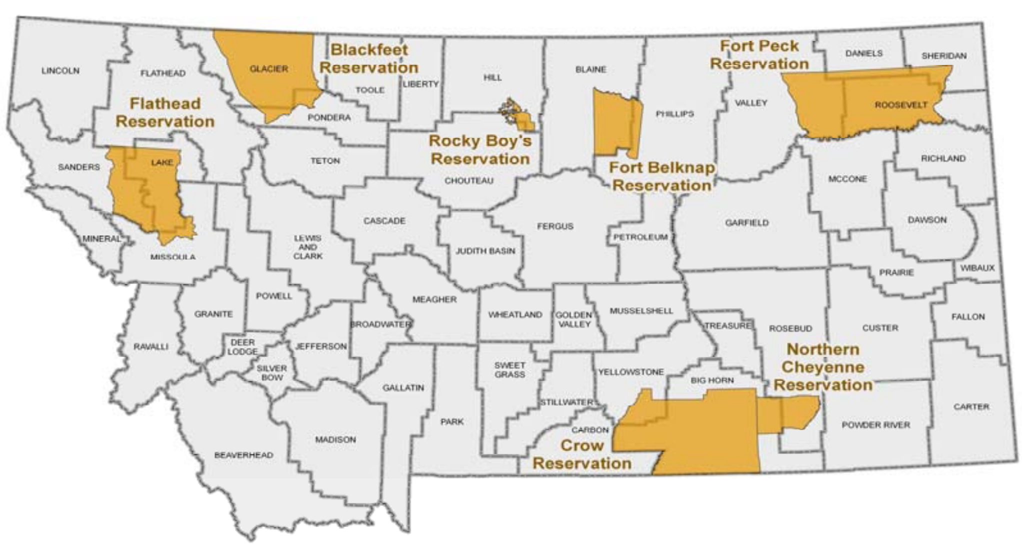
<u>White Paper</u>

Delivery of Broadband Services to Un-served and Underserved Areas and Populations in Montana, Particularly Montana's Seven Indian Reservations



Prepared by the
Governor's Office of Economic Development
(Revised August 2009)

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Introduction

The Governor's Office of Economic Development (GOED) is charged by the Montana Legislature to focus on five areas that affect economic development:

- workforce development,
- technology development,
- infrastructure improvement,
- permitting & regulation, and
- business recruitment, retention, expansion and start-ups.

In 2005 GOED concluded that there was a serious lack of communications capability in and around Montana's seven Native American Reservations. Given the low economic activity on said reservations, it was clear that lack of modern communications was contributing to that lack of economic achievement in Indian Country here in Montana. This lack of communications capability was directly related to the GOED mission in technology development and infrastructure improvement as well as having an effect on workforce development.

Without question the communications private sector had not found a justification for investment in Indian Country. In June of 2005, GOED requested Bresnan Communications to investigate the possibility of investing in communications in Indian Country and they put together a plan, with support from the State Tribal Economic Development Commission, to accomplish improved communications. After four years of effort, Bresnan has continued to reach out to all of Indian Country and put together an infrastructure plan. Regretfully, the plan to deliver communications infrastructure and services to Montana's Indian Country did not "pencil out" in terms of giving a return on the serious investment that was required. This came as no surprise as the private investment likely would have been made earlier by someone had an adequate ROI been possible.

Nonetheless, the plan developed by Bresnan for the creation of a broadband backbone to insure service delivery to all seven reservations became a targeted objective of the state in terms of seeking a subsidy that could cover significant portions of the capital cost as a way to insure that Bresnan or other service providers could reach Indian Country and get an adequate return on their investment. Such a subsidy became available with the federal government's broadband stimulation (ARRA) grant opportunities. But not for this funding, this plan could not otherwise be implemented.

