American Indian Policy Institute
Arizona State University

Representative Teresa Leger Fernandez
Subcommittee for Indigenous Peoples of the United States

Dr. Traci Morris (Chickasaw Nation)
Executive Director
American Indian Policy Institute,
Arizona State University
201 N. Central Ave., Chase Building 33rd Floor
Phoenix, AZ 85005-2603
[redacted]

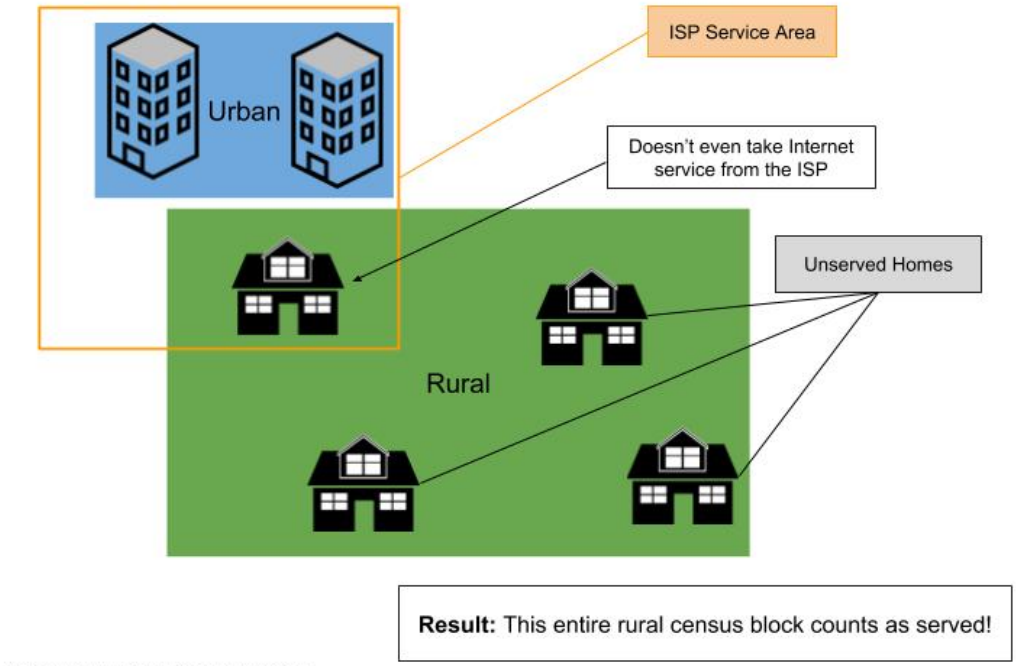
Wednesday, April 21, 2021

Supplementary Information

Diagram of FCC Broadband Data Overstatement, Diagram, ILSR, March 2018
Percent of Population with Access (2015 - 2019), Line Chart, FCC Data.
Dec. 2019 Tribal Lands Data Disaggregated: Percent of Population with Access, Column chart, FCC Data.
Morris, Traci and Howard, Brian. Tribal Technology Assessment Infographic, American Indian Policy Institute. (2019).
Morris, Traci and Howard, Brian. Tribal Digital Divide Policy Brief and Recommendations. (2020).
Howard, Brian. Spectrum Airwaves: A Natural Resource Tribes Must Leverage. (2019).
Morris, Traci and Howard, Brian. Tribal Technology Assessment: The State of Internet Service on Tribal Lands. (2019).
Trostle, H Rose. Building Indigenous Future Zones: Four Tribal Broadband Case Studies. (February 2020). Institute for Local Self-Reliance. https://ilsr.org/report-indigenous-future-zones/
National Congress of American Indians. Infrastructure Legislative Proposal. (2021). https://ncai.org/NCAI_Indian_Country_Infrastructure_Letter_-FINAL_Update-.pdf

American Indian Policy Institute
Arizona State University

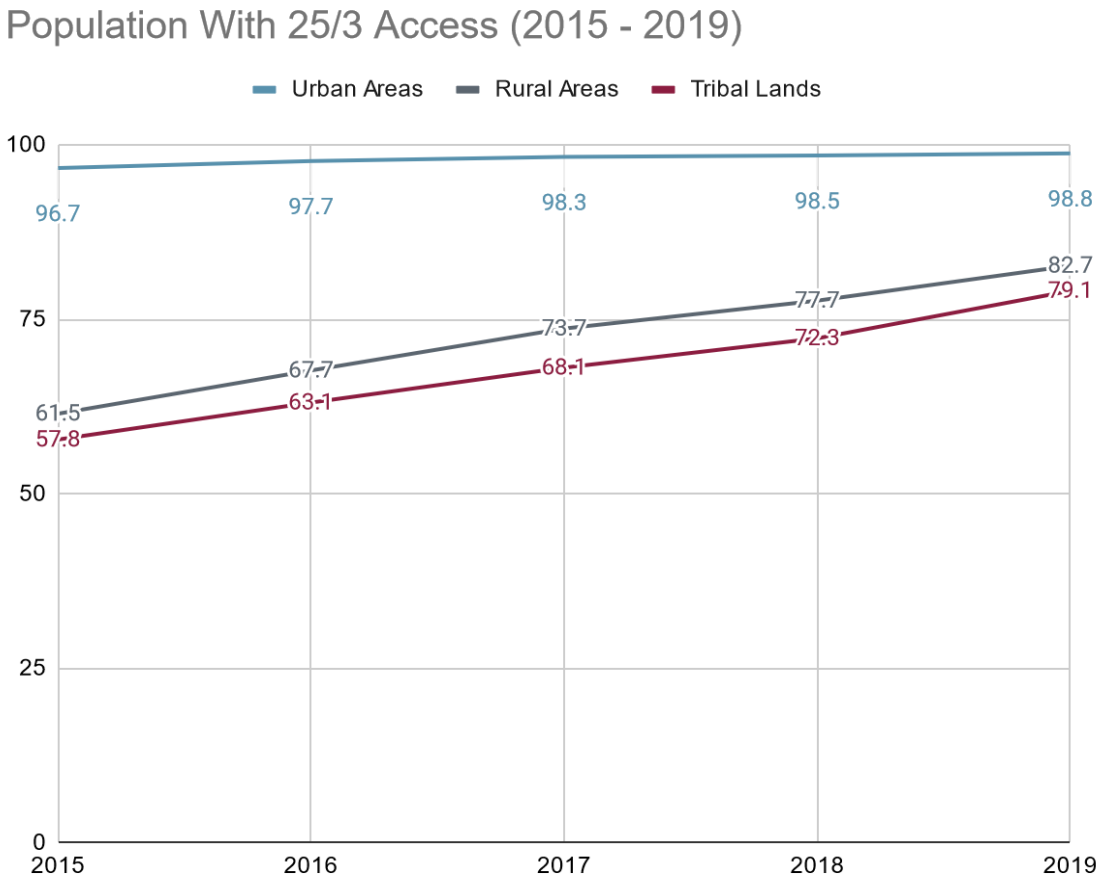
Diagram of FCC Broadband Data Overstatement



Designed by H. Trostle, Research Associate, Institute for Local Self-Reliance. March 2018.

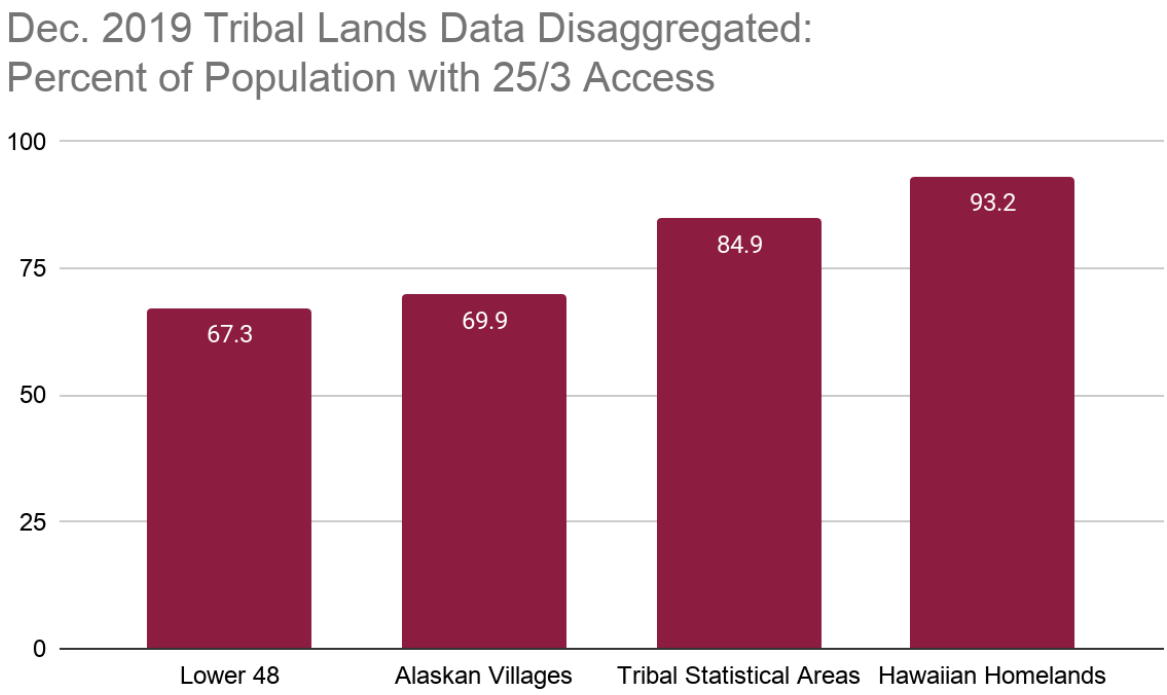
The Form 477 includes entire census blocks if an Internet Service Provider could extend coverage to even a single home.

American Indian Policy Institute
Arizona State University



Percent of Population with Access (2015 - 2019), Line chart representation of Federal Communications Commission, Fourteenth Broadband Deployment Report, 33, Figure 1. (2021). https://docs.fcc.gov/public/attachments/FCC-21-18A1.pdf

American Indian Policy Institute
Arizona State University



Dec. 2019 Tribal Lands Data Disaggregated: Percent of Population with Access, Column chart representation of Federal Communications Commission, Fourteenth Broadband Deployment Report, 44, Figure 10. (2021). https://docs.fcc.gov/public/attachments/FCC-21-18A1.pdf

TRIBAL TECHNOLOGY ASSESSMENT

THE STATE OF INTERNET SERVICE ON TRIBAL LANDS

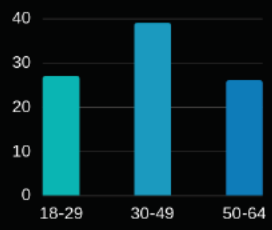
a tribally driven participatory research study

95% member of a federally recognized tribe

73% reside on federal indian reservation

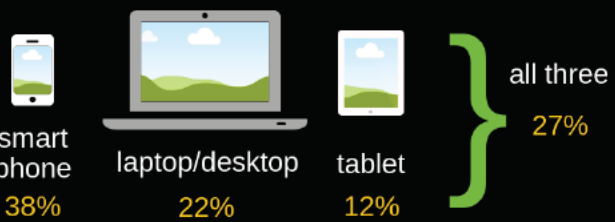
q6. household income (USD)

q3. age distribution



q8. top platforms

q10. device used to access the internet



TRIBAL TECHNOLOGY ASSESSMENT

THE STATE OF INTERNET SERVICE ON TRIBAL LANDS

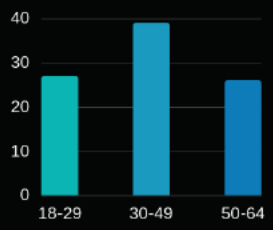
a tribally driven participatory research study

95% member of a federally recognized tribe

73% reside on federal indian reservation

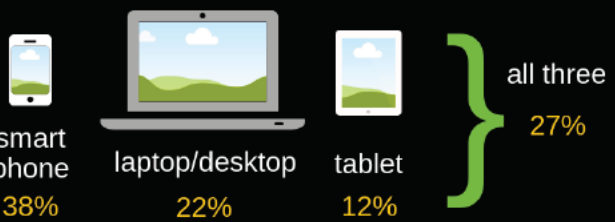
q6. household income (USD)

q3. age distribution



q8. top platforms

q10. device used to access the internet



ASU American Indian Policy Institute
Arizona State University

ASU American Indian Policy Institute
Arizona State University

American Indian Policy Institute
Arizona State University

POLICY BRIEF

Tribal Digital Divide
Policy Brief and Recommendations

Talking Points on the Tribal Digital Divide

In 2019, the American Indian Policy Institute published the "Tribal Technology Assessment: The State of Internet Service on Tribal Lands". The TTA surveyed residents of tribal reservation residents and found that:

- **18 percent** of tribal reservation residents have **no internet access** at home, wireless or land-based.
- **33 percent** rely on internet service from a **smartphone** at home. However, the reliability of smartphone internet connections is questionable.
- **31 percent** of respondents stated that their connection was '**spotty**' or they had **no connection** at home.
- These findings emphasize the need for increased in-home high-speed broadband access for residents of tribal lands.

The digital divide is not new in Indian Country or other rural areas and the COVID-19 pandemic has exacerbated these issues. For instance, in 2000 the U.S. Census determined that less than 10 percent of tribal lands had access to the internet. In 2019, the FCC acknowledged that the digital divide on rural and tribal lands remains significant with over **26 percent** of Americans in rural areas and **32 percent** on tribal lands lacking at-home high-speed internet access capable of handling data-intensive services.

Similarly, the 2018 Arizona Statewide Broadband Strategic Plan noted that:

- "In Arizona, **162,382 people** living on tribal lands (95%) have either unserved or underserved telecommunication infrastructure needs. They do not have access to fixed advanced telecommunications capabilities, and often resort to local (community anchor institutions, such as libraries and schools) for their only connection to the rest of the digital world."

Public Wi-Fi is not always an option under normal circumstances, and especially now since businesses and public service institutions are closing to stem the spread of COVID-19. Where residents have internet access there are issues with limited bandwidth capabilities, meaning they cannot run data intensive applications such as video streaming and conferencing.

Policy Recommendations to Address Internet Access on Rural and Tribal Lands

Future COVID-19 stimulus funding should direct resources for internet access on tribal reservations and Alaska Native villages. The following policy recommendations have been put forward by national tribal and non-tribal organizations and advocacy groups, including the *National Congress of American Indians*, the *New America Foundation's Open Technology Institute*, *Public Knowledge*, and the *National Hispanic Media Coalition*.

- ***Support $2 billion in E-rate funding for states and tribal anchor institutions.*** The E-rate Program (also known as the Schools and Libraries Program) is administered by the Federal Communications Commission and covers connection costs to bring high-speed internet to schools and libraries. It can also cover internal connection costs at these institutions, such as the purchase of routers and other devices to provide Wi-Fi service. The E-Rate Program should also be expanded to allow school buses to act as mobile hot spots. While schools remain closed, buses can be parked in local communities to provide local Wi-Fi services.
- ***Require unlimited voice, text, and data services for Lifeline subscribers*.** Another FCC program, Lifeline, provides discounted telephone and cell phone service for low-income individuals that are 135% below the federal poverty line. However, these services are currently capped with limited voice, text, and internet data services. On some reservations up to 85% of residents are Lifeline subscribers.
- ***Require the FCC to extend the 2.5 GHz Tribal Priority Window for tribes to access unclaimed spectrum licenses over their lands.*** In December 2019, the FCC announced that tribes would have a first-in-right priority to claim dormant spectrum in the 2.5 GHz band (also known as the Education Broadband Service) over their reservations and Alaska Native Villages. This spectrum would provide high-speed wireless internet access for economic development, governance operations, public safety, education, and healthcare. The current filing window for tribes to submit applications to claim these spectrum licenses closes on August 3, 2020. Since COVID-19 has created unique challenges for government operations in general, the tribal priority window to these licenses should be extended until April 2021.
- ***Provide waivers for matching fund requirements under all broadband loan and grant programs and do not limit funding based on "rurality".*** There are over 50 federal programs that support broadband deployment, adoption, and digital skills training. Any required matching funds for these programs should be waived to address the digital divide on tribal lands. Additionally, programs with limiting definitions of "rural" should be waived to ensure that all tribal lands have access to federal funds for broadband deployment.
- ***Direct federal funding for broadband deployment and feasibility studies solely to tribes and tribal entities.*** Funds for broadband infrastructure planning, deployment, and maintenance should be directly awarded to tribal governments, tribal consortia, and other tribal entities. Funds awarded directly to states to conduct feasibility and deployment studies for broadband infrastructure have rarely been shared with tribes and has historically resulted in internet infrastructure needs being overlooked on tribal lands.

For more information contact:

Traci Morris, PhD
Director
[redacted]

Brian Howard
Research and Policy Analyst
[redacted]

Arizona State University
American Indian Policy Institute
Watts College of Public Service and
Community Solutions
https://aipi.asu.edu/

Phone: 480-965-1055 / Fax: 480-965-6404

American Indian Policy Institute
Arizona State University

POLICY OVERVIEW

Spectrum Airwaves: A Natural Resource Tribes Must Leverage

This Policy Overview is Authored by
AIPI Research & Policy Analyst Brian Howard
October 16, 2019

Background – What is Spectrum?

Spectrum has become a vital and important natural resource because it is finite and has economic and public use, purpose, and benefit. Similar to other natural resources such as water, timber, minerals, and precious metals, the use of radio frequencies (spectrum) has become integrated into everyday life. However, unlike other natural resources, the spectrum frequencies used to wirelessly transmit digital television, radio, and voice and data communications (e.g. the internet) are not visible to the human eye without the use of technological instruments. Because spectrum is not a tangible resource it can be difficult to understand how telecommunications and the internet are transmitted wirelessly using spectrum frequencies and the importance of having access to spectrum licenses.

While we access the internet every day through the use of computers/laptops, smartphones, and tablets, the information accessed through the internet is stored on millions of servers in data centers (large climate-controlled warehouses) located around the world. From those data centers the internet is transmitted globally through high-speed fiber optic cabling located underground, above land, and under oceans. Spectrum is a valuable resource for transferring information on the internet from a fiber optic backhaul network and transmitting it wirelessly through a cell tower to another communications device—such as another cell tower or wireless access point like a Wi-Fi network, or directly to a computer/laptop, smartphone, or tablet.

The use of spectrum by tribal governments, corporations, and citizens is an important, yet complicated subject. Some tribes have been successful in obtaining spectrum licenses to establish their own radio and low-power television stations, while others have used unlicensed spectrum (e.g. whitespace spectrum) to transmit data and communications over lands that industry providers have refused, or overlooked, to serve. Nonetheless, it is imperative that tribes exercise their sovereignty to leverage spectrum resources to serve the economic and public needs of their governments, businesses, and communities.

This Policy Overview is not meant to explain the specific engineering and technical aspects associated with the wireless transmission of data. Instead, it seeks to explain the importance of how spectrum is managed and allocated by the federal government for commercial and public use and how these activities affect Tribal Nations. Without access to radio frequencies that wirelessly transmit data, the use of radio stations, digital television, and smartphone communications cannot exist. Throughout this paper it is also important to note, however, that access to high-speed fiber optic cable backhaul and middle mile infrastructure[i] must be within reasonable distances of tribal reservations before an initial wireless broadcast/transmission of data can occur. Therefore, spectrum is part of a broader ecosystem of broadband technologies that tribes must have access to. This Policy Overview will provide a review of federal policies

associated with tribal access to spectrum licenses and the challenges tribes face in leveraging spectrum for economic and public use.

Spectrum Management and Allocation – The Role of the Federal Government

As commercial wireless networks expand to serve more consumers, transmit larger amounts of data, and advance to provide faster internet speeds, the telecommunications industry will consistently require additional bands of spectrum to keep pace with consumer and commercial needs. Primarily, two entities within the federal government are responsible for managing and allocating spectrum for federal, public, and private use. The National Telecommunications and Information Administration (NTIA) is responsible for managing spectrum used by federal departments, agencies, and the military, while the Federal Communications Commission (FCC) is tasked with managing spectrum used by commercial, public, and private entities.[ii]

On June 28, 2010 President Obama issued a Presidential Memorandum to free 500 MHz of spectrum held by federal and non-federal entities for the purpose of driving commercial wireless deployment nationwide.[iii] This action was one of the first recent major policy initiatives to identify spectrum held by the federal government and military for the purposes of transitioning such spectrum licenses to commercial wireless use. The Memorandum directed NTIA to collaborate with the FCC to complete this initiative by the year 2020. It also encouraged the FCC to provide 'exclusive use' to identified spectrum by awarding licenses to commercial providers, or developing a mechanism where spectrum could be shared between commercial and federal government entities.[iv]

Following the 2010 Presidential Memorandum, the FCC held multiple spectrum auctions to repurpose existing assigned licenses for commercial wireless use. In June 2011 the FCC held Auction 92, which auctioned 16 spectrum licenses in the 700 MHz band for commercial purposes and generated $19.7 million for the U.S. Treasury from seven auction bidders.[v] In September 2012, the FCC initiated a Notice of Proposed Rulemaking to hold the first ever 'incentive auction' for the broadcast television industry to voluntarily relinquish certain spectrum licenses to the FCC to auction for commercial mobile use.[vi] Following nearly four years of rulemakings by the FCC, the first-ever incentive auction commenced in March 2016 and closed in March 2017.[vii] The incentive auction generated $19.8 billion in revenue, of which over $10 billion was awarded to broadcast bidders that had relinquished spectrum for the auction and $7 billion was deposited in the U.S. Treasury.[viii] Finally, one of the most profitable FCC auctions was held between November 2014 and January 2015. FCC Auction 97 proposed to repurpose 1,614 spectrum licenses from federal use to support commercial mobile service deployment.[ix] The auction culminated in 1,611 licenses being awarded to 31 bidders and generated $41.3 billion in revenue.[x] Of the over $41 billion generated in Auction 97, $7 billion was used to fund the construction of a nationwide public safety broadband network known as FirstNet; $300 million for public safety communications research; $115 million to fund grants for implementation of Next Generation 911; and over $20 billion was deposited in the U.S. Treasury for budget deficit reduction.[xi]

In October 2018, President Trump issued a new Presidential Memorandum that rescinded and replaced the Obama Memorandum issued in 2010. President Trump's, "Presidential Memorandum on Developing a Sustainable Spectrum Strategy for America's Future", sought to continue repurposing spectrum from federal and military use for commercial mobile purposes but had an emphasis on identifying spectrum for 5G cellular deployment.[xii] In November 2018 the FCC initiated the first-ever auction of high-band spectrum to support the deployment of 5G services.[xiii] The FCC proceeded with the auction of high-band spectrum to support 5G deployment through two auction proceedings—Auction 101 concluded in January 2019 and culminated in 2,965 licenses bid upon by 40 entities and generated $702.5 million in gross revenue[xiv], and Auction 102 concluded in May 2019 and culminated in 2,904 licenses bid upon by 29 entities and generated $2.02 billion in net revenue[xv].

Awareness of these spectrum auctions held over the past decade is important to understand how these events have affected, if not excluded, Tribal Nation participation. As illustrated by the numerous aforementioned

auctions, spectrum is a high-priced, highly-valued commodity that generates millions/billions of dollars in an auction proceeding. The spectrum auction mechanism has favored those in the telecommunications industry with the immense deep-pocket, on-hand resources and capital needed to participate in spectrum auctions. The following sections of this Policy Overview will provide a synopsis of federal regulatory actions that have sought to level the playing field for tribes to access spectrum licenses, albeit many of these regulatory actions have had limited to varying levels of success until recently. As with any other type of natural resource development and utilization on tribal lands, the federal government—as trustee to tribes—has a fiduciary responsibility to identify tribal barriers to access while promulgating laws and regulations that increase Tribal Nation access to this finite resource.

The 'Tribal Priority' to AM and FM Radio Licenses – The First Spectrum Precedent for Tribes

The recommendation that a 'Tribal Priority' should be established for tribes to access spectrum licenses prior to a commercial auction proceeding is not a new concept. In April 2009 the FCC initiated a Notice of Proposed Rulemaking in MB Docket No. 09-52, *Policies to Promote Rural Radio Service and to Streamline Allotment and Assignment Procedures*, which proposed a Tribal Priority to FM and AM radio allotments prior to such spectrum licenses going to auction.[xvi] During consideration of the 2009 proceeding to adopt a Tribal Priority to radio licenses there were 41 FM radio stations in operation in Indian Country.[xvii] According to Native Public Media—an organization representing tribal radio and television stations—there are now currently 57 radio stations and 4 television stations that are owned and operated by tribes in the U.S.[xviii] Following establishment of a Tribal Priority to AM and FM radio licenses, the Navajo Nation and Hualapai Tribe were the first to obtain FM radio allotments in March 2013.[xix]

The radio broadcast Tribal Priority is important because it established a first-ever FCC precedent to spectrum licenses for tribal governments, tribal consortia, and entities 51 percent or more owned or controlled by a tribe or tribes. Legal arguments offered by Native Public Media and the National Congress of American Indians also emphasized the unique sovereign status of Tribal Nations and the fiduciary trust relationship between the federal government and tribes as justification for adoption of the Tribal Priority.[xx] Further, in adopting the Tribal Priority in the AM/FM radio proceeding the FCC stated that:

> "[Adopting the Tribal Priority] will advance the Commission's longstanding commitment, in accordance with the federal trust relationship, 'to work with Indian Tribes on a government-to-government basis…to ensure, through its regulations and policy initiatives, and consistent with Section 1 of the Communications Act of 1934, that Indian Tribes have adequate access to communications services. Pursuant to that commitment, the Commission has recognized 'the rights of Indian Tribal governments to set their own communications priorities and goals for the welfare of their membership.' The new Tribal Priority will promote those sovereign rights by enabling Tribes to provide vital radio services to their communities."[xxi]

FCC WT Docket No. 11-40 – Proposals to Increase Tribal Access to Commercial Spectrum Licenses

While the MB Docket 09-52 proceeding was specific to radio broadcast licenses over tribal lands, 14 months later the FCC proposed an expansion to the 'Tribal Priority'. On March 3, 2011 the FCC issued a Notice of Proposed Rulemaking in WT Docket No. 11-40, *Improving Communications Services for Native Nations by Promoting Greater Utilization of Spectrum over Tribal Lands*. The FCC proposed an expansion of the Tribal Priority to include commercial wireless spectrum within the geographic boundaries of a tribal reservation, but also posed questions about whether or not the Priority should be expanded to include unserved and underserved areas surrounding reservations.[xxii] The FCC also proposed establishing a separate Tribal Priority to unassigned wireless licenses over tribal lands.[xxiii] In addition to proposing these Tribal Priorities, the FCC also proposed creation of a formal negotiation process for tribes to access currently held spectrum through a secondary market mechanism, and to re-license dormant spectrum over tribal lands from current licensees.[xxiv]

The proposal to structure a formal negotiation process for tribes to access spectrum through a secondary market mechanism would have allowed tribes to enter into 'good faith' negotiations with incumbent licensees to

partition or lease portions of a spectrum license over tribal lands.[xxv] The FCC proposed structuring these interactions through a Notice of Intent filing that could be submitted by a tribe interested in obtaining secondary market access from a telecommunications provider holding spectrum license(s) over their lands.[xxvi] The FCC, acting for the benefit of the tribe in recognition of its trust relationship, would have been involved in these negotiations as a sort of intermediary. In the rulemaking the FCC sought comment on structuring the 'good faith' negotiation process by proposing a two-part test to determine if a licensee had exercised good faith negotiations when approached by a tribe. The first part proposed a list of standards for the negotiation process with the FCC stating that:

> "First, a licensee may not refuse to negotiate with a Tribal entity whose Tribal lands are within its service area but to which it has not deployed service. Second, a licensee must appoint a negotiating representative with authority to bargain on partitioning and spectrum leasing issues. Third, a licensee must agree to meet at reasonable times and locations and cannot act in a manner that would unduly delay the course of negotiations. Fourth, a licensee may not put forth a single, unilateral proposal. By this, we envision that a licensee would have to be willing to consider and discuss alternative terms or counter-proposals, as it would appear that 'take it or leave it' bargaining without consideration of reasonable alternatives could be found to be inconsistent with an affirmative obligation to negotiate in good faith. Fifth, a Tribal entity, in responding to an offer proposed by a licensee, must provide considered reasons for rejecting any aspect of the licensee's offer. Finally, if an agreement is reached, a licensee must agree to execute a written agreement that sets forth the full agreement, between the licensee and the Tribal entity."[xxvii]

The second part of the good faith test that the FCC sought comment on was whether or not to adopt a 'totality of the circumstances standard'. This standard would have allowed "a Tribal entity to present facts to the Commission which, even though they do not allege a violation of the objective standards, given the totality of the circumstances constitute a failure to negotiate in good faith.[xxviii] In presenting the facts of a licensee failing to negotiate in good faith the burden of proof would be upon the tribal entity filing the complaint to the FCC.[xxix]

Finally, the FCC sought comment on a 'Build-or-Divest Process', which had been proposed by a number of tribal commenters such as the National Congress of American Indians, Native Public Media, the National Tribal Telecommunications Association, and the Navajo Nation Telecommunications Regulatory Commission.[xxx] The Build-or-Divest Process would allow a qualifying tribal entity to "require a licensee to build or divest a geographic area covering unserved or underserved Tribal lands within its license area."[xxxi] The FCC proposed a Notice of Intent filing procedure for a tribe to initiate this process after a licensee had met its buildout requirements for a spectrum license area, but failed to provide service on unserved or underserved tribal lands.[xxxii] Following the filing of a Notice of Intent the FCC also sought comment on whether a licensee should be allowed to extend service coverage on tribal lands, or outright "relinquish its [license] for the unserved or underserved Tribal land within the geographic area of its license".[xxxiii]

Tribal commenters, which included tribal governments, consortia, telecommunications providers, and organizations and associations, supported the adoption of these proposals. Among these tribal entities, the National Congress of American Indians (NCAI) consistently filed comments in the WT 11-40 proceeding urging the FCC to adopt the Tribal Priority, tribal secondary market access, and Build-or-Divest proposals. In October 2012 NCAI—the oldest, largest, and most representative organization of tribal governments—passed Resolution #SAC-12-034, "Promoting Tribal Nation Access and Use of Spectrum for Communications Services".[xxxiv] The Resolution affirmed a July 2012 filing submitted by NCAI to the FCC calling for the FCC to adopt the tribal proposals in WT 11-40 stating:

> "Tribal Nations need access to spectrum that was licensed long ago to companies that have failed to build out to communities on Tribal Lands. Much needed rule changes will serve tribal needs in these least connected regions of the country. It is not only a matter of need but also a matter of efficiency in the use of this important resource, and especially in those many instances where the spectrum is not being used for the benefit of our communities."[xxxv]

However, no further action on WT Docket No. 11-40 was taken by the FCC. The proposals to increase Tribal Nation access to commercial wireless licenses have since remained stagnant. Issues with tribal access to spectrum licenses would persist as new FCC proposals to deploy high-speed mobile broadband services were advanced by the FCC. Spectrum auctions held by the FCC to incentivize deployment of mobile broadband services nationwide did not take into consideration the barriers to entry that tribes would experience to participate in such auctions.

