



Case Library

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Overview

The Case Library is a bank of miniature case studies that revolve around the relation of tribes and their progression to include broadband infrastructure into their reservations and communities. Such cases examine the needs and values of the tribes, what are issues that arose during the process to attain, install, and accept broadband into the reservation, what processes along the way were done correctly or incorrectly, how was the project received by community members, what resolution came about and what motivated the tribes to move forward with these projects. Pulling together these case studies to build a bank provides current tribes ideas on how others utilized the internet and the benefits it held for the community and next generation. It also assists outsiders to understand what can be done to build interest, mobilize the community to learn, what are major issues, and how the tribes worked with the structure of engagement with technology.

These studies are also being used to build a thematic analysis. Pulling together common themes such as motivation, education, roadblocks, engagement, empathy and tribal infrastructure, it breaks down the possible conflicts and discusses issues which arose from cases and lists productive means to address and approach culturally appreciative plans for engaging with tribal communities to build engagement, motivation, and interest. It also assists to analyze perceived threats, social boundaries, and power perceptions that are in the roots of the divide and how we can address them. Each case study has provided a section for key themes which relates it to different corresponding themes on the second section to see what difficulties were discussed within the case and possible suggested solutions.

The last section to follow is additional overall suggestions learned from some segments of the cases.

Cases

Blackfeet Nation

- **Case**
 - The Blackfeet Nation is a federally recognized tribe in Montana.
 - The process of getting quality technology to those living on the Blackfeet reservation is 20 years in the making
 - Over half the tribe does not have access to broadband. Installation would bring employment, faster services, allow ranchers to online pricing, provide a school-age child with additional resources, letting a remote community member use telehealth, and helping a local business reach customers outside of their community.
 - The tribe has begun the third phase of their work which will bring broadband to the communities of the Blackfeet Reservation using a fiber optic network that will be wholly owned by the Tribe
 - Partnered with Siyeh Communications providing over 1,000 times more bandwidth and 100 times faster speeds.
- **Funding/ Support**
 - 1997: dug the first landline for phones
 - 1999: The Siyeh Corporation formed as the business arm of the tribal council with the intent of separating business development from political influence
 - 2000: The Siyeh Corporation started a cable TV service throughout the Blackfeet region, marking the beginning of what would become the current telecommunications project
 - Siyeh joined forces with Turtle Island Communications, eventually managing to secure a \$500,000 grant from the Shakopee Mdewakanton Sioux Community out of Minnesota, which helped as Siyeh acquired the Browning Telephone Exchange from 3 Rivers Cooperative, including its rights to provide telecoms services in the area.
 - 2012: Tribe entered into an agreement with CommunityTel to be included in an ARRA grant that provided a “middle mile” infrastructure that would span the Blackfeet Reservation.
 - Tribal Council negotiated owner-ship of 12 “dark fibers” as part of that infrastructure through an IRU agreement
 - 2015: Ronan Telephone wrote Blackfeet their application for a \$13.5 million ARRA grant for broadband on the reservation
 - \$500,000 funding donated from The Shakopee Mdewakanton Sioux Community

- \$38.6 million in CARES Act funding, \$7.5 million of which went to the telecoms project.
- **Strategies for success**
 - Building Educational Success
 - Browning Public Schools and the Blackfeet Community College implemented "distance learning" this fall.
 - The decision requires navigation as many students don't have internet access or a computer at home. According to
 - According to the 2014-2018 American Community Survey, only 51% of households on the Blackfeet Reservation had broadband access.
 - Schools will offer jetpacks, or devices that boost signal, for families without internet.
 - the Blackfeet Community College is considering distributing hotspots to boost internet connection or having an outdoor space near the school where students can safely connect to WiFi
 - Securing Funding
 - Turtle Island Communications Inc: contracted to design the system and engineer a plan for the buildout.
 - Turtle Island Communication is 100% Indian owned, and they have experience assisting Tribes who played a major role in voicing concerns for changing FCC federal policy.
 - The Shakopee Mdewakanton Sioux Community from Minnesota has shown great support by donating \$500,000 to assist us with the first phase of building out the fiber optic network,”
 - Partnership with Siyeh Communications and merged with Starlink Cable and Oki Communications.

Key Themes: Education - Reliance - Tribal Infrastructure - Engagement - Motivation

Specific Themes: Telehealth - Educational Success - Employment

Strategies: Securing Funding - Partnerships

Forms of Access: Tribe owned Fiber optic network

Reference: <https://nativenews.jour.umt.edu/projects/2021-home/investing-in-connection/>
<https://blackfeetnation.com/>

Cherokee Nation

- **Case**
 - The Cherokee Nation, based in Tahlequah in eastern Oklahoma, has been working for years on connectivity and learned during the pandemic last year that nearly three dozen communities lacked service.
 - The tribe set up hot spots in those areas to give people WiFi access and issued 11,000 hot spots to school children and other tribal members who needed them.
 - The goal is to make connectivity permanent for those who currently lack WiFi services
- **Funding/ Support**
 - 2021: Cherokee Nation Principal Chief Chuck Hoskin Jr. told President Joe Biden on Wednesday that the broadband portion of the \$1 trillion infrastructure bill will help the tribe continue connecting its youth, elders and other members to the internet.
 - Oklahoma would get an estimated \$100 million from the bill for broadband expansion. Separately, Hoskin said, the bill includes \$2 billion and extends for four years a federal grant program for tribes across the country.
 - Cherokee Connect - the tribe's universal connectivity initiative, is focused on serving as a broadband resource and deploying connectivity that fills the gap for Cherokee households currently lacking internet access.
 - provides access to affordable, reliable broadband of the Cherokee Nation citizens.
 - Cherokee Connect is a place where citizens can provide information about their connectivity needs, learn tips and tricks when using the Internet, and ways we are working to bring access throughout the Cherokee Nation.
 - Providing temporary subsidy during COVID-19 Emergency or Funding Expended - \$75 subsidy on tribal land.
 - In response to the pandemic, the Cherokee Nation launched the Respond, Recover, Rebuild Mobile Hotspot Connectivity Assistance Program that provided a mobile hotspot device to thousands of Cherokee households lacking internet
 - Pursuing the funding from the Tribal Broadband Connectivity Grant Program through the Department of Commerce's National Telecommunications and Information Administration (NTIA).
 - Cherokee Nation recently partnered with Starlink on a pilot project to provide Cherokee speakers access to reliable broadband.
 - The \$11 billion investment in the Indian Country infrastructure package was to address needs from repairing our roads, updating water systems, to broadband deployment.
- **Strategies for success for this project**

- Acknowledge benefits for multiple age groups
 - Cherokee children need high speed internet for school/ elders need access to telemedicine that can not currently be gained because they live outside connectivity.
- Have a step by step plan in place that allows for points of internet access that grows at different points of development
 - Building with Cherokee Connect provides drive-up Wi-Fi zones at 35 locations throughout the Cherokee Nation as they build broadband efforts and federal broadband subsidies for low-income households on tribal lands.
 - Respond, Recover and Rebuild Mobile Hotspot Connectivity Assistance
 - multi-million dollar program that will give Cherokee Citizens lacking internet up to a year of service.
 - The goal is to decrease the digital divide while the Nation develops reliable broadband access throughout their communities.
 - Hotspots provided are smaller, portable devices that work just like a WiFi network.

Key Themes: Roadblocks - Empathy - Motivation - Education - Reliance

Specific Themes: Affordability - Hot spots

Strategies: Digital Divide Decrease - Acknowledgement

Forms of Access: Wifi - Hotspots -universal connectivity initiative - Portal Wifi

Reference: <https://nativetimes.com/2015?view=archive&month=6>

<https://www.cherokee.org/>

Choctaw Nation

- **Case**
 - The Choctaw Nation is an American Indian territory covering about 6,952,960 acres, in southeastern Oklahoma with a population of 223,279. It is the third-largest federally recognized tribe in the United States and the second-largest Indian reservation in the area after the Navajo.
 - The Choctaw nation has implemented broadband within their communities, but with over 275,000 low-income households who are unable to access internet their goal was expand access
- **Funding/ Support**
 - ConnectHome: launching in the Choctaw Nation—and will initially reach low-income households—and some 200,000 children—with the ability to access the Internet at home.
 - Received additional \$52,700 for service costs and router fees to living facilities in the affordable homes program
 - Due to positive results with ConnectHome, the Choctaw Nation was selected as one of the pioneer sites for the initiative, with Choctaws living in rural HUD housing being the first in the nation to receive this help.
 - The Choctaw Nation has been awarded a \$2,987,850 grant from the U.S. Department of Agriculture to build broadband internet infrastructure in Le Flore County.
- **Strategies for success for this project**
 - Determine Purposes For BroadBand
 - Build social media presence, share news and information as quickly and accurately as possible.
 - Building an online communications team also works diligently to keep the website up to date and share information through text and email alert systems.
 - Access to video appointments for The Choctaw Nation Virtual Medical Visit service enables healthcare access for patients not able to travel to the provider for specific non-life-threatening injuries and illnesses.
 - The Choctaw Nation believes in living out the Chahta spirit through faith, family, and culture. They believe it is their responsibility to ensure that every child has every conceivable opportunity to be successful and make a positive impact on the world. By partnering with public and private institutions they are working to make this dream a reality.
 - Understand the Land
 - while the cables run through the towns, it still does not reach individual residences. Natives will have to come into town to use their computers at school or the library.