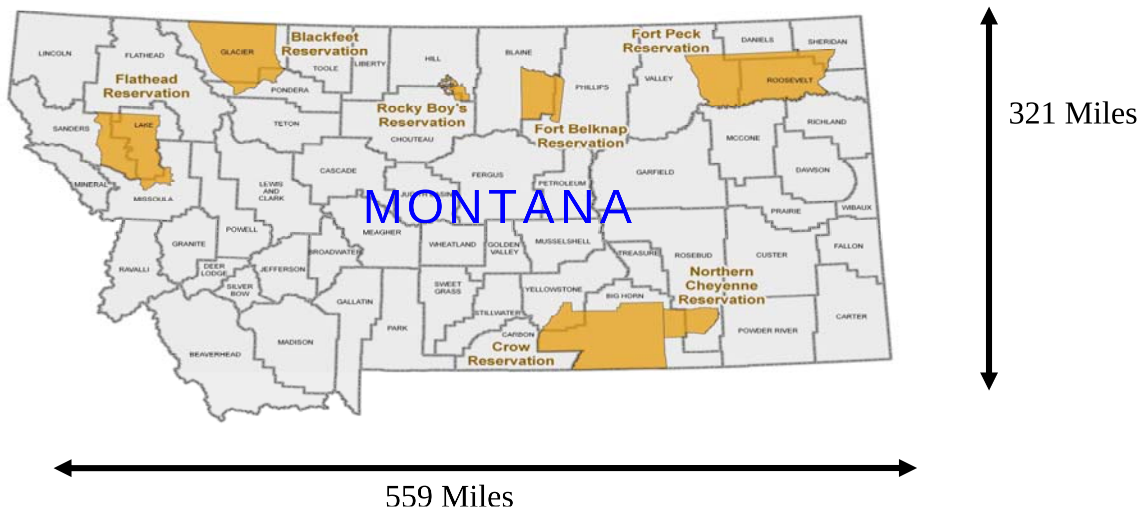
The work done by Bresnan on behalf of GOED since 2005 was not a waste, but gave Montana a "leg up" in terms of taking advantage of the federal broadband initiative. It therefore represents the core of a multifaceted effort by the state to utilize federal broadband funding opportunities to open the door for investment in communications infrastructure and services in Indian Country.

The purpose of this white paper is to outline the overall plan of the state of Montana for the delivery of broadband services to un-served and underserved areas and populations in this state through the utilization of public and private investment and federal broadband stimulus funding. Implementation of the plan will provide broadband access to vulnerable populations in remote areas across Montana, targeted primarily on the seven Native American Reservations.

Target Population

Montana has more Native American Reservations than any other state. A listing of the reservations and the federally recognized tribes found on those reservations is shown below, as is a map showing how widely dispersed are the locations of those reservations.

Tribe	Reservation
Blackfeet Tribe	Blackfeet Reservation
Chippewa Cree Tribe	Rocky Boy's Reservation
Confederated Salish, Kootenai & Pend d'Oreille Tribes	Flathead Reservation
Crow Tribe	Crow Reservation
Fort Belknap Assiniboine & Gros Ventre Tribes	Fort Belknap Reservation
Fort Peck Assiniboine & Sioux Tribes	Fort Peck Reservation
Northern Cheyenne Tribe	Northern Cheyenne Reservation



To get a sense of how widely dispersed the Montana Indian Reservations are, note the mileage in Montana reflected by the above map. As compared to the eastern United States, please note the following: from the Northwest corner to the Southeast corner of Montana is 650 miles; if the NW corner of Montana was placed on Chicago, the SE corner would reach all the way to Washington, D.C. The following map is demonstrative of the size of Montana. With around only 950,000 people, Montana consists of 6.5 acres for each citizen. One can understand the remoteness from which many areas of Montana suffer.