The Mobility Fund and Tribal Mobility Fund Auctions – Tribal Issues and Barriers to Participation

Eight months following the WT 11-40 proceeding, the FCC released the *USF/ICC Transformation Order*—otherwise known as the Connect America Fund (CAF) Order.[xxxvi] Released in November 2011 the CAF Order recognized the need to reform and modernize the Universal Service Fund programs to support the deployment of high-speed mobile and fixed broadband services. The Universal Service Fund is comprised of four programs:

1) The High Cost Fund (also known as the Connect America Fund) provides subsidized support to telecommunications carriers to deploy affordable telecommunications service in areas where infrastructure deployment costs are expensive;[xxxvii]
2) The Low-Income Programs cover telephone installation costs for consumers (Link-Up Program) as well as provide low-income individuals with access to affordable telephone and cell phone billing plans (Lifeline Program);[xxxviii]
3) The Rural Health Care Program provides funding for broadband access to eligible health care provider centers that are non-profit or public entities; and[xxxix]
4) The Schools and Libraries Program (known as E-Rate) provides affordable telecommunications services to connect schools and libraries to the internet and covers some internal connection costs within these facilities.[xl]

The Universal Service Fund is supported by contributions by telecommunications service providers that are usually collected from end-users (consumers).[xli] Consumers can usually see a 'Universal Service Fee', or 'USF Fee', on their telephone and cell phone bills—this fee is collected by telecommunications providers and is deposited in the Universal Service Fund to support the four aforementioned programs.

In reforming and modernizing the Universal Service Fund programs in the CAF Order, the FCC established the Mobility Fund and Tribal Mobility Fund to operate in *two phases* to fund mobile broadband deployment. *Phase 1* of the Mobility Fund sought to provide "up to $300 million in one-time support to immediately accelerate deployment of networks for mobile voice and broadband services in unserved areas", which included tribal lands.[xlii] Additionally, in *Phase 1* of these awards, the FCC proposed "a separate and complementary one-time Tribal Mobility Fund…to award up to $50 million in additional universal service funding to Tribal lands to accelerate mobile voice and broadband availability…"[xliii] *Phase 2* of the Mobility Fund would provide up to $500 million a year for wireless broadband deployment, of which $100 million would be dedicated to wireless deployment on unserved tribal lands.[xliv]

During these two phases of the Mobility Fund—inclusive of the Tribal Mobility Fund in *Phase 1*—unserved tribal lands were eligible for up to $450 million in subsidies to support the deployment of high-speed broadband wireless services. However, the award of these funds was to occur through a 'reverse auction' mechanism, which favored low-cost bids to meet high-speed wireless coverage goals in unserved areas.[xlv] In adopting the reverse auction process the FCC stated:

> "We are unpersuaded by arguments that we should not conduct a reverse auction because larger carriers, with greater economies of scale or other potential advantages, will be able to bid more competitively that smaller providers. For a variety of reasons…we are confident that both the auction design and natural advantages of carriers with existing investments in networks in rural areas should provide opportunities for smaller providers to compete effectively at auction."[xlvi]

While the reverse auction process awarded service providers that indicated they required the lowest amount necessary to meet coverage requirements in unserved areas, two other issues would entirely prevent tribal participation in the Mobility Fund and Tribal Mobility Fund Auctions.

These issues were highlighted in retrospect by comments filed to the FCC by the National Congress of American Indians (NCAI) in May 2015. Reflecting on the Mobility Fund *Phase 1* reverse auction held on September 27, 2012, NCAI stated that three tribally-owned and operated telecommunications providers attempted to participate "but only one provider was able to meet all the eligibility criteria and selected as a winning bidder".[xlvii] NCAI highlighted two primary barriers to tribal participation in the Mobility Fund and Tribal Mobility Fund auctions. First, bidders were required to provide an irrevocable letter of credit, which proved problematic for tribal bidders to produce since "many tribes still face immense challenges in gaining access to capital and credit to support infrastructure projects on tribal lands."[xlviii] Further, NCAI stated that "the primary assets of tribes are their lands, which cannot be collateralized because they are held in trust by the federal government…"[xlix] Second, bidders were required to own or have access to a spectrum license, or licenses, covering unserved areas to participate in the Mobility Fund and Tribal Mobility Fund auctions.[l] NCAI stated:

> "While tribes and tribal organizations have requested that the Commission create a program to bring wireless services to tribal lands lacking such infrastructure, the Mobility Fund and Tribal Mobility Fund did little to empower tribes and tribally-controlled entities to serve their own lands. [The Tribal Mobility Fund auction] sought to provide incentives to bring commercial wireless service exclusively to tribal lands, yet it provided no new access to or opportunities for tribes or tribally-controlled entities to access vital spectrum licenses on tribal lands."[li]

NCAI's comments before the FCC reiterated the need for action on WT Docket No. 11-40 to increase Tribal Nation access to commercial wireless spectrum licenses. NCAI stated that "until the Commission takes concerted action to increase tribal access to spectrum licenses, the opportunities and prosperities wireless services can offer tribal lands will continue to elude our populations."[lii] The FCC's inaction on WT Docket No. 11-40 has led to missed opportunities for tribes to access commercial wireless spectrum—as illustrated in the Mobility Fund and Tribal Mobility Fund auctions. However, a recent FCC rulemaking has created an incremental step towards increasing tribal access to spectrum, albeit not a complete and comprehensive solution to the issues and barriers tribes have in accessing spectrum licenses.

The Educational Broadband Service – A New Precedent for a 'Tribal Priority' to Spectrum Licenses

On May 10, 2018 the Federal Communications Commission (FCC) issued a Notice of Proposed Rulemaking to repurpose spectrum previously assigned for educational use and make it available for commercial wireless services. Identified as the 2.5 GHz band, the FCC has recognized it as prime spectrum real estate to support the deployment of next generation mobile services, including those that support 5G technologies.[liii] In proposing to repurpose the 2.5 GHz band the FCC recognized that much of the band (operating between the 2496-2690 MHz frequencies) lay dormant and unassigned. A majority of the frequencies assigned under the band were previously allocated under the Educational Broadband Service (EBS), which "permits the transmission of instructional material for the formal education of students by accredited public and private schools, colleges, and universities."[liv] The FCC determined that while "there are 1,300 EBS licensees holding over 2190 licenses", most of the current, "EBS licenses cover only about one half of the geographic area of the United States".[lv] Much of the 2.5 GHz band remains unassigned and unutilized in rural areas west of the Mississippi River.[lvi] Additionally, the award of EBS applications was suspended by the FCC in 1993 with only two occurrences in 1995 and 1996 allowing for an application filing window to obtain an EBS license.[lvii]

The FCC proposed four actions regarding the 2.5 GHz band. *First*, the FCC proposed to allow for current EBS licensees to obtain additional coverage in nearby Census tracts since many current licensees have small, irregular Geographic Service Areas (GSAs) due to prior FCC modifications to licenses.[lviii] Expanding the coverage and GSA of current EBS licenses to include additional Census tracts that the licensee covers or

intersects would address irregular shaped GSAs and consolidate fragmented service areas under a single EBS license (not adopted in the final rulemaking).[lix] *Second*, the FCC proposed a series of priority filing windows for current EBS licensees, rural Tribal Nations, and other education entities to obtain access to the 2.5 GHz band.[lx] Part of this proposal would allow rural Tribal Nations—with a local presence in a given license area—to receive a 'Tribal Priority' to unassigned 2.5 GHz spectrum "to address educational and communications needs [in] their communities…"[lxi] The *third* proposal sought to update FCC rules for the 2.5 GHz band by removing outdated regulations that were no longer applicable while the *fourth* proposal sought comments on additional approaches to utilize the 2.5 GHz band for effective use.[lxii]

On July 11, 2019 the FCC adopted a Report and Order to allow flexible use of the 2.5 GHz band to support next generation telecommunications and 5G deployment, as well as a Tribal Priority to EBS licenses.[lxiii] *First*, the FCC removed the 'educational use requirements' for EBS licensees to use the 2.5 GHz spectrum strictly for educational purposes. Specifically, the FCC stated that it was "in the public interest to give licensees flexibility to put 2.5 GHz spectrum to its most efficient use, rather than maintaining or updating outmoded educational use requirements that have not been changed since 1998".[lxiv] This decision would allow current and future EBS licensees to transfer or lease their licenses for commercial wireless use rather than for instructional educational purposes.[lxv] Several commenters, particularly those representing educational institutions were not in support of eliminating the 'educational use requirements' fearing that it would result in EBS licensees "losing negotiating leverage and…give commercial entities the incentive and ability to offer licensees unfavorable sale terms rather than new or renewed leases."[lxvi] However, the FCC stated that removing the 'educational use requirements' would enable current and future EBS licensees more flexibility to use such licenses for both educational and commercial purposes and this action would not affect current EBS license leases and contractual arrangements.[lxvii] The FCC also removed leasing restrictions unique to EBS licenses, stating that the EBS lease restrictions "constrain commercial operations and deter investment, particularly in rural areas."[lxviii]

Opening the 2.5 GHz band to support commercial wireless use, while recognizing the inherent authority of licensees to also use the spectrum for educational purposes, benefited the adoption of a Tribal Priority to EBS spectrum in this proceeding. The FCC ruled that the Tribal Priority to EBS licenses would be granted to telecommunications companies and other entities owned and operated by a federally-recognized tribe or a tribal consortium.[lxix] The Tribal Priority to EBS licenses would also apply to Tribal Colleges and Universities and other educational entities, provided that they are also owned and operated by a federally-recognized tribe or a tribal consortium.[lxx] It is important to note, however, that the Tribal Priority is limited to 'rural' tribal lands with the FCC stating that "Tribal lands will be considered rural if they are not part of an urbanized area or urban cluster area with a population equal to or greater than 50,000."[lxxi] Finally, the FCC recognized that tribes had proposed "a 90-day notice period prior to the opening of the priority filing window with a 60-day window for the filing of applications" to access EBS spectrum licenses in the 2.5 GHz band.[lxxii] Rather than establish the Tribal Priority filing window procedures in the Report and Order, the FCC directed its Wireless Telecommunications to announce these procedures in a forthcoming Public Notice.[lxxiii]

Conclusion: Tribal Nation Access to Spectrum Licenses is a Critical Component to Bridging the Digital Divide in Indian Country

As illustrated in this Policy Overview, tribes have experienced difficulty in accessing commercial spectrum licenses to provide high-speed wireless services on tribal lands. The first-ever 'Tribal Priority' to spectrum was established in a 2010 AM/FM radio proceeding, but it has not been until recent months that actions to expand this Priority to commercial wireless spectrum licenses has occurred. While the 2.5 GHz proceeding establishes another precedent for a Tribal Priority, it cannot be viewed as the comprehensive solution that will create a level playing field for tribes to access spectrum. The proposals from the 2011 WT Docket No. 11-40 proceeding are still relevant and provide the most comprehensive spectrum policy overhaul needed to fully enable tribal access to commercial spectrum licenses. The proposals to enable tribes to enter into secondary market negotiations with current license holders over tribal lands as well as the Build-or-Divest proposal offer

the most meaningful policy changes that would benefit tribes across the board. The 2.5 GHz proceeding offers a one-time Tribal Priority to the spectrum located within that frequency range, whereas the WT 11-40 proceeding would ensure a Tribal Priority to all spectrum frequencies over tribal lands.

Tribes must exercise their sovereign right to access and utilize this natural resource. Spectrum frequencies are finite and as the internet and technology continues to permeate every life these frequencies will be obtained and held onto by industry because of its intrinsic value. The federal government, as trustee to Tribal Nations, must also understand and address the historical and present-day barriers that prevent tribal participation in spectrum auctions and the inability of tribes to access spectrum through secondary market mechanisms. Providing tribes with access to spectrum licenses provides an opportunity for tribes to construct their own wireless networks or leverage the license to attract service providers to bring telecommunications services to tribal lands for the benefit of their communities and economies.

For more information contact:

Brian Howard
Research & Policy Analyst
[redacted]

American Indian Policy Institute
Arizona State University
Watts College of Public Service and
Community Solutions

https://aipi.asu.edu/

American Indian Policy Institute
Arizona State University

End Notes

[i] *Definitions: Middle Mile Infrastructure* is defined as the telecommunications link from a high-speed fiber optic backhaul network, or *core network*, to a local network for data distribution. *Last Mile Infrastructure* is defined as the telecommunications connection from a local area network to a home, business, or other type of 'end' facility where a user(s) is accessing the telecommunications service.

[ii] *See* National Telecommunications and Information Administration. "Spectrum Management". *Available* at https://www.ntia.doc.gov/category/spectrum-management; and *see* Federal Communications Commission. "Radio Spectrum Allocation". *Available* at https://www.fcc.gov/engineering-technology/policy-and-rules-division/general/radio-spectrum-allocation.

[iii] *See* The White House, Office of the Press Secretary, "Presidential Memorandum: Unleashing the Wireless Broadband Revolution". June, 28, 2010. *Available* at https://obamawhitehouse.archives.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution.

[iv] *Ibid*.

[v] *See* Federal Communications Commission. Auction 92: 700 MHz Band. July 2011. *Available* at https://www.fcc.gov/auction/92.

[vi] *See* Federal Communications Commission. *In the Matter of Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*. Docket No. 12-268. October 2, 2012. *Available* at https://docs.fcc.gov/public/attachments/FCC-12-118A1.pdf.

[vii] *See* Federal Communications Commission. Broadcast Incentive Auction and Post-Auction Transition. May 9, 2017. *Available* at https://www.fcc.gov/about-fcc/fcc-initiatives/incentive-auctions.

[viii] *Ibid*.

[ix] *See* Federal Communications Commission. *Public Notice: Auction of Advanced Wireless Services Licenses Scheduled for November 13, 2014; Comment Sought on Competitive Bidding Procedures for Auction 97*. AU Docket No. 14-78. May 19, 2014. *Available* at https://docs.fcc.gov/public/attachments/DA-14-669A1.pdf.

[x] *See* Federal Communications Commission. Auction 97: Advanced Wireless Services (AWS-3). January 2015. *Available* at https://www.fcc.gov/auction/97.

[xi] *See* Federal Communications Commission. Putting Auction 97 in the History Books. January 29, 2015. *Available* at https://www.fcc.gov/news-events/blog/2015/01/29/putting-auction-97-history-books.

[xii] *See* The White House. "Presidential Memorandum on Developing a Sustainable Spectrum Strategy for America's Future". October 25, 2018. *Available* at https://www.whitehouse.gov/presidential-actions/presidential-memorandum-developing-sustainable-spectrum-strategy-americas-future/.

[xiii] *See* Federal Communications Commission, Office of the Chairman. "FCC's First-Ever High-Band 5G Spectrum Auction Begins Today: FCC Will Make Available 1.55 Gigahertz of Spectrum Through 28 GH and 24 GHz Auctions". November 14, 2018. *Available* at https://docs.fcc.gov/public/attachments/DOC-355073A1.pdf.

[xiv] *See* Federal Communications Commission. *Public Notice: Auction of 28 GHz Upper Microwave Flexible Use Service Licenses for Next-Generation Wireless Services Closes; Gross Winning Bid Amounts Announced for Auction 101*. AU Docket No. 18-85. January 31, 2019. *Available* at https://docs.fcc.gov/public/attachments/DA-19-23A1.pdf.

[xv] *See* Federal Communications Commission. *Public Notice: Auction of 24 GHz Upper Microwave Flexible Use Service Licenses Closes; Winning Bidders Announced for Auction 102*. AU Docket No. 18-85. June 3, 2019. *Available* at https://docs.fcc.gov/public/attachments/DA-19-485A1.pdf.

[xvi] *See* Federal Communications Commission. *In the Matter of Policies to Promote Rural Radio Service and to Streamline Allotment and Assignment Procedures*. MB Docket No. 09-52 and RM-1158. April 2010. *Available* at https://www.fcc.gov/document/policies-promote-rural-radio-service-and-streamline-allotment-and-2.

[xvii] *See* Federal Communications Commission. *In the Matter of Policies to Promote Rural Radio Service and to Streamline Allotment and Assignment Procedures*. MB Docket No. 09-52 and RM-1158. April 2010. *Available* at https://www.fcc.gov/document/policies-promote-rural-radio-service-and-streamline-allotment-and-2.

[xviii] *See* Native Public Media. "Our Mission". *Available* at https://www.nativepublicmedia.org/about.

[xix] *See* Federal Communications Commission. *Tribal Radio Priority*. FCC Blog by Geoffrey Blackwell, Chief, Office of Native Affairs and Policy. March 1, 2013. *Available* at https://www.fcc.gov/news-events/blog/2013/03/01/tribal-radio-priority.

[xx] *See* Federal Communications Commission. *In the Matter of Policies to Promote Rural Radio Service and to Streamline Allotment and Assignment Procedures*. MB Docket No. 09-52 and RM-1158. April 2010. *Available* at https://www.fcc.gov/document/policies-promote-rural-radio-service-and-streamline-allotment-and-2.

[xxi] *Ibid.* Pg. 6. ¶9.

[xxii] *See* Federal Communications Commission. *In the Matter of Improving Communications Services for Native Nations by Promoting Greater Utilization of Spectrum over Tribal Lands*. WT Docket No. 11-40. March 2011. *Available* at https://ecfsapi.fcc.gov/file/7021686654.pdf.

[xxiii] *Ibid*. Pg. 13, ¶35.

[xxiv] *Ibid*. Pg. 6.

[xxv] *Ibid*. Pg. 16.

[xxvi] *Ibid*. Pg. 17.

[xxvii] *Ibid*. Pg. 17-18, ¶48.

[xxviii] *Ibid*. Pg. 18, ¶49.

[xxix] *Ibid*.

[xxx] *Ibid*. Pg. 18, ¶53, footnote 87.

[xxxi] *Ibid*. Pg. 18, ¶53.

[xxxii] *Ibid*. Pg. 18, ¶54.

[xxxiii] *Ibid*. Pg. 19, ¶55.

[xxxiv] *See* Federal Communications Commission, Electronic Comment Filing System. Filing Detail: Proceeding 11-40. Filed by the National Congress of American Indians. *Available* at https://www.fcc.gov/ecfs/filing/6017116024.

[xxxv] *Ibid*. *Available* at https://ecfsapi.fcc.gov/file/7022038976.pdf.

[xxxvi] *See* Federal Communications Commission. *In the Matter of Connect America Fund, et al*. WC Docket No. 10-90, GN Docket No. 09-51, WC Docket No. 07-135 and 05-337, CC Docket No. 01-92 and 96-45, WC Docket No. 03-109, and WT Docket No. 10-208. FCC 11-161. Released November 18, 2011. *Available* at https://docs.fcc.gov/public/attachments/FCC-11-161A1.pdf.

[xxxvii] *See* Federal Communications Commission. Universal Service for High Cost Areas – Connect America Fund. Accessed October 15, 2019. *Available* at https://www.fcc.gov/general/universal-service-high-cost-areas-connect-america-fund.

[xxxviii] *See* Federal Communications Commission. Universal Service: Low-Income Consumers. Accessed October 15, 2019. *Available* at https://www.fcc.gov/general/universal-service-low-income-consumers.

[xxxix] *See* Federal Communications Commission. Rural Healthcare Program: Summary of the Rural Healthcare Program. Accessed October 15, 2019. *Available* at https://www.fcc.gov/general/rural-health-care-program.

[xl] *See* Federal Communications Commission. E-rate: Universal Service Program for Schools and Libraries. Accessed October 15, 2019. *Available* at https://www.fcc.gov/consumers/guides/universal-service-program-schools-and-libraries-e-rate.

[xli] *See* Federal Communications Commission. Universal Service. Accessed October 15, 2019. *Available* at https://www.fcc.gov/general/universal-service.

[xlii] *See* Federal Communications Commission. *In the Matter of Connect America Fund, et al*. WC Docket No. 10-90, GN Docket No. 09-51, WC Docket No. 07-135 and 05-337, CC Docket No. 01-92 and 96-45, WC Docket No. 03-109, and WT Docket No. 10-208. Pg. 13, ¶ 28. FCC 11-161. Released November 18, 2011. *Available* at https://docs.fcc.gov/public/attachments/FCC-11-161A1.pdf.

[xliii] *Ibid*.

[xliv] *Ibid*.

[xlv] *Ibid*. Pg. 119, ¶322.

[xlvi] *Ibid*. Pg. 120, ¶326.

[xlvii] *See* National Congress of American Indians. *NCAI Comments on Public Notice FCC 15-49—Request for Further Comment on Issues Related to Competitive Bidding Proceeding; WT Docket Nos. 14-170 and 05-211, GN Docket No. 12-268, and RM-11395*. May 14, 2015—corrected May 20, 2015. *Available* at https://ecfsapi.fcc.gov/file/60001048335.pdf.

[xlviii] *Ibid*.

[xlix] *Ibid*.

[l] *Ibid*.

[li] *Ibid*.

[lii] *Ibid*.

[liii] *See* Federal Communications Commission. *In the Matter of Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands,* and, *Transforming the 2.5 GHz Band*. WT Docket No. 03-66 (Terminated), and WT Docket No. 18-120. Released May 10, 2018. *Available* at https://docs.fcc.gov/public/attachments/FCC-18-59A1.pdf.

[liv] *Ibid*. Pg. 2, ¶2.

[lv] *Ibid*. Pg. 3, ¶5.

[lvi] *Ibid*.

[lvii] *Ibid*. Pg. 6, ¶4.

[lviii] *Ibid*. Pg. 3, ¶5, and Pg. 6, ¶9.

[lix] *Ibid*. Pg. 7, ¶13.

[lx] *Ibid*. Pg. 6, ¶9.

[lxi] *Ibid*. Pg. 12, ¶35.

[lxii] *Ibid*. Pg. 18-19.

[lxiii] *See* Federal Communications Commission. *In the Matter of Transforming the 2.5 GHz Band*. WT Docket No. 18-120. Released July 11, 2019. *Available* at https://docs.fcc.gov/public/attachments/FCC-19-62A1.pdf.

[lxiv] *Ibid*. Pg.11, ¶26.

[lxv] *Ibid*. Pg. 6, ¶15.

[lxvi] *Ibid*. Pg. 7, ¶18.

[lxvii] *Ibid*. Pg. 6, ¶17, and Pg. 7, ¶18.

[lxviii] *Ibid*. Pg. 13, ¶32 and ¶33.

[lxix] *Ibid*. Pg. 19, ¶50.

[lxx] *Ibid*.

[lxxi] *Ibid*. Pg. 22, ¶58.

[lxxii] *Ibid*. Pg. 23, ¶61.

[lxxiii] *Ibid*. Pg. 23, ¶61.

FALL 2019

Tribal Technology Assessment

THE STATE OF INTERNET SERVICE ON TRIBAL LANDS

Brian Howard
Traci Morris

ASU American Indian Policy Institute
Arizona State University

Acknowledgements

The Arizona State University, American Indian Policy Institute would like to thank the following individuals for their leadership, expertise, and contribution for making the *Tribal Technology Assessment: The State of Internet Service on Tribal Lands* a reality. Cover photo courtesy of Southern California Tribal Chairman's Association, Pala Reservation

Geoffrey Blackwell (Muscogee Creek/Chicksaw/Choctaw/Omaha)
Chief Strategic Officer & General Counsel
Amerind Risk
AIPI Advisory Board – Vice President

Bryan Brayboy (Lumbee)
Special Advisor to President Crow on American Indian Affairs
Arizona State University
AIPI Advisory Board – Member

Dante Desiderio (Sappony)
Executive Director
Native American Finance Officers Association
AIPI Advisory Board – Member

JoAnn di Filippo
Grant Writer, American Indian Policy Institute
Arizona State University

Sascha Meinrath
Palmer Chair in Telecommunications
Penn State University
Director of X-Lab
AIPI Advisory Board – Member

Jacob Moore (Tohono O'odham)
Assistant Vice President of Tribal Relations
Arizona State University
AIPI Advisory Board – Member

Karen Mossberger
Professor, School of Public Affairs
Arizona State University
AIPI Advisory Board – Member

Matthew Rantanen (Cree)
Director, Tribal Digital Village
Southern California Tribal Chairman's Association
AIPI Advisory Board – Member

Mikhail Sundust (Akimel O'odham)
Policy Communications Coordinator, American Indian Policy Institute
Arizona State University

About the ASU American Indian Policy Institute

The American Indian Policy Institute at Arizona State University is a research and policy institution dedicated to providing Tribal governments and their citizens with meaningful information regarding Tribal affairs at the Federal and State of Arizona government levels. The American Indian Policy Institute serves Tribal leaders, governments, organizations, and citizens in capacity building, training, and research and policy analysis to establish a foundation for future generations.

Traci Morris PhD, Director, AIPI

Dr. Morris is a member of the Chickasaw Nation of Oklahoma. Under her leadership, AIPI has grown and diversified its service to Indian Country by providing policy analysis, tribally-driven research, and economic development capacity building. In her work at both ASU and prior, Morris has worked with Native American Nations; Tribal businesses; Native American non-profits; written a college-accredited curriculum; and has advocated for digital inclusion at the Federal Communications Commission and on Capitol Hill. Morris's research and publications on Native American media and the Digital Divide is focused on Internet use, digital inclusion, network neutrality, digital and new media curriculums, digital inclusion and development of broadband networks in Indian Country. Her book, *Native American Voices: A Reader,* continues to be a primary teaching tool in colleges throughout the country. Morris is also an author in the *2009 New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses*.

Brian Howard, Research & Policy Analyst, AIPI

Howard is Akimel O'odham, Tohono O'odham, and Piipash, and an enrolled citizen of the Gila River Indian Community where he grew up in the Komatke District. Howard provides analyses of various infrastructure and sovereignty issues relevant to Tribal communities and manages AIPI's Legislative and Administrative Policy Update tracking federal and Arizona State government actions affecting Tribal communities. Prior to joining the AIPI team in November 2016, Howard served over five years as a Legislative Associate with the National Congress of American Indians (NCAI) in Washington, DC. Working on behalf of American Indian and Alaska Native Tribal governments, Howard's work included advocating Tribal policy initiatives in Congress, the Administration, and the White House on matters regarding Tribal Telecommunications, Government Contracting, and Cultural Protections. Howard graduated from the University of New Mexico in 2009 with his B.A. in Native American Studies focusing on Federal Indian Law and Policy with a minor in Political Science. He is currently pursuing his Master's in Science and Technology Policy at Arizona State University and will graduate in Spring 2020.

Table of Contents

Executive Summary

Access to high-speed internet service has become an essential component to the nation's economy, education, healthcare, and workforce development. However, despite the disparate levels of internet service on Tribal lands there remains no recent academic or quantitative study addressing this void of knowledge. The purpose of AIPI's research study *Tribal Technology Assessment: The State of Internet Service on Tribal Lands* was to create the first academic and replicable quantitative study of broadband access, device use, and uses of the internet by Tribal peoples on Tribal lands. The central tenet of the study was to document the Digital Divide(s) and to create a new baseline for future studies with the expectation of potentially measuring growth in coming years.

While the work was conducted in an academic setting, this study is structured like an industry white paper or briefing as its intended audience is Tribal leaders and Tribal communities as well as federal policymakers and the private sector telecommunications industry. This paper also includes a number of 'Policy Recommendations to Improve High-Speed Broadband on Tribal Lands' to signify the roles and responsibilities of Congress and federal departments and agencies, as well as opportunities to enact meaningful change in and by the private telecommunications sector and Tribal governments, enterprises, and organizations. These recommendations were developed by members of AIPI's Advisory Board, which represent elected leaders of Tribal governments and leaders from national Tribal organizations and associations. It should be noted this study integrates participatory research and was Tribally driven as Tribal leadership initiated the research and was involved in all facets of the design, development, interpretation of, and writing of this paper.

As advancements in technology continue to spur the creation of applications requiring faster connections and increased bandwidth capabilities, it is important to understand the gaps in technology and internet access for disenfranchised communities. The lack of telecommunications infrastructure and consumer adoption has consistently been associated with rural and remote areas, and economically distressed communities. For residents of Tribal lands, the Digital Divide has persisted for decades starting initially with the absence of traditional landline telephones and followed by the lack of terrestrial and mobile phone internet services.