- Due to terrain,(mountains and valleys) towers would need to be placed at the top of each hill to gain full Wifi access

Key Themes: Roadblock - Education - Empathy - Motivation - Emergency
Management - Marketing - Engagement

Specific Themes: low income community - healthcare - Terrain

Strategies: Purposefulness

Forms of Access: every family

Reference:

<https://www.choctawnation.com/news-events/press-media/wiring-choctaw-nation>

Coeur d'Alene Tribe

- **Case**
 - The Coeur d'Alene live in Idaho, Washington, and Montana as it is their ancestral homeland with 2,000 tribal members, and the reservation is about 345,000 acres in northern Idaho.
 - The need for the network started out of an unfulfilled need in the community.
 - In 2004 the tribe relied on dial up that still fell short of 56 Kbps because the system was dependent on 100 year old copper lines buried and degraded quickly on that infrastructure and thus wanted to improve internet speed and access
- **Funding**
 - 2004: applied for a Community Connect Grant through USDA Rural Development, receiving funds to build a small wireless network providing up to 1.5 Megabits per second (Mbps).
 - 2010: it became evident that there was not enough unlicensed spectrum to meet their needs, and the challenge of signal interference was increasing.
 - 2012: the tribe received ARRA funding of \$12.2 million to build a fiber network to support the wireless network, half loan and half grant, through the USDA Rural Utilities Service to build both middle-mile and Fiber-to-the-Home.
- **Strategies for success for this project**
 - Issues: project took time to start as no one else was building on the reservation because no one wanted to take on the work and thus had to build motivation and engagement.
 - Tribal members need to be invested long term
 - Lessons learned
 - Invest time, money, and education in tribal members with technical skills
 - Hire locally and develop local talent. Builds and sustains trust
 - Technology is progressing rapidly with much competition. providing good service is a continuing challenge as needs and utilization also change. although the fiber in the ground is future proof, you still have to make sure to change the electronics about every decade on the headend
 - With COVID-19, the network has experienced increased strain. Users report more lag if there are multiple devices trying to use the network simultaneously.
 - The Technology Department continues to improve upon the wireless network to support all the users.

Key Themes: Motivation - Engagement - Education - Roadblock - Empathy

Specific Themes: Covid-19 - Overcoming stalled projects

Strategies: Local Involvement - Building Motivation

Forms of Access: Community

References: <https://ilsr.org/wp-content/uploads/2021/02/IndigenousFutureZones-0221.pdf>

Crow Indian Reservation

- **Case**
 - The Crow people are a federally recognized tribe. The Crow Indian Reservation is located in southern Montana, with an enrolled membership of approximately 11,000, of whom 7,900 reside in the reservation.
 - Tribe has been actively trying since 2013 to gain internet access.
 - Small federal funding has provided access to internet around certain parts of the reservation but it often lags or does not stretch to all members
 - In light of Covid and the recent election the need for increased internet speed and strength became a more serious matter
- **Funding/ Support**
 - 2021: receiving spectrum licenses through the Federal Communication Commission's Rural Tribal Priority Window.
 - 2.5 gigahertz frequency to provide broadband to underserved Indian reservations
 - \$20 million in federal stimulus money
 - Department of Agriculture's agreement in ensuring their historic-preservation permit
- **Strategies for success**
 - This specific case focus upon rights of the people, in this case voters rights:
 - low voter turnout this year due to poor internet.
 - Lauri Kindness- (regional organizer for the Crow Reservation with Montana Native Vote)
 - "There's a lot of people who were not getting the proper information or messaging that we were putting out, so come Election Day they went to where they normally go when we have satellite sites for in-person voting. They didn't know there weren't any -- they didn't get the message."
 - Dulcie Bear Don't Walk (elections administrator)
 - no satellite voting locations on the reservation due to the increase in COVID-19 cases they've seen.
 - "If you don't have good internet, you're not going to be able to pull up a lot of these different things like voter registration."
 - access and affordability make it difficult for reservations to get adequate internet.
 - Building awareness for unrecognized rights such as voters rights and access assist in having the community understand the importance of the project as well as what capabilities such services had outside of everyday internet and entertainment
 - Building the Economy

- Unemployment on the Crow Indian Reservation hit 10.5 percent in 2009 - unemployment rate for May 2010 was 9.5 percent
- Bringing high-speed cable Internet access to businesses and homes on the Crow Indian Reservation can assist with generating a number of jobs and help stimulate the local economy.
- Know local tribe historic preservation regulations
 - The federal project to install high-speed Internet on the reservation was delayed due to a cease and desist order to contractor Nemont Telephone Cooperative.
 - It cited the need for a historic-preservation permit and demanded that historic-preservation monitors be present at all future construction as Emerson Bull Chief (tribe's historic-preservation officer) was concerned subcontractors won't properly handle items of historical interest they may encounter on the reservation.
 - Several actions can be taken to forgo such delays:
 - Discussion of tribal council of off sacred and historical land before and during installation planning
 - Implantation of historic-preservation permit
 - U.S. Agriculture Departments involvement on historic grounds and permits

Key Themes: Economy - Tribal Infrastructure - Empathy - Roadblocks

Specific Themes: Historic Preservation - COVID - 19 - Voter Rights - Employment

Strategies: Government and Tribal Council involvement

Forms of Access: Community

Reference: <https://muninetworks.org/content/indigenous-networks>

<https://nbcmontana.com/news/local/fcc-grants-broadband-licenses-to-7-of-8-montana-tribes>

Fond du Lac Band

- **Case**
 - The Fond du Lac Band is one of the six bands of Ojibwe with more than 4,000 people..
 - In 2006 The Fond du Lac Band wanted high-speed Internet service throughout their communities and started to compare wireless and hardwired network types, calling for ten wireless towers throughout the reservation
 - There were a number of issues with this plan, however, one of which was geography.
 - Northern Minnesota has many hills and forests which the wireless technology was not going to be able to penetrate but as it is inexpensive the tribe moved forward with seeking grants
 - to many remote areas. It was, however, fairly inexpensive, and Fond du Lac moved forward with seeking grants for the project but could not find funding as many thought the project was “economically infeasible.”
 - The tribe changed to a Fiber-to-the-Home network through the Blandin Foundation and pursued grants through the USDA, and added 13 wireless hotspots to several of these buildings by 2013. There are about a dozen businesses connected to the network, not including home businesses.
- **Funding**
 - They worked with the Blandin Foundation in Minnesota and pursued grants through the USDA.
 - In 2015, they were finally awarded a USDA Community Connect Grant.
 - Two Minnesota Border to Border Broadband Grants were approved and one Housing & Urban Development (HUD) Indian Community Development Block Grant.
 - In total, it was about \$9 million in grants, and the Fond du Lac Band matched half that amount with \$4.5 million in cash on hand.
- **Strategies for success for this project**
 - Considered multiple avenues to bring Internet service to remote areas and weigh the full cost of building a network.
 - Fully include the community in their project.
 - Working with the Blandin Foundation, they held public meetings to learn what the community members wanted and designed the network to meet their expectations.
 - Doing background research and involving the community early in the process are all forms of pre-planning.
 - Creates a clear narrative that grant agencies can follow to see how an Internet service project will impact the community.

- Focus on problem-solving issues common to any new network, such as improving customer service and adjusting to problems last minute
 - For the first year of operation, they contracted out customer service, but if the problem is something physical, there are a couple of crews on call that will go out to fix it
- The program also supports cultural knowledge, during which some of the apps from 2014 went into detail about beading, plants, and the Ojibwe language.

Key Themes: Roadblocks - Engagement - Motivation - Education

Specific Themes: Cultural Knowledge - Narratives

Strategies: Community Engagement

Forms of Access: Community - Hot Spots - Fiber-to-the-Home network

Fort Peck Assiniboine Reservation

- **Case**
 - The Fort Peck Indian Reservation is located near Fort Peck, Montana and is home of several federally recognized bands of Assiniboine, Nakota, Lakota, and Dakota Native Americans
 - Have been looking to build and strengthen broadband infrastructure to assist assist in distance learning, telehealth, and working from home as the internet is now a critical need during the pandemic
- **Funding/ Support**
 - 2020: FCC granted digital sovereignty — ownership over their own spectrum
 - will increase connectivity across our state's tribal communities and increase access to critical health and education services
 - provides up to 117.5 megahertz of 2.5 GHz band spectrum that can be used by tribes to connect their communities
 - FCC gave the tribe highly-valuable wireless spectrum licenses for free, making it one of the first tribal-controlled wireless networks to come out of a Federal Communications Commission program
- **Strategies for success**
 - Motivation
 - The tribe has been trying to gain funding and assistance for building broad band but have not been able to access assistance due to spread out territory, terrain, a funding required
 - new federal tribal broadband fund has revitalized the tribe's hopes allowing them to continue to push forward
 - Are now working to finance and plan for 4 towers