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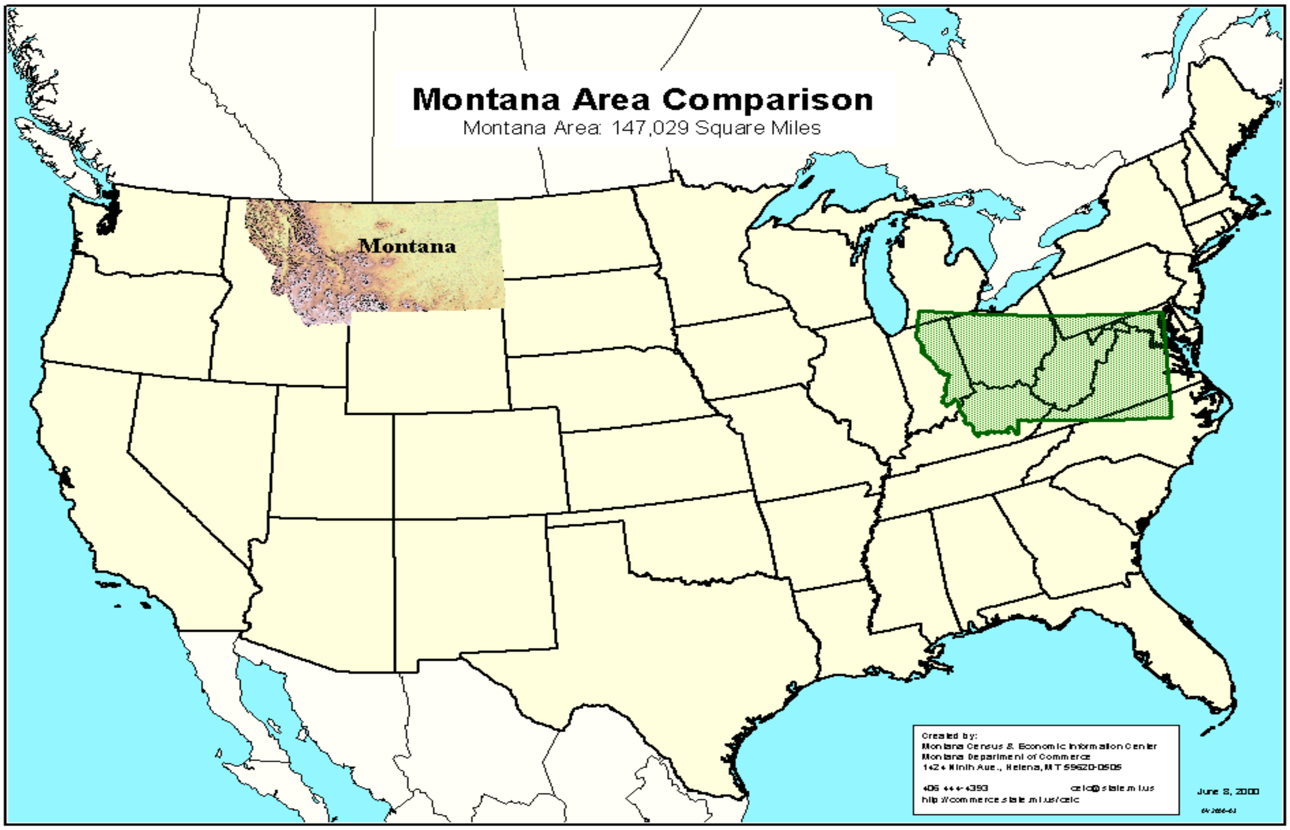


Some Specifics on Targeted Population

According to the 2000 Census, Montana is home to over 66,000 people of American Indian heritage, the majority of who reside on one of seven Tribal reservations.[1] Nearly 60% of the 64,000 Montanans living on the seven Tribal reservations included in this application are American Indians. These Tribal reservation populations significantly lag behind other Montana residents – and the nation – in income, education, employment, and health.

[1] Unless otherwise noted, all data cited in this narrative is derived from the 2000 Census.

Income

While Montana's 2000 median household income ($33,024) was below the national average ($41,994), the median household income for American Indian households on the seven Tribal reservations of Montana was only $23,113. Montana's four poorest counties (where an average 29.4% of the population is in poverty, compared to the state average of 14.6%) are home to four of seven Tribal reservations located in the state. For instance, Roosevelt County, home to nearly 75% of the Fort Peck reservation, has a median household income of $24,834 and an 8.1% unemployment rate; with 30.3% of the population living in poverty and a full 56.7% of the population living below 200% of the poverty rate.

The average poverty rate for American Indian residents on the seven Montana's Tribal reservations is 40.5%, with a full half of the American Indian residents on the Fort Peck and Northern Cheyenne living in poverty. Almost 25% of the American Indian population on the seven Tribal reservations is unemployed, with an average of 16% dependent on some type of public assistance.

