider price and affordability. It barely mentions digital literacy. If the agency is serious about living up to its duty under the law to report on the state of broadband in this country, these omissions render its conclusions suspect.

Crises can reveal a lot. This pandemic has demonstrated conclusively that broadband is no longer nice-to-have. It's need-to-have. What we also need is an honest accounting from the FCC about the state of broadband in this country. Because when we get to the other side of this crisis, we need to rebuild our economy and closing the digital divide is the right place to start. I wish that this report could contribute to that effort. I wish it could provide accurate data to inform our action. I wish it could provide a meaningful template for broadband for all. But it does not. I dissent.

STATEMENT OF
COMMISSIONER GEOFFREY STARKS,
DISSENTING

Re: *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket 19-285, 2020 Broadband Deployment Report.

The FCC's limited progress on new broadband maps has left the Commission without high-quality, nationwide data on the deployment of Advanced Telecommunications Capability. It is a shame that we are once again relying on Form 477 data, with all its inaccuracies. At this point, Form 477's problems are well documented, acknowledged throughout the telecommunications industry, and recognized by bipartisan majorities in both houses of Congress. And they are recounted in the 2018 and 2019 iterations of this report. We are all well versed in Form 477's flaws.

The fact that this report must rely on the unreliable should be reflected in its conclusions. I cannot approve the report's confident declaration that this data constitutes "compelling evidence" that Advanced Telecommunications Capability is being deployed on a reasonable and timely basis. We do not have a strong basis for that conclusion, and we should say so. I therefore respectfully dissent.

This report, which I have called the "State of the Union" for the digital divide, calls closing the digital divide "the Commission's top priority." I wholeheartedly agree with that aspiration, which has not always been evident in the Commission's actions. Earlier this year, the Commission committed more than $16 billion to bringing broadband to our hardest to reach areas through the Rural Digital Opportunity Fund. But we know that the digital divide is not just a rural issue. Census Bureau surveys show that three times as many households in urban areas remain unconnected as in rural areas.[291] When it comes to making sure all Americans can access affordable, high-quality broadband, we have a long way to go.

In light of the struggles many Americans have faced over the last six weeks, it is especially perplexing and disturbing that the majority would cast this report as a victory lap. When public health requires social distancing and even quarantine, closing the digital divide becomes central to our safety and economic security. But too many Americans cannot access online work, medical help, and distance learning because broadband is too expensive or not available. As we enact emergency efforts to respond to the COVID-19 crisis, I will continue to call on the Commission to speed the work of correcting our broadband deployment data and to develop better data and policy on affordability—critical steps toward a lasting solution to the digital divide.

I thank the many staff members from across the Commission who contributed to the creation of this report.

[291] *See* Blair Levin and Larry Downes, *Cities, not rural areas, are the real Internet deserts*, N.Y. Times (Sept. 13, 2019), https://www.washingtonpost.com/technology/2019/09/13/cities-not-rural-areas-are-real-internet-deserts/.

Report on Broadband Deployment in Indian Country, Pursuant to the Repack Airwaves Yielding Better Access for Users of Modern Services Act of 2018

Prepared by the:

Consumer & Governmental Affairs Bureau
Wireless Telecommunications Bureau
Wireline Competition Bureau

Submitted to the:

Senate Committee on Commerce, Science, and Transportation
House of Representatives Committee on Energy and Commerce

May 2019

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I. INTRODUCTION

Pursuant to Section 508(a)(1) of the Repack Airwaves Yielding Better Access for Users of Modern Services Act of 2018 (RAY BAUM'S Act or the Act), the Consumer & Governmental Affairs Bureau, Wireless Telecommunications Bureau, and Wireline Competition Bureau (Bureaus) of the Federal Communications Commission (FCC or Commission) submit this report to the Committee on Energy and Commerce of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.[1] The Act directs the Commission to evaluate broadband coverage in Indian country and on land held by a Native Corporation pursuant to the Alaska Native Claims Settlement Act.[2] Consistent with this directive, the Bureaus provide an analysis of broadband deployment on Tribal lands using FCC Form 477 data as of December 2017, as well as an overview of the Commission's ongoing efforts to address unserved areas on Tribal lands that are not yet reflected in this data.

As this report shows, while deployment to Tribal lands has increased in recent years, additional work remains to increase deployment to the certain Tribal areas and reach our goal of closing the digital divide for all Americans. Tribal lands experience lower rates of both fixed and mobile broadband deployment as compared to non-Tribal areas of the United States, particularly in rural areas.[3] For example, while 92% of housing units on urban Tribal lands are covered by a fixed terrestrial provider of 25/3 Mbps broadband service—just six points behind their non-Tribal urban counterparts—just 46.6% of housing units on rural Tribal lands have access to that service, a nearly 27-point gap compared to non-Tribal rural areas. Mobile LTE coverage on Tribal lands is similarly behind deployment on non-Tribal lands; while 99.8% of the population living on non-Tribal areas are covered by mobile LTE service, only 96% of the population living on Tribal land are covered with such service. And generally, individuals living on Tribal lands that are covered have access to fewer carriers providing 4G LTE coverage. The Commission will initiate a proceeding in the near term to address these deployment challenges and help to close the broadband gap on Tribal lands.

II. BACKGROUND

Tribal lands often present significant obstacles to deploying broadband and are expensive to serve.[4] These challenges to deployment on Tribal lands include rugged terrain, complex permitting processes governing access to Tribal lands, jurisdictional issues involving states and sovereign Tribal governments, lack of the necessary infrastructure, and a predominance of residential, rather than business, customers.[5] High poverty rates and low-income levels on Tribal lands, as well as cultural and language barriers, further inhibit the widespread availability of broadband to Tribal residents.[6]

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[1] *See Consolidated Appropriations Act, 2018*, Pub. L. No. 115-141, Div. P—RAY BAUM'S Act of 2018, § 508(a)(1), 132 Stat. 348, 1095-96 (2018) (RAY BAUM'S Act of 2018).

[2] *Id.*

[3] *See* FCC, *Fixed Broadband Deployment Data from FCC Form 477*, *available at* https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477; FCC, *Mobile Deployment Form 477 Data*, *available at* https://www.fcc.gov/mobile-deployment-form-477-data.

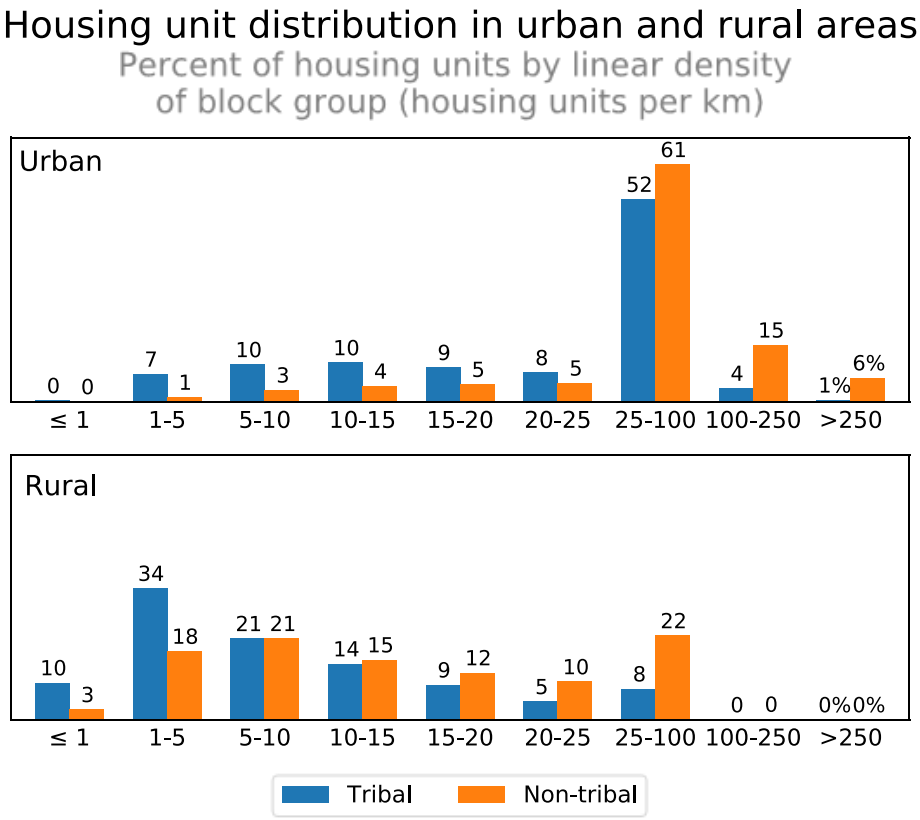
[4] *Connect America Fund et al*., Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 17818-19, para. 479 (2011) (*USF/ICC Transformation Order), aff'd sub nom, In re: FCC 11-161*, 753 F.3d 1015 (10th Cir. 2014).