Key Themes: Motivation - Roadblocks

Specific Themes: Territory - Funding - distance learning, telehealth

Strategies: Building Communication

Forms of Access: Towers - Everyone

Reference: <http://www.fortpecktribes.org/departments.html>

Gila River Indian Reservation

- **Case**
 - Gila River Indian Community covers just over 370,000 acres just south of Phoenix, Arizona of 14,000 people
 - When the COVID-19 pandemic began, residents on the reservation needed broadband to get kids online for school, attend meetings, and connect with loved ones.
- **Funding**
 - Gila River used funding from the CARES Act to install more wireless internet and develop vehicles that act as mobile hotspots when parked near schools and community centers.
 - The E-Rate program provides funding for mobile hotspots at schools and libraries for families to access brief windows of time to use the internet.
 - Limited hours, weak connections, and E-Rate rules that prohibit funding for home internet access makes this an imperfect long-term solution.
 - While some communities may have access to broadband, the price of connectivity can be a significant barrier to get families connected.
- **Strategies for success for this project**
 - Cost still is one of the largest barriers moving forward with the broadband installation for the Gila River Reservation. Finding funding and partnerships is a key focus
 - Understanding the economic impact this has on the reservation is required in order to help build a sustainable infrastructure within the reservation
 - While the FCC's Lifeline program provides a \$25 monthly subsidy for households participating on tribal lands, \$25 just doesn't cut it when the average monthly cost for internet service in the Native Nation is \$127.51.

Key Themes: Reliance - Empathy - Engagement - Economy

Specific Themes: Covid -19 - Distance Learning

Strategies: Building Funding - Building Partnerships

Forms of Access: Community

Reference:

<https://cronkitenews.azpbs.org/2015/07/22/gila-river-leader-says-lack-of-broadband-is-harming-tribal-rural-areas/>

<https://ilsr.org/>

Havasupai Tribe

- **Case**
 - The Havasupai Tribe is located at the bottom of the Grand Canyon of 600 tribal members
 - Lacking broadband access at a time when connectivity has proven essential for distance learning, telehealth appointments, meetings over video platforms, connecting to remote work, and much more.
 - Only 20 percent of students at the federally operated Havasupai Elementary School graduate from high school.
 - Havasupai Elementary School is the only school on the Havasupai Reservation and only goes up to the eighth grade
 - To address these challenges, a local community college partnered with the Tribe to establish online GED classes.
 - With students unable to access the internet at home, the first year of the program had no graduates.
- **Funding**
 - MuralNet partnered with the Tribe to help them utilize public airwaves to access the internet.
 - The total cost was closer to \$127,000
 - 2018: FCC granted a temporary permit for the Tribe to use spectrum in the 2.5GHz band.
 - The Tribe used this permit to get high-speed internet via a private LTE network in the reservation's remote location, allowing students to access online GED and community college classes.
 - According to Chairwoman Ophelia Watahomigie-Corliss, the Havasupai Tribe established high-speed internet in the village within five days of the license approval.
 - 2019: FCC granted the Havasupai Tribe a permanent license to the 2.5GHz band.
 - The LTE network provides new education, health, and emergency service opportunities critical to the Havasupai Tribe.
- **Strategies for success for this project**
 - Public awareness and advocacy from within the tribe and neighboring tribes assisted in finding partnerships
 - Current issues arise when the internet pauses or freezes and the frustration level can often to get as many were not fully introduced to lives with broadband but tossed in
 - MuralNet CEO Mariel Triggs, trains the Havasupai how to install a network box outside a home and does the best she can at introducing them to new processes and at home usage
 - Building a relationship/ partnership with the FCC and seeing the success of their progress resulted in the FCC opening a priority filing window for tribal communities to apply for licenses in the 2.5GHz band prior to a commercial auction.

- Issues do arise as the window to apply is short and the FCC would require the tribes to build their infrastructure (towers and antennas) in half the time required of major telecom companies.
- Ensure that all policy formalities have been addressed. One of the largest issues was that once the money was gathered FCC policy held the project up

Key Themes: Reliance - Motivation - Tribal Infrastructure

Specific Themes: Covid-19 - Distance Learning - TelaHealth

Strategies: Advocacy - Building Partnerships - Education

Forms of Access: Schools / Universities - Community

Reference:

<https://www.npr.org/2019/09/16/759908026/most-isolated-tribe-in-continental-u-s-gets-broadband>

Hopi Tribe

- **Case**
 - The Hopi Tribe is a sovereign nation located in northeastern Arizona. The reservation occupies part of Coconino and Navajo counties, encompasses more than 1.5 million acres, and is made up of 12 villages totaling an estimated population of 19,327.
 - The tribe currently has broadband internet in only some pockets of the reservation, but for where it does exist it works very slowly.
 - This issues is primarily due to the economically disadvantaged villages who can not afford such services
- **Funding/ Support**
 - The Hopi service relies on federal loans to expand its network.
 - 2018: Received Agriculture Department loan to bring internet access to another 650 homes on the reservation through a fiber-optic connection and let those on old-technology copper lines get faster internet access.
 - Rep. Greg Stanton of Phoenix feels that indigenous access to high-speed internet is absolutely critical now more than ever, as closing the digital divide provides access to current-day needs.
 - 2019: Stanton amended the House bill restoring net neutrality to require that the Federal Communications Commission work more closely with tribal nations to assess their internet needs and to improve access and reliability.
- **Strategies for success for this project**
 - Need to find organizations that understand the high cost and low density areas as it is often overlooked by major corporations, but small investors are willing to work and grow
 - As many carriers wouldn't even come in and offer service to the majority of these reservations, tribes built their own telecommunications networks.
 - There are nine tribally owned and operated telecommunication companies in the U.S. one of which is Hopi Telecommunications Inc.
 - Access and reliability
 - This is a constant balance in finding connection and service that can stretch to even the most remote parts of the reservation.
 - can be a delicate balancing act for providers in rural areas.
 - more needs to be done to help reservations improve infrastructure for broadband and to provide more opportunities to the households that need it.

Key Themes: Roadblocks - Reliance - Marketing

Specific Themes: Low Income

Strategies: Government involvement

Forms of Access: Tribe owned telecommunications - everyone - household

Reference:

<https://www.indianz.com/News/2019/05/09/cronkite-news-indian-country-falling-beh.asp>

Iñupiaq (Iḷisaġvik College)

- **Case**
 - The Iñupiat are a group of Alaska Natives, whose traditional territory roughly spans northeast from Norton Sound on the Bering Sea to the northernmost part of the Canada–United States border .
 - Iḷisaġvik College pays \$10,000 a month for an internet speed of 10 megabits per second.
 - The college’s total budget is approximately \$20 million.
 - The college, located in Utqiagvik, Alaska—a town of about 4,200 people has the highest cost and slowest speed internet among the 35 tribal colleges and universities.
 - Iḷisaġvik College and the eight surrounding communities connect to the internet via undersea fiber, which the private company Quintillion installed during an attempt to lay fiber from Japan to London via the Arctic.
 - In the communities surrounding Iḷisaġvik College, individual households pay high rates, too: \$300 capped at a speed of 6 megabits per second.
 - With students now home learning remotely their bill went to \$3,000 to \$5,000 because the kids are home and on the internet
- **Funding**
 - The American Indian Higher Education Consortium secured the CARES Act funding when the pandemic hit. The legislation earmarked \$20 million to help some of the tribal colleges face the fundamental challenges in their broadband infrastructure.
 - Currently still in the process of waiting additional support and funding
- **Strategies for success for this project**
 - As the project effects not just the younger generation at the college but the curround community, especially in light of the pandemic, the support the the community was a great help with motivation and action
 - AIHEC has also been hosting weekly calls with tribal college IT staff.
 - calls create a network of people to reach out to for ideas and support as the schools navigate the complexities of remote learning and broadband infrastructure.
 - Continuation of the project remains hopeful but high prices still remain the largest challenge.

