July 3, 2019

Marlene H. Dortch, Secretary
Federal Communications Commission
Office of the Secretary
445 12th Street, SW, Room TW-B204
Washington D.C. 20544

Re: WT Docket No. 18-120, Transforming the 2.5 GHz Band

Dear Secretary Dortch,

We were pleased to see that the FCC Order for WT Docket No. 18-120 allows for a Tribal priority window before the unlicensed Educational Broadband Service (EBS) spectrum goes to auction and competitive bidding begins. While this is a great opportunity, we feel that the 90-day window for education and outreach followed by a 60-day application window is too narrow a timeframe. Based on MuralNet's experience with tribal nations in Arizona, we strongly encourage the FCC to consider a year-long tribal priority window that includes rolling automatic application approval with permission for immediate buildout for Native nations applying for spectrum.

Outreach and Consensus Building Takes Time
Decision makers within the tribal governments who MuralNet has worked have been methodical and thorough when it comes to infrastructure projects. They take the time to research and understand the technology and the ways in which it will impact their community. Before proposing the high speed Internet project to the Havasupai Tribal Council, Councilwoman Ophelia Watahomigie-Corliss spent hours meeting and communicating with representatives of Northern Arizona University, Niles Radio Communication and MuralNet in order to understand the capabilities of an LTE high speed Internet network and what was needed to maintain it. She then solicited input from community members about what they would want from an Internet network and worked with her colleagues to draw up a plan that reflected her people's values, aspirations and way of life. Nearly five months after the initial discussions regarding the broadband project, the Tribal Council passed a resolution to build their high speed Internet network. (see Figure 1).

Timeline for The Havasupai Tribe's Network Deployment

Figure 1: Timeline for The Havasupai Tribe's Network Deployment. Outreach took almost 5 months. Preparing the application was just one month, because funding was provided by MuralNet.

Longer Application Window

The Havasupai Tribe's original application for special temporary authorization of use of the A channels over their land was fairly simple: the geographic service area (GSA) would be bounded by a 35-mile circle centered in the village of Supai and MuralNet would provide the funds for equipment, legal and engineering needs. It only took a month to gather the necessary data and finish the application. Maintenance of the networks takes only a few hours a month, so financial sustainability is not an issue.

This is not the case for MuralNet's later projects. With five times the amount of spectrum available, network plans are more ambitious and expensive. It takes time to find funding and determine a realistic geographic service area (GSA) that can maximize coverage while meeting proposed FCC build-out requirements. Smaller grants needed to cover around fifty homes near an anchor institution takes a few months to secure. Larger projects require more capital than government grants and loans can provide. Government funding such as the Distance Learning and Telemedicine Grant or the Reconnect Grant and Loan Program take six to nine months from pre-application data collection to the announcement of awards. Public/private partnerships can cover CapEx and OpEx costs, but it has taken at least five months to develop fair business plans, draw up the agreements, notify the FCC, and receive approval for the projects to move forward. This is well beyond the 150 days proposed for outreach and application.

One Wave Inspires the Next: Early Deployments and Rolling Application Approvals

Many communities are wary of what Internet access would bring to their community and what it would entail to build and sustain a network. Considering these things takes time, and Internet connectivity champions within the community often seek information regarding nearby networks to explore their options and avoid potential pitfalls. Once they see the ease of deployment and develop confidence that the community has or could build the capacity to run their own network, they are inclined to move forward.

After the deployment of the Havasupai Tribe's pilot network (first wave), other nearby tribal communities took notice. Representatives of five other tribal nations contacted Councilwoman Ophelia Watahomigie-Corliss to learn about what they had built. Now MuralNet is partnering or advising six communities in Arizona (second wave) about building their own EBS spectrum networks, some of which can be deployed within weeks of being granted a license.. In this case, regional growth was sparked by a model deployment nearby. There are similar outreach models for high-speed Internet projects in New Mexico and Oregon, with each consecutive wave growing exponentially (see figure 2). If the tribal priority window allows for immediate build-outs for neighboring tribal communities to observe, the successive wave will lead to more tribal nations claiming EBS spectrum, more build-outs and more people on rural tribal lands being connected to sufficient Internet.

