



Executive Summary - Akiak Broadband Feasibility Study Report

Submitted under BIA Grant: National Tribal Broadband Grant
(NTGB) 2020

I. Overview

This Akiak Native Community Broadband Feasibility Study was completed under Bureau of Indian Affairs National Tribal Broadband Study grant Akiak NTBG2020 to determine the most feasible solution to bringing affordable broadband internet to the unserved Tribal Community in remote Akiak, AK.

This Study Report includes an optimal, practical, and executable Akiak Broadband Plan to bring high-speed internet connectivity to meet the next 3-5 year needs of the Tribal Community in Akiak, Alaska. Implementation of the broadband recommendations in the Study will improve the quality of life, spur economic development and commercial activity, create opportunities for self-employment, enhance educational resources and remote learning opportunities, and meet emergency and law enforcement needs. The Akiak Broadband Plan was written as a village-based scalable model that can be leveraged and reused by the 55 other federally recognized Tribes in the Yukon Kuskokwim Delta (YKD) to bring affordable broadband internet to their unserved Tribal Communities. The Sections of this report align with the defined Study objectives:

1. **Broadband for the Akiak Native Community** – Assesses the current internet connectivity state of unserved Akiak in the unserved Bethel Census Area as one of 56 Tribes in the unserved Yukon-Kuskokwim Delta (YKD).
2. **Current Fixed and Mobil Internet Connectivity** - Assesses the current internet services available to and used by the Akiak Native Community, “Tribal Community”, in Akiak, Alaska. The Tribal Community includes people, households, offices, clinic, community centers, businesses, and the Akiak School.
3. **Tribal Community Broadband Needs 5-10 Years** - Describes the current and future broadband high-speed internet connectivity needs for the Tribal Community defined through Household, Business, and Government use cases over the next 5 to 10 years.
4. **Tribal Community Broadband Options** - Assesses nine fixed and mobile internet options to determine the most feasible and technically acceptable broadband options capable of meeting the Tribal Community needs over the next 5-10 years.
5. **Tribal Community Broadband Solution Analysis and Feasibility** - Analysis of the three down-selected options and a determination of the most feasible and desirable broadband solutions to meet the internet connectivity needs of the Tribal Community over the next 5-10 years.
6. **Tribal Community Internet Service Provider (ISP) Analysis and Feasibility** - Assesses Internet Service Provider (ISP) and Wireless Internet Service Provider (WISP) requirements for the recommended LEO 2.5GHz fixed wireless broadband solution. Analyze ISP and WISP service offerings and recommend the most feasible services for the initial period. Assess the long-term options for the Tribe, as owner of the equipment and 2.5GHz solution, to outsource ISP and WISP services for higher quality and value or to become their own ISP and/or WISP over time.
7. **Major Findings** – summarizes the high-level findings of the Study.
8. **Recommended Tribal Community Broadband Plan** – The Akiak Broadband Plan to deliver the LEO 2.5GHz fixed wireless solution to meet the Tribal Community 3 to 5-year internet needs for up to 120 locations in Akiak using the ANC FCC 2.5GHz spectrum license.
9. **Other Considerations** – includes options for consideration by the Tribal Community.

II. Executive Summary

- ❖ **The Akiak Native Community (ANC) is in one of the most unserved places in America and Alaska.**
The unserved ANC in the unserved Bethel Census Area (BCA) is one of 56 federally recognized unserved Tribes in the unserved Yukon-Kuskokwim Delta (YKD) of SW Alaska. “Unserved” means without access to broadband internet. The FCC defines “broadband” as internet connectivity at minimum download/upload speeds of 25Mbps/3Mbps. The YKD, an area larger than the State of Pennsylvania, is the 2nd largest unserved area in America. The 18,300 plus unserved population in the BCA is 84% Alaska Native representing the largest co-located unserved general and indigenous populations in the State of Alaska.
- ❖ **The unserved ANC and YKD Tribal Communities were left out, left behind and hardest hit by the COVID-19 Pandemic.**
The digital divide was a chasm of inequality for the unserved ANC and YKD Tribes who did not have the same access to information and tools to prepare for, prevent and respond to the COVID outbreak as did areas with broadband. This inequality is highlighted by the difference in COVID infection and death rates in Alaska between the 22 Census areas with broadband and the 7 unserved Census areas. If you live in the unserved BCA, you were twice as likely to get and die from COVID-19 than any of the people in the 22 areas of Alaska with broadband. The unserved ANC had a 61% COVID positive rate.
- ❖ **Lack of ISP options results in high rates for low quality internet service depresses internet use in the ANC and YKD Tribal Communities.**
The ANC and YKD Tribal Communities are unserved with only one viable ISP. Without competition, the price for internet is high. Without minimum broadband speeds, the value of the internet service for the price is low. At the same price point from the same ISP, a Tribal citizen in Alaska gets 10X-30X less value in Akiak than a Tribal citizen in Anchorage. The result is lower internet use in Akiak and the BCA.
- ❖ **Broadband is needed to meet the Tribal Community’s Household, Business, and Government use cases over the next 5-10 years.**
The ANC Household, Business and Government use cases are not being met today and require minimum broadband speeds capable of providing data transmission driven by video streaming and conferencing needs which represent 84% of internet use traffic. This was clearly evident in the unserved Tribal Community’s inability to access telehealth for COVID and distance learning for students of the physically closed Akiak School.
- ❖ **LEO 2.5GHz fixed wireless is the most feasible affordable broadband solution for the ANC and YKD Tribal Communities for the next 3-5 years.**
Of the nine broadband options evaluated, three were determined to be technically acceptable for Akiak and met the 3 to 5-year internet use case needs of the Tribal Community. Of the three broadband options evaluated for feasibility, Low Earth Orbit (LEO) fixed wireless was determined to be the most feasible for the ANC and YKD Tribal Communities. Fiber optic broadband is not the most feasible or affordable broadband option but it is the only technically acceptable option capable of meeting all of the Tribal Community use case needs over the next 3-10 years.