Key Themes: Motivation - Engagement - Roadblocks - Education

Specific Themes: Education - Studnets

Strategies: Communication - Community Support

Forms of Access: Colleague / University - Household

Reference: <https://nativesciencereport.org/2020/08/the-backroad-to-broadband/>

Makah Indian Reservation

- **Case**
 - The Makah Reservation is a long standing tribe that has lived around Neah Bay at the northwest tip of Washington State
 - The tribe has been working to obtain better broadband services for the last several years but due to its landscape of dense rainforest and steep hills, far removed from any major urban center, it has been difficult for services.
 - In light of covid the pandemic has become an immediate service required for clinics, schools, and first responders.
- **Funding/ Support**
 - The Makah Tribe gained the license for Educational Broadband Service, or EBS over their territory through FCC
 - EBS is uniquely suited to remote locations, requiring fewer towers and less extensive infrastructure to reach hard-to-connect locations.
 - Partnership with MuralNet and gathered the equipment – about \$5,000 worth – required to launch its own network over EBS.
 - applied for a Special Temporary Authorization (STA) from the FCC, which would allow them to begin using the spectrum immediately and could later be expanded to a permanent license
 - Makah Tribe and CenturyLink introduced high speed broadband internet in Neah Bay, Washington
 - CenturyLink will provide internet speeds between 25 and 40 mbps.
- **Strategies for success**
 - Viewing Broadband access as a means of emergency management
 - First responders did not have speeds fast enough to connect or respond. The importance of broadband during the pandemic played a major role in mobilizing the community
 - provide better healthcare, education and emergency services
 - Organization and Partnership
 - Partnerships give tribe opportunity to have access to the world
 - Process is not easy, it took two years for CenturyLink to bring in broadband access and provided support amongst the reservation
 - Still working with hurdles of specific areas that can not get access but Information Technology Director is still in process of working with communication towers

Key Themes: Emergency Management - Reliance - Roadblocks

Specific Themes: Terrain - First Responders - Healthcare

Strategies: Partnerships - Respond and Mobilize

Forms of Access: Emergency Personnel - Municipal Offices -

Reference:

<https://www.fcc.gov/document/fcc-grants-makah-tribe-spectrum-access-broadband-during-pandemic>

Mescalero Apache Reservation

- **Case**
 - Federally recognized as the Mescalero Apache Tribe of the Mescalero Apache Reservation, the tribe is located in New Mexico with a population around 3,156.
 - the tribe has had phone services through tribal owned Mescalero Apache Telecom services, but has been a gradually growing service to include full range of broadband for the community
- **Funding/ Support**
 - 2015: \$5.397,000 loan from the Rural Development's Utilities Service's Telecommunications Program and the Substantially Underserved Trust Land Program given to Mescalero Apache Telephone Inc. to finance a multimillion-dollar broadband communication system.
 - MATI can upgrade specific portions of its copper cable facilities with fiber, primarily aimed at the homes of 1,178 telephone customers and 500 data customers currently served by the company, which is a wholly-owned corporation of the tribe that operates one exchange serving the reservation.
 - Mescalero Apache Telecom: the tribe's owned and operated telephone and Internet service provider
 - first tribally owned telephone company to bring broadband service to the entire residential community
- **Strategies for success**
 - Revenue / Economy
 - Broadband is critical for the tribe to market its main source of revenue, the Inn of the Mountain Gods Resort Casino: Marketing tool
 - Puts money back into stimulating the economy
 - if the tribe is going to have economic development broadband is a key to attracting it and building the infrastructure
 - Focus on the people
 - Gives students a chance to get back to classes (virtually)
 - Allows fire and police to work from own stations instead of working from subunits
 - Everyday needs to making calls and texting from the comfort of one's home

Key Themes: Economy - Marketing - Motivation

Specific Themes: Economic Development - Advertising

Strategies: Information Sharing - Cultural Development

Forms of Access: Community - Calling / texting

Reference:

<https://www.publicnewsservice.org/2015-03-25/consumer-issues/mescalero-apache-tribe-gets-5-4-million-usda-loan-for-broadband-expansion/a45300-1>

Nez Perce Tribe

- **Case**
 - The Nez Perce Tribe are in Idaho, Washington, and Oregon on 750,000 acres of reservation.
 - The wireless network came out of a need for better connectivity between the government offices as connectivity was so poor it took entire days to send emails, and remote offices were unable to transmit large amounts of data as they relied on bundled T1s and homes still relied on dial-up connections.
- **Steps**
 - 2000: The Nez Perce started to deploy fiber where the tribal headquarters are located and connected 18 locations and added additional fiber over subsequent years to connect more communities and remote facilities.
 - 2009: the Nez Perce tribal law enforcement were looking to connect their five towers, including some that were rather remote leading to wireless connection.
 - 2012: the network still proved to be insufficient.
 - The wireless network was set up and run entirely as a tribal utility, supported by the Nation and focused on delivering needed services.
 - Nez Perce Networks began selling service to home customers, local businesses and government/city entities, and leased tower space to cellular companies to improve cellular service on the reservation.
 - The tribe did a lot of research when the federal government made available funding programs for high-speed Internet service, including the Broadband Technology Opportunities Program (BTOP) through the American Recovery & Reinvestment Act of 2009 (ARRA).
 - They applied for a BTOP and were not selected until the second round and built a wireless ring around the reservation with 23 towers and co-located facilities on 12 additional towers.
- **Funding:**
 - Combined funding from the Idaho Gem Grant Program and USDA Community Connect grant developed multiple towers.
 - Funding and Expansion In total, the network cost an estimated \$23 million.
- **Strategies for success for this project**
 - Funding: Successful research is required as many programs have specific requirements about profitability and return on investment, but Indian Country does not always fit these standard models. Applying for funding through the USDA can also be difficult because the USDA has a non-compete clause restricting the number of funded USDA areas.
 - Private Internet Service Providers may choose to overlook Indian Country because they do not want to navigate the Rights of Way and meet the standards for local training and employment through the Tribal Employment Rights Offices.

- It is hard to get commercial loans because tribes cannot collateralize federal lands. The USDA is often the main loan source for broadband services in Indian Country.
- Acknowledgment of past crimes: When the US discovered gold on the tribe's land in 1863 they forced the tribe to sign a treaty cutting down their reservation size and allowing settlers to come and steal resources. Later, the federal government again attempted to reduce the lands through the Allotment Act. This creates mistrust in working with the US government and often times needs to be addressed in order to move forward
- Public-private partnerships with local governments and cell phone companies were critical to access the towers they needed.
 - The Native Nation had to draw on a variety of programs to find the funding for all the projects: ARRA BTOP, USDA programs like Community Connect, RBOG, RBEG; the Idaho Gem Grant Program and the Idaho Broadband Grant.

Key Themes: Empathy - Reliance - Education - Motivation - Engagement

Specific Themes: Funding Acknowledgement of Past Crimes

Strategies: Public and Private Partnerships - Fundraising

Forms of Access: Community - Government offices- Towers

Reference: <https://ilsr.org/wp-content/uploads/2021/02/IndigenousFutureZones-0221.pdf>

<https://nativesciencereport.org/2020/08/the-backroad-to-broadband/>

Oglala Sioux Tribe

- **Case**
 - The Oglala Sioux Tribe, located on the Pine Ridge Indian Reservation, is approximately 3 million acres and home to a very rural and underserved population.
 - The COVID-19 pandemic has laid bare how vulnerable communities are when they are left without basic connectivity—lacking in telehealth, remote learning, telework, public safety and economic capabilities.
 - Low population density across the reservation and its terrain have resulted in limited wireless broadband communications in parts of the reservation, making communication among tribal law enforcement and other first responders a challenge
 - Tribe is in need of infrastructure and resources necessary to deploy and sustain an affordable broadband network.
 - Tribe has undertaken efforts to exercise digital sovereignty to serve peoples' connectivity needs, including by licensing the 2.5 GHz spectrum over the Reservation and initiating the build-out process.
 - one main issue was the "homework gap" caused by lack of wireless connectivity in rural tribal areas.
 - schools received a donation of hot-spot devices but had no signal to use them and had families pooling money for one subscription and all the students to use in a singular home.
- **Funding/ Support**
 - looking to build partnership with TBCP to build support for connectivity
 - Partnership with National Telecommunications & Information Administration (NTIA) as it moves forward with the TBCP.
 - FirstNet has provided police departments vehicles with Mi-Fi devices that connect to a cellular network and create a mini wireless broadband cloud or hotspot to provide internet access for the vehicles' devices, now officers do not have to travel to substations
 - Feb. 2020: the agency began offering tribal governments complementary licensing of the radio airwave communication spectrum's 2.5 GHz band of mobile and digital signal previously reserved for educational institutions.
 - Sept 2020: federal government-approved application for tribal entities to take command of rural broadband internet services.
 - Phase 1: install two articles of microwave equipment in each community
 - It will take three to four weeks depending on equipment availability.

- Phase 2: building self-supporting lattice towers 100 to 120 feet tall that will hold upgraded equipment
- **Strategies for success for this project**
 - Tribes should be able to define their goals for their own people, and goals may vary between Tribes.
 - Developing the infrastructure necessary to deploy broadband throughout the Reservation requires a significant financial commitment, and tribes do not always have success partnering with others to meet our connectivity needs.
 - Tribes need to be able to exercise sovereignty over the infrastructure upon which our people depend to ensure such infrastructure is actually used to provide affordable and sustainable programs to their citizens.
 - Tribes need sufficient time to conduct historic and environmental reviews that honor their people and protect their sacred places.