[5] *See id. See also Connect America Fund et al.*, Report and Order, Order and Order on Reconsideration, and Further Notice of Proposed Rulemaking, 31 FCC Rcd 3087, 3224, paras. 368-69 (2016) (*Rate-of-Return Reform Order*); *Connect America Fund*, Report and Order, 33 FCC Rcd 3602, 3602-03, para. 2 (2018) (*Tribal OpEx Relief Order*).

[6] *See Rate-of-Return Reform Order*, 31 FCC Rcd at 3224, paras. 368-69; *Tribal OpEx Relief Order*, 33 FCC Rcd at 3602-03, para. 2.

Additionally, the population of individuals living on Tribal lands is disproportionately skewed toward rural, rather than urban, areas; approximately 48% of housing units on Tribal lands are located in rural areas compared to approximately 21% of non-Tribal housing units. Moreover, Tribal lands, both rural and urban, tend to be less densely populated than non-Tribal lands. For example, the linear density (i.e., the number of housing units per kilometer of road distance) data shown in Figure 1 indicates substantial differences between Tribal and non-Tribal areas in both urban and rural blocks.

Fig. 1



The lower density of Tribal areas is particularly magnified in rural areas; as Figure 1 shows, while only 36% of Tribal housing units in urban areas are located in census block groups with 20 or fewer housing units per kilometer of road distance, 88% of Tribal housing units in rural areas are located in such census block groups. Given that carriers must undertake significantly higher costs to construct broadband networks in remote, isolated areas, the lack of density in rural Tribal areas appears to have a negative effect on broadband deployment.

The Commission has a long-recognized trust relationship with Tribal Nations.[7] This government-to-government relationship guides the Commission's dealings with Tribal Nations and its efforts to promote Tribal self-sufficiency, economic development, and access to communications facilities and services.[8] Given the complexity and challenges of expanding service to Tribal lands, the Commission has taken a multi-faceted approach that includes: engaging in ongoing consultation with Tribes on a

[7] *See Establishing a Government-to-Government Relationship with Indian Tribes*, Policy Statement, 16 FCC Rcd 4078 (2000).

[8] *Id.* at 4080-81.

government-to-government basis, consistent with our trust responsibility; making funds available to support broadband access and deployment through the Universal Service Fund (USF or Fund); and evaluating opportunities to make spectrum available for the provision of mobile broadband services on Tribal lands.[9] Moreover, the Commission has found that reducing regulatory barriers to entry and investment will encourage and promote competitive, dynamic, and innovative communication services.[10] Thus, the Commission has acted in both wireline and wireless infrastructure proceedings to reduce the administrative burdens associated with deploying broadband-capable networks.[11] Together, these initiatives best leverage the Commission's resources and authority to increase the availability of broadband services on Tribal lands.

III. CURRENT DEPLOYMENT ON TRIBAL LANDS

The Commission has interpreted Section 254 of the Communications Act as an obligation to ensure universal availability of broadband networks to all Americans, including Americans living on Tribal lands. To that end, the Commission has established a baseline standard for fixed broadband at speeds of 25/3 Mbps for high-cost areas, including Tribal lands.[12] As consumer expectations continue to increase, it is important to evaluate broadband deployment across a range of speeds to determine whether adequate services are available on Tribal lands.

A. Data and Methodology Overview

The deployment data underlying this report result from the Commission's FCC Form 477 data collection. The Commission uses FCC Form 477 to collect voice and broadband data from all facilities-based providers of mobile and fixed telecommunication services. These data are used by the Commission to produce the various maps and reports on the state of voice and broadband coverage in the United States, as well as to inform the Commission's policy decisions.[13] The population and housing unit counts reflected in this report are based on the same block-level estimates used in the Commission's *Broadband Deployment Report*.[14]

In this report, the fixed broadband coverage numbers rely on the December 2017 Form 477 fixed-broadband deployment data.[15] Only residential broadband is included in this analysis. The "Any

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[9] *See infra* pgs. 9-18.

[10] *See e.g.*, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2018 Broadband Deployment Report, 33 FCC Rcd 1660, 1708, para. 96 (2018).

[11] *See e.g.*, *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, 32 FCC Rcd 3266 (2017); *Accelerating Wireless Deployment by Removing Barriers to Infrastructure Investment, Report and Order*, 32 FCC Rcd 9760 (2017).

[12] *Connect America Fund et al*., Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 5949, 5959, para. 24 (2016); *Connect America Fund et al*., Report and Order et al., 31 FCC Rcd 3087, 3097-98, para. 25 (2016); *See Connect America Fund, et al.* Report and Order, Further Notice of Proposed Rulemaking, and Order on Reconsideration, FCC 18-176, para. 3 (2018) (*December 2018 Rate-of-Return Order*).

[13] The semi-annual FCC Form 477 collection currently does not have a formal challenge process as the collection is designed for providers of voice and broadband service to report where they can reasonably provide service upon a request from a customer.

[14] *See Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2018 Broadband Deployment Report, 33 FCC Rcd 1660 (2018). *See also* FCC Wireline Competition Bureau, *Staff Block Estimates*, *available at* https://www.fcc.gov/reports-research/data/staff-block-estimates.

[15] *See* FCC, *Fixed Broadband Deployment Data from FCC Form 477*, *available at* https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477.

Technology" category on Form 477 includes any fixed broadband technology, the "Any Terrestrial" category excludes satellite but includes all other fixed technologies, and the "Any Wired" category includes only Asymmetric digital subscriber line (ADSL), cable, and fiber.

The mobile broadband coverage numbers in this Report similarly rely on the December 2017 Form 477 mobile broadband deployment data using the centroid methodology for any LTE coverage.[16] Each census block is classified according to the number of LTE providers serving that census block. Census block areas include only land area according to 2010 U.S. Census Bureau figures.[17] The population, number of road miles and area in square miles is summed for the number of providers for Tribal and non-Tribal areas.[18]

The Commission is aware of shortcomings in the Form 477 data collection, and when the FCC Form 477 data are used to inform its funding and policy decisions, the Commission considers the limitations and challenges of the dataset.[19] The Commission has an open proceeding considering ways to improve the accuracy and granularity of that data collection.[20] Among other matters, the Commission sought comment on whether "it should move to a more granular basis for reporting deployment data and, if so, what basis would be appropriate."[21] The Act directs the Commission to initiate a proceeding to address unserved Tribal areas identified in this report,[22] which will provide the Commission with the opportunity to explore potential options for improving and refining Tribal broadband deployment data, including seeking additional input on the data collection process from both individual Tribes and inter-Tribal organizations on a national and regional basis.

B. Fixed Broadband Deployment

In this section, we evaluate fixed broadband deployment on Tribal lands across a range of speeds. While substantial progress has been made in reaching the Commission's goal of bringing high-speed

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[16] *See* FCC, *Mobile Deployment Form 477 Data*, *available at* https://www.fcc.gov/mobile-deployment-form-477-data. The centroid methodology overlays geographic polygons showing wireless coverage onto a map of census blocks. It codes a census block as "covered" if the calculated center point (the "centroid") of the census block is within the coverage polygon. If a centroid is covered, then all of the population and land area in the corresponding census block is also coded as covered. *See FCC Releases Data on Mobile Broadband Deployment as of December 31, 2015 Collected Through FCC Form 477*, 31 FCC Rcd 10886, 10890 (2016).

[17] Staff also determined the road length associated with each block using a geography calculation rather than a projection, with distances measured in meters. Road lengths shared between two census blocks were split between blocks so that the total length of roads did not change. The analysis focused on road types (MAF/TIGER Feature Class Codes) of S1400, S1200, and S1740.

[18] Our assessment of Tribal lands is conducted by examining the census blocks that have been identified by the Census Bureau as federally recognized Tribal lands for the 2010 Census. *See Communications Marketplace Report*, FCC 18-181 at 97 n.598.

[19] Though staff examine FCC Form 477 data for quality and consistency, the data may understate or overstate deployment of services to the extent that broadband providers fail to report data or misreport data. *See* FCC, *Explanation of Broadband Deployment Data* (Nov. 20, 2017), https://www.fcc.gov/general/explanation-broadband-deployment-data (describing quality and consistency checks performed on providers' submitted data and explaining any adjustments made to the Form 477 data as filed).