❖ **Akiak Broadband Plan - 2021/2022 implementation of LEO 2.5GHz fixed wireless solution in Akiak (Phase I) followed by TBD fiber optic when available in YKD (Phase II).**

The most feasible, affordable, and optimal village-based LEO broadband solution for ANC and the YKD Tribal Communities is a hybrid LEO/GEO HTS integrated satellite service to Akiak for middle mile/backhaul internet infrastructure and scalable 2.5GHz fixed wireless for the last mile to all building locations in Akiak for last mile internet infrastructure. Optional but recommended is the inclusion of Voice over IP (VoIP) telephone equipment and service to all Akiak building locations.

❖ **Recommend ANC outsource ISP and WISP services for initial period followed by reevaluation to determine best value options for outsource and/or in house Tribe as ISP/WISP.**

The ANC will own the last mile infrastructure including the 2.5GHz equipment, license, and housing. After an initial period of outsourcing the management, operations, and maintenance of the ISP and WISP internet access and use services, we recommend the ANC continue to reevaluate their options to outsource for best value service provider and/or have the Tribe perform some or all ISP/WISP services in house.

❖ **The ANC should consider options to leverage expertise to assist YKD Tribal Communities access broadband.**

Take advantage of growing Akiak broadband expertise and village implementation experience through the pilot Akiak LEO 2.5GHz project to help YKD Tribal Communities use historic federal and state grants to deliver feasible affordable broadband. Explore creating a YKD Tribal Organization consortium to take maximum advantage of grant funding to deliver broadband to YKD Tribal Communities including the NTIA Tribal Broadband Connectivity grants (proposals due September 1, 2021). Explore expanding LEO 2.5GHz fixed wireless for YKD schools and village clinics. Explore opportunities to join cellular/mobile networks and revenue sharing.

IX. Major Findings

Broadband for the Akiak Native Community

1. Finding - ANC and YKD Tribal Communities are Unserved. ANC and the entire YKD, including both the BCA and Kusilvak Census Area, are “unserved” by broadband. The unserved 56 YKD Tribes represent almost 10% of the total number of 574 federally recognized Indian Tribes in the United States. They are 25% of the total number of 229 Tribes in the State of Alaska
2. Finding - One of the largest unserved areas in America and Tribal populations in Alaska. According to the [FCC Fixed Broadband Deployment Map](#), the Bethel Census Area (BCA) is the second largest unserved area in America. The BCA has the largest unserved general and indigenous populations in the State of Alaska. Its 18,386 residents including 15,444 (84%) American Indian/Alaska Natives (AI/AN), represent the largest co-located number of unserved Alaskans.

3. **Finding** - Unserved ANC and YKD Tribes were hardest hit by COVID-19 Pandemic. The digital divide was a chasm of inequality for the unserved ANC and YKD Tribes who did not have the same access to information and tools to prepare for, prevent and respond to the COVID outbreak as did areas with broadband. This inequality is highlighted by the difference in COVID infection and death rates in Alaska between the 22 Census areas with broadband and the 7 unserved Census areas (FACTS, 2021). If you lived in the unserved BCA you were twice as likely to get and die from COVID-19 as any population in any of the 22 Census areas with broadband in Alaska.