Key Themes: Reliance - Empathy - Motivation - Engagement

Specific Themes: COVID - 19 - Telehealth - Terrain

Strategies: Environmental Review - Partnerships - Goal Recognition - information sharing

Forms of Access: Schools - Hotspots- Community

Reference:

<https://broadbandusa.ntia.doc.gov/sites/default/files/2021-04/Oglala%20Sioux.pdf>

Osage Nation

- **Case**
 - The Osage Reservation has primitive internet access, many rely on satellites for Internet service and streaming of media is difficult.
 - The city of Pawhuska is looking forward to working with Osage Nation and making forward progress with a Wi-Fi system
 - Building municipal Wi-Fi projects based on programs put in place by other municipalities throughout the country.
 - The Osage Nation and the city of Pawhuska have been collaborating on the development of a municipal Wi-Fi system for public use. The system will provide a free Internet connection for residents and visitors. I
 - The Wi-Fi system is intended to help close the 'Digital Divide' by providing a good Internet connection. The technology does have limitations. It's not intended to be a replacement for a dedicated broadband connection.
 - Building a broadband system is necessary for many reasons. Distance learning, business communications, and social interactions, through the use of the Internet supports our people's work, education, entertainment, culture, language, and much more.
- **Funding/ Support**
 - 2015: The Osage Congress approved a bill to support a feasibility study for broadband connection.
 - ACRS Telecommunications Engineering has been contracted by the Osage Nation to provide high speed internet.
 - Aid from Coronavirus Aid, Relief, and Economic Security Act (CARES) funds
 - 2017: \$3 million funding from Community Connect grant through the U.S. Department of Agriculture and a \$450,000 matching money appropriation from the Osage Nation Congress
 - 2020: started progress on three tower sites are now staked out for the Grayhorse community's portion of the grant-funded project
- **Strategies for success for this project**
 - Engagement with the community (Public Forums)
 - Opening a forum to the public and will provide information on the purpose, goals, and benefits and allow time for public comments and questions.
 - provides valuable data that could ultimately improve other issues, such as utilities, in the rural area that is also Osage County.
 - Osage leadership is aware of the need to improve internet connection to develop and improve Osage economy and achieve long-term goals as a culturally progressive Native Sovereign Nation.

- Osage congress will commit to a plan and strategy to phase in broadband infrastructure.
 - The first phase will be to build Osage government broadband infrastructure and expand to the public from there. This will be achieved by Osage funding as well as federal grants and low interest loans.
- Building Partnerships
 - Chief states: The CARES Act provided the funds and Chief Standing Bear gave approval to make it happen. There was a high importance of partnering with the city on this project. Without access to their infrastructure, building a network wouldn't be possible.

Key Themes: Economy - Engagement - Tribal Infrastructure - Education - Empathy - Marketing

Specific Themes: Community engagement

Strategies: Information and Cultural Sharing - Partnerships

Forms of Access: Municipal Wi-Fi

Reference:

<https://www.osagenews.org/en/article/2017/03/13/congress-passes-450000-match-grant-fund-broadband-internet-project/>

<https://www.matisp.net/about>

Pu`uhonua O Waimanalo Village

- **Case**
 - The Pu`uhonua O Waimanalo Village is a sovereign, 55-acre territory on the Hawaiian island of O`ahu.
 - They are the oldest Hawaiian sovereignty group in existence, founded in 1994
 - Was lacking connect and broadband and decided to add its own internet access, installed for, and by, their own Indigenous community.
- **Funding**
 - The Internet Society (ISOC) is helping the nation install its broadband, hosting an Indigenous Connectivity Summit in Hawai`i in mid-November, where communities from across North America will come together to learn from one another and share solutions.
 - ISOC supports communities leading their own access solutions, to enable an environment that promotes even more access to solutions
 - ISOC focuses its work in places where there is no economic incentive for an internet service provider (ISP) to make money, and therefore an entire population is left unserved.
 - Money then stays in the community as they build, control and make a more meaningful and better community
- **Strategies for success for this project**
 - Internet is a means to share the story and culture of the village with the rest of the world
 - “The internet is important for us to share our story,” says Brandon Maka`awa`awa, deputy head of state of the Nation of Hawai`i.
 - Indigenous voices are often not at the table when these connectivity conversations are otherwise had, having internet access allows new voices to be heard
 - With the help of the Internet Society, we will unlock something that will help bring people together and help us find world peace,” says Maka`awa`awa, who sees internet access as a step in the direction of a global shift toward peace.
 - “It’s about us improving our way of life,” Maka`awa`awa continues. “You need to build it. We’re going to build solutions for our community. We’re tired of waiting for the reconciliation we deserve. So we need to create solutions for ourselves.”
 - A small group is entering the community for installation, showing the community how to install and operate the system
 - Village ensures that the community is involved within the process of installation, learning, and building internet access within the community
 - people are able to self-identify to take ISOC training to learn to install, run, and manage the network
 - Build Self Reliance

- This movement is bottom-up and community-driven, Native Hawaiians are establishing their own Internet systems – and in doing so, sharing important lessons about appropriate and inclusive forms of technology development.

Key Themes: Engagement - Marketing - Empathy - Education

Specific Themes: Self Reliance- Bringing a voice to the people - Building opportunities

Strategies: Inclusive technology - Native owned system

Forms of Access: Community - Everyone

Reference: <https://ilsr.org/hawaii-community-broadband-clip-episode-88/>

<https://www.internetsociety.org/blog/2019/10/these-are-our-first-roadways-internet-access-and-self-determination-in-puuhoonua-o-waimanalo/>

Quileute Indian Reservation

- **Case**
 - The Quileute Indian Reservation is located in Washington, at the mouth of the Quillayute River. The 2000 census reported an official resident population of 371 people on the reservation.
 - Tribe is pushing for better broadband access as a means to keep up with emergency management for first responders as reservation is in constant threat of relocation to high ground
- **Funding/ Support**
 - 2018: Utilities and Transportation Commission is providing \$800,000 of Qwest Performance Assurance Plan will to bring broadband internet to La Push
 - memorandum of understanding with the Quileute Tribe, the state's Utilities and Transportation Commission, and CenturyLink will lead to high-speed internet being brought to the tribe's Lower Village
 - new broadband facilities will be capable of providing at least 25 megabits per second to the remote area
- **Strategies for success**
 - Viewing Broadband access as a means of emergency management
 - Broadband will benefit many, including police officers, first responders, health clinics, our administration, schools, families and the Coast Guard
 - Broadband is the single most important economic development tool for the reservation, as a tribe in constant threat of relocation due to climate change access to broadband builds a safer, connected community

Key Themes: Emergency Management - Roadblock

Specific Themes: First Responders - Terrain

Strategies: Regency needs of broadband

Forms of Access: Everyone - Municipal Buildings - Hotspots - health clinics - schools

Reference:

<https://www.peninsuladailynews.com/news/agreement-step-in-bringing-high-speed-internet-to-la-push/>

<https://quileutenation.org/>

Shinnecock Indian Nation

- **Case**
 - Nation is located on the East End of Long Island, surrounded by the Town of Southampton in Suffolk County.
 - In desperate need of broadband due to covid and unable to access any resources they needed to survive
 - tribal government cannot fully participate in the business of serving and protecting the Nation
 - children of the Shinnecock Nation are impeded from continuing their education
- **Funding/ Support**
 - 2021: Shinnecock Indian Nation received a federal grant of more than \$9 million as part of the Biden administration's efforts to help American Indian tribes affected by the COVID-19 pandemic.
- **Strategies for success**
 - Prior Proper Planning With Funding
 - created a committee to study tribal needs and to determine how best to spend federal grant
 - Provides ability to help build up tribal technology, governmental and emergency infrastructure
 - early projects being contemplated include wider broadband connectivity on the reservation, tribal government infrastructure and security, and continued funding for assistance programs
 - Pre planning ensure that funding does not get wrongly placed within other projects without enough to finish the project and fits the required needs to all members of the tribe

Key Themes: Revenue - Economy

Specific Themes: Resources - Business

Strategies: Building Committees - Building Infrastructure

Forms of Access: Community - Government and local offices

Reference:

<https://www.newsday.com/business/coronavirus/shinnecock-nation-federal-grant-1.50268>
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St. Regis Mohawk Tribe

- **Case**
 - The St. Regis Mohawk Tribe is a single community on the border of the US and Canada (New York - Quebec/Ontario)
 - Mid - 2000's the tribe wanted to provide everyone in the community reliable Internet access, but It took a decade to determine the best project plan and to secure funding.
 - Mohawk Networks uses both Fiber-to-the-Home and fixed wireless to connect everyone, stringing about 70 miles of fiber along poles throughout the community.
 - In 2010, a Broadband Technology Opportunity Program grant brought 60 public computers to key places providing access to the Internet, even if they do not have a home connection through Mohawk Networks.
 - Mohawk Networks is one of the few Native Nations' networks providing Internet access beyond the borders of its reservation.
 - Opportunity for economic development that serves both the tribe and neighboring non-tribal towns with high quality Internet access.
 - The wireless network was a separate project from the fiber network. It provides Internet access for rural farms, and Mohawk Networks maintains the ability to expand the reach of the fixed wireless network off-reservation.
- **Funding**
 - \$10 Million for the fiber project came from the American Recovery and Reinvestment Act.
 - The funding required matching funds of \$5 million from the St. Regis Mohawk Tribe.
- **Strategies for success for this project**
 - Importance of financial sustainability and choosing good partners.
 - The Mohawk Networks was one of the first fiber networks built by a Native Nation. They worked with external consultants to choose partners that understand how to work with the tribe.
 - Need to have good finance and accounting teams to manage grants.
 - Money has to be available upfront to cover expenses, and the team needs to understand what counts as an eligible expense for the grant. Raising the capital for a project is not enough, operational expenses have to be taken into account.
 - Have a long term plan
 - Indigenous representatives should be hired on a salaried basis to serve as liaisons to assist communities with their applications for funding and participation in policy processes
 - Federal grants should be created and tailored to Indigenous communities for basic planning, digital inclusion, and network operation and maintenance