Timeline and Impact for a Year-long Tribal Priority Window Rolling Application Approval

Figure 2: Predicted impact based on the two-wave model. Many more households on tribal lands will be connected if the Tribal priority window is extended.

Competing Applications

With a short tribal priority window, multiple applications for the same area are likely. For example: a tribal council, tribally affiliated utilities commission, an outside internet service provider and a tribal college could all apply for the same spectrum. We recognize that by statute[1], all bids for the same resource have to go to competitive bidding. However, given the sovereignty of tribal governments, any application for spectrum over tribal lands that are submitted by a tribal council should be automatically granted and the application window for those specific tribal lands closed. This will allow a first wave of applicants to get spectrum fast and build their networks, inspiring nearby communities to do the same.

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[1] 47 U.S.C. § 309(j)(1)

Projected Impact for Arizona Tribal Communities

The pilot network brought the Havasupai's Head Start program in compliance with national standards, allowed teachers to continue their higher education and specialty certificates remotely, and connected high school students to real-time classes for the first time[2]. The Havasupai Tribe will upgrade their network to broadband now that more EBS spectrum will be available to them. They plan to start on online high school, bring telemedicine to the village, spur economic development through online markets, and make their network financially sustainable by selling Internet access to tourists[3]. With the increased capacity, every building in the village could have broadband[4].

Given current proposed FCC rules (see figure 3), ten tribal nations could claim unlicensed EBS spectrum. The success of The Havasupai Tribe's network has lead to three other Arizona tribal communities[5] to work with MuralNet to build broadband networks utilizing the unlicensed EBS spectrum that will be available to them. As of December 31, 2017, only 68% of people living on tribal lands has access to fixed terrestrial 25 Mbps/3Mbps broadband Internet[6]. That drops to 32%[7] for the four Arizona tribal communities that MuralNet is working with to build broadband networks with currently unlicensed EBS spectrum. While only seven Internet connections Havasupai qualify as broadband speeds, it has directly caused a second wave that will double the rates of households connected to broadband to 68% in partner communities with two communities connecting all households (see table 1) by 2020. In just a few years, the digital divide can be completely closed in these hard to reach areas as more backhaul becomes available. The way new technology spreads between tribal communities means adding a few more months to a tribal priority window to allow for a second wave of applications has exponential gains.

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[2] Havasupai Tribal Council, FCC Comment on Proceeding 18-120, ¶ 5 (May 31st, 2018) https://ecfsapi.fcc.gov/file/10621163005692/18060021-12.pdf

[3] MuralNet, FCC Comment on Proceeding 18-120, ¶ 1 (May 24, 2019)

[4] Broadband as defined as 25 Mbps down/3 Mbps up

[5] MuralNet is working with two other communities without access to unlicensed EBS spectrum to build networks through partnerships with current license or lease holders.

[6] Source: FCC, Communications Marketplace Report, Appendix D, pp. 203-204, available at https://docs.fcc.gov/public/attachments/FCC-18-181A9.pdf.

[7] Assuming percent household broadband subscriptions reported for their tribal Nations apply to them. Extrapolated from 2010 census file population estimates of target towns available at https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml, 2013-2017 American Community Survey 5-Year Estimates of occupied households available at https://www.census.gov/tribal/?st=04&aianihh=2430 and PERCENT OF HOUSEHOLDS WITH A BROADBAND INTERNET SUBSCRIPTION - United States -- American Indian Area/Alaska Native Area/Alaska Native Regional Corporation Universe: Households, 2013-2017 American Community Survey 5-Year Estimates available at https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_5YR_GCT2801.US03&prodType=table