[20] *Modernizing the FCC Form 477 Data Program*, Further Notice of Proposed Rulemaking, 32 FCC Rcd 6329 (2017).

[21] *Id.* at 6344, para. 44.

[22] RAY BAUM'S Act of 2018 § 508(b), 132 Stat. at 1096.

Internet access to high-cost areas, including Tribal lands, more work remains to increase deployment of fixed broadband options for those living in Tribal areas.

Overall Deployment. Figure 2 below underscores the divide between deployment of fixed broadband on Tribal and non-Tribal lands. For example, over 56% of non-Tribal housing units are covered by two or more wired providers of 25/3 Mbps service, while approximately 21% of Tribal housing units are covered by two or more such providers.[23]

Fig. 2

Deployment of 25/3 Mbps Fixed Service to Non-Tribal and Tribal Housing Units (HUs)												
	By Any Technology				By Any Terrestrial Technology				By Any Wired Technology			
# providers	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*
0	98	28	0%	2%	9,418	550	7%	31%	11,734	628	8%	36%
1	1,615	195	1%	11%	42,023	644	30%	37%	48,975	762	36%	43%
2	13,578	503	10%	29%	58,640	362	43%	21%	62,578	335	46%	19%
3 or more	121,962	1,024	89%	58%	27,173	194	20%	11%	13,966	26	10%	2%
Total	137,254	1,750	100%	100%	137,254	1,750	100%	100%	137,254	1,750	100%	100%

Even when examining fixed broadband deployment at lower speeds, Tribal housing units lag behind those on non-Tribal lands. For example, as Figure 3 shows, only 6% of housing units on non-Tribal lands lack coverage by any wired provider of 10/1 Mbps, while 25% of housing units on Tribal lands—about 431,000—have no wired option for 10/1 Mbps service. Figure 3 also demonstrates that even those individuals who do have access to such a provider, tend to have access to fewer providers than their counterparts on non-Tribal lands. A significant number of housing units on Tribal lands, 45%, is limited to only one wired option, compared to only 22% of those on non-Tribal lands.

Fig. 3

Deployment of 10/1 Mbps Fixed Service to Non-Tribal and Tribal Housing Units (HUs)												
	By Any Technology				By Any Terrestrial Technology				By Any Wired Technology			
# providers	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*
0	21	26	0%	2%	4,411	287	3%	16%	7,685	431	6%	25%
1	745	99	1%	5%	23,829	591	17%	34%	30,989	797	22%	45%
2	6,631	362	5%	21%	62,997	518	46%	30%	79,661	471	58%	27%
3 or more	129,857	1,264	94%	72%	46,016	355	34%	20%	18,918	51	14%	3%
Total	137,254	1,750	100%	100%	137,254	1,750	100%	100%	137,254	1,750	100%	100%

At the higher speeds presented in Figure 4 below, Non-Tribal housing units are more than three times as likely to have at least one provider of 100/10 Mbps service than housing units on Tribal lands. Additionally, only 12% of Tribal housing units have a choice of more than one terrestrial provider of 100/10 Mbps service, as opposed to approximately 46% of non-Tribal housing units, and 12% of Tribal

[23] As defined by the U.S. Census Bureau, a "housing unit" includes "a house, an apartment, a group of rooms, or a single room occupied or intended for occupancy as separate living quarters." *See* United States Census Bureau, *Housing Vacancies and Home Ownership: Definitions*, https://www.census.gov/housing/hvs/definitions.pdf (Fourth Quarter 2018).

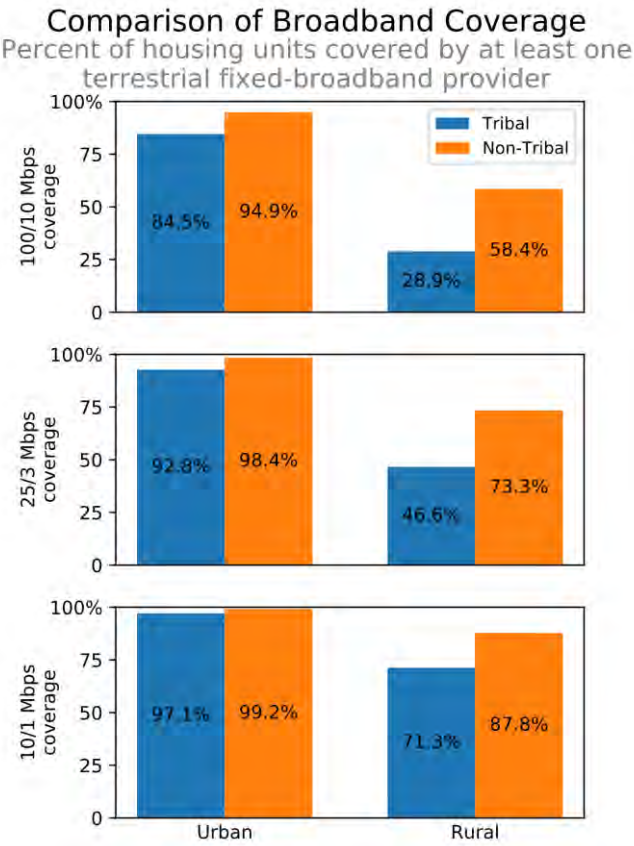
housing units have a choice of more than one wired provider of such service, as compared to approximately 44% of non-Tribal housing units.

Fig. 4

Deployment of 100/10 Mbps Fixed Service to Non-Tribal and Tribal Housing Units (HUs)												
	By Any Technology				By Any Terrestrial Technology				By Any Wired Technology			
# providers	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*	Non-tribal HU (000s)	Tribal HU (000s)	*Non-tribal*	*Tribal*
0	17,505	782	13%	45%	17,505	782	13%	45%	18,127	794	13%	45%
1	56,427	765	41%	43%	56,427	765	41%	43%	59,162	757	43%	43%
2	48,587	187	35%	11%	48,587	187	35%	11%	48,769	183	36%	11%
3 or more	14,734	17	11%	1%	14,734	17	11%	1%	11,196	16	8%	1%
Total	137,254	1,750	100%	100%	137,254	1,750	100%	100%	137,254	1,750	100%	100%

Urban/Rural Deployment Differences. As noted above, the data indicate that a gap exists in fixed broadband deployment among Tribal lands themselves. Examining coverage by terrestrial fixed providers on a more granular geographic level may explain this difference. Figure 5 demonstrates that, while urban non-Tribal housing units experience a higher level of deployment across a variety of speeds than urban Tribal housing units, the difference in deployment is relatively small; by contrast, rural Tribal areas experience much larger coverage gaps at every speed than their rural non-Tribal counterparts.

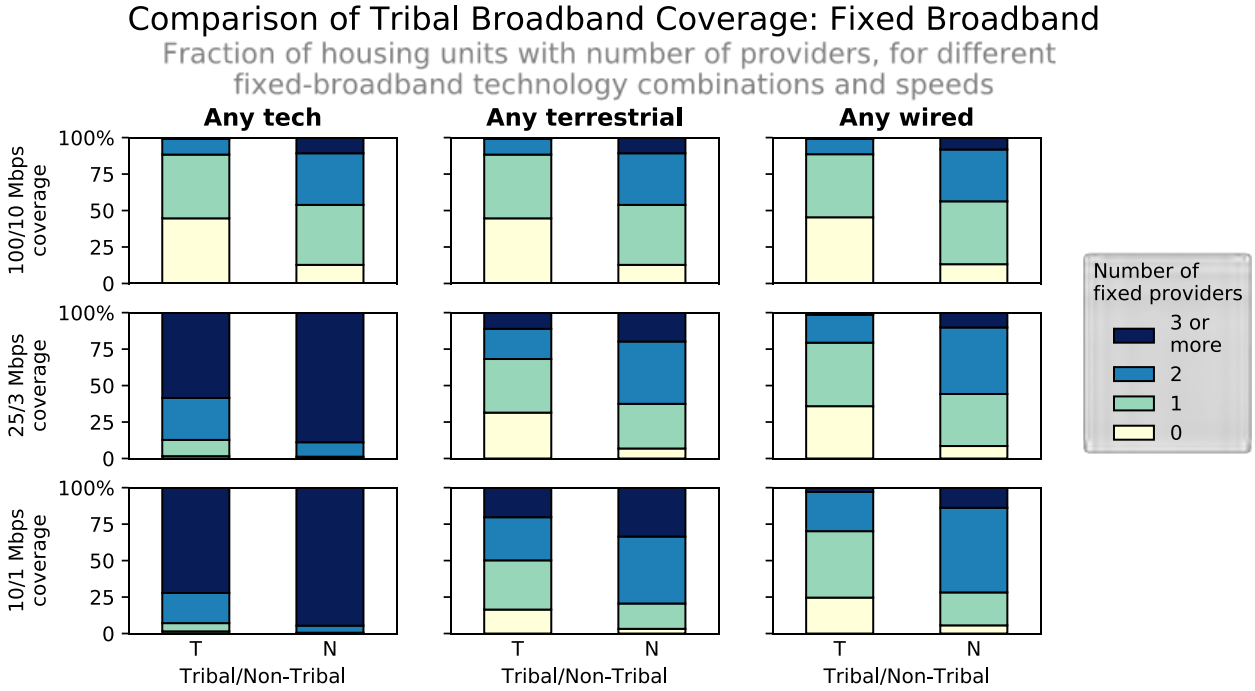
Fig. 5



For example, while there is an approximately six percentage point difference in 25/3 Mbps deployment between urban Tribal and urban non-Tribal housing units, that difference jumps to over 26