A primary issue in addressing the Digital Divide in Indian Country has been a lack of consistent and reliable data collection that provides an accurate assessment of internet access on Tribal lands. The most recent data of internet access on Tribal lands is provided primarily through the U.S. Census Bureau's American Community Survey and the annual publication of the Federal Communications Commission's (FCC) Broadband Deployment Report, also previously referred to as the *Broadband Progress Report*. Based on data from the FCC's *2018 Broadband Deployment Report,* nearly 65 percent of Tribal lands have access to terrestrial high-speed broadband speeds of 25 Mbps upload and 3 Mbps download (25 Mbps/3 Mbps), which is the baseline speed established by the FCC to define what constitutes a high-speed broadband connection (Federal Communications Commission [FCC], 2018a).

The 160 individual Tribal respondents who participated in the subject study represented Tribal lands in 19 different states and all Bureau of Indian Affairs (BIA) regions. Study respondents participated through various means including in-person via on-site survey locations, and those individuals that participated via the anonymous weblink. Overall, despite the relatively small sample, data indicates that respondents on Tribal lands are using cellphones, specifically smart phones, to access the internet. Additionally, many Tribal respondents are connecting publicly

and at a friend or relative's house. The age distribution shows a representative spread demographically between ages and that respondents are using the internet for not only social uses, but civic and educational uses as well and mostly on a smart phone device. This implies data limitations as opposed to wired connections, data caps, and price consideration.

A broad ecosystem of telecommunications services and applications is needed to appropriately and adequately address the Digital Divide in Indian Country. While the findings of this Tribal Technology Assessment highlight and emphasize the strong reliance on and use of mobile technologies within Tribal communities, it is crucial to understand the infrastructure technologies needed to provide ubiquitous and affordable internet service. The future is both terrestrial-based fiber, or high-capacity fixed wireless to the home, and the provision of affordable high-speed mobile services. The data in this study clearly shows mobile is strongly adopted purely because there is no other choice; Indian Country has adapted to the only option available currently. But mobile can never be the sole alternative for hardline internet services because it cannot scale to match market driven and communal capacity needs, such as those needed for education, healthcare, and economic development functions. While we need mobile coverage for communications, emergency services, and general improvement of life, it is not and should not be viewed as the only internet solution. What is needed to support redundant connectivity on Tribal lands are innovative funding mechanisms that drive infrastructure investment using a wide variety of technologies.

This is a Tribally-driven study and is done in the true vein of participatory research. The AIPI was charged with creating this work by Tribal leadership for the purposes of creating a replicable study to measure Tribal connectivity, access, and use. The concept of this study was conceived by leaders of the National Congress of American Indians, the Native American Finance Officers Association, and AIPI Advisory Board members as early as January 2016. The resulting data in the current study and data to be obtained in subsequent years is created specifically for use in Tribal advocacy by Tribal Nations; for use by NCAI and other national, regional, and intertribal organizations; for use by federal agencies; and for Congress. Tribal leaders worked with AIPI throughout the process from concept to question design, dissemination of the survey, review of the data, and drafting recommendations in a collaborative process to ensure the product will be useable in an applied format by the various cited audiences.

Overview

In January 2016, the American Indian Policy Institute (AIPI) at Arizona State University (ASU) formed an Advisory Council comprised of internal university faculty and external Tribal and community leaders of local, regional, and national influence. Operating formally like a board of directors, the first retreat of the AIPI Advisory Council produced a singular directive: to conduct a study that would obtain detailed information on internet access and use by residents of American Indian reservations located in the 48 contiguous United States. This directed study was to update information from the last and only specific study of access and use on Tribal lands, the 2009 *New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses* (Morris & Meinrath, 2009), as well

Tribal Technology Assessment: The State of Internet Service on Tribal Lands study was to create the first academic and replicable quantitative study of broadband access, device use, and uses of the internet by tribal peoples on Tribal lands.

as create a new survey instrument that could be replicated in coming years in order to provide comparative data.

Our research team was comprised of a number of those involved with the creation of the *2009 New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses* including primary authors Dr. Traci Morris and Sascha Meinrath. Morris is the current AIPI Director and the principal investigator and primary author of this study, the *Tribal Technology Assessment*. Meinrath serves on the AIPI Advisory Council, along with Geoffrey Blackwell, who also played a significant role in the 2009 New Media Study. In addition to Blackwell and Meinrath, several other members of the AIPI Advisory Council with expertise in telecommunications assisted in the research planning and development for this study including Dr. Karen Mossberger, Dante Desiderio, and Matthew Rantanen. Finally, AIPI policy and research analyst Brian Howard, a former National Congress of American Indians, Legislative Associate, was a researcher and co-author on this study.

Historical Perspective: Why This Research Is Important

In order to understand the importance of the 2009 *New Media Study* and why this work serves as a pivotal framework for the current project, some context is required. At the time, the 2010 Decennial U.S. Census and annual American Community Survey began collecting data on internet access for residents of Tribal lands, comprehensive data on internet access and use on reservations had not been previously collected by the federal government or by any other research. Commissioned by the Tribal organization Native Public Media and written to be used as an advocacy tool for use by Tribal governments, federal agencies, and Congress, The *New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses* study provided the first baseline data of internet access for American Indians living on reservations (Morris & Meinrath, 2009). Results of the study revealed what types of technologies were being used to access the internet, and how American Indians were using the internet to access a variety of online services. The findings from this study enabled researchers to construct a preliminary profile of technology and broadband use for American Indians living on reservations, as well as acknowledge the depth of information gaps necessary for evidence-based research. Beyond that, the *New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses* provided baseline information for the FCC and Congress and the Study was widely cited over the ensuing years because it was the *only* data available that provided a glimpse about internet use and Native Americans living on reservations.

The nation was reeling from the economic downturn of 2008 and in an effort to spur recovery efforts, in February 2009 Congress enacted the *American Recovery and Reinvestment Act* (ARRA, P.L. 111-5), which was an economic stimulus package that provided targeted funding for the nation's infrastructure projects. Advancing deployment and upgrading existing networks of the nations' telecommunications infrastructure was one of the mandates under ARRA, and the U.S. Department of Agriculture (USDA) and Department of Commerce were the primary agencies charged with providing grants and loans to accomplish these goals. In addition to the ARRA legislation enacted in 2009, the then-newly inaugurated President Barack Obama reaffirmed Executive Order 13175 by issuing a memorandum to all heads of the Administration to develop Tribal consultation policies (The White House, 2009), an Executive Order previously issued in 1999 by President Bill Clinton (The White House, 2000).

With the start of the 111th Congress and the new Presidential Administration in 2009, the USDA established its Office of Tribal Affairs (USDA OTR) in late 2009 and the Federal

Communications Commission established its Office of Native Affairs and Policy (FCC ONAP) in early 2010. Both USDA OTR and the FCC ONAP would play pivotal roles in the development of telecommunications policy, funding, and deployment throughout the early years of the 2010's. The 2009 *New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses* had a direct impact for Tribal Nations in that its policy recommendations included the recommendation of a Tribal Office at the FCC and a number of its other policy recommendations were foundational and informed the *National Broadband Plan* released by the Federal Communications Commission in March 2010 (FCC, 2010b).

Background on Federal Trust Relationship

In understanding why data on broadband access and use on Tribal lands is required, a brief explanation of the federal trust relationship is in order. Also known as the federal trust responsibility, it describes a legal relationship between the U.S. government and American Indian and Alaska Native Tribes. While the Commerce and Treaty Clauses of the U.S. Constitution had seemingly recognized Indian Tribes as distinct political entities, it was not until early judicial interpretations of the Constitution that the federal government began to formally establish oversight of Indian affairs. As Canby Jr (2015) explains, "the Constitution itself certainly contains no explicit delineation of a relationship, fiduciary or otherwise, but it does grant powers to the federal government that have been held to authorize its role as trustee" (p. 37). The U.S. Constitution, under the Commerce Clause, granted Congress with powers to "regulate commerce with foreign nations, and among the several states, and with the Indian tribes" (U.S. Const. art. 1, § 8), and also granted the President, upon approval of the Senate, to enter into treaties with Indian Nations (U.S. Const. art. 2, §2). Although the Presidential authority to enter into treaties with Indian Nations was rescinded by congressional statute in 1871, the Commerce Clause (U.S. Const. art. 1, § 8) and Treaty Clause (U.S. Const. art. 2, §2) provided the foundation for judicial interpretation of the federal trust relationship with Indian Tribes in the first, nearly 100 years of the United States. According to Donnellan (2017),

> "The United States Supreme Court recognized the undisputed existence of a general trust relationship between the United States and the Indian peoples. The trust relationship extends not only to Indian tribes as governmental units but to tribal members living on and off the reservation. Under this trust relationship, the United States government has the obligation to protect Tribal Lands, resources, honor the rights of self-government, and provide basic social, medical, and educational services" (p. 355).

In the early years of the United States, treatymaking with Indian Nations was carried over from earlier colonial America when European countries entered into treaties with Tribes for the exchange of lands and promises of peace (Canby Jr, 2015). Between 1778 and 1871, over 370 treaties were ratified between the U.S. government and Indian Nations (National Congress of American Indians [NCAI], n.d.). Treaties established formal boundaries of Indian lands (reservations) and also commonly included provisions guaranteeing Tribal rights to hunt and fish, as well as protection from depredation (Canby Jr, 2015). In exchange for Indian lands, the U.S. government also promised to provide health care, education, housing, economic development, and agricultural assistance to Indian Tribes (NCAI, n.d.).

Concerned with being excluded from the executive branch's treatymaking with Indian Tribes, as well as growing discontent with recognizing Indian Tribes as 'nations', Congress ended the President's authority to enter into treaties with Indian Tribes in 1871 (Canby, Jr, 2015). Through this action, as well as the plenary power of Congress granted through the Commerce Clause of the Constitution, it was assumed that Congress retained ultimate authority over Indian affairs

henceforth. This was upheld by the Supreme Court in the 1903 case, *Lonewolf v. Hitchcock* (187 U.S. 553), which stated, "plenary authority over the tribal relations of the Indians has been exercised by Congress from the beginning, and the power has always been deemed a political one...." (as cited in Canby Jr, 2015, p. 39).

Through treaties, U.S. Supreme Court decisions, and Acts of Congress, the federal trust relationship has evolved throughout the history of the United States. Canby Jr (2015) states, "at its broadest, the relationship includes a mixture of legal duties, moral obligations, understandings and expectancies that have arisen from the entire course of dealing between the federal government and the tribes" (p.35). The importance in discussing the federal trust relationship between Tribal governments and the U.S. federal government serves to provide the reader with an understanding of how historical Tribal sovereignty perspectives impact contemporary views regarding telecommunications and broadband access on Tribal lands.

Current State of Telecommunications on Tribal Lands

The Digital Divide(s)

The Digital Divide is generally defined as the economic and social inequality of an individual, households, businesses, geographic areas, or populations, in regards to lack of access, knowledge, or use of information and communications technology. While data proves racial minorities demonstrate lower levels of access (Mossberger et al., 2013), it is specifically important to note that all minorities are cited in existing data except Tribes—for which no data is cited and, again, supports the need for this study.

This definition of the Digital Divide is simplistic and dated; realistically there are multiple Digital Divides in Indian Country (and other communities) and this impacts e-commerce and economic development in Indian Country. The divide(s) include those with no connection; those with poor connection; those with mobile only access (quality of access); those with library only access (location of access); and, those with overburdened pipes making broadband speeds as low as dial-up access. Additionally, there is the producer versus consumer gap (producers have better access/lower income knowledge divide and access divide). As with all populations, there are those with little or no internet interest, as well. Thus, it is easy to see that those who are already marginalized will have even less access.

Access to high-speed internet service has become an essential component to the nation's economy, education, healthcare, and workforce development. As advancements in technology continue to spur the creation of applications requiring faster connections and increased bandwidth capabilities, it is important to understand the gaps in technology and internet access for disenfranchised communities. The lack of telecommunications infrastructure and consumer adoption has consistently been associated with rural and remote areas, and economically distressed communities. For residents of Tribal lands, the Digital Divide has persisted for decades starting initially with the absence of traditional landline telephones and followed by the lack of terrestrial and mobile phone internet services.

Significance of the Problem

A primary issue in addressing the Digital Divide in Indian Country has been a lack of consistent and reliable data collection that provides an accurate assessment of internet access on Tribal

lands. The most recent data of internet access on Tribal lands is provided primarily through the U.S. Census Bureau's American Community Survey and the annual publication of the Federal Communications Commission's (FCC) Broadband Deployment Report, also previously referred to as the *Broadband Progress Report*. Based on data from the FCC's *2018 Broadband Deployment Report,* nearly 65 percent of Tribal lands have access to terrestrial high-speed broadband speeds of 25 Mbps upload and 3 Mbps download (25 Mbps/3 Mbps), which is the baseline speed established by the FCC to define what constitutes a high-speed broadband connection (FCC, 2018a).

A primary issue in addressing the Digital Divide(s) in Indian Country has been a **lack of consistent and reliable data collection** that provides an accurate assessment of Internet access on Tribal lands

While the FCC's 2018 report stated that 35 percent of Tribal lands lack access to terrestrial high-speed broadband internet (FCC, 2018a), the 2016 U.S. Census American Community Survey estimated that approximately 32 percent of American Indian and Alaska Native households lacked access to a computer with a broadband internet subscription (U.S. Census Bureau, 2016). Despite this limited data being collected, problems persist within current data collection methods at the FCC and the U.S. Census Bureau. While the ACS reports on population estimates based on a random sampling of census tracts and blocks across the country, the FCC's report is also limited since data collected from service providers can be misinterpreted as serving all households in a census block. The FCC also does not collect data on the affordability of services in an area, which could preclude subscribership even if the service is available.

Research Plan

This is a Tribally-driven study and is done in the true vein of participatory research. The AIPI was charged with creating this work by Tribal leadership for the purposes of creating a replicable study to measure Tribal connectivity, access, and use. This study was first conceived by leaders of the National Congress of American Indians, the Native American Finance Officers Association, and AIPI Advisory Board members in January 2016. The current study and data to be obtained in subsequent years are created specifically for use in Tribal advocacy by Tribal Nations; for use by NCAI and other organizations; and for use by federal agencies and Congress. Tribal leaders worked with AIPI throughout the process from concept to question design, dissemination of the survey, review of the data, and drafting of recommendations in a collaborative process to ensure the product will be usable in an applied format by the various cited audiences.

In a note about style and terminology, while most social sciences at ASU use the American Psychological Association (APA) writing style, AIPI has modified this style to mirror language, phrasing, and style used by Tribal Nations, the National Congress of American Indians (NCAI), federal agencies, and Congress. This will include but is not limited to irregular capitalization of terms such as Tribal Nations or Native Nations or Tribes; use of lesser known terms and phrasing such as Indian Country and Tribal Nations; and use of Tribal lands designations used by federal agencies such as Former Reservation Lands in Oklahoma and Indian Country. For purposes of this study, 'Tribal lands' is defined as an American Indian reservation, pueblo, colony, Former Reservation Lands in Oklahoma, and Tribal statistical area located in the contiguous lower 48 states.

This work uses the terms Native Nations and Tribal Nations interchangeably; these terms, as well as Native American as opposed to American Indian, are used by the NCAI. While the Federal Government uses the terms American Indian/Alaska Native (AI/AN), this study only looked at the lower forty-eight states, therefore, the term AI/AI was not applicable. The study also makes liberal use of the term Indian Country, which is not only a legal designation for all lands that are formerly reservation lands or Tribal lands, but also a philosophical term for Tribal lands.

Methodology

AIPI undertook methodology discussions as early as spring 2016 in order to prepare for the lengthy Human Subjects Review (HSR) process required. Obviously, with 573 Tribal Nations in the United States, methods were limited by money, time, human capacity, and HSR processes. Although funding for this study was limited, AIPI was committed to undertaking this critical work, which was expedited by AIPI's two senior researchers who were leading experts in Tribal telecommunications. Additionally, AIPI welcomed the opportunity to collaborate with Tribal leaders and experts in the field on the study. However, even with two researchers, this was not enough capacity to reach out to all the Tribes directly. In order to expedite the process, it was determined that reaching out to individual Tribal members via events, via email, and via social media would gather a broader variety of responses in a shorter period of time. Additionally, since the survey instrument was designed to not collect personally identifiable data or specific Tribal data, our HSR process was manageable in that our study methods were subject to only university review and not national Tribal review.

This quantitative study was implemented using surveys on the Qualtrics platform at Arizona State University. Survey questions were disseminated in person at various public events via online platforms such as email lists and via social media. The survey instrument was designed to allow for the bifurcation of survey results based on in-person or online results in order to be able to create comparisons. The ASU Human Subjects Review and IRB process and approvals were undertaken in 2017 and modified twice in order to expand the scope and capture both in-person and online respondents. AIPI's research study titled, *Tribal Technology Assessment: The State of Internet Service on Tribal Lands*, received Institutional Review Board approval from Arizona State University in April 2017.

Surveying a randomized, representative sample of Indian Country would be an extremely difficult task for a variety of reasons. Tribal lands are widely dispersed, and identifying eligible respondents from a national sample would be extraordinarily expensive. National polling organizations such as the Pew Research Center have not reported data on Native Americans for this reason. Currently, the limited data that is available for research use is from large-sample Bureau of the Census surveys that range from hundreds of thousands to millions of households. Furthermore, the data collected, such as the American Community Survey, reports only home use or devices, and does not reveal how Tribal populations are using technology, barriers to use, or other information needed to inform Tribal or federal policy. More information has been collected at times through the Census' Current Population Survey, but this includes urban populations and self-identification is not the same as enrolled membership in a Tribe. It is necessary to hear the voices and experiences of those living on Tribal lands and to understand patterns across Tribal communities.

While this is not a random sample of Indian Country, it involved a broad range of participants from a variety of Tribes across a number of states, drawn from both in-person and online

surveys, with in-depth data on the digital experiences of respondents. Similarly, respondents were asked about broadband availability and internet use in their communities, as well as their personal use. Demographic data has been collected, so responses can be compared to residents of Indian Country overall. For these reasons, the survey yields important new information that can begin to fill gaps in knowledge about the state of internet connectivity and use in Indian Country.

Survey respondents were recruited at Tribal gatherings held off reservation lands during 2017, starting with a script that asked participants whether they were residents of Tribal lands. Potential participants were informed that their responses would be confidential, participation was at their option, and they could withdraw their participation at any time. No personally identifiable information was collected, other than a zip code request. Potential participants were approached during Tribal gatherings (i.e., Pow Wows and Tribal art markets) by AIPI researchers. If a participant agreed to partake in the survey, the individual registered on-site using a tablet or accessing a weblink to the 20-25 minute survey designed to capture information about residents of Tribal lands and their internet capabilities.

Locations for recruiting participants included: ASU Pow Wow, Tempe, AZ (April 21-23), Gathering Of Nations Pow Wow, Albuquerque, NM (April 27-29), Red Earth Festival, Oklahoma City, Oklahoma (June 9-11), and the Santa Fe Indian Market, Santa Fe, NM (August 19-20).

The initial Research Team conducting the survey included Dr. Traci Morris, Brian Howard, Sharon Torres, and Dr. JoAnn di Filippo. The broader ASU team included as research consultants Jacob Moore, Dr. Bryan Brayboy, and Dr. Karen Mossberger. Community and Tribal leaders that either participated in study development and/or contributed include: Geoffrey Blackwell, Irene Flannery, Dante Desiderio, Professor Sascha Meinrath, and Matthew Rantanen.

The Research Team and members of AIPI's Advisory Council with expertise in Tribal telecommunications issues formulated the initial set of questions for the AIPI Tribal Technology Assessment. Creating a robust survey instrument proved to be challenging in many ways. First, since data was needed from Tribal members living on Tribal lands, the survey needed to verify enrollment status via self-identification of membership in a federally recognized Tribe selected from a drop-down list. Second, the instrument needed to verify survey respondent residential location without being personally identifiable. Requiring zip codes was the obvious choice. Though there are significant limitations to collecting zip code data due to its limited subdivision and specificity (see 2018 GAO Report), using this identifier both verified respondent locations and obtained data similar in nature to other studies and census data.

Desired data included internet speeds on Tribal lands; however, the challenge was how best to construct this as an effective question. The most obvious question was 'what are your speeds' and list them. But, in reality, many of us do not know our provider's advertised speeds. In the end, the research team devising the questions decided that it would be more effective to ask how respondents accessed the internet such as via cable, phone service provider, satellite or dial-up. This question enabled the researchers to assign speed ranges based on provider access options (i.e., phone vs. cable access)(see question 11). It is also consistent with questions that have been used in other surveys in internet access conducted by Pew and the Bureau of the Census.

Additionally, the survey instrument sought to assess how individual Tribal members on reservations were:

- using the internet;
- accessing (devices) the internet;
- what they were generally using internet for;
- who in the household had access to and was using the internet;
- was internet access available in the household; and
- where no access was available, how access to the internet was secured.

Survey dissemination, under the guidance of the Human Subjects Review board, obtained permission to distribute the questionnaire at public events, email platforms, and via social media. AIPI conducted its survey at Tribal pow wows and art markets that were located off-reservation. These off-reservation events were selected due to their proximity to a Tribal reservation(s) and with an understanding that Tribal citizens residing on a reservation attended these events.

In early 2018, additional outreach was conducted and the survey was disseminated electronically via both email and social media. AIPI utilized a wide variety of networks to gain the broadest demographic reach for the survey instrument. Obviously, since AIPI is a research institute within Arizona State University, which is the largest university in the country and one that has the largest Native student population, the survey was distributed widely throughout University networks. Additionally, the research team possessed access to vast networks of varying demographics throughout Indian Country and, thus, the team disseminated the study throughout various email networks on Tribal lands. Finally, there is much anecdotal data suggesting that Tribal members are making significant use of various social media networks. Therefore, AIPI made use of both Twitter and Facebook, with several paid ads on the latter network. The use of multiple methods was important for a more complete view of Tribal Nations. Face-to-face survey collection at Tribal gatherings allowed the team to capture the experiences of individuals with limited or no internet use, while online networks facilitated greater national participation in the survey.

The *Tribal Technology Assessment: The State of Internet Service on Tribal Lands* survey instrument included twenty-two questions (Q1-Q22) and began with an introductory script informing respondents the survey would take between ten and fifteen minutes to complete, identities would remain confidential, and responses would be used to inform the general public and policymakers on current levels of internet and technology access available to U.S. federally-recognized Tribes in the lower 48 states. The survey script was amended April 12, 2018 to include language specifying data was being collected from residents of Tribal reservations within the contiguous United States, thereby excluding Tribal residents located in Alaska, Hawaii, and Indigenous peoples in the U.S. territories and to reference the use of the anonymous weblink respondents had used to access the survey, as opposed to language used to reference respondents taking the survey at the external locations.

Upon review of the survey script, respondents indicated whether or not they agreed to participate in the survey and acknowledge they were 18 years of age or older.

A History of Data Neglect

The most recent publication that provides an in-depth analysis of the challenges to internet access for Tribal communities is Marisa Duarte's *Network Sovereignty: Building the Internet across Indian Country*. Published in 2017, Duarte's focus in *Network Sovereignty* was to integrate Indigenous views and beliefs in modern fields of science and technology, while also

highlighting personal experiences of internet use and its effects throughout Indian Country (Duarte, 2017, pgs. 7-8). As will be outlined and discussed throughout in this paper, Duarte affirms that, "while there are no exhaustive data sets at this point from which we can assess digital access, use, and connectivity across the diverse demographics of Indian Country, we can, as of this writing, still safely presume that robust internet access and productive use of the internet (as opposed to basic consumer uses) continue to be limited." (Duarte, 2017, pg. 57). Furthermore, Duarte (2017) provides key factors that outline the challenges to internet access and adoption for Tribal communities:

> "(1) [Information and communication technology] devices such as smartphones, laptops, tablets, and gaming consoles continue to be expensive for the average Native American household; (2) subscription rates for broadband cable, wireless, and satellite access continue to be more expensive for people residing in rural and remote locations, with many reservation communities located in such regions of the United States; (3) high unemployment rates in Indian Country mean there is less opportunity for individuals to gain Internet access through workplace computers; and (4) there are few regularly published data sets on numbers of users accessing Internet services through reservation schools, libraries, elders centers or computing centers, or nearby public schools and libraries; and (5) there are few studies that measure digital literacy skills and Internet uses, both of which represent different measures from those associated with basic technical connectivity" (p. 57).

A current survey of sources reveals there is sparse research collected, compiled, and reported on the availability of telecommunications services on Tribal lands. Furthermore, research regarding the adoption rates and various uses of applications on the internet by residents of Tribal lands is exceedingly more difficult to ascertain. It is widely recognized that Pew Research Center has established the standard for research and data collection on internet access and adoption for populations across the country. However, Pew does not conduct research on American Indian and Alaska Native populations due to limited samples available regarding said populations. Additionally, while the U.S. Census has collected data on internet use and barriers to use with much larger samples than Pew, with hundreds of thousands of households, the Current Population Survey has not consistently reported data for Native Americans. For example, in a 2011 report by the Department of Commerce there is at least one reference where computer and internet use by a householder's race and ethnicity could not report on data for American Indian and Alaska Native households due to the limitations in data available for these populations (U.S. Department of Commerce, 2011). Even when data on American Indians and Alaska Natives has been included; however, the data is aggregated nationally and includes urban populations as well as those living on Tribal lands. Connectivity differs substantially for remote Tribal areas, and the U.S. Department of Commerce data does not reflect these varied experiences.

What little data there is comes from a handful of federal reports and data that are conflicting and incomplete, at best. Much of this is due to differing metrics, data that is carrier reported and not independently verified, or dependence on other flawed data sets making it impossible to compare and contrast. These studies come from the Federal Communications Commission, the U.S. Department of Commerce, and the Government Accountability Office, as discussed in the subsequent sections.

National Broadband Plan 2010

Through the National Broadband Plan the U.S. affirmed its goals to be a world leader in mobile and wireless technologies and that Americans and vital community anchor institutions should have access to high-speed broadband networks (FCC, 2010b, p. XIV).

The National Broadband Plan was published in March 2010 by the Federal Communications Commission (FCC). The plan was based on recommendations made by the general public, advocacy/non-profit organizations, and industry, as well as input from federal agencies and state, local, and Tribal governments (Federal Communications Commission [FCC], 2010b). Through the *American Recovery and Reinvestment Act of 2009* (P.L. 111-5) Congress directed the FCC to develop the National Broadband Plan to serve as a roadmap that would ensure every U.S. citizen has access to affordable broadband services (FCC, 2010b, p. XI). The National Broadband Plan provided the foundation for many programmatic reforms, such as the transition of Universal Service Fund support from legacy telephone to the deployment of broadband technologies and the freeing up of additional spectrum radio waves to support nationwide commercial wireless deployment (FCC, 2010b, p. XIII). Through the National Broadband Plan the U.S. affirmed its goals to be a world leader in mobile and wireless technologies, with all Americans and vital community anchor institutions having access to high-speed broadband networks (FCC, 2010b, p. XIV).

Several recommendations were made in the National Broadband Plan to improve broadband access on Tribal lands and, among the input provided by many Tribal entities, the FCC also cited the 2009 *New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses* publication by Native Public Media and the New America Foundation (FCC, 2010b).

The National Broadband Plan acknowledged that many Tribal lands "face significant obstacles to the deployment of broadband infrastructure, including high buildout costs, limited financial resources that deter investment by commercial providers and a shortage of technically trained members who can undertake deployment and adoption planning" (FCC, 2010b, p. 152). A proposal to establish a Tribal Broadband Fund to provide grants to connect Tribal community anchor institutions, provide technical assistance and infrastructure deployment planning, and support digital literacy programs was included among the recommendations offered to increase broadband service on Tribal lands. (FCC, 2010b, p. 152). Chapter 9.7 of the National Broadband Plan also made recommendations to increase coordination and consultation with Tribes stating that "the Executive Branch should establish a Federal-Tribal Broadband Initiative through which the federal government can coordinate both internally and directly with Tribal governments on broadband-related policies, programs and initiatives" and that "the FCC should increase its commitment to government- to-government coordination with Tribal leaders" (FCC, 2010b, p. 184). As will be commonly referenced throughout this paper, the National Broadband Plan also recommended that "the federal government should improve the quality of data on broadband in Tribal lands" (FCC, 2010b, p. 184).

The Federal Communications Commission: Broadband Progress/Deployment Reports

The FCC's Broadband Deployment/Progress Reports are based on data collected from Form 477, which must be filed with the FCC by all facilities-based broadband service providers (FCC, 2018b) . However, data compiled from Form 477 reports service availability at the census block level and not by household (FCC, 2018b, p. 18). An entire census block can be considered 'served' if a provider claims to provide service at just a single location in that area, which does not necessarily mean every person has internet access from a provider in that census block (FCC, 2018b, p. 18). A recent 2018 study conducted by the Government Accountability Office also made this determination, and will be discussed further in this paper. Additionally, data reported prior to 2014 was collected through the State Broadband Initiative (SBI) program administered by the National Telecommunications & Information Administration, and which was initially used to populate service levels for the National Broadband Map (FCC, 2018b, p. 18).

The FCC's Broadband Deployment/Progress Reports are based on data collected from Form 477, which must be filed with the FCC by all facilities-based broadband service providers.