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- federal funds are allocated to private, non-Indigenous entities operating on Indigenous lands, that entity should be required to train community members to maintain the network on their own land or at minimum hire community members for local labor.
 - They should also be required to service a higher penetration rate to ensure homes are serviced as well as businesses

Key Themes: Engagement - Education

Specific Themes: Indigenous involvement

Strategies: Representation - Native owned network

Forms of Access: Fiber-to-the-Home - community

Taos Pueblo Tribe

- **Case**
 - The Taos Pueblo is one of the oldest continuously inhabited communities in New Mexico that spans 15 acres with a population of around 1,425.
 - The Tribe originally had no access to Broadband Internet.
 - In 2014 the Taos Pueblo tribe began work on starting high-speed Internet service from Kit Carson Telecom.
- **Funding/ Support**
 - 2011 - 2012: partnered with Kit Carson Telecom and start of construction begins for installation of fiber optics
 - \$44 million grant through Recovery and Reinvestment Act of 2009 to bring Fiber-To-The-Home, and a \$19.5 Million dollar United States Department of Agriculture loan.
 - program gives Taos Pueblo Tribal members the tools necessary to create economic development, telehealth/telemedicine, and most importantly educational opportunities
- **Strategies for success for this project**
 - Partnerships that provide education
 - Working with Kit Carson Telecom not only provided opportunities for funding but also provides programing to community members to develop educational opportunities, health initiatives, and connectivity between members

Key Themes: Reliance - Engagement

Specific Themes: Education - Health initiatives

Strategies: Native Involvement - Partnerships

Forms of Access: Everyone - Community

Reference: <https://muninetworks.org/content/indigenous-networks>

https://www.taosnews.com/news/taos-pueblo-has-access-to-high-speed-internet/article_a770d1be-4256-5405-88d3-c410dc4ace47.html

Yakutat Tlingit Tribe

- **Case**
 - The Yakutat tribe is an isolated community of about 650 on the bay off the Gulf of Alaska
 - Have very limited broadband and face difficulties with building because they have no roads to move supplies and no electrical grids to power cellular towers.
- **Funding/ Support**
 - 2021: Cordova Telecom Cooperative is providing \$18.88 million to expand their broadband network over 200 miles to their neighbors in Yakutat
 - Cordova Telecom's solution is to install five towers on mountaintops and refuel them annually via helicopter
 - Cordova Telecom's new network is expected to become operational in Yakutat by fall 2021, initially delivering connectivity at 2.6 gigabytes per second.
 - NICEY will be financed in large part by a U.S. Department of Agriculture (USDA) ReConnect grant of nearly \$19 million awarded to CTC in December.
 - This money will help fund not only the deployment of the fiber network in Yakutat but also the construction of several remote wireless towers to connect the village to the broader Internet
- **Strategies for success**
 - Partnerships
 - This project could not be completed without the assistance of their neighbors
 - it's important to count on your neighbors and work together
 - Benefits both communities: will allow for greater services in health care, schools, and social services and will positively impact lives and opportunities for everyone in communities
 - Builds stronger ties and relations
 - Cordova and Yakutat also share a long history and are home to many of the same tribes.

Key Themes: Roadblocks - Reliance - Motivation

Specific Themes: Outside Tribal Support - Neighbors

Strategies: partnerships - community relations

Forms of Access: Remote wireless towers - universities - health care systems

Reference:

<https://ilsr.org/native-alaskan-population-get-closer-to-accessing-high-quality-internet-service/>

<https://www.usda.gov/media/blog/2020/01/13/uniquely-alaskan-solution-bring-broadband-isolated-gulf-community>

Yavapai Prescott Indian Tribe

- **Case**
 - This tribe is in Prescott, Arizona, is a self-sustaining sovereign nation that has numerous IT needs to service a variety of businesses such as retail stores, real estate offices, and a popular casino.
 - MIS/Network Manager Chad Dixson sought out a new system that would allow for growth.
- **Funding/ Support**
 - Working with CommSpeed, a Prescott Valley-based wireless Internet Service Provider (ISP) and Conceptual Systems and Software, a Chino Valley-based networking firm.
 - The Tribe has significantly enhanced communication capabilities between its numerous enterprises through a new high-speed wireless network, which links all tribal offices and gaming sites.
 - 1 Gig Ethernet with 100 Mbps Direct Internet Access (DIA) was prescribed
 - 2003: Launch of its new wireless wide area network (WAN) and a comprehensive website.
- **Strategies for success for this project**
 - Focus on an increased efficacy for now and future generations and opportunities
 - Ernie Jones, president of the Yavapai-Prescott Indian Tribe: “This technology will allow us to greatly increase our efficiency, and our new email will improve the way the Tribe communicates within the organization and beyond.”
 - The Tribe has also debuted its first comprehensive website, www.ypit.com.
 - The site offers a brief history of the Tribe, information on tribal environmental programs, businesses operating on the reservation, community news and links to the Bucky’s and Yavapai Casino site.
 - Working with Commspeed improved YPIT’s network performance as well as offer plenty of flexibility for future growth and growth of opportunities for the tribe
 - Offers career and educational opportunities for current and future generations

Key Themes: Empathy - Marketing - Economy

Specific Themes: employment - advertisement

Strategies: information sharing

Forms of Access: community

Reference:

<https://business.sparklight.com/sites/default/files/media-assets/COB%20Yavapai%20Case%20Study%20v1.pdf>

https://www.ypit.com/press/010603_rls-wireless.htm

https://www.ypit.com/about_ypit.htm

Yurok Reservation

- **Case**
 - The Yurok Indian Reservation is located in parts of Del Norte and Humboldt counties, California, on a 44-mile stretch of the Klamath River, home to roughly 6,311 tribal members
 - Community lacked broadband access to be equipped for high speed internet service throughout their communities
- **Funding**
 - 2013: California Public Utilities Commission approved a \$6.5 million grant for the Yurok and neighboring Karuk tribes to build an 82-mile fiber backbone to an existing internet hub, and then build out last-mile wireless connections to around 814 homes and businesses throughout the land.
 - 2018: California state government deemed the environmental assessment complete, and the joint Klamath River Rural Broadband Initiative is awaiting approval from the California Advanced Services Fund on the initiative's additional requests for funding to expand the project.
 - The proposed project would open up broadband service for health clinics, tribal offices, and businesses.
- **Strategies for success for this project**
 - By creating their own network, the Yurok Tribe has helped build a network infrastructure, as well as acquire the necessary permits from both state and federal agencies.
 - YurokConnect is a wireless broadband network that covers the entirety of the Yurok Tribe Reservation, comprising a one-mile wide tract running along both sides of the Klamath River and extending for 45 miles to the Pacific Ocean
 - YurokConnect offers single-family residences service up to 800 Kbps for \$40 per month, and up to 2 Mbps for \$80 per month.
 - With the The reservation's terrain being rough, mountainous, and heavily forested, making it exceptionally difficult to build out communications infrastructure, using the TV white space spectrum made it possible for the tribe to install fewer towers and also reduced the amount of hardware required on the user end to connect to the network.
 - Given the reservation's terrain and scattered population, the white space spectrum license was particularly advantageous for building an efficient and cost-effective network.
 - Yurok tribe was currently relying on towers to provide broadband to some areas, but when redwood trees grow taller, they can block the point to point signal, and as the redwoods are a sacred part of the tribe they are not to be harmed, finding spectrum to be a better option for their needs and values
 - YurokConnect has brought a multitude of benefits for the nearly 5,000 Tribe members who previously lacked internet access on their land.

- The network has created better opportunities for telemedicine, distance learning, public safety, and communications infrastructure for Yurok's fishery management and tribal government operations.
- Found partnership with other tribe (Karuk Tribe) to build and obtain funds, support, and local awareness
- By prioritizing the needs of the community and end users, rather than return on investment, these networks keep internet access affordable and high-quality.

Key Themes: Reliance - Motivation - Roadblocks

Specific Themes: Neighbors - Terrain

Strategies: Local Awareness - Outside tribal support

Forms of Access: Community - Schools - Healthcare

Reference:

https://auburnpub.com/blogs/eye_on_ny/cayuga-county-s-high-speed-internet-needs-state-broadband-initiatives/article_5b7cca42-0682-5560-acd2-5681a78fddeb.html

<https://www.yuroktribe.org/post/yurok-tribe-implements-extensive-broadband-project>

Thematic Analysis

Economy:

Employment - Revenue

Conversations on Difficulties

- Many reservations and communities require broadband as a means to make a living and build a company already in place
- Unemployment in multiple communities are are high, providing broadband could assist with opening jobs opportunities but many worry about the troubles of having to learning and operating a new technical system

Responses and Suggestions

- Broadband and internet services can additionally be used as a marketing tool to build business and attract tourism and revenue for casinos and national parks to which communities rely on the tourism
 - Puts money back into stimulating the economy
 - if the tribe is going to have economic development broadband is a key to attracting it and building the infrastructure
- Bringing high-speed cable Internet access to businesses and homes can assist

Education:

Language - Translation

Conversations on Difficulties

- Most of this is not well known knowledge to the tribal community
- This type of technology is a different language in the absence of the tribal community and thus we must present the special communications to them through a different language for ourselves so that they can understand.
 - Sometimes, one can listen, but cannot understand the technical part of a conversation.
 - This should spur some interest in educating the Tribal community on how things work from a technical perspective, before and after listening to their needs and concerns.