percentage points when comparing deployment to rural Tribal and rural non-Tribal housing units. Similarly, deployment of 10/1 Mbps speeds to rural Tribal housing units trails deployment to rural non-Tribal housing units by 19 percentage points, as opposed to the two percentage-point difference in 10/1 Mbps coverage between Tribal and non-Tribal housing units in urban areas. Even at higher speeds such as 100/10 Mbps, the disparity is stark—only about 10 percentage points between urban Tribal and urban non-Tribal housing units, as opposed to almost 30 percentage points between rural Tribal and rural non-Tribal housing units.

Fig. 6



Comparison of Coverage by Number of Providers. As Figure 6 reflects, for each group of fixed technologies and performance tier, more individual on Tribal lands lack access to service than their counterparts on non-Tribal lands, and those individuals that are served tend to have access to fewer providers than individuals on non-Tribal lands. About 98% of Tribal housing units are covered by at least one provider of 25/3 Mbps service when all current technologies (satellite, fixed wireless, wired offerings) are considered. When only terrestrial providers are considered, approximately 69% on Tribal housing units are covered by a provider offering 25/3 Mbps service, and that number shrinks to less than 65% when only wired providers are considered. These numbers are significantly lower than the more than 92% of non-Tribal housing units that have access to one or more wired providers of 25/3 Mbps service. Tribal lands also have near ubiquitous access to speeds of 10/1 Mbps across all technologies. When looking at only wired providers, however, about 75% of housing units in Tribal areas have access to at least one provider offering 10/1 Mbps speeds, but only about 30% can choose between two or more providers of such service. This data point stands in contrast to that of those living on non-Tribal lands, where approximately 72% of housing units have access to two or more wired providers of 10/1 Mbps service. Finally, with regard to 100/10 Mbps service, Figure 6 demonstrates that wired technologies currently are the predominant method of delivering such speeds on Tribal lands. Only about 55% of housing units on Tribal lands have access to one or more provider offering such speeds, however, compared to almost 90% of non-Tribal lands.

In sum, across all metrics, Tribal areas continue to trail non-Tribal areas when it comes to fixed broadband deployment, and especially so in rural, lower density areas.

C. Mobile Broadband Deployment

This section examines 4G LTE mobile broadband deployment on Tribal lands. Mobile broadband deployment on Tribal lands outpaces fixed broadband deployment. However, mobile broadband deployment on Tribal lands lags behind mobile broadband deployment on non-Tribal lands, with 4G LTE coverage reaching a smaller percentage of the population and road miles on Tribal lands than on non-Tribal lands.

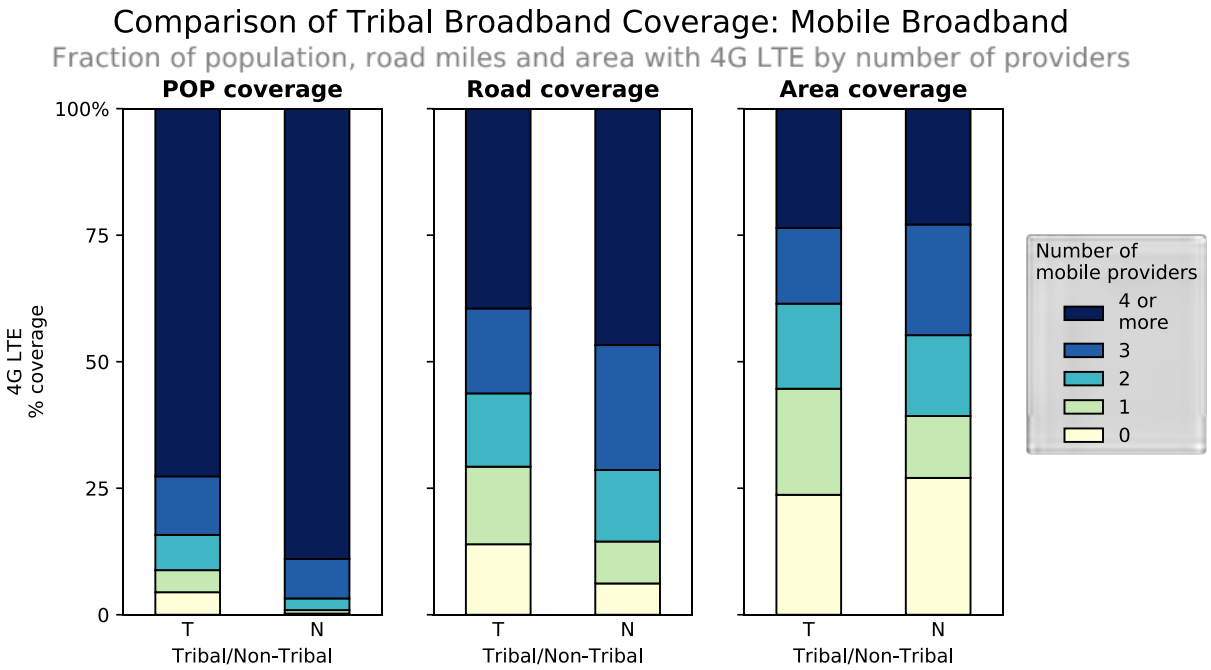
Overall Deployment. Figure 7 presents a detailed look at 4G LTE deployment on Tribal lands. Almost 96% of the population on Tribal Lands is covered by at least one 4G LTE provider, leaving approximately 4% of the population on Tribal Lands without 4G LTE coverage by any provider. In comparison, only 0.2% of the population on non-Tribal lands are not covered at all with 4G LTE from any provider. The pattern is similar when considering 4G LTE coverage on roads. Only approximately 86% of road miles on Tribal lands are covered by at least one provider of 4G LTE, whereas almost 94% of non-Tribal road miles are covered. Finally, although the percentage of land area with no 4G LTE coverage is slightly higher for non-Tribal lands as compared with Tribal lands, it is almost twice as likely that there is only one service provider with 4G LTE coverage on Tribal lands when compared to non-Tribal lands, which tend to be covered by a higher number of 4G LTE providers. Given that mobile connectivity and reliability are particularly important on Tribal lands, additional work is needed to improve 4G LTE coverage in these areas.

Fig. 7

Deployment of 4G LTE Mobile Service to Non-Tribal and Tribal Population (POPs)												
	Population				**Road coverage**				**Area coverage**			
# providers	**Non-tribal POPs (000s)**	**Tribal POPs (000s)**	***Non-tribal***	***Tribal***	**Non-tribal roads (mi)**	**Tribal roads (mi)**	***Non-tribal***	***Tribal***	**Non-tribal area (sq mi)**	**Tribal area (sq mi)**	***Non-tribal***	***Tribal***
0	734	179	0%	4%	383,061	40,878	6%	14%	907	43	27%	24%
1	2,254	175	1%	4%	513,208	44,962	8%	15%	410	38	12%	21%
2	7,499	280	2%	7%	874,871	42,508	14%	15%	536	31	16%	17%
3	25,380	465	8%	12%	1,528,663	49,230	25%	17%	733	27	22%	14%
4 or more	289,547	2,919	89%	73%	2,893,267	115,827	47%	39%	768	43	23%	24%
Total	325,414	4,017	100%	100%	6,193,070	293,405	100%	100%	3,354	182	100%	100%

Comparison of Coverage by Number of Providers. As demonstrated by Figure 8, in terms of both covered population and covered road miles, 4G LTE coverage by at least one provider lags behind coverage on non-Tribal lands. In addition, for Tribal areas where there is coverage, it is more likely that non-Tribal lands will be covered by a greater number of providers than Tribal lands.