The FCC's two most recent publications regarding internet availability on Tribal lands include its *2016 Broadband Progress Report* and the *2018 Broadband Deployment Report*. Annually, the FCC is mandated by the *1996 Telecommunications Act* to initiate a Notice of Inquiry (NOI) and determine the availability of advanced telecommunications for all Americans, including the advanced telecommunications capabilities of elementary and secondary schools and classrooms (47 U.S.C. § 1302(b)). The NOI poses questions regarding current market conditions or research findings relevant to the telecommunications industry, and also solicits comments from industry and others concerning various benchmarks and metrics used to measure internet access (FCC, 2017). Following this rulemaking, the FCC produces an annual publication on, "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion" (47 U.S.C. § 1302(b)).

The Broadband Progress/Deployment Reports also reference Form 477 data from the two years prior to each annual publication. Thus, for instance, the FCC *2016 Broadband Progress Report* references data collected in 2014 and the *FCC 2018 Broadband Deployment Report* references data collected in 2016. There was no report issued in 2017 due to, "changes in the industry and . . . recent [FCC] actions to encourage broadband deployment" (FCC, 2017, p. 2).

FCC 2016 Broadband Progress Report

According to the FCC's *2016 Broadband Progress Report*, 41 percent of the over 1.5 million people residing on Tribal lands lacked access to broadband speeds of 25 Mbps/3 Mbps, compared to 10 percent of the U.S. overall (FCC, 2016). The 2016 report also found that 68 percent of rural Tribal lands and 14 percent of Tribal lands in an urban area lacked access to broadband internet (Federal Communications Commission, 2016, p. 35). The term 'Tribal lands' included all reservations in the lower 48 states, Alaska Native Villages, Hawaiian Homelands, and Tribal Statistical Areas. While 58 percent of Tribal lands in the lower 48 states lacked access to high-speed internet compared to 49 percent of Alaska Native Villages (FCC, 2016, p. 35), the disparities between urban and rural coverage for the two data sets were also high. The FCC (2016) determined that of the Tribal lands located in the lower 48 states, 72 percent of those in rural areas and 33 percent in urban areas lacked access to high-speed internet while 70 percent of rural areas and 15 percent of urban areas in Alaska Native Villages lacked access (p. 35). Comparatively, just 10 percent of the U.S. overall lacked access to broadband internet, which was further disaggregated to find that 39 percent in rural areas of the U.S. and 4 percent in urban areas of the U.S. did not have high-speed internet (FCC, 2016, p. 34).

According to this 2016 report , 41 percent of the over 1.5 million people residing on Tribal lands lacked access to broadband speeds of 25 Mbps/3 Mbps, compared to 10 percent of the U.S. overall (FCC, 2016, p. 34). The 2016 report also found that 68 percent of rural Tribal lands and 14 percent of Tribal lands in an urban area lacked access to broadband internet (FCC, 2016, p. 35).

FCC 2018 Broadband Deployment Report

Following the *Thirteenth Section 706 Report Notice of Inquiry* the FCC renamed its annual report the 'Broadband Deployment Report' and also included new reporting metrics on mobile internet access (FCC, 2017). The FCC also stated that through its interpretation of Sec. 706 of the *1996 Telecommunications Act* (47 U.S.C. § 1302(b)), data reported in its *2018 Broadband Deployment Report* should reflect, "whether advanced telecommunications capability '*is being deployed* to all Americans'—not whether it has already been deployed to all Americans" (FCC, 2018a).

In its *2018 Broadband Deployment Report* the FCC determined that an estimated 35 percent of residents of Tribal lands lacked access to fixed broadband speeds of 25 Mbps/3 Mbps compared to 8 percent of the U.S. overall (FCC, 2018, p. 22). The data reported in the FCC's 2018 report also included the deployment of mobile LTE at speeds of 5 Mbps/1 Mbps, which was not referenced in the FCC's *2016 Broadband Progress Report*. However, there is a difference of 1.2 million people in the FCC's 2018 report of deployment on Tribal lands; the 2016 data stated that nearly 65 percent of 2.5 million people on Tribal lands had access to terrestrial 25 Mbps/3 Mbps services, while nearly 95 percent of 3.7 million people on Tribal lands had access to mobile LTE (FCC, 2018, p. 23-24). While the reporting of fixed terrestrial and mobile LTE service relies on data compiled from the FCC's Form 477, the FCC noted that its reporting of mobile LTE from

In 2017, the FCC renamed its annual report the 'Broadband Deployment Report' and also included new reporting metrics on mobile internet access making cross analysis with other reports problematic and also inflated population and coverage estimates.

Form 477 data was supplemented with crowd-sourced data collected by the Ookla Speedtest mobile app (FCC, 2018, p. 19-20).

The use of the Ookla data, as a crowd-sourced form of data collection, to supplement data for Form 477 could account for the differences in population reports of those on Tribal lands having access to just terrestrial service and those having access to both terrestrial and mobile LTE. The FCC (2018) acknowledged that crowd-sourced data, "are often not collected pursuant to statistical sampling techniques, and may require adjustments to construct a representative sample from the raw data", but such data can, "provide the benefit of generating a large volume of data at a very low cost and . . . [measure] actual consumer experience on a network in a wide variety of locations, indoor and outdoor" (p. 20). Furthermore, the FCC's (2018) usage of the Ookla data was based on the number of actual speed tests done within a county by users of the app, and the FCC defined a sufficient sample size of at least 300 observations of Ookla speed tests within a county (p. 20-21).

The FCC also reported combined data for Tribal lands with access to fixed terrestrial broadband speeds of 25 Mbps/3 Mbps and mobile LTE speeds of 5 Mbps/1 Mbps. For purposes of the following data points, access to terrestrial services is referring to speeds of 25 Mbps/3 Mbps while access to mobile services is referring to speeds of 5 Mbps/1 Mbps, and the term *all* Tribal lands is inclusive of those in the lower 48 states, Alaska Native Villages, Tribal Statistical Areas, and Hawaiian Homelands. The FCC (2018) reported that 36 percent of all Tribal lands lacked access to both terrestrial and mobile broadband services, while 59 percent of rural Tribal lands and about 11 percent of urban Tribal lands lacked access to terrestrial and mobile services (p. 28).

Nearly 55 percent of Tribal lands located in the lower 48 states lacked access to terrestrial and mobile services, compared to 28 percent of Alaska Native villages and 27 percent of Tribal Statistical Villages (FCC, 2018, p. 28). The FCC also reported data of *residents* of Tribal lands with access to terrestrial and mobile services, which draw stark contrasts to the *deployment* data reported for access on Tribal lands. The FCC (2018) reported that nearly 96 percent of residents of all Tribal lands had access to terrestrial and mobile services (P. 77). The disaggregated data reported that nearly 92 percent of residents of Tribal lands located in the lower 48 states had access to terrestrial and mobile services, compared to 70 percent of residents of Alaska Native Villages and nearly 100 percent of Tribal Statistical Areas (FCC, 2018, p. 77-78).

2006 GAO Report - Telecommunications: Challenges to Assessing and Improving Telecommunications for Native Americans on Tribal Lands

This report is the first data that exists about telecommunications on Tribal lands. The purpose of the report was to determine appropriate federal policies and funding mechanisms that would increase access to phone and internet services on Tribal lands.

In January 2006, the U.S. Government Accountability Office (GAO) released a report titled, *Telecommunications: Challenges to Assessing and Improving Telecommunications for Native Americans on Tribal Lands* (U.S. Government Accountability Office [GAO], 2006). The 2006 report was requested by the late Chairman John McCain (R-AZ), and Vice Chairman Byron Dorgan (D-ND) of the Senate Committee on Indian Affairs, and late Co-Chairman Daniel Inouye (D-HI) of the Senate

Committee on Commerce, Science and Transportation. The purpose of the report was to determine appropriate federal policies and funding mechanisms that would increase access to phone and internet services on Tribal lands. According to GAO (2006), the agency reviewed the following items to inform Congress on the current state of telecommunications on Tribal lands:

> "1) The status of telecommunications subscribership (telephone and Internet) for Native Americans on tribal lands in the lower 48 states and Alaska; 2) federal programs available for improving telecommunications on tribal lands; 3) the barriers that exist to improving telecommunications on tribal lands; and 4) how some tribes are addressing these barriers" (p. 1).

While other GAO reports were published on various Tribal telecommunications issues, the 2006 report provided an in-depth analysis of barriers to access, and provided case study examples of Tribes actively working to address these issues. GAO relied on data from the U.S. Census Bureau's 2000 Decennial Census to reference and compare telephone subscribership rates for Native American households on Tribal lands. Census data revealed that 69 percent of Native American households on Tribal lands in the lower 48 states had access to telephone service compared to the national average of 98 percent (GAO, 2006, p. 2).

While the 2000 Decennial Census identified basic telephone access rates, there were no questions on the census that informed internet access and adoption rates or cell phone service availability on Tribal lands. A major finding by GAO (2006) also determined that the two primary barriers to telecommunications access on Tribal and Alaska Native lands were the rurality and rugged terrain of such lands, as well as citing that Tribes had inadequate financial resources to invest in telecommunications (p. 32). The third and fourth most cited barriers to deploying telecommunications services on Tribal lands included the lack of Tribal members with technical expertise to plan, deploy, and maintain telecommunications networks, and the complex, costly process of obtaining rights-of-way permits through the Bureau of Indian Affairs (GAO, 2006, p. 5).

Although significant barriers and challenges were identified, GAO also recognized innovative efforts by Tribes to bring telecommunications services to their lands. For its report, GAO (2006) interviewed officials from 26 Tribes in the lower 48 states, 12 Alaska regional Native non-profit organizations, and a number of representatives from federal agencies, intertribal organizations, and telecommunications service providers (p. 2). GAO's interviews with the Coeur d'Alene Tribe and Mescalero Apache Tribe highlighted their efforts to address the issue of limited Tribal financial resources byway of pursuing funding through U.S. Department of Agriculture loan and grant programs (GAO, 2006 p. 40-41). The Eastern Band of Cherokee in North Carolina was able to deploy a fiber optic cable network in rural and rugged terrain by partnering with a local business (GAO, 2006, p. 43), and the Southern California Tribal Chairman's Association developed the Tribal Digital Village Network that operated on shared spectrum wireless technologies to provide internet service to 17 Tribes in Southern California (GAO, 2006, p. 45).

Finally, GAO (2006) found that two of the Tribes they interviewed, the Oglala Sioux Tribe and the Navajo Nation, worked with wireless service providers to provide and improve telephone access on their reservations, which were supported by accessing subsidized programs of the Universal Service Fund regulated by the Federal Communications Commission (p. 46-47). Although these successes detailed innovative solutions for Tribes to bridge the Digital Divide, reports continued to illustrate that Tribes consistently lagged behind the overall U.S. population as telecommunications technologies and services progressed. It was not until a decade later in January 2016 that the next major GAO assessment of Tribal telecommunications availability was conducted and released, and by then the telecommunications marketplace had changed

drastically for many communities; however, many of the same barriers and challenges to telecommunications access and availability remained unchanged.

2016 GAO Report - Telecommunications: Additional Coordination and Performance Measurement Needed for High-Speed Internet Access Programs on Tribal Lands

A decade following the 2006 report, the Government Accountability Office (GAO) issued a follow-up report, *Telecommunications: Additional Coordination and Performance Measurement Needed for High-Speed Internet Access Programs on Tribal Lands*. The 2016 GAO report was primarily requested by Ranking Member Frank Pallone, Jr. (D-NJ-6) of the House Committee on Energy and Commerce, and Ranking Member Anna Eshoo (D-CA-18) of the House Subcommittee on Communications and Technology. Additional Members of Congress requesting the GAO study included Representatives Ben Ray Lujan (D-NM-3), Don Young (R-AK-At Large), Tom Cole (R-OK-4), Derek Kilmer (D-WA-6), Suzan DelBene (D-WA-1), and Jared Huffman (D-CA-2) (U.S. Government Accountability Office [GAO], 2016). Congressional requesters directed GAO to investigate the availability of high-speed internet access on Tribal lands and in response GAO (2016) examined:

> "1) Perspectives of selected tribes and providers on the importance of high-speed Internet access for tribes and any barriers to increasing this access on Tribal Lands; 2) the level of interrelation and coordination between federal programs at the [Federal Communications Commission] and [U.S. Department of Agriculture] that promote high-speed internet access on tribal lands; and 3) existing data and FCC performance goals and measures related to access to high-speed Internet service on tribal lands and for tribal institutions" (pg.1).

For purposes of this report, GAO (2016) defined 'Tribal lands' as those including, "any federally recognized Indian tribe's reservation off-reservation trust lands, pueblo, or colony, and Alaska Native regions established pursuant to the Alaskan Native Claims Settlement Act, Pub. L. No. 92-203, 85 Stat. 688" (p. 4). GAO (2016) found that of the 21 Tribes interviewed, "many reported poverty and affordability as drivers of low subscribership to existing Internet services or as a barrier to broadening the availability of services" (p. 12). In analyzing 2013 U.S. Census data from the American Community Survey, GAO (2016) determined that 15 of the 21 Tribes interviewed were experiencing poverty rates in excess of the national average of 15.5 percent (p. 12-13).

Tribal officials from the Pueblo of Laguna indicated their residents could not afford both phone and internet service packages and opted for mobile internet subscriptions; Tribal officials from the Confederated Tribes of Salish and Kootenai said their residents could only afford internet subscriptions to the slowest speeds available (GAO 2016, p. 13). In Alaska, GAO reported that residents, "had Internet access through a regional service provider, [but the] provider's services had low data allocations that subscribers routinely exceeded and paid penalties as a result" (p. 13-14). Through its interviews with officials in Bethel, Arkansas, GAO (2016) found that, "applicants for tribal housing assistance with outstanding debt of more than five percent of their income from unpaid mobile Internet bills were ineligible for the assistance" (p. 14). Two internet providers interviewed by GAO (2016) also noted that unpaid internet bills among Tribal households they served provided a disincentive for them to offer internet services (p. 14).

This report was requested by members of congress as a follow up to the 2006 GAO Report.

Congressional requesters directed GAO to investigate the availability of high-speed internet access on Tribal lands and in response GAO.

The report found that of the 21 Tribes interviewed, "many reported poverty and affordability as drivers of low subscribership to existing Internet services or as a barrier to broadening the availability of services" (p. 12).

It was reported that internet connections varied between 1 Mbps and over 25 Mbps on the Tribal lands of those interviewed (p. 9).

Through further interviews conducted with American Indian Tribes and Alaska Native Villages and Associations, GAO (2016) reported that internet connections varied between 1 Mbps and over 25 Mbps on the Tribal lands of those interviewed (p. 9). Half of the Tribal entities interviewed by GAO also indicated several barriers to accessing the internet on their lands, such as high costs, limited data availability, slow download speeds, and unreliable internet service connectivity (GAO, 2016, p. 9). Additionally, many of the Tribal interviewees indicated having mobile internet service, but a few noted they only had 4G service and a few others stated they had no mobile services on their lands (GAO, 2016, p. 9).

Nearly half of the Tribes interviewed noted that they lacked the capacity to apply for funding from federal programs and also did not have Tribal members with the required technical expertise to design broadband internet networks (GAO, 2016, p. 14-15). Further complicating Tribal access to federal funds for internet infrastructure, GAO (2016) noted that programs administered by the Federal Communications Commission (FCC) and U.S. Department of Agriculture (USDA) did not effectively coordinate their outreach and technical assistance efforts regarding programs targeted for internet infrastructure (p. 21).

GAO (2016) noted that in its 2006 report it recommended the federal government collect data regarding internet access on Tribal lands which has occurred since, but noted that the FCC had not developed performance goals and measurements for such access (p. 22). The National Broadband Map was one of the major initiatives funded by the *American Recovery and Reinvestment Act of 2009* (P.L. 111-5) to collect data on telecommunications access levels across the country. From 2010 to 2014, the National Broadband Map published data on its website based on data collected from telecommunications service providers (GAO, 2016, p. 23).

GAO (2016), however, did not analyze the accuracy of the data referenced in the National Broadband Map, but indicated the data was based on census block coverage (p. 23- 24). As with the data collection conducted through the FCC's Form 477, GAO (2016) stated that, "if a service provider reported any availability of high-speed Internet in a Census block, the entire block was counted as served. This could create misrepresentations of service in rural areas, which generally constitute large Census blocks" (p. 24-25). GAO (2016) reported that some Tribal officials stated that, "the National Broadband Map exaggerated the level of service on their reservation making them unable to compete for some [Universal Service Fund] and [USDA Rural Utilities Service] programs" (p. 25).

2018 GAO Report - Broadband Internet: FCC's Data Overstate Access on Tribal Lands

In September 2018, the Government Accountability Office (GAO) issued a report that reiterated issues with data collection by the Federal Communications Commission (FCC) and its Form 477. The report was requested by Chairman John Hoeven (R-ND) and Vice Chairman Tom Udall (D-NM) of the Senate Committee on Indian Affairs. The request of the report was also supported by Senators John Barrasso (R-WY), Maria Cantwell (D-WA), Steve Daines (R-MT), Martin Heinrich (D-NM), Heidi Heitkamp (D-ND), Brian Schatz (D-HI), and Jon Tester (D-MT) (U.S. Government Accountability Office [GAO], 2018). The report was requested to examine the methods of data collection for broadband internet service on Tribal lands, and in response GAO (2018) examined:

> 1) 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 2) the extent to which FCC obtains Tribal input on the accuracy of provider-submitted broadband data for Tribal lands (p.3).

- The FCC collects data on broadband ***availability*** from providers.
- Data collection methods leads to overstatements of service for Tribal lands.
- Because the FCC uses these data to measure broadband ***access***, it overstates broadband access on Tribal lands.
- ***Availability does not***

GAO (2018) interviewed officials from 25 Tribal governments or representatives from Tribally-owned and operated communications providers, and also conducted 9 site visits to Tribal lands (p. 3). GAO (2018) also interviewed 10 non-Tribal telecommunications providers of fixed and mobile services, 3 associations representing the telecommunications industry, and reviewed public comment filings submitted by industry providers to the FCC on various rulemaking issues (p.4). As aforementioned in the 2016 report produced by GAO, passage of the *American Recovery and Reinvestment Act of 2009* (P.L. 111-5) charged the National Telecommunications & Information Administration (NTIA) with awarding grants to the states and territories to collect data for a National Broadband Map (GAO, 2018, p. 9-10).

Upon final allocation of grant funds to NTIA in 2014, the FCC maintained online access to the National Broadband Map through a memorandum of understanding with NTIA (GAO, 2018, p. 10). Although the FCC did not receive a budget request of $3 million from Congress for fiscal years 2015 and 2016 to update the map, it was able to launch an updated 'Fixed Broadband Deployment' map in 2018 (GAO 2018, p. 10-11). The FCC's 'Fixed Broadband Deployment' map relies on data collected twice a year from its Form 477, which requires, "fixed broadband providers [to] submit a list of the census blocks in which their broadband service is available" and, "mobile providers [must] submit 'shapefiles'...of their coverage areas" (GAO, 2018, p. 10). GAO (2018) determined that the FCC's Form 477 data:

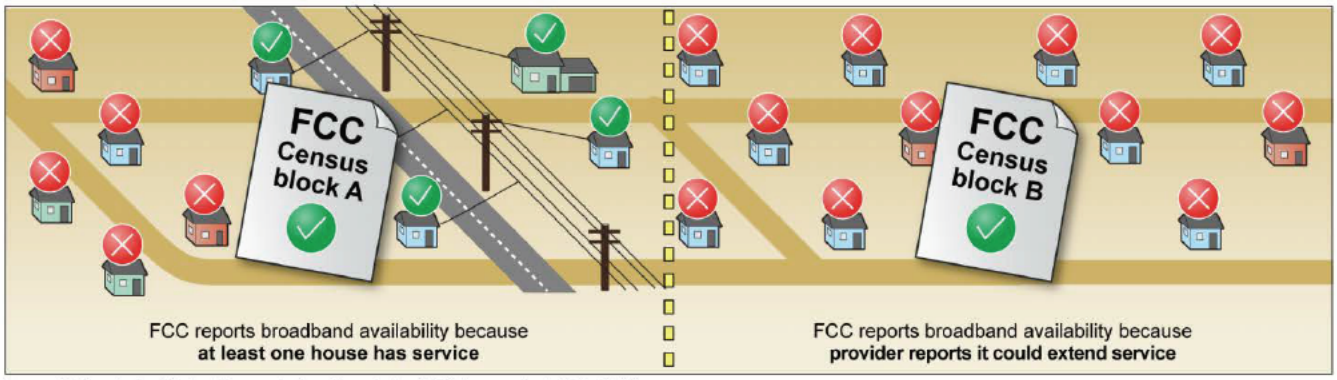
> "Does not accurately or completely capture broadband access on tribal lands because it (1) captures nationwide broadband *availability* data—areas where providers may have broadband infrastructure—but does so in a way that leads to overstatements of availability, and (2) does not capture information 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" (p. 14).

Data Reliability: Barriers and Challenges

In reference to Form 477 mobile data, half of the Tribal government officials interviewed by GAO expressed concern that coverage maps were overstated for services available on their lands. Similarly, comments filed to the FCC by broadband providers questioned using Form 477 data to identify eligible areas for the FCC's Mobility Fund Phase II program, which provides targeted funding for mobile deployment in unserved areas (GAO, 2018, p. 15-16). As mentioned throughout this paper, issues have also been raised regarding the accuracy of Form 477 data on access levels to terrestrial broadband services. The FCC's annual broadband reports and service area maps are based on Form 477 filings submitted by broadband providers self-reporting the census blocks their service is available (GAO, 2018, p. 16-17).

The FCC's Form 477 definition of 'available' is, "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" (GAO, 2018, p. 17). GAO (2018) determined that the 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" (p.17). GAO (2018) found that in a filing submitted by one provider to the FCC, "[the] 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" (p.17).

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



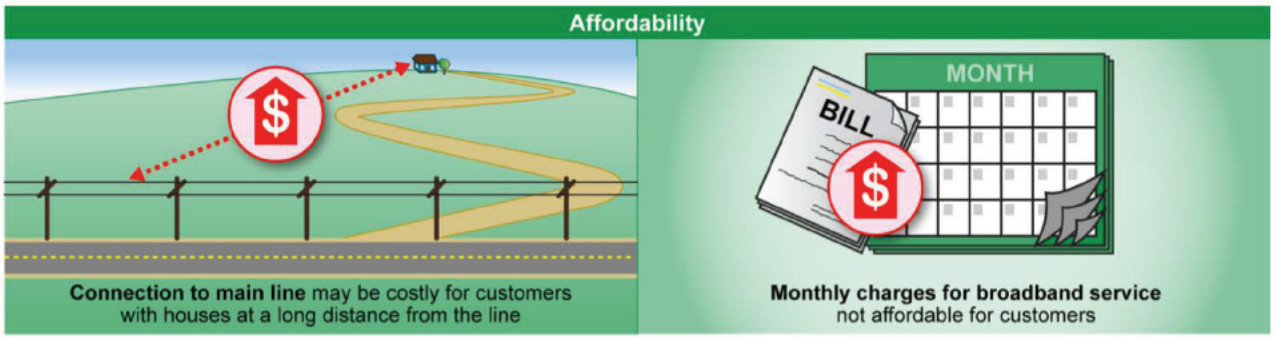
Source: GAO analysis of Federal Communications Commission (FCC) documents. | GAO-18-630

While the FCC continues to use census block data from its Form 477, it has also acknowledged that not every person or location may have broadband access within a reported census block (GAO, 2018, p. 19). Furthermore, the FCC has acknowledged that in rural areas census blocks can be quite large and that providers may only serve a portion of a large census block where rural Tribal lands are located (GAO, 2018, p. 19). GAO (2018) noted that in a few interviews with Tribal governments and organizations they stated 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" (p. 19).

Thereafter, the FCC proposed a rulemaking in 2017 to modernize its Form 477 and require that broadband providers collect and report sub-census block data to provide more granular information (GAO, 2018, p. 19). However, one-third of respondents filed comments opposing the FCC's proposal believing there was no need for more detailed information on broadband availability (GAO, 2018, p. 19). GAO (2018) also noted that, "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" (p. 19).

In addition to the census block data reporting of the Form 477, GAO also reported that the FCC does not collect and report data regarding broadband affordability, quality of service, and instances where service may be denied (GAO, 2018, p. 20). Most of the representatives of Tribal governments and organizations interviewed by GAO (2018) stated that, "affordability of broadband services is an important factor for understanding whether or not people on tribal lands could realistically access broadband services" (p. 20). One Tribe interviewed stated their residents could not subscribe to internet service because of the high cost (GAO, 2018, p. 20). The Tribe explained that the provider charged $130 per month for internet speeds of just 10 Mbps/1Mbps, which according to the FCC is, "approximately one-and-a-half times the average rate providers charge for comparable services in urban areas..." (GAO, 2018, p. 20-21).

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



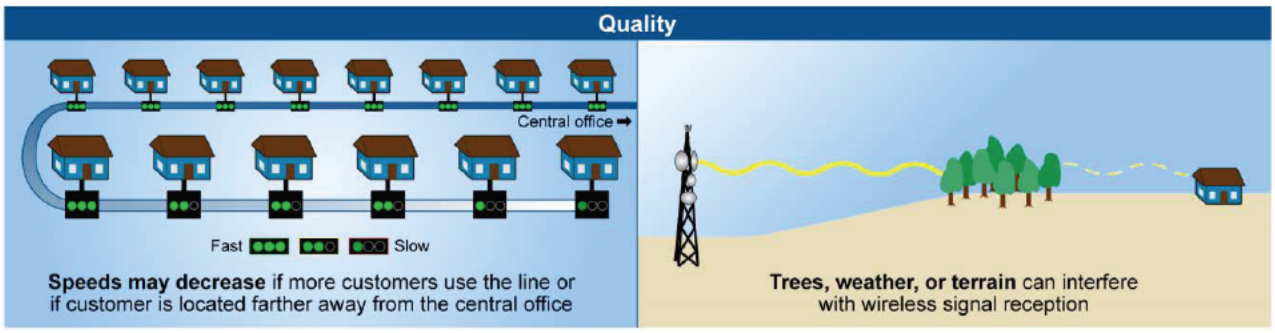
Source: GAO. | GAO-18-630

In the FCC's *2018 Broadband Progress Report* it was acknowledged that the affordability of broadband services can affect subscribership, but the collection of such data did not fall within the FCC's congressional mandate under Sec. 706 of the *1996 Telecommunications Act* (GAO, 2018, p. 21.). However, FCC officials interviewed by GAO (2018) stated 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" (p. 21).

What results is that where availability may exist, other barriers and challenges may rise to prevent access to telecommunications. Under the *1996 Telecommunications Act*, Congress defined 'advanced telecommunications capability', "as high-speed...broadband telecommunications...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)). In examining quality of service issues, GAO (2018) found that almost all of the representatives from Tribal governments and organizations interviewed said that slow internet speeds, internet outages, and high latency issues provided a barrier to access for residents of Tribal lands (p. 22). Most Tribal representatives, as well as a few broadband providers, noted that the quality of

internet service a subscriber receives can depend on issues such as terrain, weather, and the types of technology being used to provide service (GAO, 2018, p. 22). Some Tribal representatives interviewed by GAO (2018) also noted that oversubscription of available internet services, as well as outdated or limited broadband infrastructure, also hindered residents from even basic internet services (GAO, 2018, p. 22).

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

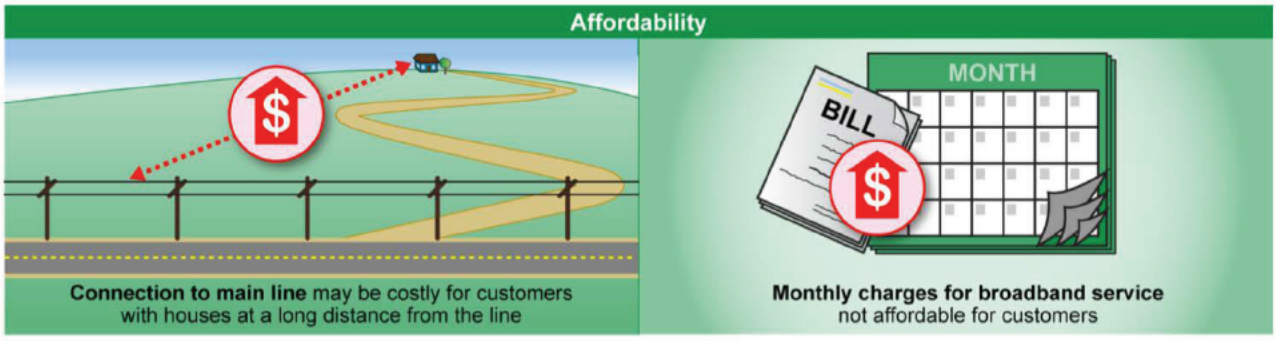


Source: GAO. | GAO-18-630

Instances where internet service is available but denied to residents requesting it is also not reported to the FCC through its Form 477. The FCC recognizes that data regarding service denial is important to ascertain if people are able to access broadband services, and the National Broadband Plan recommended the FCC collect data to determine if someone was being denied service due to their income level and geographic area (GAO, 2018, p. 23-24). Some Tribal representatives reported to GAO (2018) that service was being denied to residents of their Tribal lands, which they believed was due to disputes with the Tribal government, as well as high costs and low demands for service (p. 24). Additionally, some Tribal representatives interviewed by GAO (2018) noted that broadband providers could not provide service because current Tribal infrastructure capabilities were not able to meet provider requirements (p.24). During one of its site visits to Tribal lands, GAO (2018) stated,

> "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" (p. 24-25).