Education

American Indian students on the Tribal reservations have higher high school dropout rates than their average Montana resident counterparts. For the school year 2004-2005, the statewide dropout rate was 3.7%, while the American Indian rate was 9.0%, nearly 2.5 times higher. During the 2006-2007 school year, only 66% of all eligible American Indian students in Montana completed high school, compared to the white student graduation rate of 89%.[2] Nashua High School, on the Fort Peck Reservation, had a dropout rate of 25%. American Indian students suffer from poverty, suicide, teen birth, and substance abuse at rates higher than the national average.[3] In Montana, the fertility rate (number of births per 1,000 females of childbearing age) for American Indian mothers between the ages of 18 and 19 is over 185, compared to 57 for white Montana mothers in the same age group, 3.2 times as many.[4] Over 60% of American Indian eighth-graders attend schools where more than half the students qualify for free or reduced lunches.[5] For the 2007-2008 school year, 81% of the public school districts located on Montana's Tribal reservations did not meet federal No Child Left Behind Adequate Yearly Progress requirements.[6]

Employment

2 American Indian Education Data Fact Sheet, Montana Office of Public Instruction (March 2009).
3 Native America at the New Millennium, E.C. Henson and J. B. Taylor, John F. Kennedy School of Government at Harvard University (2002).
4 2007 Montana Vital Statistics, Office of Vital Statistics, Montana Department of Public Health and Human Services (February 2009).
5 National Indian Education Study, Part II: The Educational Experiences of American Indian and Alaska Native Students in Grades 4 and 8, U.S. Department of Education, National Center for Education Statistics, Government Printing Office (2008).
6 American Indian Education Data Fact Sheet, Montana Office of Public Instruction (March 2009).

No matter which unemployment measures are used, the rates tend to be higher on the Tribal reservations than elsewhere in Montana. Data from the 2000 Census shows an average unemployment rate for the seven Tribal reservations of 19.4%. The Bureau of Indian Affairs calculated Tribal member unemployment rates in 2005 ranging between 54% and 70%. The Montana Department of Labor and Industry also estimates unemployment for each reservation based on the census data, showing an average 2008 unemployment rate for the seven Tribal reservations at 10.8%, 2.4 times as severe as Montana's statewide unemployment rate, which was 4.5% in 2008.

Health

According to Indian Health Service, American Indians have larger families, less health insurance, and a poverty level nearly twice that of the rest of the nation's population as a whole. Montana's American Indians are no different, and in some ways are more vulnerable. The mean age of death for all American Indians in Montana, averaged over the years 1998-2007, was only 56 years old, compared to 77 for the population of the state as a whole.[7] In October 2004, according to Montana's Department of Health and Human Services Vital Statistics County Health Profiles, the median age at death for American Indians in Big Horn County, home to the Appsalooka Tribe of the Crow Reservation, was 60, compared to the Montana median age at death of 79; the national average for American Indians is 72.3 years. American Indians living in Roosevelt County, home to the Assiniboine and Sioux Tribe of the Fort Peck Indian Reservation, can expect an average lifespan of only 59. Slightly more than a fifth of the Native Americans who died in 2007 died of a traumatic cause—suicide, homicide, or accident—while only about half that proportion of the deaths of whites were attributed to these causes.[8]

Broadband Plan

In rural areas, many Montanans have no access to broadband at all, let alone applications and services, such as distance learning and telemedicine. Montana's rate of broadband access is 65.5%, slightly below the national average. However, on Tribal lands, not only is broadband access not available, basic telephone service is scarce. In some cases, cellular service is non-existent which in itself poses a large heath and safety issue. Interrupted electricity service can be a daily occurrence. Available data indicates that rural American Indian households may have a broadband subscription rate as low as 16.9%.[9]

[7] 2007 Montana Vital Statistics, Office of Vital Statistics, Montana Department of Public Health and Human Services (February 2009).
[8] *Id*.
[9] Bringing Broadband to Rural America: Report on a Rural Broadband Strategy, Federal Communications Commission (May 22, 2009), citing *Households Using The Internet In And Outside The Home, By Selected Characteristics: Total, Urban, Rural, Principal City, 2007*, tables compiled by the NTIA with data from the U.S. Census Bureau October 2007 Current Population Survey (2008).

Due to the unique issues of geographic isolation of Tribal lands, low population densities, and economic obstacles, such as high poverty and unemployment rates and low income, Montana's reservations have limited accessibility to not only Internet access, but also Broadband access.

This White Paper articulates a broadband plan for the state to insure that our Native American population can be brought into the modern era of communication via broadband improvements and ultimately by the services brought to the reservations via that broadband.

The broadband plan for the state of Montana involves four areas in which federal ARRA broadband funding is/will be sought:

- broadband mapping and planning,
- middle-mile broadband infrastructure (backbone),
- public (tribal) computer centers, &
- last-mile infrastructure and service delivery.