Fig. 8



IV. CONTINUING COMMISSION EFFORTS TO INCREASE TRIBAL DEPLOYMENT

The Commission has consistently sought to leverage its available programs to increase the availability of broadband on Tribal lands. In recent years, the Commission has reformed universal service programs, expanded direct consultation with Tribes, and made available additional, valuable spectrum resources. Because many of these initiatives have been implemented recently, the deployment data discussed above do not yet fully reflect the increased outreach and investment on Tribal lands. The Commission anticipates that more recent reforms will drive increased broadband deployment on Tribal lands.

A. Universal Service Programs

The primary means of achieving the Commission's goal of increasing the availability of fixed and mobile broadband services on Tribal lands is through the universal service program. The Fund targets support to rural areas, including Tribal lands, through four main programs: High-Cost, Lifeline, E-Rate, and Rural Health Care. In establishing or revising rules governing each of these programs, the Commission has considered the impact of deployment on Tribal lands and aims to promote deployment in these areas.

1. High-Cost Program

Support awarded to fixed and mobile carriers that serve Tribal lands through the high-cost program is a prime example of the Commission's efforts to deliver on its commitment to closing the digital divide on Tribal lands. By providing a dedicated funding mechanism where needed, the Commission is making available additional resources exclusively for carriers serving Tribal lands to maintain and expand voice and broadband networks. [24]

Fixed Services. The high-cost program has two separate tracks for fixed carriers, based generally on the carrier's size. For larger incumbent carriers, known as price cap carriers, the Commission has

[24] *USF/ICC Transformation Order*, 26 FCC Rcd at 17820, para. 482.; *Tribal OpEx Relief Order,* 33 FCC Rcd at 3602, para. 1.

offered universal service support through the Connect America Fund (CAF). Phase II of the CAF employed a two-step approach to provide ongoing support to deploy, provision, and maintain voice and broadband services in areas lacking broadband access, including remote Tribal areas. In the initial stage, ten carriers accepted statewide offers totaling over $1.5 billion in annual support for rural broadband deployment to serve over 3.6 million homes and businesses by the end of 2020.[25] The Commission anticipates that this support, along with carrier investment, will expand broadband to nearly 7.3 million rural consumers in 45 states and one U.S. territory, including Tribal lands.[26]

In areas where price cap incumbent carriers declined this support, the Commission employed a competitive bidding process to award support. The CAF Phase II auction closed in August 2018 and allocated $1.488 billion in funding to be distributed over 10 years to expand rural broadband service to over 700,000 rural homes and small businesses in unserved areas in 45 states through a variety of technologies, including terrestrial- and satellite-based solutions. In total, winning bidders in the CAF Phase II auction committed to deploying broadband service to 17,895 Tribal census blocks. The Commission expects that the CAF Phase II funding commitments will result in further deployment of broadband to Tribal lands. Areas that did not receive funding for buildout through CAF Phase II will be included in the Remote Areas Fund, which will provide support for rural, insular, or other areas that remain eligible for high-cost support. As part of that proceeding, the Commission has committed to consider preferences for Tribal entities or providers serving Tribal lands. [27]

Smaller, rural carriers, known as rate-of-return carriers, historically received universal service support based on recovering their costs plus a return on their investments, calculated by comparing their actual costs to nationwide averages. Many of these carriers continue to receive legacy support in this manner, and the Commission has initiated reforms to increase these carriers' deployments on Tribal lands. For example, to address the higher costs that legacy carriers typically face in serving Tribal lands, the Commission substantially increased the amount of operating costs that can be recovered by carriers that predominantly serve Tribal lands.[28]

The Commission also has made available a cost model—the Alternative Connect America Cost Model (A-CAM)—for rate-of-return carriers that choose not to receive legacy support. The model-based option allows these carriers to receive predictable support for a 10-year term in exchange for meeting certain broadband deployment obligations. In December 2018, the Commission modernized its rules for distributing support to rate-of-return carriers by allocating additional funding to bring 25/3 Mbps service to rural America.[29] The Commission also modified the A-CAM to encourage increased deployment in Tribal areas. While traditionally the A-CAM incorporates nationwide assumptions about take rates and potential average revenues per subscriber to estimate a per-location funding threshold, the Commission recognized that those same assumptions did not accurately account for the unique challenges of deploying broadband to rural Tribal communities.[30] Thus, the Commission incorporated a Tribal Broadband Factor into the A-CAM, which establishes funding benchmark of $39.38 on Tribal lands, the amount above

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[25] Press Release, FCC, *Carriers Accept Over $1.5 Billion in Annual Support from Connect America Fund to Expand and Support Broadband for Nearly 7.3 Million Rural Consumers in 45 States and One Territory* (Aug. 27, 2015), https://www.fcc.gov/document/carriers-accept-over-15-b-support-expand-rural-broadband.

[26] *Id.*

[27] *Connect America Fund, et al.*, Report and Order and Order on Reconsideration, 32 FCC Rcd. 1624, 1645 para. 52 (2017).

[28] *Tribal OpEx Relief Order,* 33 FCC Rcd at 3603-04, para. 5.

[29] *See December 2018 Rate-of-Return Order* at para. 14.

[30] *Id.* at para. 55.

which serving a location is considered high cost; this is a 25% decrease compared to the $52.50 funding benchmark for non-Tribal locations. The practical effect of the Tribal Broadband Factor is that more locations are considered high cost and more support is available for each high-cost location. The Commission noted that the changes would "efficiently target support to carriers that serve significant Tribal lands, as well as those carriers that serve only a minimal amount of Tribal lands or a small number of housing units on Tribal lands in their study area."[31] Additionally, the Commission sought comment on ways to incorporate a Tribal Broadband Factor into the legacy rate-of-return system.[32]

Mobile Services. To ensure the timely availability of mobile voice and broadband services on Tribal lands, the Commission adopted a dedicated funding mechanism as part of its Mobility Fund. For Mobility Fund Phase I, the Commission set aside $50 million in one-time support for unserved Tribal land areas to be awarded through a separate, Tribal Mobility Fund Phase I auction (Auction 902). A total of five winning bidders submitted $49.8 million in winning bids covering a population of 56,932 in 80 biddable areas. These areas include 18 biddable areas on five Reservations or Tribal lands in Arizona, Montana, New Mexico, and Utah; and 62 biddable areas in 49 Alaska Native Village Statistical Areas and 13 bidding areas otherwise in Alaska Native Regions.[33] Since July 2014, the Wireless Telecommunications Bureau and the Wireline Competition Bureau have authorized support to all five winning bidders, and initial disbursements totaling $16.6 million were made. Final payments totaling over $24.5 million in support have also been disbursed, completing the disbursement process for 86% of the biddable areas.[34]

Mobility Fund Phase II (MF-II) will make up to $4.53 billion in support available over 10 years to primarily rural areas that lack unsubsidized 4G LTE service, with at least $340 million expected to be set-aside for funding service to Tribal lands to be disbursed in the Tribal Mobility Phase II auction.[35] MF-II is intended to incentivize the deployment of mobile wireless service through a reverse auction, and it is critically important to supporting mobile voice and broadband coverage by ensuring that 4G LTE service is preserved and advanced in those areas of the country that lack unsubsidized 4G LTE service. The Commission used carrier-provided data and subsidy data from USAC to create a map of areas presumptively eligible for MF-II support (initial eligible areas map),[36] and it then allowed interested

[31] *Id.*

[32] *Id.* at paras. 206-09.

[33] *Tribal Mobility Fund Phase I Auction Closes, Winning Bidders Announced for Auction 902*, 29 FCC Rcd 1974, 1975, para. 1 (2014).

[34] In addition to support awarded through the Tribal Mobility Fund Phase I auction, some winning bidders in Mobility Fund Phase I Auction 901 received support to deploy mobile voice and broadband services on Tribal lands. For example, GCI Communication Corp. was an Auction 901 winning bidder authorized to receive up to $2.3 million in Mobility Fund Phase I support. The full amount of that support has been disbursed. Standing Rock Telecommunications, Inc., also was a winning bidder in Auction 901 and was authorized to receive up to $3.3 million in Mobility Fund Phase I support, $2.2 million of which has been disbursed to date.

[35] *Connect America Fund et al*., Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 2152 at 2165, para. 33 (2017).