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



Source: GAO. | GAO-18-630

Some Tribal officials interviewed by GAO (2018) reported that due to the misrepresentation of broadband access on Tribal lands, they were precluded from applying for federal funds for broadband infrastructure deployment (p. 26). GAO (2018) also reported that one Tribe that provides internet services on its lands stated that its, "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 overstates actual access on the tribe's land" (p. 26). In 2011, the FCC, through its Office of Native Affairs and Policy, issued its *Further Guidance on Tribal Government Engagement Obligation Provisions* (27 FCC Rcd 8176), which required telecommunications providers to meaningfully engage with Tribal governments on the deployment of communications services on Tribal lands (GAO, 2018, p. 32).

While not all telecommunications service providers receive Universal Service Fund support, those that do must annually file Form 477 which informs FCC data and reports. In order to be eligible for subsidy support from the Universal Service Fund, a telecommunications provider must receive certification from the FCC to be designated as an eligible telecommunications carrier (ETC). Once a telecommunications provider is designated as an ETC they become eligible to apply for subsidy support from the Universal Service Fund through its High Cost Program, Lifeline/Link-up Program, Schools and Libraries Program, or its Rural Health Care Program.

Telecommunications companies receiving such subsidy support from the Universal Service Fund are required to annually file a report to the FCC detailing engagements with Tribal government(s) in their service area(s) (Federal Communications Commission [FCC], 2012). In its *Further Guidance*, the FCC stated that documentation must be provided on engagement with Tribal government on,

> "(1) A needs assessment and deployment planning with a focus on Tribal community anchor institutions; (2) feasibility and sustainability planning; (3) marketing services in a culturally sensitive manner; (4) rights of way processes, land use permitting, facilities siting, environmental and cultural preservation review processes; and (5) compliance with Tribal business and licensing requirements" (FCC, 2012, p. 8178).

However, half of the Tribal representatives interviewed by GAO (2018) stated that obtaining information about broadband deployment on their lands was a difficult process despite it being part of the requirements for carriers to engage with Tribal governments on such an issue (p. 32). For instance, one Tribal representative informed GAO that his requests to meet with a provider serving the Tribe's lands refused to meet more than once a year to discuss the provider's deployment plans (p. 32-33). Additionally, some Tribal representatives reported to GAO (2018) that, "providers heavily redacted deployment information or required the tribe to sign a non-disclosure agreement", which one Tribal representative stated that, "these non-disclosure agreements could possibly require tribes to waive tribal sovereign immunity in order to view the data" (p. 33).

In conclusion, GAO (2018) provided the following recommendations to the Chairman of the FCC,

> "1) Develop and Implement methods—such as targeted data collection—for collecting and reporting accurate and complete data on broadband access specific to tribal lands; 2) 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; 3) Obtain feedback from tribal stakeholders and providers on how to fulfill their tribal engagement

requirements to determine whether FCC needs to clarify the agency's tribal engagement statement" (p. 35)

Survey Implementation and Data Assessment

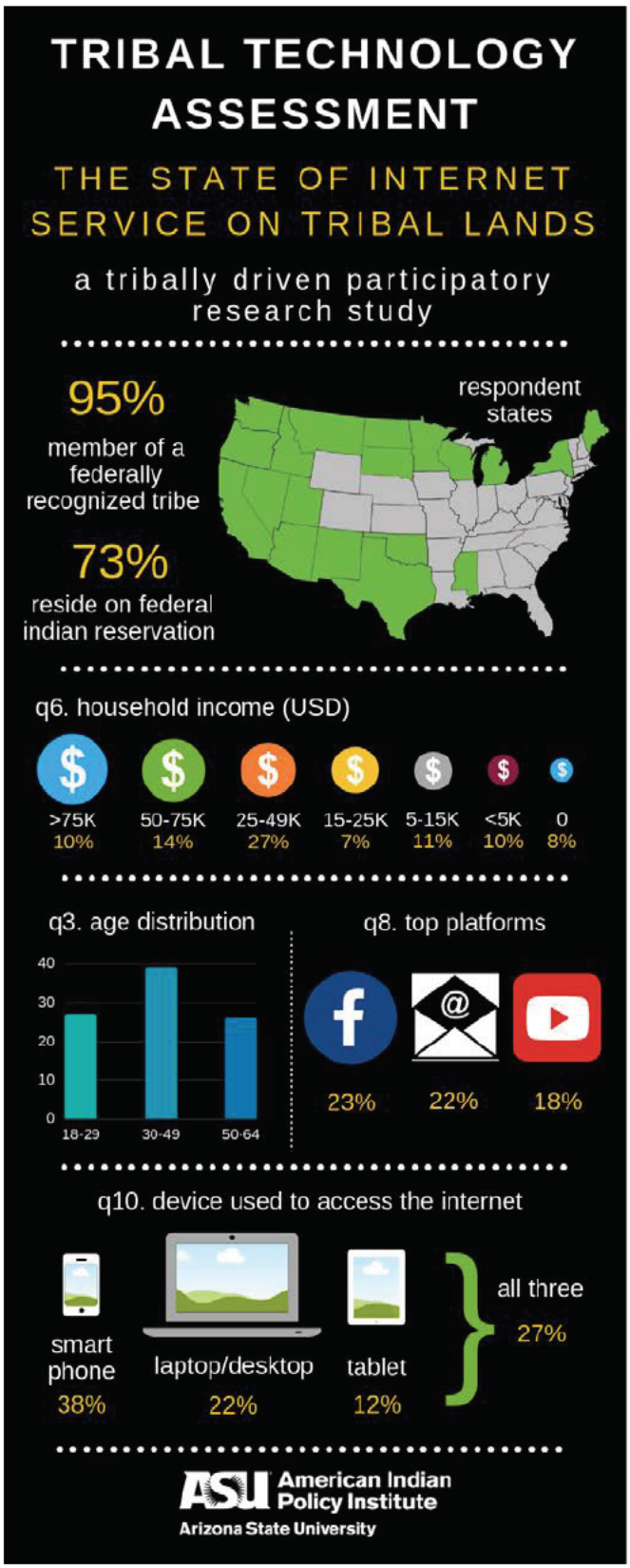
Overall, despite the relatively small sample, data indicates that respondents on Tribal lands are using cellphones, specifically smart phones, to access the internet. Additionally, many Tribal respondents are connecting publicly and at a friend or relative's house. The age distribution shows a representative spread demographically between ages and that respondents are using the internet for not only social uses, but civic and educational uses as well and mostly on a smart phone. This implies data limitations as opposed to wired connections, data caps, and price consideration. The question responses are summarized below and the included infographic depicts the top responses.

The *Tribal Technology Assessment: The State of Internet Service on Tribal Lands* survey instrument included twenty-two questions At the close of the survey on June 15, 2018 there were 244 recorded respondents that had participated to some extent in the survey,166 respondents actually qualified for the survey, and 160 (N=160) fully completed the survey. The 160 individual Tribal respondents were from Tribal lands in 19 different states and all Bureau of Indian Affairs (BIA) regions. While this is a small sample, it should be noted that the *2009* had 182 complete responses out of 196 surveys administered and that study has been the primary source of independent data until now.

Included in this report (Appendix III) is a table that documents all of the respondents, with non-identifying information, that participated in the AIPI *Tribal Technology Assessment*. The table indicates the number of respondents that fully completed the AIPI survey, as well as those that did not complete the survey and at which question of the survey they stopped at. It also provides information on the federally-recognized Tribe that respondents confirmed they were enrolled in, the number of respondents per Tribe, and in which state(s) each Tribe is located. The data is also presented to show which respondents took the AIPI survey in-person, and at what location, as well as those that took it online and where they obtained the weblink from.

Q1: I am an enrolled member of a federally-recognized tribe in the United States located in the lower 48 states (Alaska and Hawaii are excluded).

Respondents were asked to state their Tribal enrollment status. This question served as a qualifier seeking only to obtain data from federally enrolled Tribal members in the lower forty-eight states for comparison with other data sources. Upon reviewing the 244 recorded responses, 241 completed this question with 95 percent (230) affirming that they were in an enrolled member of a federally-recognized Tribe. This question was used to confirm that respondents were enrolled members of a federally-recognized Tribe based on their respective Tribe's enrollment criteria. This question included qualifier, Q1a which asked respondents the name their federally-recognized Tribe/reservation via a drop-down menu of federally-recognized Tribes located in the contiguous 48 states. From this selection, the respondent was able to select the applicable Tribal designation indicating their enrollment status as a member of the selected Tribe. The rationale for developing this question was to confirm that survey responses collected would represent those individuals that were in fact enrolled members of a federally-recognized Tribe and set-up question two in which respondents indicate whether or not he/she



resides on a Tribal reservation in the contiguous United States.

Q2: *My primary residence is on a federal Indian reservation (includes tribal lands held in trust, a Pueblo, or Former Reservation Lands in Oklahoma).*

Respondents answering this question qualified their primary residence. Our objective was to identify those residing on a federal Indian reservation (including Tribal lands held in trust, a Pueblo, or Former Reservation Lands in Oklahoma) vs. non-Tribal land. While 241 individuals completed Q1, only 226 individuals completed Q2 with 73 percent (166) affirming their primary residence was on a federal Indian reservation. Respondents were then asked to provide the zip code of their residence if stating their primary residence was on an Indian reservation. Of the 166 that provided a qualifying zip code answer, 160 fully completed the survey. The data below are based on the final 160 that fully completed the survey.

Q3: *My Age: 18-28, 30-49, 50-64, and 65+ (via a radio button).*

Information regarding the respondent's was sought for several reasons. First, to ensure respondents were legal adults aged 18 or above. Secondly, to determine age related use and access of internet. Indian Country is a young population with 32 percent being under the age of 18; 42 percent under the age of 24; and the median age of Native Americans on reservations being 26 (National Congress of American Indians [NCAI], 2018). Given the young age of Natives on the whole, the survey sought to ensure that data was captured from both young and adult populations. Respondents that confirmed their primary residence was on an Indian reservation with 39 percent indicating that they were between the ages of 30 and 49, and 27 percent between 18 and 29. Interestingly, 34 percent of respondents were 55 years old or older, with 26 percent of that total between ages 50 and 64.

Q4: *There are school age children (4-18 years old) living at my household: Yes, every day of the week; yes, almost every day of the week; yes, only some days of the week; and, no not any days of the week (via a radio button).*

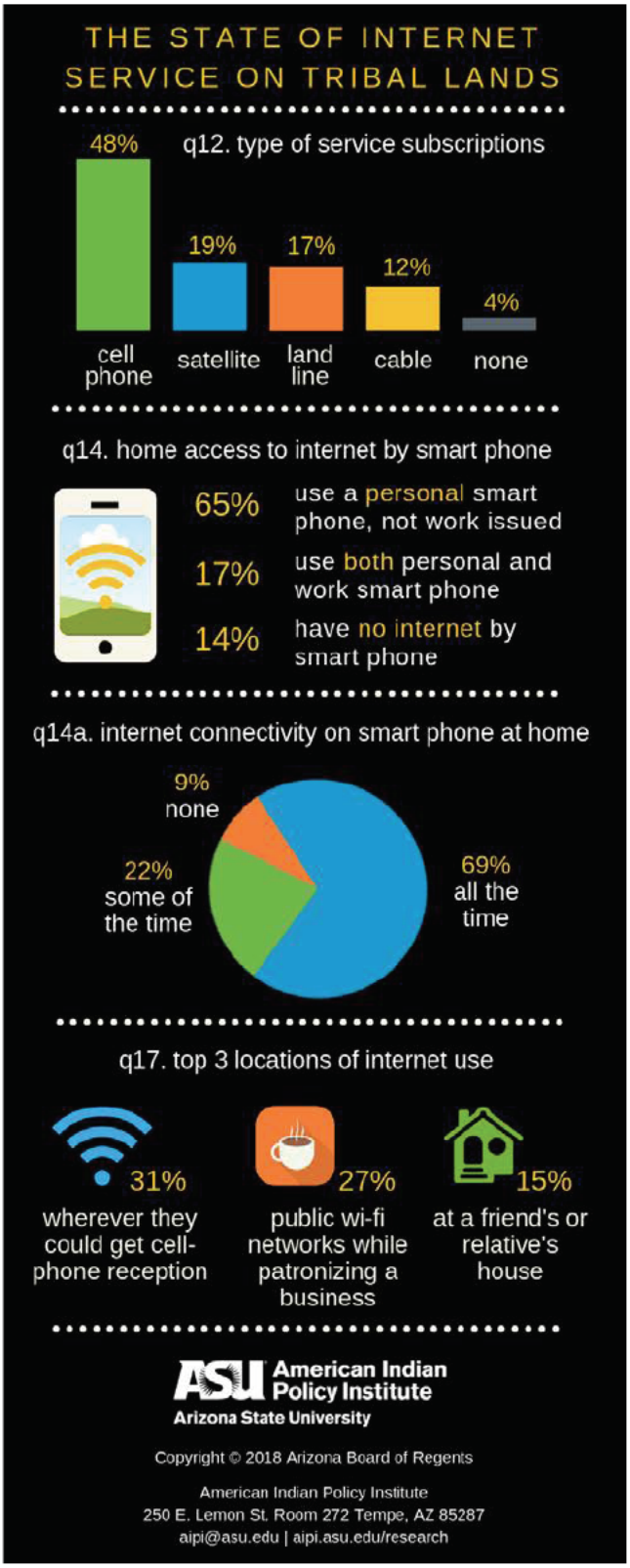
Given the significant use of the internet for educational purposes, Q3 asked respondents the number of school age children living in the household. Fifty percent indicated they had a school age child between the ages of 4 and 18 years old living at their residence. Thirty-three percent of respondents indicated that they did not have a school age child residing at their household.

Q5: *The highest level of education I have completed is: less than a high school diploma; high school graduate/diploma; GED; technical/vocational training; some college; college degree (associate's and/or bachelor's degree); graduate level degree.*

Responses indicated a wide dispersion of demographics in terms of educational levels. Of qualified respondents, 35 percent indicated they had a college degree, which was qualified as having an Associate's or Bachelor's degree. Twenty-three percent of respondents indicated they had some college education, while nearly 17 percent indicated they had a high school diploma, and another 18 percent had a graduate degree.

Q6: *My annual income is:*

Respondents were asked to indicate their annual income level given a series of choices; they could choose not to answer or fill in a box if they did not know. The respondents with the highest percentage at nearly 27 percent indicated that they had an annual income between $25,000 and $49,000. The second highest ranking choice indicated that 14 percent of respondents earned between $50,000 and $74,999 annually. Following this, and within a percentage point on either side, were those earning between $15,000 and $24,000 (10.37 percent); those choosing not to answer (10.98); those earning less than $5,000 (9.76 percent); those earning more than $75,000 (9.76 percent); and, those unemployed (8.54 percent).



Q7: *Over the past month, I have use the internet: several times a day; about once a day; several times a week; between 1 and 10 times; and, never.*

One of the larger questions the survey sought to answer was usage of the internet. Q7 was one of several seeking specific data on usage asking the general question of how often the responded had used the internet over the course of the prior month. The survey data collected found that a majority of respondents accessed the internet several times a day. A full 80 percent of respondents indicated they accessed the internet several times a day. Following this, 7.32 percent and 6.71 percent indicated they used the internet about once a day or once a week respectively.

Q8: *I have or use the following account(s) (check all that apply): Facebook; Twitter; Email; Snapchat; Instagram; LinkedIn; YouTube; or, other (specify).*

The survey sought to determine what type of media accounts respondents used in Indian Country. Among the most used accounts were Facebook (23 percent), Email (22 percent), and YouTube (18 percent). Following this and within two percentage points of each other are Instagram (10 percent), Snapchat (9.46 percent), and Twitter (8.65 percent). About one percent filled in a box indicating they used other sites such as blogs, Tumbler, Google/ Google+, Dischord, and/or Pinterest.

Q9: *I own or use any of the following (check all that apply): a desktop computer and/or laptop; smart phone; tablet computer; all of the above; I don't own any of these; I own a flip phone.*

Following a question on device ownership, the survey asked respondents about technology used to access the internet. Not surprisingly, 35 percent of respondents own or use a smart phone. Nearly 24 percent own or use a computer and/or laptop computer, and 23 percent own or use a multitude of devices including computer/laptop computer, smart phone, and tablet computer. Finally, 16 percent use a tablet of no particular specified brand.

Q10: *I use the following to access the internet or go online (check all that apply): a desktop computer and/or laptop; smart phone; tablet computer; all of the above; I don't own any of these; I own a flip phone.*

The objective of this question was to further expand on the type of device used by respondents. Given the state of connectivity on Tribal lands, it is not surprising the data indicates that 38 percent use smart phones for internet access. Nearly 22 percent use a desktop or laptop for access and nearly 12 percent use a tablet. Finally, nearly 27 percent use all three of these types of devices to access the internet.

Q11: *I have access to the internet at my household (check any that apply): Yes, with a subscription to the internet through a cable company (such as Cox, Comcast, RCN, etc.); Yes, through a phone company (such as CenturyLink, Frontier, Windstream, tribally-owned/operated service provider, etc.); Yes, through a cell-phone provider (such as a smart phone or mobile Wi-Fi hotspots/jetpacks); Yes, through a satellite service provider; Yes, through Dial-Up service; No, I do not get any internet access in my household.*

Respondents were asked how they access the internet; however, in answering this question we were also able to determine internet speed access ranges. Knowing that most respondents would not know their internet speeds if asked, the instrument used the question of how they access the internet to determine speeds. It is widely recognized by industry professionals that

cell phone speeds, cable speed, DSL speed, and satellite speed all differ greatly in performance and speed delivery/transmission. Therefore, this question really sought to determine speed and technology access on Tribal lands. The largest percentage of survey respondents (36 percent) are accessing the internet via a phone company such as CenturyLink, Frontier, Windstream or a Tribally owned/ operated service provider. Another 29 percent are accessing through a cell-phone provider via smart phone or mobile wi-fi hotspots. Just 12 percent are accessing the internet through a cable subscription. Six percent are accessing the internet through satellite. Finally, there are still people on Tribal lands accessing the internet through dial-up. While that number is only 1 percent, it is an indicator of how slow access speeds are and to what lengths people will go to access the internet.

Q12 I am a subscriber or primary account holder of the following providers (check all that apply): Cell-phone; Home (landline) telephone; Cable; Satellite; I am not a subscriber to any of these.

Question 12 served to ask respondents if they were the primary subscriber or primary account holder with regard to various types of providers of technology. More than 47 percent of respondents indicated they subscribe to a cell phone plan, 18 percent indicated subscribe to satellite, and 17 percent subscribed to home (landline) telephone service. Twelve percent subscribe to a cable service. However, nearly 4 percent do not subscribe to any service at all.

Q12a: *If you are not a subscriber to any of the services listed in Q12 and if you could choose between only one way of accessing the internet, which would you prefer?*

Question 12A was only provided to respondents of Q12 that indicated they did not subscribe to any service plans provided by a cell phone, home (landline) telephone, cable, or satellite and asked them how they would prefer to access the internet. Sixty-three percent of qualified respondents indicated they would prefer to access the internet through wireless connectivity (such as a smart phone, or a wireless-connected tablet such as an iPad), while 36 percent indicated they would prefer a wired connection (indicating a cable company or wireline phone company).

Q13: *I can send emails and access the internet through the use of: A personal smart phone; A work smart phone; Both a personal and work smart phone; I use one phone for both personal and work activities; None of the above. (Skip To: Q14a If I can send emails and access the internet through the use of: = I use one phone for both personal and work activities)*

The survey sought to differentiate between internet access and use at an individual's household and not at their place of employment; the meta-question was to ensure that respondents were answering questions about use and access in their home, not at their workplace. In other surveys, it has been shown that people living on the reservation often had access at their workplace and answered accordingly, but this survey specifically sought to determine home use on the reservation. Given this context, survey question thirteen indicated that 83 percent of respondents were sending emails and accessing the internet through the use of a personal smart phone and only about 6 percent through a work issued and smart phone, with just 5 percent using both.

Q14: I can get internet access through a smart phone at my household using: A personal smart phone, but not my work smart phone; My work smart phone, but not my personal smart phone; Both my personal smart phone and my work smart phone get internet at my household; I cannot get internet at my household by any means on a smart phone.

This question asked respondents if and how they were accessing the internet at their *household* through a personal smart phone or an employer issued smart phone. The question also sought to determine if only one or both devices had internet access at their household or if an individual could not access the internet at all by using a smart phone. The data indicated that 65 percent of respondents accessed the internet at their household through a personal smart phone, but not their work smart phone. Only 17 percent stated they could access the internet through both their personal and work smart phone. *Fourteen percent of respondents indicated that they could not get internet at their household by any means on a smart phone*.

- *Fourteen percent of respondents indicated that they could not get internet at their household by any means on a smart phone.*

Q14a: *I have Internet access on my phone while at home: All the time; Some of the time; I have to travel outside my residence to get reception; I do not have reception at my residence or can travel to a nearby location that has access.*

Individuals that responded to question 13 saying that they used one phone for personal and work activities to send emails and access the internet did not provide an answer to question 14 and were instead skipped to question 14a. Question 14a asked them about the quality of their connection at home, if they had internet access on their smartphone while at home and 69 percent stated they have internet access on their smart phone all of the time at their home residence, while 22 percent indicated they only had access some of the time. Nearly six percent of respondents claimed that they had to travel outside of their home residence to get smart phone reception while about 3 percent stated that they did not have smart phone reception at their house.

Q15: *I feel my internet use is more limited than I want because I do not have enough data on my cell-phone plan: Yes / No.*

Question fifteen queried respondents as to whether they felt their internet use was limited because of cell phone access only. The response was nearly even between yes and no answers with 50 percent affirming they felt their internet use was more limited then they wanted because they did not have enough data on their cell-phone plan, while 49 percent felt they had enough data on their cell-phone plan.

Q16: *The main reason I do no use the internet at home (check all that apply).*

Q16 was designed to solicit responses from respondents regarding why they did not use the internet at home. Respondents were provided a drop down menu with eight possible selections including “other” and asked to check “all that apply,” The majority of respondents selected “other”; however, we do not feel this is reliable information as there was no opportunity for respondents to insert their response as to “other.” Therefore, Q16 is eliminated in the data analysis and continues with question seventeen.

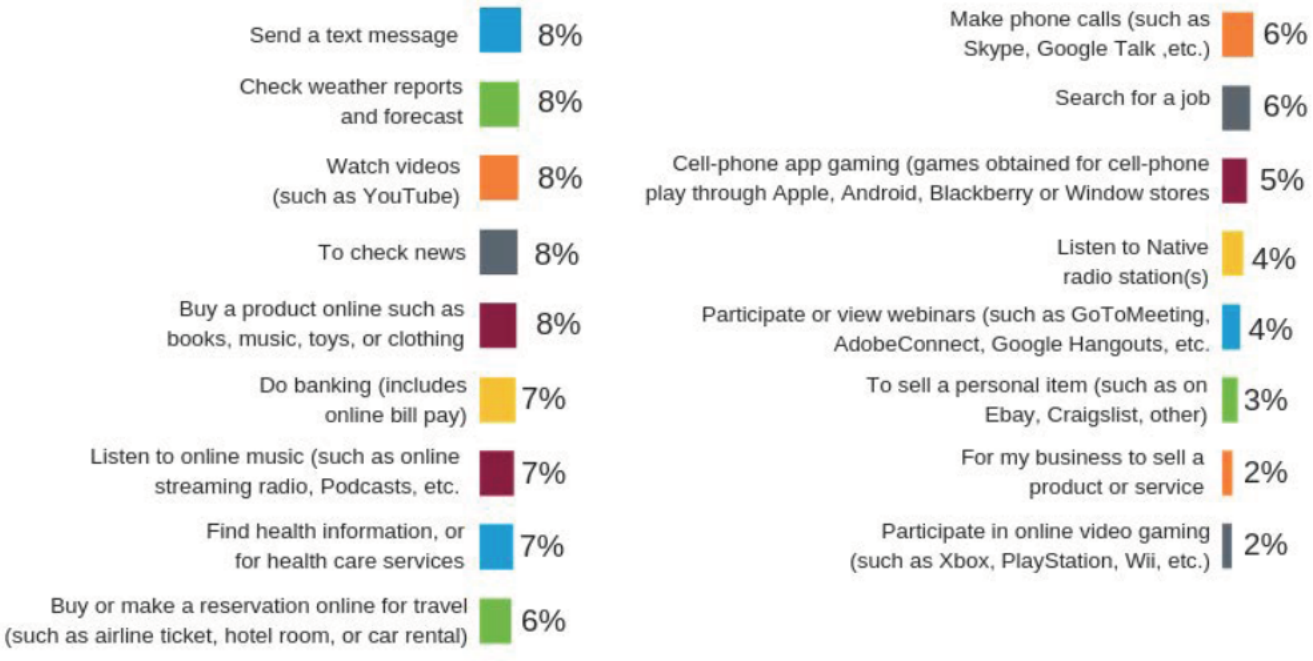
Q17: *I use the internet at the following locations (check all that apply): School; Community center or library; Open Wi-Fi while patronizing an open place of business (fast food, coffee shop, etc.); At a friend or relative's house; Wherever I can get cell-phone reception.*

The objective of Q17 sought to quantify where reservation respondents are accessing the internet if not at home. There are many anecdotal claims of those accessing the internet at

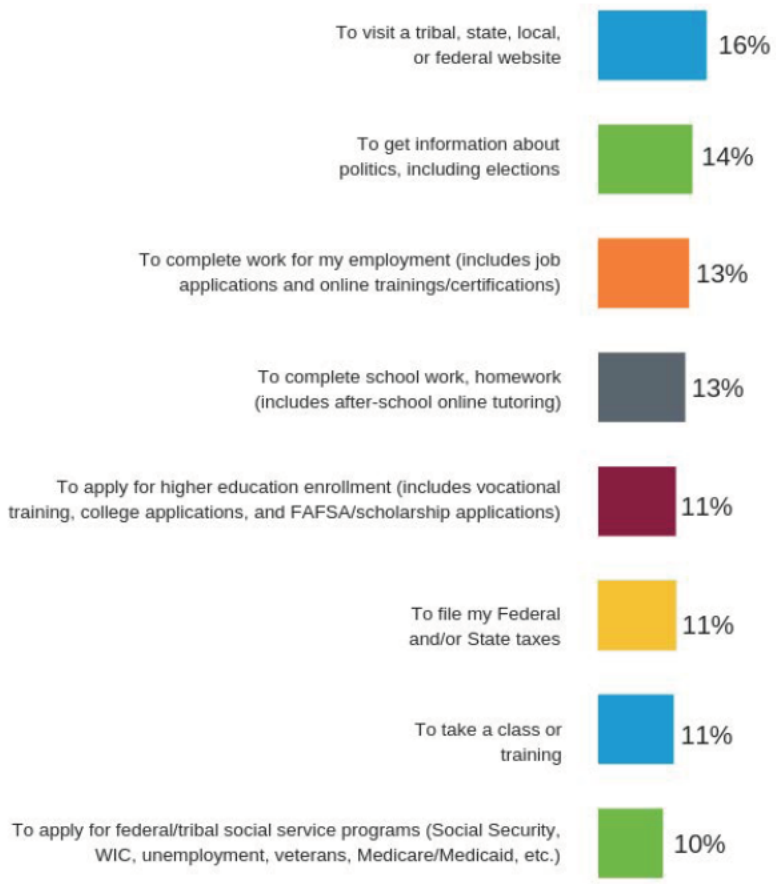
various locations from the side of the road to a parking lot of a business; this question seeks to quantify this situation and determine validity. Respondents were asked at what locations they access the internet. The majority of respondents or over 31 percent indicated that they used the internet wherever they could get cell-phone reception. About 27 percent stated that they used the internet by accessing public Wi-Fi networks while patronizing a place of business, such as a fast food restaurant or coffee shop. Another 15 percent responded to accessing the internet at a friend or relative's house. Nearly 15 percent accessed the internet at school, and just 11 percent accessed the internet at a community center or library presumably because they do not have internet connection in their home.

Q18: *Have you ever used the internet to do any of the following things (check all that apply): Buy a product online such as books, music, toys, or clothing (1); Buy or make a reservation online for travel (such as airline ticket, hotel room, or car rental) (2); To sell a personal item (such as on Ebay, Craigslist, other) (3); For my business to sell a product or service (4); Check weather reports and forecasts (5); To check news (6); Send a text message (7); Search for a job (8); Watch videos (such as YouTube) (9); Listen to online music (such as online streaming radio, Podcasts, etc.) (10); Listen to Native radio station(s) (11); Make phone calls (such as Skype, Google Talk, etc.) (12); Participate or view webinars (such as GoToMeeting, AdobeConnect, Google Hangouts, etc.) (13); Find health information, or for health care services (14); Do banking (includes online bill pay) (15); Participate in online video gaming (such as Xbox, PlayStation, Wii, etc.) (16); Cell-phone app gaming (games obtained for cell-phone play through Apple, Android, Blackberry, or Windows stores) (17).*

Respondents were asked about internet use for personal and social uses including from buying and selling products to checking news to banking and health care. They could check any and all boxes from 17 choices. See data chart below and refer to survey instrument.