Current Fixed and Mobil Internet Connectivity

1. **Finding** - Lack of ISP Competition Drives Higher Prices for Lower Value Internet Connectivity. GCI Holdings LLC has an effective monopoly on the current terrestrial internet connectivity options for Akiak, AK and the YKD. At the same price point from the same ISP, a Tribal citizen in Alaska gets 10X-30X less internet connectivity value in Akiak than Anchorage.
2. **Finding** - Higher Prices and Lower Value Reduces Internet Use. Akiak and the BCA are unserved with only one viable ISP. Without competition, the price for internet is high. Without minimum broadband speeds, the value of the internet service for the price is low. The result is lower internet use in Akiak and the BCA. A review of comparison data shows a clear and significant lower use of internet service for households with a computer in the BCA than the national average and the average in Anchorage County, a served areas with at least five broadband ISP providers.

Tribal Community Broadband Needs 5-10 Years

1. **Finding** - Household Use Cases. The ANC Household use cases are not being met today and require minimum broadband speeds of data transmission of average household useage of 400-483GB/month.
2. **Finding** - Business Use Cases. The ANC Business use cases are not being met today driven by video streaming and conferencing needs which require minimum broadband speeds of and represent 84% of internet use traffic.
3. **Finding** - Government Use Cases. The ANC Government use cases are not being met today. Broadband internet connectivity is required to meet minimum needs for a range of government use cases from telemedicine file transmission speeds to distance learning video streaming and conferencing real time data transmission.

Tribal Community Broadband Options

1. **Finding** - Low Earth Orbit (LEO) was determined to be the most feasible broadband option for the ANC and YKD Tribal Communities

Of the nine broadband options evaluated, three were determined to be technically acceptable for Akiak and met the 5 year internet use needs of the Tribal Community. Of the three broadband

options evaluated for feasibility, Low Earth Orbit (LEO) was determined to be the most feasible broadband option for the ANC and YKD Tribal Communities.

Broadband Options Use Case Scores

1. **Finding** – The following three broadband options are technically acceptable for implementation in Akiak, meet the 5 year needs of the Tribal Community, and will be analyzed to determine the level of feasibility:
 - Fiber to the premise
 - Low Earth Orbit Satellite
 - Delivery using Fixed Wireless 2.5GHz

Feasibility Scores

1. **Finding** – LEO is most feasible, Fiber Optic is most desired for future
Based on the evaluation in this section the LEO satellite solution is the most feasible broadband solution to meet the needs of the ANC and YKD Tribal Communities over the next 5 years. Fiber optic broadband is the only feasible option to meet all of the Tribal Community needs over the next 10 years.

Tribal Community Broadband Solution Analysis and Feasibility

1. **Finding** – LEO 2.5GHz fixed wireless broadband recommended to meet all 3-5 year plus needs
LEO 2.5GHz fixed wireless broadband delivered to all Akiak building locations is the most feasible, affordable, and optimal solution to meet the ANC's year internet connectivity needs over the next 3-5 years. The Tribe will own all the broadband solution equipment in Akiak and the 2.5GHz fixed wireless solution. This solution is repeatable and extensible to all YKD Tribal Communities.
2. **Finding** – Fiber optic recommended to meet heaviest use case needs 3-10 years plus
Adding fiber optic as a middle mile/backhaul broadband solution well meet the Tribal Community needs over the next 3-10 years. Fiber optic broadband can meet the heaviest use case needs for highest speeds, lowest latency, highest resiliency.

Tribal Community ISP Analysis and Feasibility

1. **Finding** – recommend ANC contract out ISP and WISP services for an initial period and assess options for better ISP/WISP services and/or Tribe as ISP and/or WISP

In the near-term, the most feasible internet access and use option is for the ANC to enter into contractual agreements for basic services with a PDI-approved ISP and WISP. In the long-term, the ANC has the option to continue contracting out ISP and/or WISP services or become an ISP and/or WISP. As the owner of their internet equipment and WISP solution, the ANC determines which internet access, use, and management/operations service provider(s) best meets their Tribal Community needs over time.

X. Recommended Tribal Community Broadband Plan

We recommend a two-phase broadband plan for the Akiak Native Community to deliver first the most feasible and affordable recommended LEO broadband first starting in 2021 and second, the most desirable future-proof recommended fiber optic broadband starting as early as 2023 but dependent on the availability of fiber in the YKD. *(See figure 11, AND / YKD Tribal Broadband)*

1. Phase I - design, install and transition to operations the most feasible and affordable broadband option for ANC, LEO 2.5GHz fixed wireless, for all Akiak building locations.
2. Phase II – design, install and transition to operations the most desired future-proof broadband option for ANC to meet the heaviest use cases in the Tribal Community. This is dependent on the availability of fiber optic cabling/landing station in reasonable proximity to Akiak, AK.