[36] FCC, *Mobility Fund II Initial Eligible Areas Map*, *available at* https://www.fcc.gov/reports-research/maps/mobility-fund-ii-initial-eligible-areas-map/.

parties to challenge the initial determination that a particular area is ineligible for MF-II support.[37] Sixteen Tribal governments have requested access to USAC's MF-II Challenge Process portal.[38]

The Commission plans to conduct the Tribal Mobility Fund Phase II auction as a component of the broader Mobility Fund Phase II auction.[39] The Commission determined that reserving this support within MF-II is a fair and reasonable approach to ensuring that Tribal lands are not left behind in the auction.[40] To encourage Tribal participation, the Rural Auctions Broadband Taskforce (RBATF) is conducting outreach to Tribal governments and carriers through in-person events, webinars, and educational materials.[41]

Fixed and Mobile Services in Alaska. The Commission has adopted a tailored approach to address the unique challenges of providing fixed and mobile services in Alaska. Alaska is home to 229 of the 573 federally recognized Tribes and, for purposes of the Commission's high-cost rules, consists entirely of Tribal lands.[42] Among other actions, the Commission in 2016 adopted the $1.5 billion Alaska Plan to provide Alaskan carriers with the option of receiving fixed amounts of support for a term of ten years to maintain, extend, and upgrade their fixed and mobile broadband networks within the state, beginning January 1, 2017.[43] The majority of the $1.5 billion fund was designated as "frozen support," meaning that carriers choosing to participate in the Alaska Plan would receive, on a yearly basis for the term of the plan, the same level of support they received under existing high-cost mechanisms in prior years.[44] The Commission required these providers to submit individual performance plans, with specific population-based coverage commitments by the end of year five and year ten.[45] The Bureaus approved providers' submitted commitments in 2016 without change.[46] Mobile providers are required to upgrade

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[37] *Connect America Fund; Universal Service Reform–Mobility Fund*, Order on Reconsideration and Second Report and Order, 32 FCC Rcd 6282 (2017).

[38] *Mobility Fund Phase II Challenge Process Portal Update: November 2018*, Public Notice, DA 18-1225 (RBATF 2018). On December 7, 2018, Chairman Pai announced that the Commission has launched an investigation into whether one or more major carriers violated the MF-II reverse auction's mapping rules and submitted incorrect coverage maps. Press Release, FCC, *FCC Launches Investigation Into Potential Violations of Mobility Fund Phase II Mapping Rules* (Dec. 7. 2018), https://docs.fcc.gov/public/attachments/DOC-355447A1.pdf. The Commission has suspended the next step of the challenge process—the opening of a response window—pending the conclusion of this investigation. *Id.*

[39] *MF-II Report and Order*, 32 FCC Rcd at 2167, para. 37.

[40] *Id.* at 2165, para. 33.

[41] *See MF-II Webinar PN*.

[42] *See e.g.*, *Indian Entities Recognized and Eligible to Receive Services from the United Sates Bureau of Indian Affairs*, Notice, 83 Fed. Reg. 34863 (July 23, 2018); 47 CFR § 54.5 (defining Tribal lands for the purpose of the high-cost rules to "include any federally recognized Indian tribe's reservation… [and] Alaska Native Regions established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 688)….").

[43] *Connect America Fund et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 10139 (2016) (*Alaska Plan Order*).

[44] *See Alaska Plan Order*, 31 FCC Rcd at 10143, 10159, paras. 9, 66 (freezing annual support for wireline providers at 2011 levels and wireless providers at 2014 levels).

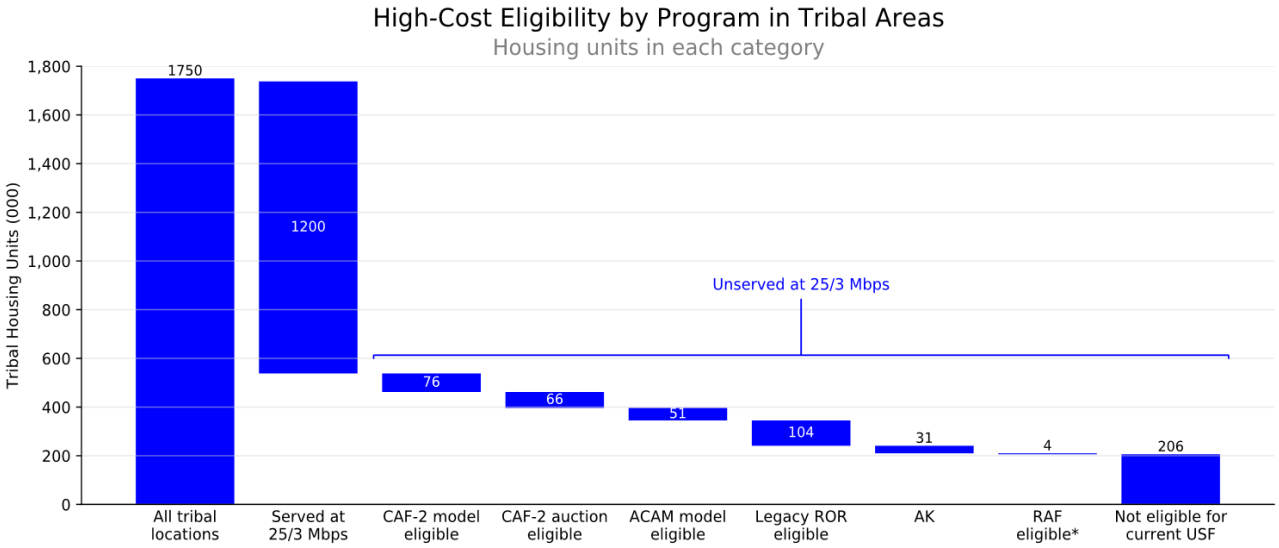
[45] *Wireless Telecommunications Bureau Approves Performance Plans of the Eight Wireless Providers That Elected to Participate in the Alaska Plan*, Public Notice, 31 FCC Rcd 13317, Appx. (WTB 2016); *Wireline Competition Bureau Authorizes Alaska Plan Support for 13 Alaskan Rate of Return Carriers*, Public Notice, 31 FCC Rcd 13347, Appx. B (WCB 2016).

[46] *Id.*

their networks to LTE, except in particular circumstances where lower levels of technology are permitted due to such limitations as insufficient middle mile capacity.[47] Mobile providers must update their commitments, however, if they have not committed to provide 10/1 Mbps LTE and new middle mile facilities become commercially available.[48] To complement using frozen support to upgrade existing networks, the Commission established a separate fund, pursuant to which $22 million per year would be allocated via reverse auction to extend mobile services to remote areas of Alaska that currently lack any mobile coverage.[49] For fixed providers participating in the Alaska Plan, the Commission adopted tailored service obligations in exchange for nearly $540 million in support over a 10-year term.[50]

The Commission also adopted a tailored plan for Alaska Communications Systems (ACS), a price cap carrier offering fixed voice and broadband services in Alaska.[51] Under this plan, the Commission required that ACS deploy voice and broadband services that meet the same speed, latency, usage and pricing metrics as established for other CAF recipients to at least 31,571 locations.[52] The Commission specified that 30% of the locations must be deployed by the end of 2018, with an additional 10% per year thereafter until the end of the 10-year term in 2025.[53]

Fig. 9



Tribal areas stand to benefit from many of these initiatives. As Figure 9 indicates, of the total 1.75 million housing units in Tribal census blocks, almost 540,000 are completely unserved by a 25/3 Mbps terrestrial fixed broadband service option. Of that number, approximately 330,000 are eligible to

[47] *Alaska Plan Order*, 31 FCC Rcd at 10167, para. 86.

[48] *Id.* at 10172, para. 102.

[49] *Id.* at 10172, para. 106.

[50] *Id.* at 10146, para. 6.

[51] *Connect America Fund*, Order, 31 FCC Rcd. 12086 (2016) (*ACS CAFII Order*).

[52] *Id.* at 12089-12092, paras. 9-21.

[53] *Id.* at 12099, para. 44. *See also* Letter from Ruth L. Willard, Senior Director Revenue Management, Alaska Communications Systems Holding Inc., to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 (Feb. 28, 2019) (submitting the list of locations to which ACS deployed broadband services meeting CAF II requirements by December 31, 2018).

receive funding through the various high-cost fund program mechanisms—the CAF model and auction, the A-CAM model, legacy rate-of-return support, the Alaska-focused programs, and the Remote Areas Fund—with the remaining unserved housing units being ineligible for any USF support. However, because the buildout supported by these mechanisms remains in progress, the expected additional coverage on Tribal lands has not yet been captured in the data collected by the Commission.