Q19: *Have you ever used the internet to do any of the following things (check all that apply): To complete school work, homework (includes after-school online tutoring) (1); Take a class or training (2); To complete work for my employment (includes job applications and online trainings/certifications) (3); To visit a tribal, state, local, or federal website (4); To apply for higher education enrollment (includes vocational training, college applications, and FAFSA/scholarship applications) (5); To file my Federal and/or State taxes (6); To apply for federal/tribal social service programs (Social Security, WIC, unemployment, veterans, Medicare/Medicaid, etc.) (7); To get information about politics, including elections (8).*

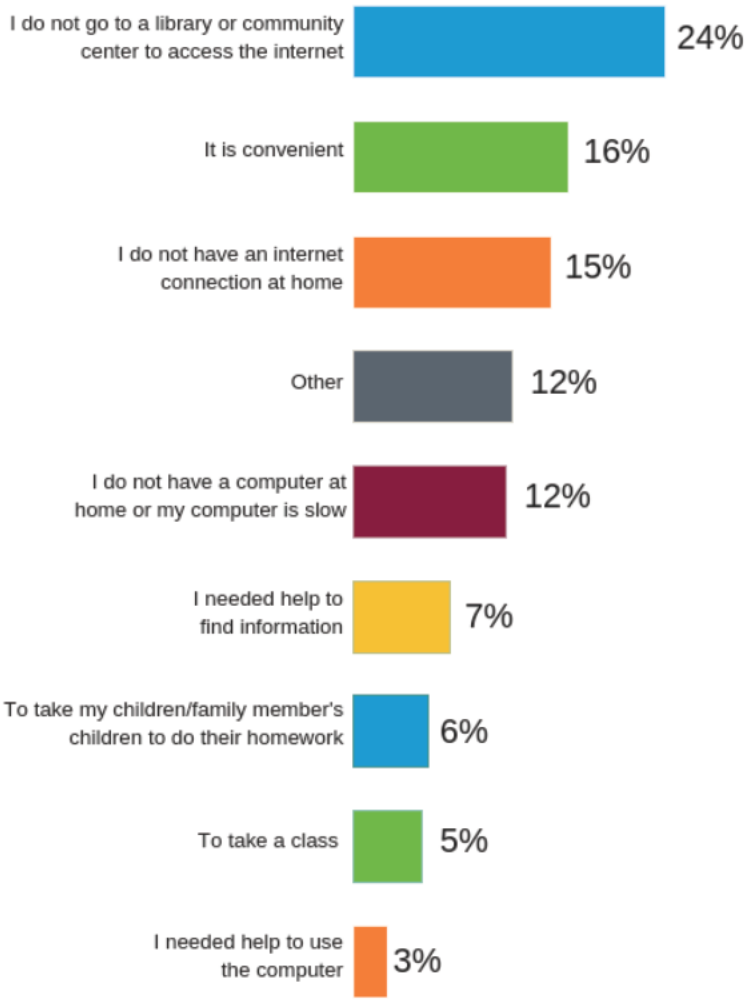


Respondents were asked about educational and civic uses of the internet. The graph below illustrates that respondents are making significant use of the internet for everything from filing taxes to online education.

Q20: *Does your tribe have information and/or programs that can provide information on the benefits of internet use and how to get the internet? Broadband, high-speed internet is not available where I live; Yes, and I know how to access the information; I am not sure/do not know; No.*

This question sought information to determine if the respondent's Tribe provided information and/or programs on the benefits of internet use and how to get access to the internet. Nearly 44 percent indicated they were unsure or did not know if their Tribe offered digital literacy information or programs. Twenty-five percent of respondents stated that their Tribe did not offer any digital literacy programs, while 20 percent indicated that their Tribe. However, nearly 44 percent stated they were did not know if their Tribe offered digital literacy programs. Finally, 10 percent indicated that there was no broadband where they lived.

Q21: *I use the internet at a library or community center because (check all that apply): I do not have a computer at home or my computer is slow (1); I do not have an internet connection at home (2); I needed help to find information (3); I needed help to use the computer (4) ; It is*



convenient (5); To take a class (6); To take my children/family member's children to do their homework (7); Other (8); I do not go to a library or community center to access the internet (9).

Because one of the most recent community studies, *Digital Inclusion in Native Communities: the Role of Tribal Libraries*, was partially on Tribal library connectivity and access, this survey asked one question on internet access and use at Tribal libraries and community centers. Respondents varied in their reasons for why and how they use the internet at their Tribal library or community center. While 23.81 percent of respondents indicated they do not go to a library or community enter to access the internet, 16 percent stated they went because it was convenient, and 15 percent responded they did not have an internet connection at home.

Q22 I received a link to this online survey from: An Email (Directly or Forwarded); From a Social Media Post.

Question 22 was a simple question to end the survey and is the question that allows the Research Team to determine where survey respondents heard about the survey, if they were not interviewed directly in-person.

Conclusion

The purpose of conducting the AIPI *Tribal Technology Assessment: The State of Internet Service on Tribal Lands* was to create the first academic and replicable quantitative study on broadband access, device use, and uses of the internet by Tribal peoples on Tribal lands. The central tenet of this study was to document the Digital Divide(s) and to create a new baseline for

future studies with the expectation of potentially measuring growth in coming years. This was a Tribally-driven research study and was done in the true vein of participatory research, as Tribal leadership initiated the research, was involved in all facets of the design, development, interpretation of, and writing of this paper. The concept of this study was conceived by leaders of the National Congress of American Indians (NCAI), the Native American Finance Officers Association (NAFOA), and AIPI Advisory Board Members as early as January 2016. The resulting data in the current study and data to be obtained in subsequent years is created specifically for use in Tribal advocacy by Tribal Nations; for use by NCAI and other organizations; and for use by federal agencies, Congress, and the White House.

The data from this survey is independent data. The *Tribal Technology Assessment* was conducted from April 21, 2017 to June 15, 2018. At the close of the survey there were 244 recorded respondents that had participated to some extent in the survey; 166 respondents that qualified to complete the survey by being a resident of Tribal lands; and 160 respondents that fully completed the survey. The individual Tribal respondents were from Tribal lands in 19 different states and all Bureau of Indian Affairs (BIA) regions. Respondents participated in the study through various means including in-person at off-reservation pow wows and art markets, as well as online through Twitter and Facebook posts and through email messaging. While this is a small sample, it should be noted that the only previous independent study—the *2009 New Media Study* implemented by Native Public Media—had 182 complete responses out of 196 surveys administered, and that study has been the primary source of independent data until now.

Overall—despite the relatively small sample—the data indicates that respondents on Tribal lands are using smart phones to access the internet, and many Tribal respondents are connecting using public Wi-Fi and connectivity at a friend or relative's house. Respondents demonstrate a representative spread demographically between ages and they are using the internet for not only social uses, but also for civic and educational purposes. Again, much of this activity is occurring through the use of a smart phone, which are important and readily accessible devices for everyday use and critical devices for emergencies.

However, while the data indicates that Tribal users are predominantly mobile users, this data and paper should not be interpreted or used to defend "mobile only" as the singular solution to providing broadband service. In this study, respondents were split in stating that their internet use was limited because they did (49 percent), or did not (50 percent) have enough data in their cell phone plan.

Furthermore, research is needed to ascertain if there are specific limitations of mobile use in certain situations, such as the reliability or preference of using mobile over fiber optics—or other high-speed, hardline services—for things such as completing student homework and conducting online educational training, testing, or class meetings. Research on the preferential or required use of devices, such as computers, laptops, or tablets, for completing homework, training, testing, or class meetings would also be beneficial to further understanding desired internet services. This survey focused on asking a broad population of adult internet users on Tribal reservations. Therefore, this study provides a baseline for future research on internet access for educational attainment, such as on-reservation parents that have school-aged children at home that require internet access for schoolwork; young adults attending online college courses; or other uses of internet for other educational purposes would assist in ascertaining the preferred devices and services desired by these Tribal populations.

Policy Recommendations and Priorities to Bridge the Digital Divide in Indian Country

A broad ecosystem of telecommunications services and applications is needed to appropriately and adequately address the Digital Divide in Indian Country. While the findings of this Tribal Technology Assessment highlight and emphasize the strong reliance on and use of mobile technologies within Tribal communities, it is crucial to understand the infrastructure technologies needed to provide ubiquitous and affordable internet service. The future is both terrestrial-based fiber, or high-capacity fixed wireless to the home, and the provision of affordable high-speed mobile services. The data in this study clearly shows mobile is strongly adopted purely because there is no other choice; Indian Country has adapted to the only option available currently. But mobile can never be the sole alternative for hardline internet services because it cannot scale to match market driven and communal capacity needs, such as those needed for education, healthcare, and economic development functions. While we need mobile coverage for communications, emergency services, and general improvement of life, it is not and should not be viewed as the only internet solution. What is needed to support redundant connectivity on Tribal lands are innovative funding mechanisms that drive infrastructure investment using a wide variety of technologies.

American populations have adopted mobile devices and wireless services over the past decade at exponential rates, and Native American populations in Indian Country became early adopters out of necessity. With the remoteness of most Tribal Nations, and the mobile lifestyles of the residents of Tribal communities, it is not surprising that mobility is a very strong theme in the aforementioned data. However, the state of broadband deployment in Indian Country is a national embarrassment, and it is necessary for both hardline and mobile services to be increasingly, and urgently, deployed in Indian Country. Current regulatory, industrial, governmental, and educational solutions are not oriented towards effective long-term and sustainable solutions that fully embrace an affordable broadband ecosystem comprised of fixed and mobile high-speed internet offerings. Indian Country does not have the market characteristics enjoyed by urban and suburban America. Much like other rural and remote areas, strategies aimed at deployment and adoption of technologies on Tribal lands must be based on a broad new approach and commitment by government and private institutions. Population density and relative wealth-based market approaches that have brought coverage to parts of the country through competitive regulatory frameworks have created a commercial model that has inadequately deployed services in rural and Tribal areas.

It is time for new authorities, new programs, and new Tribal government and technical assistance trainings that address the economic, social, and workforce needs in Indian Country. As the country continues to advance and adopt applications for broadband internet use, such as the Internet of Things, Tribal Nations and their citizens are just now experiencing their first connections to the internet or just recently receiving access to high-speed broadband. The regulatory, programmatic, and funding mechanisms championed over the past twenty years have had limited success when Tribal lands continue to lag behind high-speed internet access compared to the nation overall. Regulatory solutions have tried and failed, or succeeded only so far as the industries that have been encouraged to deploy through federal subsidies have actually formulated their business plans to serve Indian Country.

Background

Indian Country, as in rural America, has seen telephone, utility services, and now broadband pushed out to remote areas via a model of regulated subsidized service. This form of market intervention is a regulatory incentive to providers of service to deploy internet to geographic locations that are more remote and therefore more expensive to serve. Government has done this in the past via regulatory measures to support low population density networks where free market results are unsatisfactory. One example has been the Federal Communications Commission (FCC) subsidizing segments of customers via Link-up and Lifeline services for low income and/or geographically challenged telecommunications customers.

In looking at Government Accountability Office (GAO) findings, especially in regards to internet access and service reporting by the FCC, we have not progressed enough in the past decade. It is not just the small market dynamics of remoteness and lower population densities that distinguish Indian Country, compared to urban and suburban populations, it is also buying power. Indian Country needs affordability in solutions not just at the household level, which is what Lifeline and Link-Up were designed to do, but a new holistic business model that addresses reservation and community needs. Indian Country needs innovative solutions that packages affordability in a form of planning for deployment that is comprehensive in the uses of wireless and wireline technologies. Community needs must be aggregated (demand aggregation model) across residential, commercial, governmental, administrative, education, public safety, and other Tribal government and community needs until the price per user is driven down.

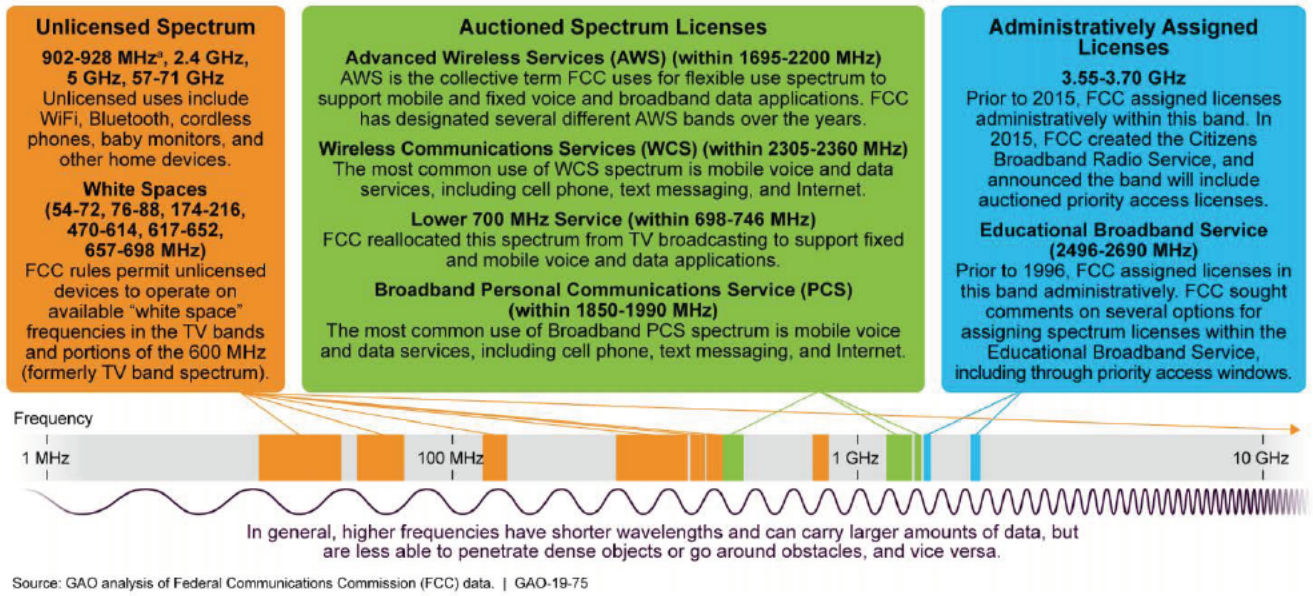
There simply is not enough buying power or population density to sustain a competition model in Indian Country, which has been proven over the past two decades. Tribes aren't anti-competition, but they cannot support competition because the population density isn't high enough. Artificially subsidizing competitive providers in Indian Country is not sustainable for all involved and will not result in robust network deployment and affordability. It is similar to a group of federal agencies that have not been effective in coordinating their programmatic efforts with each other nor their subsidies. It simply results in a modicum of networks, which try to pull as much ratepaying income out of the poorer communities to simply sustain their costs. The lack of a return on investment and reliance on federal subsidies and other programmatic funding has deterred industry from working with Tribes to deploy high-speed broadband in rural and Tribal areas. In cases where internet deployment has occurred the technologies and services offered have either provided inadequate or barely attainable broadband level speeds. Issues regarding affordability are also prevalent in cases where service may be available but cost prohibitive for consumers.

There needs to be a new model to address the Digital Divide prevalent in rural and Tribal America. What is needed is a positively related regulatory disruption to find new solutions for community based networks for positive social disruption. One possible approach would be to identify the different market conditions across Indian Country to determine comprehensive institutional and market solutions locally and regionally. Understanding the diverse market dynamics unique to the nation's 573 federally-recognized Tribes could allow federal and private institutions to leverage funding opportunities. Such funding for internet technologies and solutions could be appropriately tailored to individual Tribes and drive Tribal-centric government and community solutions to provide high-speed, reliable, and affordable fixed and mobile communications. In regards to mobile, it is important to note that genuinely robust wireless data networks are predicated not just on tower construction and location. Indian Country must have

access to reliable, high-capacity spectrum, as well as a fiber optic backbone to connect such towers. Recognition of the energy needs of Tribes must also be taken into consideration for powering fixed and wireless transmission stations, whether it's through rechargeable electric batteries, diesel fuel, wind or solar energies, or an amalgamation of such. The regulation, funding, planning and training required for this broadband ecosystem to be deployed, maintained, and upgraded throughout its lifetime will also require an interconnected and comprehensively coordinated partnership of federal, state, tribal, and private entities at both government and commercial levels.

While the U.S. Department of Agriculture (USDA) provides loan and grant programs to support the deployment of fiber optic cabling in rural and Tribal America, the Federal Communications Commission (FCC) manages all spectrum use for wireless data transmissions for mobile communications. There is a consistent lack of spectrum available for Tribal access and use that has created unfair and unrealistic market conditions for Indian Country. Indian Country has largely been left out of the process of spectrum allocation and the FCC must take concerted efforts on spectrum specific proposals for Indian Country.

Figure 2: Examples of Spectrum Frequency Bands Available for Commercial Broadband Services



Source: GAO analysis of Federal Communications Commission (FCC) data. | GAO-19-75

Recently in July 2019, the FCC adopted a Report and Order on WT Docket No. 18-120, "Transforming the 2.5 GHz Band" that will allow a filing window for Tribes to access dormant spectrum in the Educational Broadband Service (EBS) (Federal Communications Commission [FCC], 2019). The FCC adopted a 'Tribal priority window' to provide Tribally-owned and operated, or a consortium of Tribally-owned and operated, telecommunications providers with a priority to access dormant EBS spectrum licenses in the 2.5 GHz band to provide wireless broadband services. This recent action by the FCC is the type of solution needed to drive robust wireless services on Tribal lands.

However, the FCC's actions to increase spectrum offerings in the 2.5 GHz band was not the first proposal the Commission initiated to increase spectrum access for Indian Country. In March 2011, the FCC issued a Notice of Proposed Rulemaking in WT Docket No. 11-40 that was intended to address the consistent lack of spectrum access for Tribes on Tribal lands. Yet, to

date, there has been no action on WT Docket No. 11-40, which would have sought to increase Tribal access to spectrum by establishing a Tribal licensing priority for unassigned licenses on Tribal lands, establish a process for Tribes to access spectrum through secondary market negotiations with current spectrum licensees, and establish a build or divest proposal for licensees failing to serve Tribal lands within its spectrum license area of coverage (Government Accountability Office [GAO], 2018b) (*See* GAO Figure 3 Below).

Figure 3: Proposals Made in Federal Communications Commission's (FCC) 2011 Notice of Proposed Rulemaking (NPRM) to Promote Tribal Access to Spectrum

Proposal	Description
Tribal licensing priority 	Establish a licensing priority for tribal entities to obtain not-yet-assigned licenses, such as at future auctions for fixed and mobile wireless services, for unserved or underserved tribal lands. The NPRM proposed two ways to provide tribal entities with priority access, including (1) provide a tribal priority application window after FCC has announced a spectrum auction but before the window for filling auction applications opens or (2) provide a tribal priority application window before FCC has announced a spectrum auction.
Good faith negotiations 	Establish a process to help tribal entities secure access to spectrum over tribal lands through secondary market opportunities. The NPRM proposed creating a formal negotiation process that would enable a tribal entity to require a licensee holder to enter into good faith negotiations regarding a secondary market transaction for any geographic portion of the license that is covered by unserved or underserved tribal lands.
Build-or-divest process 	Establish a process where a tribal entity could require a licensee to build or divest a geographic area covering unserved or underserved tribal lands within its license area. The NPRM proposed initiating such a process where an existing licensee has satisfied the applicable construction requirements for the license yet tribal land areas remain unserved or underserved.

Source: GAO analysis of FCC information. | GAO-19-75

Furthermore, the FCC does not collect data regarding spectrum on Tribal lands and the agency does not provide Tribal governments with any information they have on spectrum availability (GAO, 2018b). While it is obvious that the FCC has long recognized the need for spectrum, little if anything was done in the 2000's to get spectrum into the hands of those Tribes that could, or wanted to, deploy wireless services. Making spectrum available will inevitably generate private revenue, provide new financing options, and real opportunity to deploy and improve communications services on Tribal lands. The alignment of federal and local planning as well as funds to bring a holistic broadband ecosystem inclusive of fixed and wireless solutions will serve to connect residential, business, health and educational institutions, and other vital operations on Tribal lands.

The Connection Between Sovereignty and Technology

Historically, from radio to telecommunications to Internet, Native Nations and Native peoples are at the forefront of new media. As evidenced in the 2009 Native Public Media and New America Foundation *New Media* study, Native communities have always embraced new technologies that increase ease of use, mobility, and every day work and personal functions (Morris & Meinrath, 2009). The importance of information and communications technologies is not to be underestimated as they have become central components to e-governance and e-commerce; economic development (online job searches, Tribes entering various commercial markets, tourism, online gaming, etc.); health (telehealth/telemedicine); public safety (FirstNet, AMBER Alert, and natural disaster/wildfire response, etc.); housing; energy (smart grid); and, education (online education/long-distance learning; libraries; e-books; databases).

It is not surprising that Native Nations have embraced innovation as their survival mechanism. Adaptability is a key element in Indian Country resiliency and in Nation building. Internet and Communications technology via Nation Building is sovereignty in practice. One of the strongest examples of Native Nation building as an exercise of sovereignty in practice is in technology that facilitates media and communications. This is a new justification for the re-alignment of priorities in funding and regulation.

There is a clear relationship between Tribal sovereignty and broadband access. As sovereign governments Tribes should be industry partners in bringing the internet to new markets; when a Tribe becomes a partner or a participant, community-driven solutions to broadband deployment take priority. It is also important to recognize that many Tribes across the nation have also become leaders in telecommunications and technology deployment and adoption.

Policy Recommendations to Improve High-Speed Internet Access on Tribal Lands

In the *2018 Broadband Deployment Report* the Federal Communications Commission (FCC) estimated that 35 percent of residents on Tribal lands lacked access to fixed broadband speeds of 25 Mbps/3 Mbps compared to 8 percent of the U.S. overall (Federal Communications Commission [FCC], 2018a). Tribal lands continue to remain the least connected areas in the U.S. to high-speed internet services. In consideration of these circumstances, Indian Country and industry partners require new re-calibrated policy solutions to bridge the Digital Divide on Tribal lands.

AIPI, through extensive Tribal engagement, has created a multi-pronged set of recommendations for entities with the potential to impact this situation, including Congress, federal agencies, Tribal Governments, industry, and institutions of higher education—such as Arizona State University. The ensuing policy recommendations are from a Tribal record of evidence in filings to the Federal Communications Commission as well as resolutions adopted by Tribal Nation members of the National Congress of American Indians—the oldest, largest, and most representative national organization representing Tribal governments.

The Role and Responsibility of Congress

As the primary branch of the federal government exercising plenary authority over the affairs of Tribal Nations, Congress has a direct fiduciary responsibility to improve the state of internet services on Tribal lands. Congressional direction and oversight of federal agencies responsible for executing legal mandates to expand high-speed internet access across the nation should take into consideration the following—

Recommendations

1. **Establish the Office of Native Affairs and Policy as a standalone, independent office at the Federal Communications Commission (FCC) with a permanent annual budget**. The FCC Office of Native Affairs and Policy (ONAP) was created in August 2010 and is currently located within the Consumer and Governmental Affairs Bureau (FCC, 2010a). ONAP is charged with engaging in consultation and coordination with American Indian and Alaska Native Tribes and working with the FCC Chair, Commissioners, bureaus, and offices to formulate and implement FCC policies and regulations for Tribal Nations (FCC, 2010a). The office is also responsible for working with external federal agencies, private organizations, and industry associations and

companies relevant to the telecommunications field (FCC, 2010a). While ONAP is charged with engaging with Tribal Nations and developing FCC regulations that reflect Tribal concerns and needs, the Office—in procedural matters—remains under the oversight of the Consumer and Governmental Affairs Bureau. The Office has also not received a permanent annual, recurring budget to support its mission and objectives to work with Indian Country. The National Congress of American Indians (NCAI) recommended that Congress use its authority to elevate ONAP to operate as a stand-alone office to ensure that it has unrestrained access to address Tribal concerns and advise the FCC Chair, Commissioners, and the Commission's bureaus and offices directly on all matters affecting Tribal Nations (National Congress of American Indians [NCAI], 2016).

2. **Prioritize Universal Service Fund dollars for direct impact on Tribal lands instead of subsidizing competition in hard-to-serve areas.** According to annual reports published by the Universal Service Administrative Company (USAC), the four programs comprising the Universal Service Fund (USF) have disbursed over $141 billion in annual funding since 1998 (Universal Service Administrative Company [USAC], 2019). USAC is an independent non-profit entity designated by the FCC to administer the four programs of the USF—the High Cost Program, Lifeline Program, Rural Health Care Program, and Schools and Libraries (E-rate) Program (USAC, 2019b). While it is unclear how much of the $141 billion in USF funding was disbursed to Tribal schools and libraries, telecommunications providers, healthcare facilities, and non-Tribal entities serving Tribal lands, it is clear that the current USF expenditures have not bridged the Digital Divide in Indian Country.

3. **Legislate the Federal Communications Commission's commitment to meaningfully include Tribal Nations in the formulation and implementation of regulations through government-to-government consultation.** In 2014 the National Congress of American Indians (NCAI) adopted Resolution #ANC-14-015, "Calling on Congress to Establish Formal Recognition of Tribal Sovereignty and Tribal Consultation in the Communications Act" at their Mid Year Conference in Anchorage, AK (NCAI, 2014). The 1934 Communications Act, and subsequent amendments in the 1996 Telecommunications Act, did not recognize Tribes as sovereign governments nor the fiduciary trust relationship between the federal government and Tribal Nations. In 2000 the FCC adopted a *Statement of Policy on Establishing a Government-to-Government Relationship with Indian Tribes* that, "[recognized] its own general trust relationship with, and responsibility to, federally-recognized Indian Tribes", and that the FCC would, "consult with Tribal governments prior to implementing any regulatory action or policy that will significantly or uniquely affect Tribal governments, their land and resources" (FCC, 2000). However, the FCC 2000 *Statement of Policy* is not legally binding. Therefore, NCAI Resolution #ANC-14-015 calls upon Congress to codify this legal relationship between Tribes and the FCC to mandate Tribal consultation and engagement to address telecommunications issues affecting Indian Country (NCAI, 2014).

4. **Establish a Tribal Broadband Fund to support broadband deployment, maintenance, and technical assistance training.** Much of the federal funding and subsidy programs created within the U.S. Department of Agriculture (USDA), Department of Commerce, and the Federal Communications Commission (FCC) to support telecommunications deployment are not Tribal-centric or Tribal-focused. To participate in accessing these federal programs and support, Tribes usually have to leverage funding from multiple federal agencies. To provide a streamlined and

centralized point of access to funding broadband telecommunications deployment the 2010 *National Broadband Plan* proposed creating a Tribal Broadband Fund. The Tribal Broadband Fund would "[bring] high-capacity connectivity to Tribal headquarters or other anchor institutions, deployment planning, infrastructure buildout, feasibility studies, technical assistance, business plan development and implementation, digital literacy, and outreach" (FCC, 2010b). The National Congress of American Indians (NCAI) supports this recommendation through NCAI Resolution #REN-13-064, "Support for the Establishment of a Tribal Broadband Fund and for Other Related Purposes" (NCAI, 2013). Adopted by NCAI's membership in 2013, Resolution #REN-13-064 states that, "Congress must support legislation to establish a Tribal Broadband Fund to support sustainable broadband deployment and acceptable broadband service adoption levels in tribal communities…" (NCAI, 2013). Creation of a Tribal Broadband Fund would provide targeted funding specifically for Tribes and Tribal lands to support broadband deployment, maintenance, and technical assistance training for a Tribal workforce. Mechanisms can also be built into a Tribal Broadband Fund to address the affordability of high-speed internet service for consumers on Tribal lands.

The Roles and Responsibilities of Federal Departments and Agencies

While Congress legislates policy priorities, various federal agencies are charged with formulating and implementing rules and regulations for broadband deployment. As trustee to Tribes the federal government has a fiduciary responsibility to connect Tribes and their citizens to high-speed broadband services. In formulating rules, regulations, and policies to improve broadband access on Tribal lands federal departments and agencies should take into consideration the following—

Recommendations

1. (***Joint Congressional and Federal Agency Recommendation***) **Identify and recommend pathways for Tribes to work with, or create their own, rural cooperatives, consortia, and other innovative partnerships to provide affordable broadband services in rural and Tribal America.** Whether by enacting legislation or developing and implementing programmatic/regulatory measures, the federal government should work with Tribes and localities to identify innovative solutions to connect rural and Tribal America. In June 2019 the Institute for Local Self-Reliance published a policy brief, "Cooperatives Fiberize Rural America: A Trusted Model for the Internet Era", which has shown a recent increase in broadband deployment in rural areas through the formation of cooperatives. The rural utility cooperative model—a successful product of the *Rural Electrification Act of 1936*—led to nearly 260 telephone and 900 electric cooperatives that exist today (Trostle et al., 2019). While existing electric cooperatives today provide electricity to around 2 million square miles, covering 47 states in the U.S., over 90 of these have pursued deployment of broadband service (Trostle et al., 2019). According to Trostle et al. (2019) a cooperative is, "a non-profit, member-owned organization that provides a needed service. Members pay a small fee to join and have voting rights within the organization". In looking at future programmatic and funding initiatives to connect Tribal lands to high-speed affordable internet Congress and federal departments and agencies should identify innovative methods to leverage federal funds with organizations such as cooperatives. As trustee, the federal government should actively identify opportunities for Tribes to partner with non-Tribal cooperatives or other entities to bring high-speed internet from lands adjacent to or nearby reservations. The federal government could also develop programs with

dedicated funding to train Tribes and Tribal entities to implement such community-based models to support broadband deployment.

2. **The Federal Communications Commission should prioritize spectrum licensing over Tribal lands directly to Tribal Nations.** In July 2012, the National Congress of American Indians submitted a letter to the FCC requesting action to increase Tribal access to commercial wireless spectrum (NCAI, 2012). Specifically, NCAI addressed an FCC Notice of Proposed Rulemaking on WT Docket No. 11-40, *In the Matter of Improving Communications and Utilization of Spectrum Over Tribal Lands* (WT 11-40). The WT 11-40 proceeding had a number of proposals to increase Tribal Nation access to spectrum licenses by proposing a 'Tribal Priority' to licenses going to auction or any type of licensing action (NCAI, 2012). Additional proposals included the creation of rules to strengthen the ability of Tribal Nations to initiate and participate in spectrum negotiations with current license holders and also the implementation of a 'Build or Divest' rule to require current industry licensees to meet deployment requirements on Tribal lands or divest their spectrum holdings over said lands if failing to provide service (NCAI, 2012). There is also a possibility of current licensees relinquishing spectrum holdings by way of participation in an incentive auction. NCAI referenced the *Middle Class Tax Relief and Job Creation Act of 2012*, where Congress authorized incentive auctions to be conducted by the FCC to free up more spectrum for commercial wireless use—methods such as this could transfer more commercial wireless spectrum for Tribal use and even dedicate certain bands/frequencies specifically for use on Tribal lands (NCAI, 2012).