<u>Broadband Mapping and Planning</u>

The state of Montana, through the Montana Department of Commerce, expects to apply for broadband mapping and planning funding from the federal government and expects to conduct a full range of broadband mapping and planning activities until such time as an accurate broadband map for the state exists including the mapping of Montana's remote rural areas, including Indian Country, pursuant to the federal grant request.

<u>Middle-Mile Broadband Infrastructure (backbone)</u>

In order to serve the rural areas of Montana, which are substantially underserved, requires the development of a broadband backbone that can serve the un-served and underserved areas throughout the state, particularly the seven Native American Reservations. There are a number of technologies that could be deployed in order to provide broadband services to the reservations. However, because of the previous effort undertaken at the request of the state by Bresnan Communications and because of reliability issues, the state of Montana prefers the development of a fiber backbone that will deliver no less than 1 giga bit (1GB) of full duplex bandwidth at each Reservation.

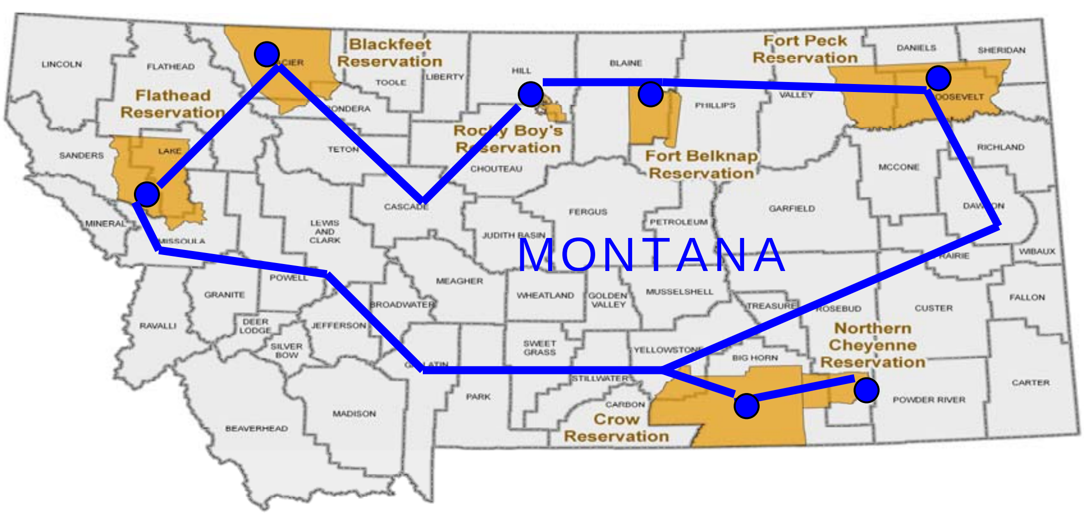
The State of Montana is interested in partnering with a private entity to expand broadband networks in Montana to un-served areas, particularly in two critical areas: "middle mile" facilities and the Native American reservations.

The State supports construction of a fiber middle mile solution that would enable broadband to schools, hospitals and other critical organizations on Native American reservations (and other rural/un-served and under-served communities along the route) and provide the opportunities for further "last mile" service delivery by multiple entities. ***The broadband backbone plan of Bresnan Communications meets that objective. Because of that and in recognition of the extensive investment in planning undertaken***

by Bresnan at the request of the state since 2005, the GOED supports the Bresnan application for federal broadband infrastructure funding for purposes of development of the broadband backbone that can serve Indian Country.