XI. Other Considerations

1. Take advantage of growing Akiak broadband expertise and village implementation experience through the pilot Akiak LEO 2.5GHz project to help YKD Tribal Communities use historic federal and state grants to deliver feasible affordable broadband.
2. Explore creating a YKD Tribal Organization consortium to take maximum advantage of broadband grant funding for YKD including the NTIA Tribal Broadband Connectivity grants (proposals due September 1, 2021).
3. Explore expanding LEO 2.5GHz fixed wireless for YKD schools and village clinics. Requires further discussion with YKHC, School Districts, State Education Dept., etc.
4. Explore expanding new village fixed wireless housing structure to operate as broadband resource centers for villages to include workstations and video conferencing (telehealth).
5. Coordinate among YKD Tribes to provide larger YKD broadband advocacy voice and seat at the table with State of Alaska and Federal Agencies.
6. Communicate with YKD Tribes who have FCC 2.5GHz spectrum licenses to let them know LEO 2.5GHz fixed wireless will meet FCC license build-out requirements.

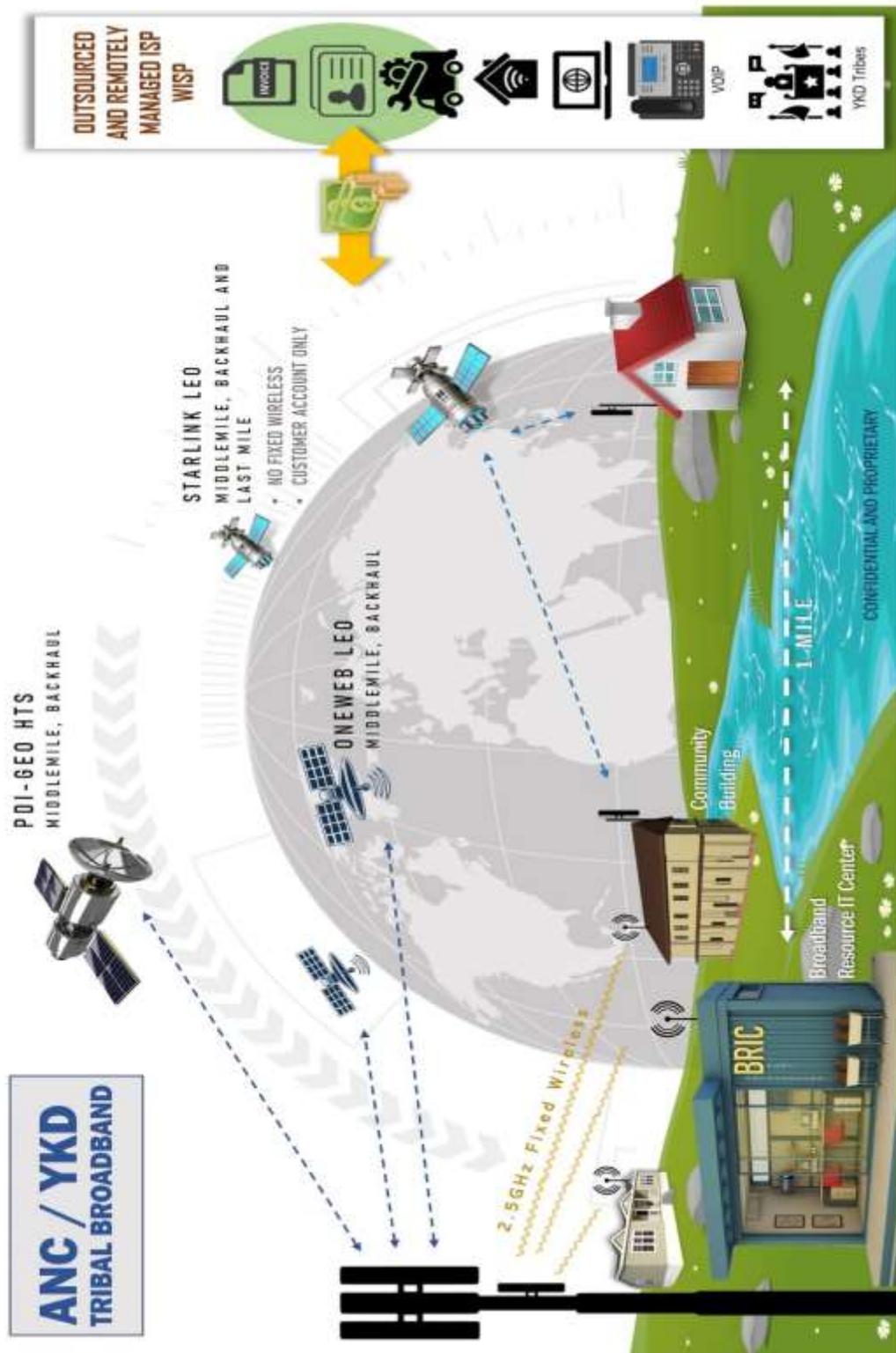


Figure 1: ANC / YKD Tribal Broadband