3. **Create and maintain a federal interagency working group to assist in identifying federal resources and technical expertise for high-speed broadband deployment.** In March 2015 President Obama signed a Presidential Memorandum on "Expanding Broadband Deployment and Adoption by Addressing Regulatory Barriers and Encouraging Investment and Training", which established a Broadband Opportunity Council comprised of 25 federal departments and agencies with programs aimed at broadband deployment and adoption (The White House, 2015). The Broadband Opportunity Council was charged with identifying regulatory barriers to wired and wireless broadband deployment nationwide, encourage public and private investments in broadband infrastructure, and deployment and adoption of broadband technologies in underserved and rural communities (The White House, 2015). In August 2015 the Council released a report with 36 action items for federal departments and agencies to take to address broadband deployment and adoption issues. In January 2017 the National Telecommunications and Information Administration (NTIA) and the U.S. Department of Agriculture released a Progress Report stating that 15 of the 36 action items from the 2015 report had been fulfilled (U.S. Department of Commerce and USDA, 2017). Since the release of the 2017 Progress Report there hasn't been any updated information regarding the work of the Broadband Opportunity Council. However, NTIA has continued working on broadband deployment and adoption issues as part of its BroadbandUSA initiative and in June 2019 released a 'Comprehensive Guide to Federal Broadband Funding', which is an online searchable database of 50 federal department and agency broadband funding programs (NTIA, 2019).

4. **Revamp consultation and training workshops offered to Tribes by the Federal Communications Commission and the U.S. Department of Agriculture, and include other relevant federal departments and agencies such as the Department of Energy, Department of Health and Human Services, Department of Housing and Urban Development, and the Department of Commerce.** In March 2019 the

Government Accountability Office (GAO) released a report, "Tribal Consultation: Additional Federal Actions Needed for Infrastructure Projects", which highlighted several issues with federal-Tribal consultation and coordination for infrastructure projects (GAO, 2019). GAO interviewed officials from 21 federal agencies and 57 Tribal Nations and determined several factors that hindered consultation processes on infrastructure projects, such as the initiation of consultation at a late stage in project development, agencies inadequately considering Tribal input when developing infrastructure projects, inaccurate contact information for agencies to inform Tribes about potential consultation activities, and difficulty in coordinating consultation and infrastructure projects when multiple federal agencies are involved (GAO, 2019). Increasing federal coordination and consultation with Tribal Nations in the early stages of infrastructure project developments and increasing coordination among federal departments and agencies participating in a project should become the primary focus in Tribal broadband infrastructure projects moving forward.

5. **Continually update and allow Tribes to challenge Form 477 data reported by the telecommunications industry to the Federal Communications Commission regarding broadband access and availability, and also include metrics to gauge the affordability of broadband services for rural and Tribal lands.** In September 2018 the Government Accountability Office (GAO) released a report, "Broadband Internet: FCC's Data Overstate Access on Tribal Lands" and found issues with broadband access and availability data reported by the FCC's Form 477. GAO found that the "FCC considers broadband to be 'available' for an entire census block if the provider *could* serve *at least one* location in the census block" (GAO, 2018). Data inaccuracies reported by the Form 477 data has precluded the ability of some Tribes in applying for federal funding to support broadband deployment on Tribal lands since data falsely indicates that certain Census blocks are considered 'served' (GAO, 2018). The GAO recommended that the FCC establish a formal process to consult with Tribal governments and entities to determine if Form 477 data submitted to the FCC by industry providers is accurate (GAO, 2018). GAO also acknowledged that the FCC does not currently collect data on broadband affordability, quality, or instances where providers have refused to provide services to certain structures and residences on Tribal lands (GAO, 2018).

Opportunities for Tribal Governments, Businesses/Enterprises, and Tribal Organizations and Trade Associations

Note: This section is based on recommendations and input from AIPI's Advisory Board, which consists of elected leaders of Tribal governments and leaders of Tribal organizations and associations.

Opportunities

1. **Identify regional and local area industry, state, federal, and business/enterprise partners.** The current market model for broadband infrastructure deployment has not been entirely successful and necessitates the need for innovative and new programmatic and funding vehicles to spur deployment and adoption. Leveraging public/private partnerships could not only support broadband deployment but also facilitate the means of accessing technical assistance and training at the local level, which would provide Tribes with increased oversight and participation in developing a next-generation workforce that is technology focused and strong. Tribal organizations,

associations, and businesses should prioritize and assist in identifying best practices for public/private partnerships and establishing points-of-contact in the private sector.

2. **Develop task forces/oversight bodies to engage on broadband discussions and recruit and retain technical experts to participate in these discussions.** Elected Tribal leadership must be proactive in broadband discussions as technology continues advancing and becomes increasingly integrated in our daily lives. Leaders are needed to voice the concerns and needs of their constituents, their communities, and to create avenues for mentorship and training a next-generation workforce. Tribal leaders and technical experts are needed for both representation and advocacy on key policy issues at local, state, and federal levels as well as understanding the vastly growing sector of emerging technologies that will require high-speed, high-capacity, reliable, and affordable broadband services—e.g. the Internet of Things, cybersecurity, artificial intelligence/machine learning, etc. Broadband task forces between Tribes, Tribal organizations, and local, state, and federal governments are needed to facilitate accessible and affordable broadband services.
3. **Strengthen the work of Tribal governments, organizations, and trade associations to advocate for increasing Tribal access to spectrum licenses**. The forthcoming deployment of 5G services and the increasing focus on other wireless solutions to provide high-speed internet and data services necessitates the need for Tribes and Tribal organizations to create task forces/working groups to participate in national policy discussions. As the federal government continues to identify how to repurpose federally-held spectrum for use in commercial markets Tribes and Tribal organizations must be at the forefront of advocacy to push increased spectrum allocation for Tribal lands. Spectrum is a finite resource, similar to other natural resources on Tribal lands, and these bands and frequencies should have a priority allocation to Tribal governments prior to any commercial auction mechanism. History has shown that competitive market forces and competitive FCC auctions have not been successful in providing spectrum licenses to local and Tribal communities. Tribes cannot simply expend several thousands or millions of dollars to purchase spectrum licenses over Tribal lands, which has led to the major telecom industry players consolidating much of the commercialized spectrum bands. Other opportunities to identify unlicensed spectrum, such as the use of channel 5 and 6 white spaces, must be pursued to obtain a 'Tribal Priority' to such spectrum.
4. **Develop sources of Tribal funding for grant and subsidy matching funds for broadband projects.** Tribes and Tribal philanthropy should actively work to identify methods for providing matching funds for federal broadband programs as well as community public/private-based solutions for broadband funding.

Opportunities for the Telecom Industry – Wireline and Wireless Service Providers

Note: This section is based on recommendations and input from AIPI's Advisory Board, which consists of elected leaders of Tribal governments and leaders of Tribal organizations and associations.

Opportunities

1. **Work with federal, state, and Tribal governments to develop new, reliable, and successful funding sources and authorities to deploy broadband services to rural and Tribal America.** Deployment of high-speed and affordable internet services have either been leisurely incremental or non-existent in rural and Tribal areas. The current

status quo of federal subsidy reliance cannot be maintained and new authorities and mechanisms to deploy broadband services to geographically challenging or sparsely populated areas must be established. The competitive market approach has failed in many of these areas across the country because there are a lack of economic incentives. Instead of focusing solely on these market principles industry has an opportunity to become an integral partner, but only if there is a willingness to participate and identify new market solutions that address the geographic and economic challenges to deploy high-speed and affordable broadband services in rural and Tribal America.

2. **Discontinue the practice of stockpiling spectrum licenses over Tribal lands, especially when real deployment and service solutions on Tribal lands are not near-term objectives.** While new deployment and adoption solutions must be developed, the wholesale acquisition of spectrum licenses over Tribal lands have provided consistent barriers to geographically challenged and sparsely populated areas. Tribes have raised this concern through several spectrum-related proceedings at the FCC. The following are three examples of Tribal government entities that have raised concerns in several different FCC dockets related to spectrum issues over Tribal lands—

   Comments filed to the FCC in 2014 by the Nez Perce Tribe, Tribal Executive Committee in Idaho, have stated that,

   > "The Nez Perce Tribe has over the past ten years proactively reached out to establish partnerships with private spectrum licensees to facilitate build out of mobile access across the Reservation. The success of these efforts has been [primarily] with small regional providers; while we know large providers hold spectrum over our lands we have not been successful in establishing relationships to facilitate deployment in the more rural/remote regions of our lands" (Nez Perce Tribe, 2014).

   Comments by the National Congress of American Indians—the largest, oldest, and most representative national organization representing Tribal governments—filed comments to the FCC in 2015 stating that, "access to and obtaining spectrum licenses historically and presently eludes tribes due to the immense capital needed to competitively bid in spectrum auctions", and that, "robust, high-speed, and dependable wireless services are essential to fostering economic growth, enhancing public safety, and supporting vital government functions" (NCAI, 2015).

   Comments filed by the Gila River Telecommunications, Inc.—a tribally-owned and operated company with an eligible telecommunications carrier designation from the FCC—in September 2016 stated that,

   > "In addition to the higher costs associated with deploying on Tribal lands, another obstacle to greater wireless deployment is a result of the Commission's building obligations (also known as "construction requirements"). Quite often the buildout obligations that are associated with the spectrum license can be met by mobile carriers without serving Tribal lands within their license area. Because spectrum licensees are generally granted an exclusive right to use, being able to meet buildout obligations while leaving the Tribal lands unserved forecloses opportunities for Tribal entities to obtain rights to that spectrum directly from the Commission" (Gila River Telecommunications Inc., 2016).

   These are but three examples of comments filed to the FCC by Tribal governments, telecommunications providers, and organizations—an extensive record of evidence can be found in the FCC's Electronic Comment Filing System under WT Docket No. 11-40 and several other spectrum proceedings that have occurred at the FCC since 2011.

3. **Engage and coordinate with Tribes to develop deployment priorities of wireline and wireless services—the FCC's 2012 'Tribal Government Engagement Obligation Provisions' provide a framework for this coordination.** Adopted in the October 2011 "Universal Service Fund/Intercarrier Compensation Transformation Order", and clarified in a 2012 "Further Guidance", the Tribal Government Engagement Obligation Provisions required that eligible telecommunications carriers demonstrate an annual certification of engagement with Tribal governments on the following,

   > "(1) a needs assessment and deployment planning with a focus on Tribal community anchor institutions; (2) feasibility and sustainability planning; (3) marketing services in a culturally sensitive manner; (4) rights of way processes, land use permitting, facilities siting, environmental and cultural preservation review processes; and (5) compliance with Tribal business and licensing requirements" (Gila River Telecommunications Inc., 2016).

4. **Develop internal training programs on how to work with Tribes, and develop external training, technical assistance, and internship/mentorship programs for Tribal members.** Developing internal programs to train staff on how to engage and coordinate with Tribes will establish a better understanding of the diverse issues and challenges of deploying broadband on Tribal lands. Having staff knowledgeable and capable of liaising between Tribal governments and the corporate structure can serve to create and strengthen relations between Tribes and industry. These training programs should be created with input from Tribal leaders, communities, and technical experts to ensure their success and establish trust. Attending Tribal conferences, meetings, and events provide great opportunities for networking with these individuals. Additionally, developing external training, technical assistance, and internship/mentorship programs would also contribute to building trust and showing good intentions to proactively develop relationships with Tribes and their citizens. All of these must be community-driven, solution-oriented, and practical to be successful.

Recommendations for Arizona State University's American Indian Policy Institute

Note: This section is based on recommendations and input from AIPI's Advisory Board, which consists of elected leaders of Tribal governments and leaders of Tribal organizations and associations.

Opportunities

1. **The ASU American Indian Policy Institute should work to coordinate and engage across the broad expertise offered by ASU's schools, programs, institutes, and initiatives to assist Tribal training, certifications, and partnership-building in a manner that exemplifies ASU's New American University vision and community embeddedness.** AIPI acting in the capacity of Tribal community liaison has immense opportunity to establish and foster pathways to develop community-driven solutions to technology and telecommunications access and adoption. AIPI can achieve this because of ASU's Charter to advance, "research and discovery of public value…and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves" (Arizona State University, 2018). AIPI has already established a partnership with the Native American Finance Officers Association for training of the Tribal Financial Manager's Certificate (TFMC) Program, and has recently established a partnership with ASU's Thunderbird School of Global Management to assist with the TFMC training and future executive leadership training tailored for Tribes. AIPI is currently working on similar training programs and modules in the areas of Tribal

agriculture/agribusiness, professional development on policy analysis, and other work in areas of emerging technologies and their Tribal applications.

2. **The American Indian Policy Institute should create a conference focused on technology and telecommunications issues, trainings, and policy issues that can be accessible to a broad range of backgrounds and expertise to include Tribal leaders, technical experts, policy advocates, researchers, engineers, philanthropy, and industry representatives.** This conference could also provide a point-of-access for Tribal representatives to connect to the expertise and resources offered by the schools, programs, institutes, and initiatives at Arizona State University.
3. **The American Indian Policy Institute should publish materials on 'Best Practices' in technology and telecommunications deployment and adoption on Tribal lands, especially on Rights-of-way and other permitting processes as reference materials for Tribes.** The publication of these materials would be beneficial to Tribes looking at how to develop community-driven solutions for broadband deployment and sustainability as technology continues to progress. For instance, providing background and guidance on approval of rights-of-way permits not only on Tribal lands but also identifying processes for working with off-reservation local, state, and federal lands and governments would effectively streamline this complex permitting process.
4. **The American Indian Policy Institute should work with ASU partners and Tribal governments and organizations to develop information and reference materials on cybersecurity protocols, funding, and training.** As part of offering technical expertise to Tribal governments and communities, AIPI should work with partners to educate Tribes on issues of cybersecurity. These trainings, programs, and reference materials should educate Tribes on the importance of cybersecurity for the protection of Tribal networks responsible for transmitting sensitive information in the fields of healthcare, education, businesses and enterprises (both small and large scale), and governance issues such as voting and financial audits/information.

References

Arizona State University. (2018). ASU Charter and Goals. Retrieved from https://newamericanuniversity.asu.edu/node/25

Canby Jr, W. C. (2015). *American Indian Law in a Nutshell*. St. Paul, MN.

Donnellan, E. S. (2017). No Connection: The Issue of Internet on the Reservation. *American Indian Law Journal, 5*(2), 31. Retrieved from https://digitalcommons.law.seattleu.edu/cgi/viewcontent.cgi?article=1164&context=ailj

Duarte, M. E. (2017). *Network sovereignty: building the Internet across Indian Country*. Seattle: University of Washington.

Federal Communications Commission. (2010). *FCC Establishes Office of Native Affairs and Policy*. FCC News Retrieved from https://docs.fcc.gov/public/attachments/DOC-300855A1.pdf

Federal Communications Commission [FCC]. (2000). *Statement of Policy on Establishing a Government-to-Government Relationship with Indian Tribes*. (FCC 00-207). Retrieved from https://docs.fcc.gov/public/attachments/FCC-00-207A1.pdf

Federal Communications Commission [FCC]. (2010b). Connecting America: The National Broadband Plan. Retrieved from https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf

Federal Communications Commission [FCC]. (2012). *Public Notice: 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*. Federal Communications Commission Retrieved from https://apps.fcc.gov/edocs_public/attachmatch/DA-12-1165A1_Rcd.pdf

Federal Communications Commission [FCC]. (2016). *2016 Broadband Progress Report*. Retrieved from https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2016-broadband-progress-report

Federal Communications Commission [FCC]. (2017). *FCC Seeks Comment & Information to Guide Annual Inquiry Under Sec. 706*. Retrieved from https://docs.fcc.gov/public/attachments/FCC-17-109A1.pdf

Federal Communications Commission [FCC]. (2018a). *2018 Broadband Deployment Report*. Retrieved from https://docs.fcc.gov/public/attachments/FCC-18-10A1.pdf

Federal Communications Commission [FCC]. (2018b). Fixed Broadband Deployment Data from FCC Form 477. *Federal Communications Commission.* Retrieved from https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477

Federal Communications Commission [FCC]. (2019). *In the Matter of Transforming the 2.5 GHz Band. WT Docket No. 18-120*. (FCC 19-62). Retrieved from https://docs.fcc.gov/public/attachments/FCC-19-62A1.pdf

Gila River Telecommunications Inc. (2016). *Comments of Gila River Telecommunications, Inc. to #ConnectingCommunities; WC Docket Nos. 10-90, 11-42, 07-135, WT Docket No. 11-40, and MB Docket No. 09-52*. FCC Electronic Comment Filing System Retrieved from https://ecfsapi.fcc.gov/file/10921241450283/GRTI%20Comments%20on%20Connecting%20Communities%20on%20Tribal%20lands.pdf

Government Accountability Office [GAO]. (2018b). *Tribal Broadband: FCC Should Undertake Efforts to Better Promote Tribal Access to Spectrum*. (GAO 19-75). Retrieved from https://www.gao.gov/assets/700/695455.pdf

Morris, T., & Meinrath, S. D. (2009). *New Media, Technology and Internet Use in Indian Country: Quantitative and Qualitative Analyses*. Retrieved from https://aipi.clas.asu.edu/sites/default/files/new_media_study_2009.pdf

Mossberger, K., Tolbert, Caroline, and Franko, William W. (2013). *Digital Cities: The Internet and the Geography of Opportunity*. New York, NY: Oxford University Press.

National Congress of American Indians [NCAI]. (2012). Resolution #SAC-12-034: Promoting Tribal Nation Access and Use of Spectrum for Communications Services. Retrieved from http://www.ncai.org/attachments/Resolution_rYYpZVNclWOCqlrGloYXfbRdouiKtxSePLwbZoYYEDWbtuztTwP_SAC-12-034%20final.pdf

National Congress of American Indians [NCAI]. (2013). *Resolution #REN-13-064: Support for the Establishment of a Tribal Broadband Fund and for Other Related Purposes*. Retrieved from http://www.ncai.org/attachments/Resolution_DIzqmRRZHqzraWoasGiGEVjlQOmvpeljBlNMeuAUbJRsVogzYkB_REN-13-064%20final.pdf

National Congress of American Indians [NCAI]. (2014). Resolution #ANC-14-015: Calling on Congress to Establish Formal Recognition of Tribal Sovereignty and Tribal Consultation in the Communications Act. Retrieved from http://www.ncai.org/attachments/Resolution_zVFdLvRFNDsaqQRsnPeMNwvwysBkeljFrHjseSBcRfjlxelrwGc_ANC-14-015.pdf

National Congress of American Indians [NCAI]. (2015). *RE: NCAI Comments on Public Notice FCC 15-49—Request for Further Comment on Issues Related to Competitive Bidding Proceeding; WT Docket Nos. 14-170 and 05-211, GN Docket No. 12-268, and RM-11395*. FCC Electronic Comment Filing System. Retrieved from https://ecfsapi.fcc.gov/file/60001048335.pdf

National Congress of American Indians [NCAI]. (2016). *Testimony for the Record: "The GAO Report on, 'Telecommunications: Additional Coordination and Performance Measurement Needed for High-Speed Internet Access Programs on Tribal Lands'"*. Retrieved from http://www.ncai.org/attachments/Testimonial_NnJjwqIqVQtORsqZICOFGklArWRSrowmgyamZirATFysMdhQlKf_05.11.2016_SCIA_GAO%20Report_Telecom.pdf

National Congress of American Indians [NCAI]. (2018). Indian Country Demographics. *National Congress of American Indians.* Retrieved from http://www.ncai.org/about-tribes/demographics

National Congress of American Indians [NCAI]. (n.d.). *Tribal Nations and the United States: An Introduction*. Retrieved from http://www.ncai.org/attachments/PolicyPaper_VmQazPEqbvZDMeaDvbupWTSZLmzyzBKOknQRXnUyoVMoyFkEWGH_Tribal%20Nations%20and%20the%20United%20States_An%20Introduction.pdf

National Telecommunications and Information Administration. (2019). NTIA Releases Comprehensive Guide to Federal Broadband Funding. Retrieved from https://broadbandusa.ntia.doc.gov/ntia-news/ntia-releases-comprehensive-guide-federal-broadband-funding#contententarea

Nez Perce Tribe. (2014). *RE: Nez Perce Tribe ex parte presentation of comments (WT Docket 11-40: Notice of Proposed Rulemaking - Improving Communications Services for Native Nations by*

Promoting greater Utilization of Spectrum over Tribal lands). FCC Electronic Comment Filing System. Retrieved from https://ecfsapi.fcc.gov/file/60000974761.pdf

The White House. (2000). *Executive Order 13175, Consultation and Coordination with Indian Tribal Governments*. (65 FR 67249). Retrieved from https://www.federalregister.gov/documents/2000/11/09/00-29003/consultation-and-coordination-with-indian-tribal-governments

The White House. (2009). *Memorandum for the Heads of Executive Departments and Agencies: Tribal Consultation*. Retrieved from https://obamawhitehouse.archives.gov/the-press-office/memorandum-tribal-consultation-signed-president

The White House. (2015). *Presidential Memorandum — Expanding Broadband Deployment and Adoption by Addressing Regulatory Barriers and Encouraging Investment and Training*. Retrieved from https://obamawhitehouse.archives.gov/the-press-office/2015/03/23/presidential-memorandum-expanding-broadband-deployment-and-adoption-addr

Trostle, H., Kienbaum, K., Mitchell, C. (2019). Cooperatives Fiberize Rural America: A Trusted Model for the Internet Era. Institute for Local Self-Reliance. Retrieved from https://ilsr.org/wp-content/uploads/2019/06/2019-06-Rural-Coop-Policy-Brief-Update.pdf

U.S. Census Bureau. (2016). *2016 American Community Survey 1-Year Estimates*. Retrieved from https://factfinder.census.gov/bkmk/table/1.0/en/ACS/16_1YR/S0201/0100000US/popgroup~006

U.S. Department of Commerce. (2011). *Exploring the Digital Nation: Computer and Internet Use at Home*. Retrieved from https://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_computer_and_internet_use_at_home_11092011.pdf

U.S. Department of Commerce and USDA. (2017). *Broadband Opportunity Council Agencies' Progress Report*. Retrieved from https://www.ntia.doc.gov/files/ntia/publications/broadband_opportunity_council_agencies_progress_report_jan2017.pdf

U.S. Government Accountability Office. (2016). *Telecommunications: Additional Coordination and Performance Measurement Needed for High-Speed Internet Access Programs on Tribal Lands* (GAO-16-222). Retrieved from https://www.gao.gov/assets/680/674906.pdf

U.S. Government Accountability Office [GAO]. (2006). *Telecommunications: Challenges to Assessing and Improving Telecommunications For Native Americans on Tribal Lands* (GAO-06-189). Retrieved from https://www.gao.gov/assets/250/248920.pdf

U.S. Government Accountability Office [GAO]. (2018). *Broadband Internet: FCC's Data Overstate Access on Tribal Lands*. Retrieved from https://www.gao.gov/assets/700/694386.pdf

U.S. Government Accountability Office [GAO]. (2019). *Tribal Consultation: Additional Federal Actions Needed for Infrastructure Projects*. Retrieved from https://www.gao.gov/assets/700/697694.pdf

Universal Service Administrative Company [USAC]. (2019). Publications: Annual Reports - 1999-2018. Retrieved from https://www.usac.org/about/tools/publications/annual-reports/default.aspx

Universal Service Administrative Company [USAC]. (2019b). About USAC. Retrieved from https://www.usac.org/about/default.aspx

Appendix I: Survey Instrument

Tribal Technology Assessment: The State of Internet Service on Tribal Lands

Survey Flow

Block: Question Block

Start of Block: Beginning of Survey

I Tribal Technology Assessment: Determining the State of Internet Service on Tribal Lands

This survey should take between 10 and 15 minutes to complete and is being administered by the American Indian Policy Institute at Arizona State University. Your identity will remain confidential and your responses to the survey will only be used to inform the general public and policymakers on the current levels of internet and technology access available to U.S. federally-recognized tribes located in the lower 48 United States (Alaska and Hawaii are excluded). We invite your participation in this study and we will be collecting no identifiable data from you through this website link or through any questions posed to respondents of the survey.
If you have any questions concerning the research study, please contact the researcher Dr. Traci Morris at: t.morris@asu.edu or 480-965-9005. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

If you agree to being a participant in this survey, please indicate below:

☐ Yes, I am 18 years of age or older and I agree to participate in this survey and acknowledge that my identity will remain confidential. (1)

Skip To: II If Tribal Technology Assessment: Determining the State of Internet Service on Tribal Lands This su... = Yes, I am 18 years of age or older and I agree to participate in this survey and acknowledge that my identity will remain confidential.

II Thank you for agreeing to participate in this survey being administered by the American Indian Policy Institute at Arizona State University. Your responses to this survey will help in providing data for a study to highlight the state of internet on Tribal lands, or lack thereof.

To begin the survey, click the 'Next' button below.

Q1 I am an enrolled member of a federally-recognized tribe in the United States located in the lower 48 states (Alaska and Hawaii are excluded):

- ☐ Yes (2)
- ☐ No (1)

Skip To: Q1a If I am an enrolled member of a federally-recognized tribe in the United States located in the lower... = Yes

Q1a Name of your federally-recognized tribe/reservation (organized alphabetically):

▼ Absentee-Shawnee Tribe of Indians of Oklahoma (1) ... Zuni Tribe of the Zuni Reservation, New Mexico (345)

Q2 My primary residence is on a federal Indian reservation (includes tribal lands held in trust, a Pueblo, or Former Reservation in Oklahoma):

- ☐ Yes (specify zip code of residence): (1) _____
- ☐ No (2)

Skip To: End of Survey If My primary residence is on a federal Indian reservation (includes tribal lands held in trust, a P... = No

Q3 My age:

- ☐ 18-29 (1)
- ☐ 30-49 (2)
- ☐ 50-64 (3)
- ☐ 65+ (4)

Q4 There are school age children (4-18 years old) living at my household.

- [ ] Yes, every day of the week (1)
- [ ] Yes, almost every day of the week (2)
- [ ] Yes, only some days of the week (3)
- [ ] No, not any days of the week (4)

Q5 The highest level of education I have completed is:

- [ ] Less than a high school diploma (1)
- [ ] High school graduate/diploma (2)
- [ ] GED (3)
- [ ] Technical/vocational training (4)
- [ ] Some college (5)
- [ ] College degree (an Associate's degree and/or Bachelor's degree) (6)
- [ ] Graduate level degree (Master's degree, Juris Doctorate degree, Medical doctor degree, or PhD) (7)

Q6 My annual income level is:

- [ ] Less than $5,000 (1)
- [ ] Between $5,000 and $14,999 (2)
- [ ] Between $15,000 and $24,999 (3)
- [ ] Between $25,000 and $49,999 (4)
- [ ] Between $50,000 and $74,999 (5)
- [ ] $75,000 or more (6)
- [ ] Choose not to answer (7)
- [ ] Unsure, but my job pays me an hourly rate of: $ (8) _____
- [ ] Unemployed (9)

Q7 Over the past month, I have used the internet:

- [ ] Several times a day (1)
- [ ] About once a day (2)
- [ ] Several times a week (3)
- [ ] Between 1 and 10 times (4)
- [ ] Never (5)

Q8 I have or I use the following account(s) (check all that apply):

- [ ] Facebook (1)
- [ ] Twitter (2)
- [ ] Email account (3)
- [ ] Snapchat (4)
- [ ] Instagram (5)
- [ ] Linkedin (6)
- [ ] YouTube (7)
- [ ] Other social media account (specify): (8) _____

Q9 I own or use any of the following (check all that apply):

- [ ] a. Desktop computer and/or a laptop computer (1)
- [ ] b. Smart phone (such as an iPhone, Android, Microsoft phone) (2)
- [ ] c. Tablet computer (such as an iPad, Kindle Fire, Microsoft Surface, etc.) (3)
- [ ] d. All of the above (4)
- [ ] I don't own any of these (5)
- [ ] I own a flip phone (6)

Q10 I use the following to access the internet or go online (check all that apply):

- [ ] a. Desktop computer and/or laptop computer (1)
- [ ] b. Smart phone (such as a iPhone, Android, Microsoft phone) (2)
- [ ] c. Tablet computer (such as a iPad, Kindle Fire, Microsoft Surface, etc.) (3)
- [ ] d. All of the above (4)
- [ ] I don't own any of these (5)
- [ ] I own a flip phone (6)

Q11 I have access to the internet at my household (check any that apply):

- [ ] Yes, with a subscription to the internet through a cable company (such as Cox, Comcast, RCN, etc.) (1)
- [ ] Yes, through a phone company (such as CenturyLink, Frontier, Windstream, tribally-owned/operated service provider, etc.) (2)
- [ ] Yes, through a cell-phone provider (such as a smart phone or mobile Wi-Fi hotspots/jetpacks) (3)
- [ ] Yes, through a satellite service provider (4)
- [ ] Yes, through Dial-Up service (5)
- [ ] No, I do not get any internet access in my household (6)

Q12 I am a subscriber or primary account holder of the following providers (check all that apply):

- [ ] Cell-phone (1)
- [ ] Home (landline) telephone (2)
- [ ] Cable (3)
- [ ] Satellite (4)
- [ ] I am not a subscriber to any of these (5)

Display This Question:

If I am a subscriber or primary account holder of the following providers (check all that apply): = I am not a subscriber to any of these

Q12a If you could choose between only one way of accessing the internet, which would you prefer?