2. Lifeline Program

Lifeline subscribers residing on Tribal lands are eligible to receive a $25 per month subsidy, in addition to the standard $9.25 Lifeline subsidy, to address deployment and affordability challenges for low-income consumers residing on Tribal lands.[54] The Commission is considering additional Lifeline program reforms to target funds more efficiently to areas most in need of help in securing digital opportunity.[55] These areas would include rural and Tribal areas, as well as low-income urban areas that are likely to be underserved by providers. The comment cycle on these issues has closed, and the Commission is reviewing the record as it considers further action.

3. E-Rate Program

As part of the Commission's efforts to modernize the E-Rate program, it has directed that additional discounts be provided to match funding for construction of broadband connections for Tribal schools and libraries from states, Tribal governments, or other federal agencies.[56] The Commission also ordered the creation of a new Tribal consultation, training, and outreach program to assist the Commission with gaining a better understanding of the current state of connectivity among Tribal schools and libraries, and to ensure that Tribal schools and libraries can fully participate in the E-Rate program.[57] The Tribal consultations, trainings, and outreach continue to inform and encourage Tribal participation in the E-Rate program, as well as the other universal service programs.

4. Rural Health Care Program

The Commission's Rural Health Care (RHC) program provides funding to rural health care providers, including those on Tribal lands, for broadband connectivity to support telemedicine services. Approximately one-third of disbursements through that program are directed to health care providers in Alaska.[58] Within the RHC program, the Telecommunications Program ensures that eligible health care providers pay no more than their urban counterparts for telecommunications services, and the Healthcare Connect Fund expands health care provider access to broadband, especially in rural areas, and encourages the creation of state and regional broadband health care networks.

In June 2018, the Commission increased the funding cap for the RHC program for funding year 2017 to $571 million with annual adjustments for inflation to prevent pro-rata funding reductions that

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[54] *Federal-State Joint Board on Universal Service et al*., Twelfth Report and Order, Memorandum Opinion and Order, and Further Notice of Proposed Rulemaking, 15 FCC Rcd 12208, 12230, para. 42 (2000).

[55] *Bridging the Digital Divide for Low-Income Consumers et al*., Fourth Report and Order, Order on Reconsideration, Memorandum Opinion and Order, Notice of Proposed Rulemaking, and Notice of Inquiry, 32 FCC Rcd 10475 (2017).

[56] *Modernizing the E-rate Program for Schools and Libraries*, Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8870 (2014).

[57] *Id.* at 8967-8970, paras. 243-49.

[58] *Promoting Telehealth in Rural America*, Notice of Proposed Rulemaking, 32 FCC Rcd. 10631, 10639, para. 12 (2017).

could have disproportionally impacted Tribal health care providers, especially those in Alaska.[59] Additionally, the Commission is currently reviewing how to improve the RHC program to maximize efficiencies in promoting the availability of broadband services to rural health care providers, while minimizing waste, fraud and abuse, and will consider improvements in bringing service to Tribal lands as part of that proceeding.

B. Tribal Consultations and Outreach

The Commission's Office of Native Affairs and Policy (ONAP) oversees the agency's Tribal consultations and plays an important role in the ongoing efforts to increase the deployment and adoption of communications services on Tribal lands and in Native communities.[60] ONAP is engaged in Tribal consultations relating to numerous pending Commission proceedings. For example, ONAP developed and implemented a targeted Tribal consultation plan in connection with the Commission's Wireless Infrastructure Initiative.[61] Under this plan, the Commission conducted extensive consultation and engagement in Indian country. Commissioners and FCC staff visited nine different states, including Arizona, California, Connecticut, New Mexico, North Carolina, Oregon, South Dakota, Virginia and Wisconsin, in addition to holding consultations at FCC headquarters and numerous, widely attended conference calls.[62] These consultations focused primarily on mobile infrastructure deployment, but also more generally on strategies for achieving broadband deployment on Tribal lands, including the use of universal service support.

In 2018, ONAP supported Commission staff on targeted outreach regarding the Mobility Fund Phase II Auction. As part of the auction, at least $340 million over ten years is expected to be reserved from the overall budget to support the expansion of mobile broadband in Indian country. To encourage Tribal participation in the Mobility Fund, ONAP and staff from the Commission's Rural Broadband Auctions Task Force made presentations on the auction and its challenge process through in-person events, webinars, and educational materials.[63]

ONAP also leads the reconstituted Native Nations Communications Task Force (Task Force), whose mission is to (1) help execute the Commission's Tribal Consultation policy; (2) identify barriers to broadband deployment that are unique to Tribal lands; and (3) ensure Tribal concerns are considered in all Commission proceedings related to broadband and other Commission undertakings that affect Tribal

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[59] *Promoting Telehealth in Rural America*, Report and Order, 33 FCC Rcd 6574 (2018).

[60] The Commission created the Office of Native Affairs and Policy (ONAP) in 2010 as part of its Consumer and Governmental Affairs Bureau to manage the Commission's Tribal consultation efforts and to increase the deployment and adoption of communications services on Tribal lands and in Native communities. *Establishment of the Office of Native Affairs and Policy in the Consumer and Government Affairs Bureau*, Order, 25 FCC Rcd 11104 (2010). ONAP's consultation efforts extend to federally recognized Indian tribes, Alaska Native villages, and entities related to Hawaiian home lands.

[61] *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Notice of Proposed Rulemaking and Notice of Inquiry, 32 FCC Rcd 3330 (2017) (*Wireless Infrastructure NPRM*).

[62] *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Second Report and Order, FCC 18-30, paras. 17-35 (2018) (noting, at para. 18, that "[o]ne of the in-person consultations was attended by over 70 representatives of more than 50 Tribal Nations and organizations") (*Wireless Infrastructure Second Report and Order*).

[63] *See*, *e.g.*, *Mobility Fund Phase II Challenge Process Webinar for Tribal Government Officials*, Public Notice, 33 FCC Rcd 5964 (2018) (*MF-II Webinar PN*). The RBATF has also traveled with ONAP to the Tribal Self-Governance Conference (Albuquerque, NM 4/23/18) and Affiliated Tribes of Northwest Indian Convention (Toppenish, WA 5/23/18) to engage with Tribal entities.

interests regarding communications services and facilities.[64] The first meeting of the Task Force took place in December 2018,[65] when the Task Force met with FCC Chairman Pai, FCC Commissioners Carr and Rosenworcel, and other senior Commission staff. Currently, the Task Force is working on its initial assignments, one of which is to assist the Commission in identifying and developing solutions to overcome barriers to increasing deployment of communications infrastructure and services on Tribal lands. In addition to consultation and outreach specific to pending Commission rulemaking proceedings, ONAP conducts general and ad hoc Tribal consultation, as well as outreach efforts aimed at representing the Commission's programs to Tribes, listening to Tribal concerns, and establishing and maintaining good relationships with Tribes, Tribal entities, and inter-Tribal organizations.

With support from Commission leadership and the Bureaus and Offices, ONAP holds workshops, participates in inter-Tribal organization meetings, engages in direct consultation with individual Tribes, and seeks to expand consultations to locations that historically have received less engagement because of geographical or other factors. ONAP holds FCC Tribal Workshops throughout Indian country to provide Tribal leaders, technical directors, and telecommunications and broadcast media managers with current policy and operational information. In 2018, in conjunction with the Wireline Competition Bureau, ONAP held Workshops in Lac du Flambeau, Wisconsin and Lewiston, Idaho (Nez Perce Reservation). A key focus of the Nez Perce Workshop was to identify and solicit views on removing obstacles to broadband deployment on Tribal lands.

In 2018, ONAP and other Commission staff participated in many ad hoc consultation and outreach efforts focused on increasing the availability of fixed and mobile broadband on Tribal lands. For example, in February, ONAP staff, along with staff from the Consumer and Governmental Affairs Bureau and the Wireline Competition Bureau, visited the Navajo Nation to address broadband deployment issues, including the impact of the Commission's USF support programs. In August, ONAP presented to Tribes in the Great Lakes region at the Midwest Alliance of Sovereign Tribes Summer Meeting in Wisconsin. Finally, in October, International Bureau staff traveled to Inuvik, Canada, to participate in the 2018 Indigenous Connectivity Summit, where participants compared approaches and sought to find solutions to ensure that indigenous communities across North America can connect to fast, affordable, and reliable Internet service. ONAP also conducts frequent in-person meetings with Tribal leaders and other representatives in the Commission's offices, as well as routinely holds conference calls.