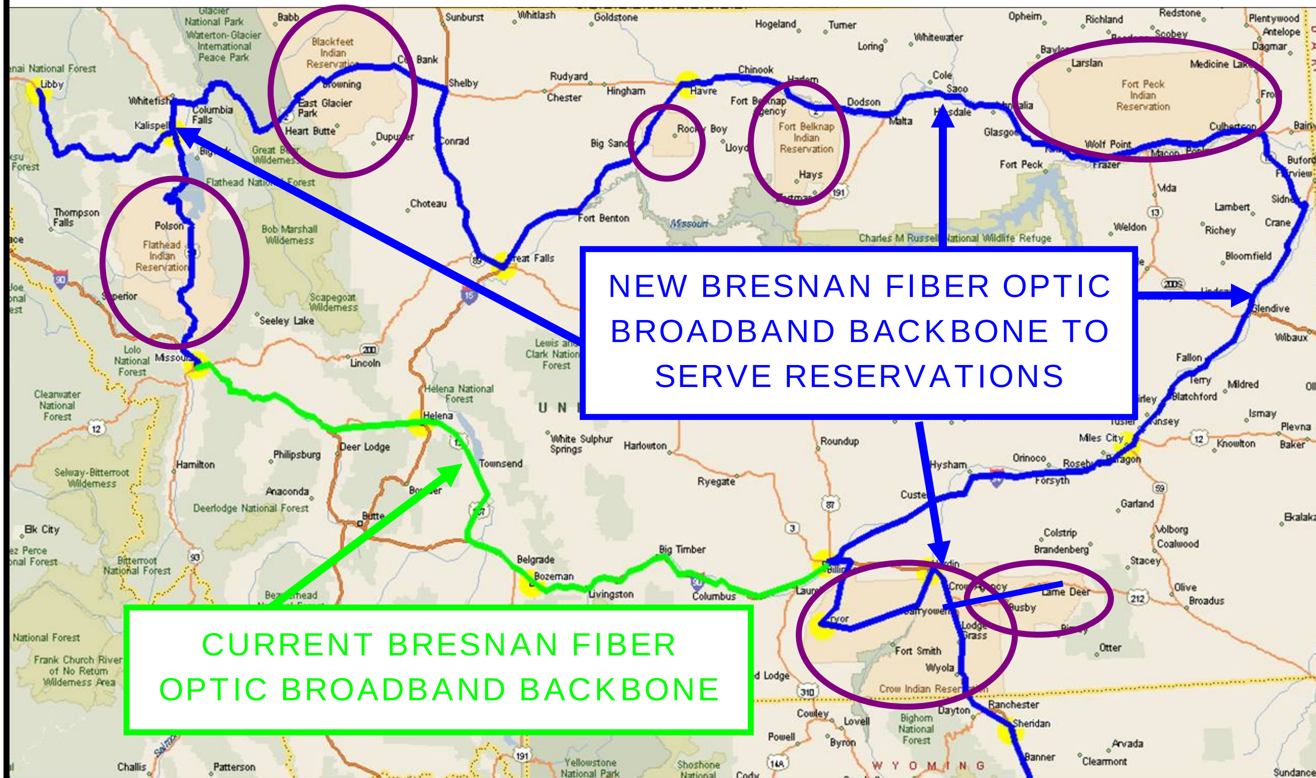
Regardless of the last mile solution to offer services to currently underserved areas and populations, a middle mile infrastructure solution will be required. The middle mile broadband backbone should provide broadband service to schools, hospitals and other critical organizations all along the new backbone route from Missoula to Billings following a northern route, with add/drop locations throughout the route, which reaches and serves all seven reservations. As a result, broadband services can and should be available to Native American reservations that wish to participate. The state would like the broadband backbone to interconnect with all approved/authorized carriers to enable multiple providers to utilize the route, and the Bresnan backbone would do that. This fiber diversity to serve the State and other large providers in Montana would promote economic development, which is important in all of rural Montana, but particularly in Indian Country.

A schematic of the middle mile broadband backbone desired by the state is shown below on the next page.



SCHEMATIC OF FIBER OPTIC BACKBONE NEEDED TO SERVE MONTANA'S SEVEN INDIAN RESERVATIONS

The actual designed route for the broadband backbone by Bresnan Communications is shown below on the next page:



FIBER OPTIC BROADBAND BACKBONE NEEDED TO SERVE THE MONTANA INDIAN RESERVATIONS

<u>Public (Tribal) Computer Centers</u>

The State of Montana will increase access to broadband on all seven Indian Reservations across the state by expanding or creating computer centers at selected Tribal community anchor institutions. The goal is expanding access to free broadband, purchasing additional computer hardware and software, extending center hours, implementing training programs targeted at community needs, and ensuring centers are accessible to the audience population served at each center -- from children to the elderly. This project synchronizes with the proposal to ensure new and expanded broadband access to all of the Tribal reservations in Montana outlined in Bresnan Communication’s anticipated separate broadband infrastructure grant application, and the proposal for a competitive grant program to increase computer ownership and broadband access to the state’s most vulnerable populations, as outlined in the Montana Department of Commerce’s anticipated separate broadband mapping and planning grant application.