- [ ] Wireless (through a smart phone, wireless-connected tablet such as an iPad, etc.) (1)
- [ ] Wired (through a cable company or wireline phone company) (2)
- [ ] Satellite (3)

Q13 I can send emails and access the internet through the use of:

- [ ] A personal smart phone (1)
- [ ] A work smart phone (2)
- [ ] Both a personal and work smart phone (3)
- [ ] I use one phone for both personal and work activities (4)
- [ ] None of the above (5)

Skip To: Q14a If I can send emails and access the internet through the use of: = I use one phone for both personal and work activities

Q14 I can get internet access through a smart phone at my household using:

- ☐ A personal smart phone, but not my work smart phone (1)
- ☐ My work smart phone, but not my personal smart phone (2)
- ☐ Both my personal smart phone and my work smart phone get internet at my household (3)
- ☐ I cannot get internet at my household by any means on a smart phone (4)

Display this question: If I can send emails and access the internet through the use of: = I use one phone for both personal and work activities

Q14a I have Internet access on my phone while at home:

- ☐ All the time (1)
- ☐ Some of the time (2)
- ☐ I have to travel outside my residence to get reception (3)
- ☐ I do not have reception at my residence or can travel to a ne (4)

Q15 I feel my internet use is more limited than I want because I do not have enough data on my cell-phone plan:

- ☐ Yes (1)
- ☐ No (2)

Q16 The main reason I do not use the internet at home (check all that apply):

- ☐ The cost is too high for me (1)
- ☐ It is difficult to understand/use (2)
- ☐ Internet is not available at my residence (3)
- ☐ I do not need it (4)
- ☐ I am worried about privacy and personal information online (5)
- ☐ I have a physical disability that makes it difficult to use the internet (6)
- ☐ I can use it somewhere else (7)
- ☐ Other (8)

Q17 I use the internet at the following locations (check all that apply):

- ☐ School (1)
- ☐ Community center or library (2)
- ☐ Open Wi-Fi while patronizing an open place of business (fast food, coffee shop, etc.) (3)
- ☐ At a friend or relative's house (4)
- ☐ Wherever I can get cell-phone reception (5)

Q18 Have you ever used the internet to do any of the following things (check all that apply):

- ☐ Buy a product online such as books, music, toys, or clothing (1)
- ☐ Buy or make a reservation online for travel (such as airline ticket, hotel room, or car rental) (2)
- ☐ To sell a personal item (such as on Ebay, Craigslist, other) (3)
- ☐ For my business to sell a product or service (4)
- ☐ Check weather reports and forecasts (5)
- ☐ To check news (6)
- ☐ Send a text message (7)
- ☐ Search for a job (8)
- ☐ Watch videos (such as YouTube) (9)
- ☐ Listen to online music (such as online streaming radio, Podcasts, etc.) (10)
- ☐ Listen to Native radio station(s) (11)
- ☐ Make phone calls (such as Skype, Google Talk, etc.) (12)
- ☐ Participate or view webinars (such as GoToMeeting, AdobeConnect, Google Hangouts, etc.) (13)
- ☐ Find health information, or for health care services (14)
- ☐ Do banking (includes online bill pay) (15)
- ☐ Participate in online video gaming (such as Xbox, PlayStation, Wii, etc.) (16)
- ☐ Cell-phone app gaming (games obtained for cell-phone play through Apple, Android, Blackberry, or Windows stores) (17)

Q19 Have you ever used the internet to do any of the following things (check all that apply):

- ☐ To complete school work, homework (includes after-school online tutoring) (1)
- ☐ Take a class or training (2)
- ☐ To complete work for my employment (includes job applications and online trainings/certifications) (3)
- ☐ To visit a tribal, state, local, or federal website (4)
- ☐ To apply for higher education enrollment (includes vocational training, college applications, and FAFSA/scholarship applications) (5)
- ☐ To file my Federal and/or State taxes (6)
- ☐ To apply for federal/tribal social service programs (Social Security, WIC, unemployment, veterans, Medicare/Medicaid, etc.) (7)
- ☐ To get information about politics, including elections (8)

Q20 Does your tribe have information and/or programs that can provide information on the benefits of internet use and how to get the internet?

- ☐ Broadband, high-speed internet is not available where I live (1)
- ☐ Yes, and I know how to access the information (2)
- ☐ I am not sure/do not know (3)
- ☐ No (4)

Q21 I use the internet at a library or community center because (check all that apply):

- ☐ I do not have a computer at home or my computer is slow (1)
- ☐ I do not have an internet connection at home (2)
- ☐ I needed help to find information (3)
- ☐ I needed help to use the computer (4)
- ☐ It is convenient (5)
- ☐ To take a class (6)
- ☐ To take my children/family member's children to do their homework (7)
- ☐ Other (8)
- ☐ I do not go to a library or community center to access the internet (9)

Q22 I received a link to this online survey from:

- ☐ An Email (Directly or Forwarded) (1)
- ☐ From a Social Media Post (2)

End of Block: Question Block

Appendix II: List of Participants by Tribe and Zip Code

Recorded Date	I am an enrolled member of a federally-recognized tribe in the United States located in the lower 48 states (Alaska and Hawaii are excluded):	Name of your federally-recognized tribe/reservation (organized alphabetically):	My primary residence is on a federal Indian reservation (includes tribal lands held in trust, a Pueblo, or Former Reservation in Oklahoma): - Yes (specify zip code of residence)
4/25/17 2:25	Yes	Navajo Nation, Arizona, New Mexico & Utah	86045
4/25/17 2:29	Yes	Navajo Nation, Arizona, New Mexico & Utah	86503
4/25/17 2:29	Yes	White Mountain Apache Tribe of the Fort Apache Reservation, Arizona	85941
4/25/17 2:29	Yes	White Mountain Apache Tribe of the Fort Apache Reservation, Arizona	85926
4/25/17 2:29	Yes	Zuni Tribe of the Zuni Reservation, New Mexico	87326
4/28/17 23:12	Yes	Round Valley Indian Tribes, Round Valley Reservation, California	95428
4/28/17 23:12	Yes	Navajo Nation, Arizona, New Mexico & Utah	87319
4/28/17 23:12	Yes	Jicarilla Apache Nation, New Mexico	87528
4/29/17 19:28	Yes	Navajo Nation, Arizona, New Mexico & Utah	87240
4/29/17 19:28	Yes	Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota	57262

4/29/17 19:28	Yes	Navajo Nation, Arizona, New Mexico & Utah	86033
4/29/17 19:28	Yes	Seneca Nation of Indians (previously listed as the Seneca Nation of New York)	14091
4/29/17 19:28	Yes	Jicarilla Apache Nation, New Mexico	87528
4/29/17 19:28	Yes	Shoshone-Bannock Tribes of the Fort Hall Reservation	83203
4/29/17 19:28	Yes	White Mountain Apache Tribe of the Fort Apache Reservation, Arizona	85941
4/29/17 19:28	Yes	Gila River Indian Community of the Gila River Indian Reservation, Arizona	85128
4/29/17 19:28	Yes	Navajo Nation, Arizona, New Mexico & Utah	87328
4/29/17 19:28	Yes	Navajo Nation, Arizona, New Mexico & Utah	86505
4/29/17 19:28	Yes	Gila River Indian Community of the Gila River Indian Reservation, Arizona	85147
4/29/17 19:28	Yes	Navajo Nation, Arizona, New Mexico & Utah	87420
4/29/17 19:28	Yes	Nez Perce Tribe	83540
4/29/17 19:28	Yes	Navajo Nation, Arizona, New Mexico & Utah	86033
4/29/17 19:28	Yes	Kickapoo Traditional Tribe of Texas	78852
4/29/17 19:29	Yes	Jicarilla Apache Nation, New Mexico	87528
4/29/17 19:29	Yes	Shoshone-Bannock Tribes of the Fort Hall Reservation	83202

4/29/17 19:29	Yes	White Mountain Apache Tribe of the Fort Apache Reservation, Arizona	85941
4/29/17 19:29	Yes	Standing Rock Sioux Tribe of North & South Dakota	58570
4/29/17 19:29	Yes	Standing Rock Sioux Tribe of North & South Dakota	57658
4/29/17 19:29	Yes	Navajo Nation, Arizona, New Mexico & Utah	87364
4/29/17 19:32	Yes	Zuni Tribe of the Zuni Reservation, New Mexico	87327
4/29/17 19:32	Yes	Navajo Nation, Arizona, New Mexico & Utah	84531
7/22/17 23:02	Yes	Standing Rock Sioux Tribe of North & South Dakota	58538
7/22/17 23:02	Yes	Nez Perce Tribe	83540
7/22/17 23:13	Yes	Crow Tribe of Montana	59022
7/22/17 23:13	Yes	Nez Perce Tribe	83540
7/22/17 23:13	Yes	Shoshone-Bannock Tribes of the Fort Hall Reservation	83204
7/22/17 23:13	Yes	Confederated Tribes and Bands of the Yakama Nation	98952
7/22/17 23:15	Yes	Nez Perce Tribe	83536
7/22/17 23:15	Yes	Navajo Nation, Arizona, New Mexico & Utah	83524
7/22/17 23:15	Yes	Navajo Nation, Arizona, New Mexico & Utah	86031
7/22/17 23:15	Yes	Confederated Tribes and Bands of the Yakama Nation	98948

7/22/17 23:15	Yes	Confederated Tribes of the Goshute Reservation, Nevada and Utah	84034
8/22/17 21:26	Yes	Navajo Nation, Arizona, New Mexico & Utah	86047
8/22/17 21:28	Yes	Pueblo of Jemez, New Mexico	87024
8/22/17 21:28	Yes	Pueblo of Santa Clara, New Mexico	87052
8/22/17 21:29	Yes	Navajo Nation, Arizona, New Mexico & Utah	87328
8/22/17 21:30	Yes	Kewa Pueblo, New Mexico (previously listed as the Pueblo of Santo Domingo)	87052
8/22/17 21:30	Yes	Navajo Nation, Arizona, New Mexico & Utah	86054
8/22/17 21:30	Yes	Pueblo of Acoma, New Mexico	87304
8/22/17 21:30	Yes	Navajo Nation, Arizona, New Mexico & Utah	86520
4/16/18 20:21	Yes	Jamul Indian Village of California	92019
4/16/18 20:22	Yes	Navajo Nation, Arizona, New Mexico & Utah	86515
4/16/18 20:24	Yes	Little Traverse Bay Bands of Odawa Indians, Michigan	49740
4/16/18 20:29	Yes	Saginaw Chippewa Indian Tribe of Michigan	48878
4/16/18 20:53	Yes	Navajo Nation, Arizona, New Mexico & Utah	86045
4/16/18 21:20	Yes	Navajo Nation, Arizona, New Mexico & Utah	86047
4/16/18 22:06	Yes	Navajo Nation, Arizona, New Mexico & Utah	86033

4/17/18 1:43	Yes	Confederated Tribes and Bands of the Yakama Nation	98933
4/17/18 5:46	Yes	Little Traverse Bay Bands of Odawa Indians, Michigan	49660
4/17/18 7:16	Yes	Navajo Nation, Arizona, New Mexico & Utah	86503
4/17/18 7:31	Yes	Navajo Nation, Arizona, New Mexico & Utah	87325
4/17/18 9:01	Yes	Navajo Nation, Arizona, New Mexico & Utah	56270
4/17/18 9:09	Yes	Choctaw Nation of Oklahoma	74033
4/17/18 9:15	Yes	Pueblo of San Felipe, New Mexico	87001
4/17/18 9:17	Yes	Navajo Nation, Arizona, New Mexico & Utah	87026
4/17/18 9:40	Yes	Navajo Nation, Arizona, New Mexico & Utah	86045
4/17/18 10:27	Yes	Gila River Indian Community of the Gila River Indian Reservation, Arizona	85147
4/17/18 13:59	Yes	San Carlos Apache Tribe of the San Carlos Reservation, Arizona	85550
4/17/18 15:02	Yes	Navajo Nation, Arizona, New Mexico & Utah	86504
4/17/18 15:20	Yes	Hopi Tribe of Arizona	86042
4/17/18 17:25	Yes	Penobscot Nation	4468
4/17/18 19:04	No	Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota	57623
4/17/18 19:25	Yes	Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota	57625

4/17/18 19:56	Yes	Skokomish Indian Tribe	98584
4/17/18 20:02	Yes	Grand Traverse Band of Ottawa and Chippewa Indians, Michigan	49670
4/17/18 20:34	Yes	Navajo Nation, Arizona, New Mexico & Utah	87313
4/17/18 22:07	Yes	Three Affiliated Tribes of the Fort Berthold Reservation, North Dakota	58636
4/17/18 22:14	Yes	Spirit Lake Tribe, North Dakota	58370
4/17/18 22:30	Yes	Gila River Indian Community of the Gila River Indian Reservation, Arizona	85147
4/17/18 22:32	Yes	Cherokee Nation of Oklahoma	92061
4/18/18 7:42	Yes	Spirit Lake Tribe, North Dakota	58357
4/18/18 8:56	Yes	Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota	57262
4/18/18 9:03	Yes	Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota	57625
4/18/18 9:16	Yes	Navajo Nation, Arizona, New Mexico & Utah	87410
4/18/18 10:10	Yes	Hoopa Valley Tribe, California	95546
4/18/18 10:51	Yes	Pascua Yaqui Tribe of Arizona	85757
4/18/18 10:54	Yes	Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota	57625
4/18/18 11:13	Yes	Passamaquoddy Tribe	4667
4/18/18 11:49	Yes	Turtle Mountain Band of Chippewa Indians of North Dakota	58316
4/18/18 12:21	Yes	Little Traverse Bay Bands of Odawa Indians, Michigan	49740

4/18/18 13:34	Yes	Gila River Indian Community of the Gila River Indian Reservation, Arizona	85147
4/18/18 21:09	Yes	Oglala Sioux Tribe	57551
4/18/18 21:26	Yes	Colorado River Indian Tribes of the Colorado River Indian Reservation, Arizona and California	85344
4/18/18 21:43	Yes	Grand Portage Band of Lake Superior Chippewa (Minnesota Chippewa Tribe, Minnesota)	55605
4/18/18 22:23	Yes	Confederated Salish and Kootenai Tribes of the Flathead Reservation	59865
4/18/18 23:06	Yes	Chickasaw Nation	73030
4/18/18 23:08	Yes	Nez Perce Tribe	83539
4/18/18 23:29	Yes	Navajo Nation, Arizona, New Mexico & Utah	87323
4/18/18 23:40	Yes	Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota	57625
4/19/18 5:02	Yes	Navajo Nation, Arizona, New Mexico & Utah	87420
4/19/18 5:38	Yes	Passamaquoddy Tribe	4668
4/19/18 11:19	Yes	Colorado River Indian Tribes of the Colorado River Indian Reservation, Arizona and California	85344
4/19/18 12:08	Yes	Leech Lake Band of Ojibwe (Minnesota Chippewa Tribe, Minnesota)	56633
4/19/18 14:41	Yes	Zuni Tribe of the Zuni Reservation, New Mexico	87327

4/19/18 21:03	Yes	Oglala Sioux Tribe	57772
4/20/18 5:19	Yes	Navajo Nation, Arizona, New Mexico & Utah	86510
4/20/18 6:40	Yes	Osage Nation	73533
4/20/18 7:13	Yes	Zuni Tribe of the Zuni Reservation, New Mexico	89427
4/20/18 7:53	Yes	Hopi Tribe of Arizona	86039
4/20/18 14:18	Yes	Pueblo of Cochiti, New Mexico	87072
4/20/18 16:04	Yes	Navajo Nation, Arizona, New Mexico & Utah	86515
4/20/18 18:12	Yes	Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota	57625
4/21/18 6:27	Yes	Kiowa Indian Tribe of Oklahoma	73005
4/21/18 8:36	Yes	Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin	54843
4/21/18 9:28	Yes	Navajo Nation, Arizona, New Mexico & Utah	85344
4/21/18 9:42	Yes	Pueblo of Laguna, New Mexico	87007
4/21/18 10:14	Yes	Tohono O'odham Nation of Arizona	85634
4/21/18 10:59	Yes	Tohono O'odham Nation of Arizona	85634
4/21/18 14:04	Yes	Tulalip Tribes of Washington	98271
4/21/18 16:17	Yes	Navajo Nation, Arizona, New Mexico & Utah	86031
4/21/18 16:48	Yes	Navajo Nation, Arizona, New Mexico & Utah	86031
4/21/18 20:28	Yes	Confederated Tribes of the Warm Springs Reservation of Oregon	97761

4/21/18 20:53	Yes	Navajo Nation, Arizona, New Mexico & Utah	86556
4/21/18 21:20	Yes	Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin	54538
4/22/18 7:56	Yes	Pawnee Nation of Oklahoma	74058
4/22/18 12:45	Yes	Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation, Wisconsin	54806
4/22/18 16:13	Yes	Stockbridge Munsee Community, Wisconsin	54416
4/22/18 20:47	Yes	Menominee Indian Tribe of Wisconsin	54135
4/22/18 20:57	Yes	Cherokee Nation of Oklahoma	74447
4/22/18 21:08	Yes	Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota	57625
4/23/18 8:49	Yes	Stockbridge Munsee Community, Wisconsin	54416
4/23/18 9:26	Yes	Kiowa Indian Tribe of Oklahoma	73015
4/23/18 11:16	Yes	Coeur D'Alene Tribe	83876
4/23/18 17:21	Yes	Kiowa Indian Tribe of Oklahoma	73005
4/23/18 18:41	No	Yomba Shoshone Tribe of the Yomba Reservation, Nevada	89310
4/23/18 23:15	Yes	Hopi Tribe of Arizona	86039
4/24/18 11:25	Yes	Navajo Nation, Arizona, New Mexico & Utah	86045
4/24/18 11:27	Yes	Ak-Chin Indian Community	46952

4/24/18 11:37	Yes	Gila River Indian Community of the Gila River Indian Reservation, Arizona	46952
4/24/18 18:08	Yes	Kiowa Indian Tribe of Oklahoma	73005
4/24/18 18:50	Yes	Mississippi Band of Choctaw Indians	39439
4/24/18 20:21	Yes	Quechan Tribe of the Fort Yuma Indian Reservation, California & Arizona	92283
4/25/18 4:22	Yes	Chickasaw Nation	73119
4/25/18 9:03	Yes	Quinault Indian Nation	98587
4/27/18 9:36	Yes	Zuni Tribe of the Zuni Reservation, New Mexico	87327
4/27/18 9:40	Yes	Navajo Nation, Arizona, New Mexico & Utah	87375
4/27/18 9:57	Yes	Navajo Nation, Arizona, New Mexico & Utah	87375
4/27/18 9:59	Yes	Navajo Nation, Arizona, New Mexico & Utah	87375
4/29/18 16:42	Yes	Apache Tribe of Oklahoma	57770
5/2/18 7:52	Yes	Quinault Indian Nation	98587
5/6/18 23:29	Yes	United Keetoowah Band of Cherokee Indians in Oklahoma	74464
5/9/18 22:55	Yes	Gila River Indian Community of the Gila River Indian Reservation, Arizona	85147
5/10/18 20:49	Yes	Three Affiliated Tribes of the Fort Berthold Reservation, North Dakota	58636
5/11/18 7:51	Yes	Muscogee (Creek) Nation	74464
5/17/18 21:59	No	Yomba Shoshone Tribe of the Yomba Reservation, Nevada	89310

5/24/18 15:11	Yes	Cherokee Nation of Oklahoma	74112
5/24/18 15:20	Yes	Chickasaw Nation	73018
5/24/18 16:26	Yes	Muscogee (Creek) Nation	74445
5/30/18 2:41	Yes	Zuni Tribe of the Zuni Reservation, New Mexico	87327
5/30/18 21:53	Yes	Swinomish Indian Tribal Community	98257
6/2/18 9:49	Yes	Lummi Tribe of the Lummi Reservation Lytton Rancheria of California	98226
6/2/18 13:37	Yes	Cherokee Nation of Oklahoma	74002
6/3/18 2:01	Yes	Mississippi Band of Choctaw Indians	39350
6/5/18 12:35	Yes	Navajo Nation, Arizona, New Mexico & Utah	86053
6/13/18 10:36	Yes	Navajo Nation, Arizona, New Mexico & Utah	86556
6/14/18 3:16	Yes	Lummi Tribe of the Lummi Reservation Lytton Rancheria of California	98226

Appendix III: List of Respondents by Tribe

166 Tribal Respondents Indicating Residence On-Reservation - Completed Survey In-Person or Online

Tribe	State	Count	In-Person Survey	Location	Online Survey	Email	Social Media	INC (Online)	Misc.
Absentee-Shawnee Tribe of Indians of Oklahoma	OK	0	-	-	-	-	-	-	-
Ak-Chin Indian Community	AZ	1	-	-	-	-	-	1	Stopped at Q5
Apache Tribe of Oklahoma	OK	1	-	-	1	-	1	-	-
Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation	WI	1	-	-	1	-	1	-	-
Cherokee Nation of Oklahoma	OK	4	-	-	4	-	4	-	-
Cheyenne River Sioux Tribe of the Cheyenne River Reservation	SD	7	-	-	7	6	1	-	-
Chickasaw Nation	OK	3	-	-	3	-	3	-	-
Choctaw Nation of Oklahoma	OK	1	-	-	1	-	1	-	-
Citizen Potawatomi Nation	OK	0	-	-	-	-	-	-	-
Coeur d'Alene Tribe	ID	1	-	-	1	1	-	-	-
Colorado River Indian Tribes	AZ/CA	2	-	-	2	-	2	-	-

Confederated Salish and Kootenai Tribes of the Flathead Reservation	MT	1	-	-	1	-	1	-	-
Confederated Tribes and Bands of the Yakama Nation	OR	3	2	(2) JPW	1	-	1	-	-
Confederated Tribes of Siletz Indians	OR	0	-	-	-	-	-	-	-
Confederated Tribes of the Chehalis Reservation	WA	0	-	-	-	-	-	-	-
Confederated Tribes of the Goshute Reservation	NV/UT	1	1	(1) JPW	-	-	-	-	-
Confederated Tribes of the Warm Springs Reservation	OR	1	-	-	1	-	1	-	-
Cowlitz Indian Tribe	WA	0	-	-	-	-	-	-	-
Crow Tribe of Montana	MT	1	1	(1) JPW	-	-	-	-	-
Eastern Shawnee Tribe of Oklahoma	OK	0	-	-	-	-	-	-	-
Fort Mojave Indian Tribe	AZ/CA/NV	0	-	-	-	-	-	-	-
Gila River Indian Community	AZ	7	2	(2) GoN	4		4	1	Stopped at Q10- Indicated only smart phone access

Grand Portage Band of Lake Superior Chippewa (Minnesota Chippewa Tribe)	MN	1	-	-	1	-	1	-	-
Grand Traverse Band of Ottawa and Chippewa Indians	MI	1	-	-	1	-	1	-	-
Hoh Indian Tribe	WA	0	-	-	-	-	-	-	-
Hoopa Valley Tribe	CA	1	-	-	1	-	1	-	-
Hopi Tribe	AZ	3	-	-	2	1	1	1	Stopped at Q17 - No access at home
Jamul Indian Village	CA	1	-	-	1	-	1	-	-
Jicarilla Apache Nation	NM	3	3	(3) GoN	-	-	-	-	-
Kewa Pueblo (previously recognized as Pueblo of Santo Domingo)	NM	1	1	(1) SFIM	-	-	-	-	-
Kickapoo Traditional Tribe of Texas	TX	1	1	(1) GoN	-	-	-	-	-
Kiowa Indian Tribe of Oklahoma	OK	4	-	-	4		4	-	-
Lac Courte Oreilles Band of Lake Superior Chippewa Indians	WI	1	-	-	1	-	1	-	-

Lac du Flambeau Band of Lake Superior Chippewa Indians	WI	1	-	-	1	-	1	-	-
Leech Lake Band of Ojibwe (Minnesota Chippewa Tribe)	MN	1	-	-	1	-	1	-	-
Little Traverse Bay Bands of Odawa Indians	MI	3	-	-	3	-	3	-	-
Lummi Tribe of the Lummi Reservation Lytton Rancheria	CA	2	-	-	2	1	1	-	-
Menominee Indian Tribe	WI	1	-	-	1	-	1	-	-
Mississippi Band of Choctaw Indians	MS	2	-	-	2	-	2	-	-
Muscogee (Creek) Nation	OK	2	-	-	2	-	2	-	-
Navajo Nation	AZ/NM/UT	43	17	(4) SFIM, (2) JPW, (9) GoN, (2) ASU PW	25	3	22	1	-
Nez Perce Tribe	ID	5	4	(3) JPW, (1) GoN	1	-	1	-	-
Oglala Sioux Tribe (Pine Ridge Indian Reservation)	SD	2	-	-	2	-	2	-	-
Osage Nation	OK	1	-	-	1	-	1	-	-
Paiute Indian Tribe of Utah (Shivwits Band of Paiutes)	UT	0	-	-	-	-	-	-	-
Pascua Yaqui Tribe of Arizona	AZ	1	-	-	1	-	1	-	-
Passamaquoddy Tribe	ME	2	-	-	2	-	2	-	-

Pawnee Nation of Oklahoma	OK	1	-	-	1	-	1	-	-
Penobscot Nation	ME	1	-	-	1	-	1	-	-
Pueblo of Acoma	NM	1	1	(1) SFIM	-	-	-	-	-
Pueblo of Cochiti	NM	1	-	-	1	-	1	-	-
Pueblo of Jemez	NM	1	1	(1) SFIM	-	-	-	-	-
Pueblo of Laguna	NM	1	-	-	1	-	1	-	-
Pueblo of San Felipe	NM	1	-	-	1	-	1	-	-
Pueblo of Santa Clara	NM	1	1	(1) SFIM	-	-	-	-	-
Quechan Tribe of the Fort Yuma Reservation	CA/AZ	1	-	-	1	-	1	-	-
Quileute Tribe	WA	0	-	-	-	-	-	-	-
Quinault Indian Nation	WA	2	-	-	1	-	1	1	Stopped at Q15 - No access at home
Rosebud Sioux Tribe	SD	0	-	-	-	-	-	-	-
Round Valley Indian Tribes	CA	1	1	(1) GoN	-	-	-	-	-
Saginaw Chippewa Indian Tribe of Michigan	MI	1	-	-	1	-	1	-	-
Salt River Pima-Maricopa Indian Community	AZ	0	-	-	-	-	-	-	-
San Carlos Apache Tribe	AZ	1	-	-	1	1	-	-	-
Sault Ste. Marie Tribe of Chippewa Indians	MI	0	-	-	-	-	-	-	-

Seneca Nation of Indians (previously recognized as the Seneca Nation of New York)	NY	1	1	(1) GoN	-	-	-	-	-
Shoshone-Bannock Tribes of the Fort Hall Reservation	ID	3	3	(1) JPW, (2) GoN	-	-	-	-	-
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation	SD	2	1	(1) GoN	1	-	1	-	-
Skokomish Indian Tribe	WA	1	-	-	1	-	1	-	-
Spirit Lake Tribe	ND	2	-	-	2	-	2	-	-
Standing Rock Sioux Tribe	ND/SD	3	3	(1) JPW, (2) GoN	-	-	-	-	-
Stockbridge Munsee Community, Wisconsin	WI	2	-	-	2	-	2	-	-
Swinomish Indian Tribal Community	WA	1	-	-	1	-	1	-	-
Three Affiliated Tribes of the Forth Berthold Reservation	ND	2	-	-	2	-	2	-	-
Tohono O'odham Nation	AZ	2	-	-	2	-	2	-	-
Tulalip Tribes of Washington	WA	1	-	-	1	-	1	-	-
Turtle Mountain Band of Chippewa Indians	ND	1	-	-	1	-	1	-	-
United Keetoowah Band of Cherokee Indians	OK	1	-	-	1	-	1	-	-
Upper Sioux Community	MN	0	-	-	-	-	-	-	-

White Mountain Apache Tribe	AZ	4	4	(2) GoN, (2) ASU PW	-	-	-	-	-
Yomba Shoshone Tribe	NV	2	-	-	1	-	1	1	Stopped at Q4
Zuni Tribe	NM	6	2	(1) GoN, (1) ASU PW	4	1	3	-	-
	Total:	**166**	50	-	110	14	96	-	-

Total Responses	160	Inc. Responses	6

Legend:
(ASU PW) – ASU Pow Wow, Tempe, AZ

(GON) – Gathering of Nations Pow Wow, Albuquerque, NM

(JPW) – Julyamsh Pow Wow, Coeur d'Alene, ID

(SFIM) – Santa Fe Indian Market, Santa Fe, NM

(INC) – Incomplete response

Respondents by BIA Region

Eastern	6	Rocky Mountain	1
Eastern Oklahoma	12	Southern Plains	7
Great Plains	19	Southwest	16
Midwest	13	Western	25
Northwest	19	Navajo	43
Pacific	5	**Total**	**166**

For more Information contact:

Dr. Traci Morris
Director
[redacted]

Brian Howard
Research & Policy Analyst
[redacted]

Arizona State University
Watts College of Public
Service and Community Solutions

American Indian Policy Institute
https://aipi.asu.edu/

American Indian Policy Institute
Arizona State University