ONAP also maintains working relationships with national and regional inter-Tribal organizations, which include some of the Tribal community's most influential members. ONAP routinely presents on a broad range of Commission programs and initiatives—such as the 2.5 GHz rulemaking, Mobility Fund Phase II, and Connected Care Pilot Program, to name a few—and holds listening sessions at inter-Tribal conferences across the country, including the National Congress of American Indians, Affiliated Tribes of Northwest Indians, United South and Eastern Tribes, National Association of Tribal Historic Preservation Officers, and National Tribal Telecommunications Association. It also has facilitated Commission leadership involvement in its work with inter-Tribal organizations, including a meeting at Commission headquarters for the National Congress of American Indians (NCAI) in February 2019, where Chairman Pai and Commissioners O'Rielly, Carr, Rosenworcel, and Starks all engaged with Tribal representatives on a range of broadband deployment issues.

Collectively, these outreach and consultative efforts have better identified and incorporated Tribal interests in Commission activities, with the aim of increasing access to broadband on Tribal lands, which is expected to be reflected in future broadband deployment data.

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[64] *FCC Seeks Nominations for Tribal Government Representatives to Serve on Renewed FCC Native Nations Communications Task Force*, Public Notice, 33 FCC Rcd 1264 (CGB 2018).

[65] *Chairman Pai Announces New Appointments to the Native Nations Communications Task Force*, Public Notice, 33 FCC Rcd 10152 (CGB 2018).

C. Additional Actions to Increase Access to Mobile Broadband on Tribal Lands

1. 2.5 GHz Band

In May 2018, the Commission released a Notice of Proposed Rulemaking (NPRM) requesting comment on significant changes to the Educational Broadband Service (EBS) in the 2.5 GHz band. Some of the proposed changes could increase opportunities for the provision of broadband services to Tribal entities on Tribal lands.[66] The 2.5 GHz band has been identified as prime spectrum for next generation mobile operations, including 5G uses. Among other things, the NPRM seeks comment on opening several filing windows for unassigned 2.5 GHz frequencies (also known as "white space") including one window that would be open only to rural Tribal Nations.[67] As outlined in the NPRM, this window would be limited to participation by "federally-recognized American Indian Tribes and Alaska Native Villages located in rural areas" and asks a number of questions about how such a definition should be applied.[68] In addition, the NPRM seeks comment on other ways that the Commission could encourage the use of 2.5 GHz spectrum on Tribal lands.[69] The NPRM also seeks comment on whether it should instead auction white space in the 2.5 GHz band and make it available to all interested entities, including Tribal Nations, as well as whether to eliminate eligibility and educational use restrictions, which would permit EBS licensees to assign their licenses to any entity, including Tribal Nations.[70]

2. Tribal Lands Bidding Credits

The Commission's rules provide the opportunity for spectrum auction winners to obtain a discount (in the form of a refund) for providing service to qualifying Tribal lands, known as the Tribal Lands Bidding Credit (TLBC).[71] To qualify for a TLBC, the winning bidder must demonstrate that it will serve qualifying Tribal lands[72] and, within 180 days after filing its license application, provide certifications from the applicable Tribal government and attest that it will construct and operate a system capable of serving 75% of the qualifying Tribal land population within three years of license grant. Recipients that do not meet the performance requirement are required to pay back the credit plus interest.

The TLBC was initially implemented in 2000, and the Wireless Telecommunications Bureau has been reviewing TLBC applications and issuing credits since that time for licenses in bands such as AWS-1 (2006), 700 MHz (2008) and AWS-3 (2015). Most recently, in 2016 and 2017, in the Broadcast Incentive Auction, the Wireless Telecommunications Bureau issued TLBCs for licenses in the 600 MHz band.

3. Recent and Planned Spectrum Auctions

The Commission has been undertaking various measures to make spectrum available to promote the proliferation of next-generation networks across the country, including on Tribal lands. With respect

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[66] *Transforming the 2.5 GHz Band*, Notice of Proposed Rulemaking, 33 FCC Rcd 4687 (2018).

[67] *Id.* at 4698-99, paras. 35-38.

[68] *Id.* at 4698-99, para. 36.

[69] *Id.* at 4699, para. 39.

[70] *Id.* at 4705, para. 61.

[71] *See* 47 CFR §1.2110(f)(3).

[72] For purposes of the TLBC, qualifying Tribal lands are defined as federally recognized Indian Tribe reservations, Pueblos, or Colonies, including former reservations in Oklahoma, Alaska Native regions, and Indian allotments, with a wireline telephone subscription penetration rate of 85% or less, based on the most recent Census data.

to low-band spectrum, the Commission in 2017 completed a two-part incentive auction to repurpose 84 megahertz of spectrum in the 600 MHz band.[73]

For mid-band spectrum, the Commission in July 2018 released an NPRM that seeks to identify potential opportunities for additional terrestrial use—particularly for wireless broadband services—of 500 megahertz of spectrum between 3.7-4.2 GHz.[74] In seeking comment on the appropriate service areas for any flexible use licenses in this band, the NPRM asks commenters to address factors such as encouraging deployment of wireless broadband services to consumers on Tribal lands.[75] Also, as discussed, the Commission has sought comment on proposals to auction spectrum in the 2.5 GHz band.[76] In October 2018, the Commission modified the rules governing the Citizens Broadband Radio Service (CBRS) in the 3.5 GHz band to promote additional investment and encourage broader and more intensive deployment in the band.[77] As part of this action, the Commission made TLBCs available to winning bidders in the 3.5 GHz auction, which will be held in 2020.[78] The Commission also released an NPRM seeking comment on making available up to 1200 megahertz of spectrum for use by unlicensed devices in the 6 GHz band (5.925-7.125 GHz) without interfering with the operation of the licensed services that will continue to use this spectrum so as to advance the Commission's efforts to make broadband connectivity available to everyone, especially those living in rural and underserved areas.[79]

Additionally, through its *Spectrum Frontiers* proceedings, the Commission has taken measures to make high-band millimeter wave spectrum available for flexible use. These millimeter wave bands will be crucial in the promotion of the deployment of fifth-generation (5G) wireless, the Internet of Things and other advanced spectrum-base services.[80] TLBCs are available to the winning bidders in these auctions.[81]

V. CONCLUSION

As the recent *Broadband Deployment Report* demonstrates, the Commission's efforts to promote widespread deployment of broadband services have led to increased availability for Americans nationwide. However, more work remains to ensure that those living on Tribal lands, which are among

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[73] *See generally* FCC, *Broadcast Incentive Auction and Post-Auction Transition*, *available at* https://www.fcc.gov/about-fcc/fcc-initiatives/incentive-auctions.

[74] *Expanding Flexible Use of the 3.7 GHz to 4.2 GHz Band et al.*, Order and Notice of Proposed Rulemaking, 33 FCC Rcd 6915, 6916, para. 1 (2018).

[75] *Id.* at 6961, para. 139.

[76] *See supra* Part IV.C.1.

[77] *Promoting Investment in the 3550-3700 MHz Band*, Report and Order, FCC 18-149 (2018).

[78] *Id.* at 51, para. 91. *See also supra* Part IV.C.2 (discussing TLBCs).

[79] *Unlicensed Use of the 6 GHz Band et al.*, Notice of Proposed Rulemaking, FCC 18-147 (2018).

[80] *See e.g.*, *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014 (2016) (*Spectrum Frontiers Report and Order*); *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, GN Docket No. 14-177, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988 (2017); *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Third Report and Order, Memorandum Opinion and Order, and Third Further Notice of Proposed Rulemaking, 33 FCC Rcd 5576 (2018); *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Fourth Report and Order, FCC 18-180 (2018) (*Spectrum Frontiers Fourth Report and Order*). *See also* FCC, Auction 101: Spectrum Frontiers–28 GHz, https://www.fcc.gov/auction/101; FCC, Auction 102: Spectrum Frontiers–24 GHz, https://www.fcc.gov/auction/102.

[81] *See Spectrum Frontiers Report and Order*, 31 FCC Rcd at 8100, para. 253; *Spectrum Frontiers Fourth Report and Order* at 14, para. 43 n.73; *Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services et al.*, Public Notice, 33 FCC Rcd 7575, 7614, 7659-60, paras. 104-105, 292-93 (2018).

the hardest-to-reach in the country, experience the myriad of benefits of robust broadband service. Although many of the Commission's current programs will continue to narrow the Tribal broadband gap, additional collaboration between the Commission, Tribal governments, and industry will further the efforts already in place. The Commission looks forward to that focused collaboration. Moreover, consistent with the Act, the Commission will initiate a proceeding in the near future to explore and develop proposals to ensure that those living in Indian country are not left behind as broadband deployment at higher speeds proliferates across the country.