Tribal Computer Centers would provide broadband education, awareness, training, access, equipment, and support to schools, libraries, medical and healthcare providers, community colleges, and other institutions of higher education, and other community support organizations and entities to facilitate greater use of broadband service by or through these organizations. A number of the Tribal community anchor institutions to be identified in Montana's proposal are public school districts and Tribal community colleges located on a Tribal reservation. These schools and colleges serve and educate some of the most vulnerable student populations in Montana. While Montana's average high school dropout rate is 8%, the high school dropout rate for high schools on Montana's Tribal reservations reaches rates as high as 25%. The anticipated proposal will likely provide the computer hardware, software, and training necessary for these schools to provide enhanced learning opportunities for these students. The U.S. Census Bureau has noted that "schools level the playing field by giving computer access to children who have none at home."[10] This is especially critical for the young American Indian population, whose median age is 25 years compared with 35 years for the nation as a whole.[11]

Tribal Computer Centers should provide broadband education, awareness, training, access, equipment, and support to organizations and agencies in some of Montana's most remote areas that provide outreach, access, equipment, and support services to facilitate grater use of broadband service by low-income, unemployed, aged, and otherwise at-risk populations. The anticipated project would provide free broadband access, purchase additional computer hardware and software, and help existing public centers extend hours and increase space to provide Internet access to vulnerable Tribal reservation populations ranging from children to the elderly. A recent survey by the American Library Association found that over 70% of the public libraries in the United States are the only source of free computer and Internet access in their communities[12] – Montana proposes to provide public computer centers at a minimum of three key community anchor institutions on each Tribal reservation to ensure free public Internet access to these susceptible Montana residents. In addition, under Montana's anticipated proposal, staff at each of the Tribal Computer Centers will be trained and then will offer training focused on specific community needs (i.e. nutrition, GED preparation, parenting, etc.). These training programs will benefit both the at-risk target population that will have access to the centers, but also help the anchor institutions where the centers are located provide better and more efficient care to the vulnerable populations they serve.

Tribal Computer Centers should stimulate the demand for broadband, economic growth, and job creation. While Montana's 2000 median household income ($33,024) was significantly below the national average ($41,994), the median household income on the Tribal reservations of Montana was far lower -- only $24,342. Montana's four poorest counties (where an average 29.4% of the population is in poverty, compared to the state average of 14.6%) are home to four of seven Tribal reservations located in the state. For instance, Roosevelt County, home to the Fort Peck reservation, has a median household

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[10] <u>Home Computers and Internet Use in the United States: August 2000</u>, U.S. Census Bureau (September 2001).
[11] Indian Health Service, U.S. Department of Health and Human Services (June 2009).
[12] <u>Libraries Connect Communities: Public Library Funding & Technology Access Study 2008-2009</u>, American Library Association (ALA), *et al.* (2009).

income of $24,834 and an 8.1% unemployment rate; with 30.3% of the population living in poverty and a full 56.7% of the population living below 200% of the poverty rate.

A recent study by the World Bank found that broadband penetration is closely associated with per capita income, identifying a 1.3% increase in economic growth for every 10% increase in high speed Internet connections.[13] The same study found that public Internet access points play an important role in introducing the Internet to people in rural areas.[14] It would be the goal of this program to provide the training and access to broadband that will translate into economic growth and employment for the impoverished communities of the Tribal reservations, in turn stimulating demand for Internet service among Tribal members. In many areas of the Tribal reservations, broadband access is simply not seen as something that is necessary or desirable, due either to limited internet access or training opportunities.[15] Providing free access and teaching people how to use it will open up a huge source of useful information that was previously unavailable. Knowledge gained by the users of the Tribal Computer Centers will be taken home and passed on to family members and other members of the community, who will then have an increased desire to access broadband. Montana envisions the coordination of the Tribal Computer Center Project with its anticipated separate grant application to the NTIA for broadband mapping and planning funds, a portion of which is targeted for a competitive grant program to increase computer ownership and Internet access to vulnerable populations in Montana and on its Tribal reservations.