Existing EBS Licenses in Arizona and Federally Recognized Tribal Lands

Channel Block
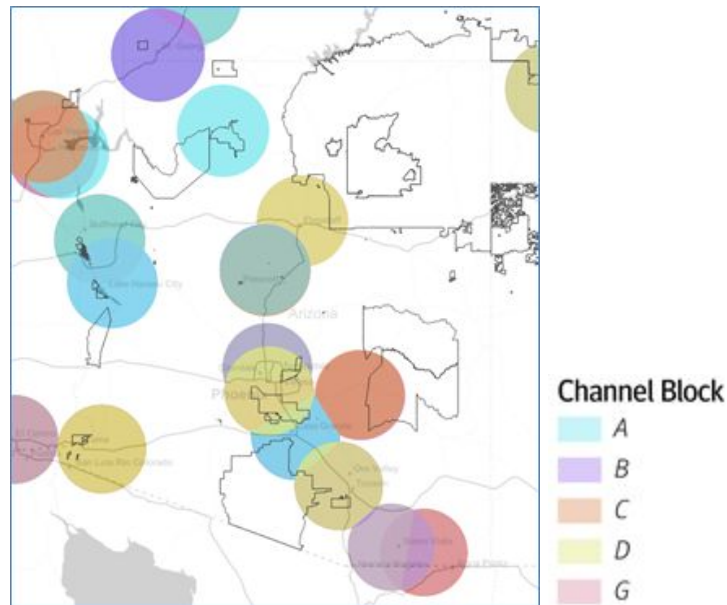- A
- B
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Figure 3: The following Native nations have the potential to claim unlicensed EBS spectrum over a significant portion of their lands: Havasupai Tribe, Hopi Tribe, Hualapai Indian Tribe, Kaibab Band of Paiute Indians, San Carlos Apache Tribe, Tohono O'odham Nation, Tonto Apache Tribe, Colorado River Indian Tribes, Fort Mojave Indian Tribe (D Channels), Navajo Nation[8]

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[8] Maps derived from TIGER/Line Shapefile, 2018, nation, U.S., Current American Indian/Alaska Native/Native Hawaiian Areas National (AIANNH) National (November 29, 2018) available at https://catalog.data.gov/dataset/tiger-line-shapefile-2018-nation-u-s-current-american-indian-alaska-native-native-hawaiian-area and FCC's BRS & EBS data (March 20, 2019) available at https://www.fcc.gov/uls/transactions/daily-weekly

Impact of the First and Second Wave of MuralNet Arizona Deployments

	First Wave: Havasupai Pilot Network	Second Wave of MuralNet Arizona Deployments
Number of Native nations	One	Four[9]
Initial percentage of households with a broadband Internet subscription[10]	0%	32%
Number of Households in Partner Tribal Communities	128[11]	863[12]
Number of new households with broadband Internet (actual and projected) if FCC buildout standards are met[13]	7	325
Final percentage of households with broadband Internet subscriptions	5%	68%[14]

Table 1: Percentage and count of households connected to broadband in communities.

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[9] including an expansion of the Havasupai Network using unlicensed EBS spectrum

[10] Extrapolated from 2010 census file population estimates of target towns available at https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml, 2013-2017 American Community Survey 5-Year Estimates of occupied households available at https://www.census.gov/tribal/?st=04&aianihh=2430 and PERCENT OF HOUSEHOLDS WITH A BROADBAND INTERNET SUBSCRIPTION - United States -- American Indian Area/Alaska Native Area/Alaska Native Regional Corporation Universe: Households, 2013-2017 American Community Survey 5-Year Estimates available at https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_5YR_GCT2801.US03&prodType=table

[11] Source: Havasupai Tribal Council, June 2019

[12] Source: 2010 Census Demographic Profile of target towns in the second wave

[13] Extrapolated from population estimates of target towns available at https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml, and PERCENT OF HOUSEHOLDS WITH A BROADBAND INTERNET SUBSCRIPTION - United States -- American Indian Area/Alaska Native Area/Alaska Native Regional Corporation Universe: Households, 2013-2017 American Community Survey 5-Year Estimates available at https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_5YR_GCT2801.US03&prodType=table

[14] Assumptions: Enough infrastructure will be installed to meet final buildout requirements of 80% coverage. Engineering plans state that this would take 2 to 3 cells adding 50 to 75 end users with broadband speeds at a cost of $10k-$50k per site.

The impact of a tribal priority window is tied to whether rules and time constraints allow for successive waves of applications from tribal entities. Based on our experience helping tribal communities build their own community networks, we advocate for

- a joint outreach and application tribal priority window extending from October 2019 to October 2020 and
- automatic application approval for Tribal Councils during the tribal priority window.

Doubling the length of the combined EBS outreach and application windows for tribal nations and strategic, immediate regional deployments will lead to a second wave of tribal community networks and massive gains in broadband connectivity, bridging the digital divide in Indian Country.

Respectfully,

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