Responses and Suggestions

- Creating dialogue about broadband to open up conversation as a means to hear feedback
- The technical knowledge/conversation needs to be expressed as a means to provide a conversation in which tribal members are given full access to an understanding of the mechanics of the installation, hardware, and opportunities of broadband.
- Tribal members should be able to ask any questions about broadband and receive full answers to their questions. They need to be presented with the opportunity to ask questions they have been too scared to previously, thus opening an honest dialogue of what will occur without holding back any flaws or technical issues that may occur moving forward.
- It is our role to change and adapt to the tribal ways of thinking and communicating when it comes to translating our wants into their needs and still allow their voices to be the ones that are heard.

Education:

Support - Advancement - Knowledge

Conversations on Difficulties

- Perspective of tribal needs and wants of how this benefits not only their future generations but the culture, land, traditions, and so forth - Expressing that this is a new type of education.
 - Just because the current and past generations did not have broadband and turned out fine does not mean that better opportunities would have arisen.
- People are often frightened of new advancements.
 - They are afraid of what technology means, that they do not have the proper skill set, requirements, specific knowledge or degrees and thus shun the idea entirely
- There's some misunderstanding between leadership and the community members
 - people don't really understand technology well enough then it's lost in translation and you don't get past this point of misunderstanding / mistrust / fear / uncertainty

Responses and Suggestions

- Support from other organizations and tribes, knowing that they are not alone in this choice and others are there to offer support
- bridge this gap of understanding/ translating opportunities.
- Bring an end to fear due to lack of education
 - Education, degrees, and special requirements are not needed and basic knowledge can be taught
 - Remove gap from misunderstanding and show that technology can be utilized within all levels and generations of the group through trainings, teachings and communication
 - Show that community already has the knowledge and ability to take this into their own hands they just need to be given tools and direction
- Paying people within the tribe who want to help teach and would incentivize community to work harder and provide their best possible effort in helping others from the tribe
 - build local capacity and educate the community to help the tribe with their initiatives rather than bringing someone from outside.
- Developing education models in realizing that young people can teach the older generations on how to use a phone, or a laptop, and or what the internet is, and how it can help develop the community or the reservation.
 - Creates a system in which community members have a better voice through the process. Builds self esteem and community esteem
 - educational content for tribes with useful ideas with regards to data archival and prevention of data destruction which can be very crucial in a tribal cultural preservation context.

Emergency Management: Covid - First Responders

Conversations on Difficulties

- Broadband is required for at home / distant learning due to the pandemic but are unsure if it will be able to reach those within the most remote places or in difficult terrain
- First responders need access to broadband as they are working on systems that are too slow or do not receive notification but worry of the same issues as it reaching remote areas as they need to act fast

Responses and Suggestions

- The importance of broadband during the pandemic can provide better healthcare, education and emergency services
- Broadband will benefit many, including police officers, first responders, health clinics, our administration, schools, families and the Coast Guard
- Systems and hot spots can be set up in local areas for people together if broadband does not reach remote areas or terrain makes it difficult.
- Organizations are offering at home installations for hotspots for students having at distance learning along with rentable laptops
- For first responders, while hotspots are also being set up and second sites for internet access, organizations are providing cars set with internet connection so that responders do not have access to the internet can be provided in a range of their vehicles.

Empathy:

Perspective - Understanding - Acknowledgment

Conversations on Difficulties

- Break down the opportunities and impact through the perspective of the tribal community
 - Different multifaceted impacts of connectivity: economic benefits, health and wellness, telehealth
 - express opportunities for young and old, broadband is not a single generation focus
- Short term and profit effects are not primary key points within the reservation. They want to know the longevity of the project and how it will impact the community's needs. This is not a single sided perspective case
- Previous lack of acknowledgement of historical wrongs, such issues of not addressing previous wrongdoings held underlying fear, mistrust, and unwillingness in trying to move forward with projects

Responses and Suggestions

- Tribes need to be listened to and have aspects acknowledged. They have fears of the effects that the addition of broadband will have within their reservations and with relations outside of the reservations. This needs to be taken seriously and have the advantages of broadband explained through terms that focus upon building not only the 7 generation out but how it will assist the current generation and the 6 others along the way.
- Such partnership requires that both sides remain open and acknowledge the advantages and the difficulties that will arise. Setting up a plan to address difficulties head on provides progressive action and can be taken by those members within the community who have already learned and can be a trusted guide between both groups.
- Advocate a case to council and the community that will showcase the longevity of the project for their benefit
 - Frame policies and regulations around tribal needs. How to better relations within the community, sensitivity to their perspective of needs that builds common interests.
- Acknowledgment of the past difficulties and an openness that further difficulties may arise.
 - Do not cover flaws but address them head on, be open, up front, and willing to accept feedback from tribal communities so that they accept feedback from you.

Engagment:

Communication - Community - Listening - Needs

Conversations on Difficulties

- Community engagement with a purpose gathering people
 - community mapping, reaching decisions, planning
 - Council members may be of different generations - Listen and hear all perspectives, fears, worries, concerns, goals they want to accomplish
 - Can oftentimes learn more from listening than talking
 - If the community becomes involved the council becomes involved
 - Not all members of the community will wish to engage
- Start a conversation with tribal leaders before engaging in a technology infrastructure project
 - Previous problems were communities knew they needed broadband but the council isn't listening or doesn't know it, or doesn't understand.
 - Communication is the hardest part in Indian country, to make sure that everybody gets to hear a message. Members tend to listen to their leadership to understand at least an evaluation of a process or a defining or debunking process that they've heard about and thus we need to provide the accurate information to then be translated to the community.
 - We are asking a lot of the community, to provide time, resources, this we need to support them and the capacity for building relationship
- Needs and technological expertise needed to translate
 - Every phase, every decision point, the tribal leader will have to be included.
 - You want to have every single option explored because it's been driven from the community.

Responses and Suggestions

- Take the time to understand communities past and previous relationships that could have turned negative.
 - Chosen glories and traumas
 - Where did these relationships go wrong, where can we build and establish lasting trust
 - Current and also traumas from past that affect current relationship
- Roles of children / young adults
 - Benefits the next seven generations from now, you're doing what we're doing to better the lives of people, seven generations from now.
 - We adopt the terminology of future-proofing and building for future generations of buildings for the children to run the tribe in the future.
- Develop a program around all the stakeholders to have a broadband plan that can be adopted into legislation rather than one leaders vision, and it's supported by the community
- Tribal digital village network- stakeholders from each community and reservation



involved with a designated person from the reservation that the tribe identified as the person that was going to be involved as a representative to hear, learn, or be taught

- A digital ambassador within the tribe to build gather and engage but also to represent leaders and their voices
- Engage with all aspects of the community from multiple generations, youth, town hall, and council to help them understand where our side is coming from
 - Provide five or six tools for facilitating coming to insights together.
 - Communication through a member of the tribe who is involved in seeing more than just the needs of the internet but the needs of the people in relation to the internet
 - Provide information through written and spoken work
 - Ask for feedback / surveys / get to know their wants, needs and values

Marketing:

Opportunities - Shared culture - Public Media Advocating

Conversations on Difficulties

- Marketing to the needs of the group
- Examine cases that present new options to the group that broadband can provide that were not feasible previously
 - Covid - extreme scenario - now you have a choice whether you want to go back to your office or not because they're open again, but they're okay because you have a broadband connection, it has changed the entire ecosystem of the way we work.
 - Family and expenses - less extreme cost of bringing family to the movies, gas, tickets, snacks, travel, versus that on being hom together with home cooked meal, netflix movie

Responses and Suggestions

- Marketing through perspectives that benefit the community that supports your community and educates the community to what you're doing.
 - Providing opportunities to advance education
 - Change the ecosystem of work and home life
 - Change the meaning of family and daily expenses
 - Share culture with outside world
 - public media advocating on behalf of Native Americans getting broadband

Motivation:

Longevity - Sustainability - Self Reliance

Conversations on Difficulties

- Build in the long-term investments for infrastructure and community lasting 7 generations
 - How to support community networks
 - How to build sustainable and impactful community building
 - Previously had brought in outside help that doesn't understand the community that isn't part of it that may or may not live there long term.
- Can we create a resilient, interconnected and affordable network that everyone benefits from

Responses and Suggestions

- Need to be able to express gains in ways that benefit the community and are long lasting, not short term.
 - Jobs / education/ promoting culture/ sharing chose trauma and glories / expanding networking/ building awareness
 - expansive building that capacity within your tribal community members creates that resiliency.
- The more people that benefit from the broadband access and the more positive opportunity it presents the more positive reinforcement that it will have on the outcome and acceptance of it becoming part of everyday scioty.
- Encourage the community that they will be able to run and handle things on their own at one point.
 - Remove focus from outside help to community learning and leading
 - Learning and education will provide access to new opportunities
- Conversations on ROI for the community and future generations
- Movements are bottom-up and community-driven, Natives are establishing their own Internet systems – and in doing so, sharing important lessons about appropriate and inclusive forms of technology development.