The Tribal Computer Center Project should:

a. bring broadband access to communities in need;
b. provide additional equipment to meet the demand at current centers, allowing a greater number of people to access broadband;
c. expand hours of operation to make centers available to people with irregular work hours;
d. provide access and services free of charge;
e. offer training programs focused on broadband and computer orientation that also address key community needs;
f. provide opportunities for parenting classes, better health services, improved job finding, GED preparation, Job Corps connections, legal services, and dropout prevention programs among others; and
g. provide economic development opportunities for tribal governments and Native American entrepreneurs.

The Tribal Computer Center project will be part of a large push to bring accessible broadband access to tribal populations in Montana. It should be combined with a middle-mile broadband fiber optic backbone infrastructure application to the federal government

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13 Information and Communications for Development 2009: Extending Reach and Increasing Impact, World Bank Group (June 2009).

14 (*Id*.)

15 Note that the U.S. Census found that for 25% of the households expressing no interest in obtaining Internet access, the primary reason was a lack of computer ownership.

from Bresnan Communications. Together, the applications will: a) build the middle-mile infrastructure that will take broadband across each of the seven reservations, b) build last-mile infrastructure to anchor institutions on the reservations that have been identified by the tribes themselves as ideal locations for computer centers, c) provide additional equipment and training to the staff of these institutions so they may better serve their target populations, and d) create or expand computer centers that are available to the community at large so that tribal members can access up-to-date computer equipment and software as well as high speed broadband internet at no charge.

The state of Montana plans to apply for ARRA broadband funds to finance Tribal Public Computer Centers to the following federally recognized Tribes on the following Tribal reservations with at least three anchor institutions per reservation:

Tribe	Reservation
Blackfeet Tribe	***Blackfeet Reservation***
Chippewa Cree Tribe	***Rocky Boy's Reservation***
Crow Tribe	***Crow Reservation***
Fort Belknap Assiniboine & Gros Ventre Tribes	***Fort Belknap Reservation***
Fort Peck Assiniboine & Sioux Tribes	***Fort Peck Reservation***
Northern Cheyenne Tribe	***Northern Cheyenne Reservation***

It is anticipated that the Tribal College on the Flathead Reservation (Confederated Salish, Kootenai & Pend d'Oreille Tribes) is applying for Public Computer Center funds. The state may apply for additional centers to serve the reservation in the second round of funding if the Tribe agrees. ***The state is supportive of the current application by the Tribal College.***

The Northern Cheyenne Tribe/Reservation is likely to apply for a "last-mile" application. While the state anticipates developing and applying for a "last-mile" system for all remaining Reservations in the second round of funding (see below), ***the state is supportive of the current last-mile application by the Northern Cheyenne Tribe under the broadband infrastructure grant program.***

Last-Mile Infrastructure and Service Delivery

The state's objective in "last mile" service delivery on all seven Indian Reservations is to provide service opportunities to multiple service providers in a manner that is as ubiquitous as possible. Given the broad areas to be covered on each reservation and the cost of deployment of fiber to all homes, the state believes that utilizing wireless technology may be especially cost effective to deliver the last mile. ***The state intends that last mile delivery to the six remaining reservations will be a primary objective in the second round of funding; the seventh reservation (Northern Cheyenne) has already applied for last mile funding in the first round (see above) and the state supports that application.***

One of the strengths of the Northern Cheyenne application is that the Tribe itself plans to own and operate the last mile delivery system, a goal which the state has for all reservations/tribes, should the tribes so desire. Following funding under round two, the state may act as in interim owner/operator of tribal last mile delivery systems for the six remaining reservations until adequate training and organizational activity can take place to allow a tribal takeover of ownership and operations.

The primary wireless methodology of last mile delivery to be advanced by the state will be WI-MAX technology. Under the approach, the WI-MAX could be delivered from towers connected to the institutions (including public centers) to which backbone fiber optic cable is provided.
The WI-MAX technology can currently provide services over an area of 15-37.5 miles radius, depending upon the topography. That is between 707 and 4418 square miles of coverage per tower, depending upon topography.

While additional hardware, software and towers needed to provide wireless last mile delivery on the reservations are a key goal for the state's second round grant efforts, the state also plans to apply for laptop computers to provide services in the schools and homes. We expect that computer manufacturers will provide such laptops to include wi-max chips and be provided to the tribes at a significant discount.

A schematic of the wireless last mile delivery model is shown below on the next page.

Wi-Max Wireless Service Last Mile Delivery Schematic