Reliance:

Partnerships -Support -Adaption

Conversations on Difficulties

- Multiple projects could not be accomplished without the aid/ support/ or assistance of neighbors and other organizations
- Relying on others can often elongate the process and cause difficulties of previously damaged relationships

Responses and Suggestions

- Benefits both communities: will allow for greater services in health care, schools, and social services and will positively impact lives and opportunities for everyone in communities.
- Partnerships give tribes opportunity to have access to the world

RoadBlocks:

Bottlenecks - Attitudes and Behaviors - Perceived Threats - Denial of services

Conversations on Difficulties

- General capacity building
 - Sacred land / nature / effect on wildlife and environment needs to be taken into account
 - Perceived threat to tribal communities way of life and cultural makeup
- Common pitfall is the desire to do something and not having the project management/ knowledge/the ability to move forward with it.
 - This takes place on both sides of the project. Can both sides provide the ability, understanding, communication, management, and resources to build the project without letting each other down or deserting the project
- Worry that the tribe is going to be able to sustain moving forward with broadband and not give up when issues arise
 - Sustainability
 - Tribal community behavior in the face of difficult outcomes
 - Unwillingness to accept changes within society
- While some members may appreciate broadband other members may not want it within their home lives
 - Changing the makeup of the home or individual
- Afraid that this could change the tribes relationship with their culture/ environment/ on another based upon introduction of new technology
 - changing the boundaries of the group
- Bypassing tribal land by long haul fiber infrastructure companies
 - Companies valued how much they should build per day and worked to avoid anything that would cause long projects (lakes, canons, tribal grounds) Looking for quickest and easiest ways. If it slowed them down they went around

Responses and Suggestions

- Establish best practices/ listening to the needs, morals, and values of the community before assuming or acting.
 - Watertower example/ building relations of trust within communities/ understanding and respecting the boundaries of the group
- Tribes can hire consultants to help
 - if tribal community members have good knowledge within the field and have them involved within the process.
 - Training, networking building relations that express best practices to the community by utilizing members within the community who understand the process
- Building on land is dependent upon each reservation, while some may welcome it and others may have their concerns. You have to be respectful and work to navigate the natural and cultural living space that you thrive in.

RoadBlocks:

Technical Concerns - Cyber Attacks - Denial of services

Conversations on Difficulties

- Lack of a general understanding of what it means to build broadening or communications at all the responsibility level.
 - Signal goes down can someone rebuild it
 - Community is now relying on a service we created and we are responsible for what goes wrong such as service being down and unable to take emergency actions
- Building a technology network infrastructure in Indian country
 - Ability to run fiber throughout the community
 - Access to middle mile backhaul
 - Affordability to sustain the project
 - build off of reservation and navigate land for sacred spaces, burials, artifacts in which many tribes outright refuse to disrupt the land
- Cyber attacks
 - Overflow of activity on a pipe that it gets blocked
 - Loss / leak of private and personal information
 - No system is perfect, there will be concerns from both sides and tribes need to know these but also know it is regularly handled

Responses and Suggestions

- Do not only focus on the two extremes of implantation but show you have a well thought out proactive (non reactive) plan that covers all finer concerns.
- Pursuing relationships and partnerships with tribes that help develop broadband routs and include development of education programs
- Cyber attacks can be managed by firewalls and management processes that can be learned to manage those types of attacks by those within the community giving the people the knowledge and control to effectively address their own systems
 - There are practices and companies that will come in and teach how to get more protected. Nothing's perfect. Expect to get hacked, but expect to be prepared and actually make sure to have ample backup of content. This needs to be expressed to the tribal council that it is a natural and expected occurrence

Tribal Infrastructure: Council -Proposal

Conversations on Difficulties

- Basic infrastructure - understanding around the political climate and tribes.
 - Tribes were forced to have a constitution like the federal government/ forced to have leadership council
 - Council operates in different ways, either final decision makers or opens up to entire population for votes when building a proposal/ resolution
 - Resolutions would then be built by our team and enacted by tribe to either be passed by community or tribal leadership depending on tribal infrastructure
 - Marketing proposal to tribe or marketing it to the community as a whole presents different tactics, relations, and outreach

Responses and Suggestions

- Specific time designated to focusing on infrastructure of the tribe.
 - When marketing to tribal leaders is detailed and every corner examined, work will need to be explained to provide assurances and honesty of the entire project. In Marketing to the community it may require more work gathering feedback from individual members and their wants and needs
- Work with the council to make decisions and set guidelines for operation. as long as you're under the guidelines that were set forth, you may operate without all the bureaucracy.

Additional Overall Suggestions

- **Improve Access to Capital.**
 - Native Nations do not have the same access to capital as municipalities or as private Internet service providers
 - Lending institutions should address their processes for lending to Native Nations to determine how to better support network projects, and the federal government should regularly evaluate funding opportunities for network projects by Native Nations

- **Funding**
 - Avoid single purpose funding
 - Federal funding is often limited to a single purpose, such as connecting Indian Health Services facilities or schools and libraries, which tends to create Internet silos rather than broad access.
 - Difficulty in accessing finances from banks due in part to lack of education about technology and the value of community network business models. In addition, banks do not accept assets on tribal lands as collateral.
 - pursuing various funding opportunities is lengthy and complex, particularly as many community networks do not have a full-time staff person dedicated to the role.

- **Recognizing the Preparation Needed to Take Advantage of Opportunities**
 - Native Nations that have already started projects or have plans to start projects can easily jump on new funding opportunities if they have a core team of network professionals ready and waiting for the next funding opportunity.
 - Ensure long term planning and a sustainable community network
 - Assess current and future connectivity needs and incorporating them into the business plan and technical solution are critical to the foundation of a successful community network.
 - Others agreed another crucial aspect to longevity is managing a network as a business organization that can champion technology, develop strategic plans, and ensure succession planning within the community

- **Fostering an Enabling Environment**
 - demonstrated the link between Internet access and social and economic development, particularly when Indigenous communities develop their own connectivity solutions.
 - help foster an enabling environment that facilitates the creation of more Indigenous community networks, participants suggested taking a resolution on tribal connectivity issues to senior-most councils
 - Present underlined role of all citizens to help promote an enabling environment. This includes supporting educational opportunities within communities,

- advocating for infrastructure development, and participating in events and organizations that can promote supportive governance and policies
- The FCC should not lease licenses to spectrum over any Native Nations to non-native entities. Spectrum should be treated as a natural resource, and the FCC should recognize Native Nations' autonomy in determining how to use spectrum for Internet access.
- **Creative connectivity solutions that focus on sustainability.**
 - An enabling environment of supportive policies, funding opportunities and public education.
 - Capacity building and education within communities.
 - **Support culture and language preservation within communities**
 - digitizing cultural objects, stories, songs and ceremonies for storage in spaces like digital libraries.
 - language revitalization, particularly for those that have no written form, through educational apps, video tutorials, and Indigenous language keyboards.
 - Promote awareness of Indigenous rights issues, combat cultural stereotypes, and promote understanding around controversial cultural practices.
 - Focusing on network security, data storage/server locations, access permissions, and working with Elders to judge what content is and isn't appropriate for public access.
 - By taking ownership of connectivity solutions communities can work to grow culture in new and healthy ways.
 - The Tribal Employment Rights Offices provide a value often overlooked by lending institutions or the federal government by making sure that training and hiring is done locally and that the community is benefiting from the new job opportunities that a network project brings.
 - **Opportunities for youth**
 - facilitate distance education in communities that did not have high school or post-secondary institution
 - Access to education within the community meant students could complete their studies at home and maintain a critical connection with their family, community, and land.
 - **Barriers: The expense of service in remote communities**
 - Has to create broad connectivity solutions for large areas with different native communities all with different needs and priorities
 - missed opportunities for community development due to a lack of cooperation among institutions due to funding and infrastructure
 - Indigenous rights were ignored during installations of a fibre optic line along traditional land without consultation or consent from the band council.

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- **Technology and Sustainability**
 - Lack of interest, education opportunities or redundancy required to ensure network continuity
 - Struggle to keep up with technology as community needs evolved and required greater access

 - **Sharing Culture**
 - Internet is a means to share the story and culture of the village with the rest of the world
 - It is a place to share a story and culture with those outside the reservation
 - Indigenous voices are often not at the table when these connectivity conversations are otherwise had, having internet access allows new voices to be heard

Resources

Databases - NewsPapers - Government Organizations - Public Broadcasting - Tribal Webpages

- Blackfeet Nation Webpage
- Quileute Webpage
- Cronkite News
- Public News Service
- Native Science Report
- Community Networks
- Fort Peck Tribe Webpage
- The Yurok Tribe Webpage
- Internet society
- News Day
- Native Times
- Cherokee Nation Webpage
- Yavapai Prescott Webpage
- United States Department of Agriculture
- U.S. Government Accountability Office
- The National Broadcasting Company
- Osage News
- Broadband USA
- Institute for Local Self Reliance
- National Public Radio
- Choctaw Nation Webpage
- Native News Journal