



March 7, 2014

**Letter – Expression of Interest  
VIA ECFS**

Chairman Thomas Wheeler  
Commissioner Mignon Clyburn  
Commissioner Jessica Rosenworcel  
Commissioner Ajit Pai  
Commissioner Michael O’Rielly  
Jonathan Chambers  
Federal Communications Commission  
445 12th Street, SW  
Washington, DC 20554

**Re: Expression of Interest – Rural Broadband Experiments  
Connect America Fund, WC Docket No. 10-90**

Dear Chairman Wheeler, Commissioners, and Mr. Chambers,

This letter is to express Inyo Network’s interest in receiving funding from the Rural Broadband Experiments announced at the January 31<sup>st</sup> FCC Open Meeting. We refer to this project as the *“Tribal and CAI VoIP Experiment.”*

**BACKGROUND**

Below is a summary of our company and the organizational ecosystem that we have constructed for the implementation of the proposed experiment.

**Inyo Networks.** Inyo Networks is a certificated telephone corporation located in Vallejo California, with extensive operations in the Eastern Sierra region of California. In conjunction with the California Broadband Cooperative and Praxis Associates, Inc. it recently completed a 600-mile Next Generation, high-capacity BTOP Middle Mile Project between Reno Nevada and Barstow, California known by its project name of *Digital 395*. In this endeavor, over 300 Community Anchor Institutions (CAIs) and Points of Interconnection (POIs) are connected. Funded by the NTIA, the California Public Utilities Commission, and programmatic revenue, it has been widely regarded as a successful, large-scale undertaking.

Inyo Networks is presently engaged as the Network Operator for the California Broadband Cooperative, Inc. (CBC). In this capacity Inyo Networks directly serves approximately 200 governmental, educational and medical CAIs, as well as provides backhaul to all Cable and Fixed Wireless, and one of the two dominant wire line carriers of the region. With the network only recently completed, the last LEC and all cellular companies are in contract negotiations for Middle Mile broadband.

In addition to its role as the Region's Middle Mile service provider (via CBC), Inyo Networks serves the area as a Last Mile, fiber optic service provider of major commercial customers. Presently, the combined networks of CBC and Inyo Networks provide the following services: IP Services up to 10Gbps, Point-to-Point Private Circuits, Dark Fiber, Wavelengths, Conduit Leasing, and Collocation. Inyo Networks, as a retail service provider plans to offer voice services throughout CBC and Inyo Networks customer base, which is largely in designated high cost service areas.

**Tribal Partners.** The region presently served by CBC-Inyo Networks contains seven federally recognized tribes. Each tribe presently receives 50Mbps of IP services, although none of the tribes can pass these benefits through to their members. The tribes seek to develop Last Mile networks on their reservations to bring the benefits of the BTOP program to their members. For this reason, the tribes within the serving area seek to own their own networks for self-sustainability and tribal jobs. In addition to the seven Eastern Sierra tribes, there are three other projects that we have been involved with: (1) Tule River Indian Reservation (built FTTP network in 2005 under RUS/CPUC funding); (2) the Reno Sparks Indian Colony (presently constructing an RUS wireless system); and (3) Pyramid Lake Paiute Tribe where we constructed a Middle Mile project throughout the reservation. More information on these partners current broadband capability is presented in Attachment A.

**Construction Partner.** Praxis Optical Networks, the contractor overseeing and installing the aforementioned BTOP Middle Mile network, Tule River network and Reno Sparks Indian Colony network, will provide engineering and construction on tribal lands, hire and train qualified tribal members for long-term employment skills and network maintenance. This was effectively done at the Tule River Indian reservation. The tribes will learn telecom installation operations for their reservation. Praxis Optical Networks successfully installed nearly 900-miles of grant-funded fiber over the past three years and connected over 35,000 homes for ATT.

**State of California.** The California Public Utilities Commission (CPUC) will provide aid to construction (as a fiscal partner) with a 20% share of grant funding from its California Advanced Services Fund (CASF) for those sections of the project within California. We are seeking similar support in the State of Nevada,

although there appears to be no state mechanism for this. The Pyramid Lake Paiute Tribe is looking into various sources of funding, with no firm options at this time.

Apart from the above list of partners, as a principal of Inyo Networks, I hold a Ph.D. from UCLA where in my earlier career I was a research methodology specialist in the development of Quasi-Experimental Designs. This social science methodology utilized natural settings impacted by clearly identified interventions (defined by the specific nature of the change and exact timeframes when the effect took place). These methods have been extensively used in policy evaluations, where I employed them at the Department of State (USAID) and several other health and education policies worldwide. We believe this additional expert knowledge can be of significant use to the FCC in data-capture and related analytics, by analyzing patterns of adoption, changes in behavior and their financial impact. In recent years, I've taught advanced classes at the University of San Francisco's Graduate Program in Public Policy, where I concentrated on Emerging Technologies and the Digital Divide. Our selection of targeted tribal lands (at varying degrees of broadband introduction) is, in part, an effort to assess varying impact while leveraging existing infrastructure.

**GEOGRAPHIC TERRITORY**

Inyo Networks intends to offer VOIP services to all CAIs connecting to the CBC network and to its own end-user customers in the Eastern Sierra between Barstow, CA and Reno, NV. The 10 tribal networks are located in Central California, the Eastern Sierra, and Northern Nevada, as depicted on the map in Exhibit B, and further identified by eligible census tracts in Exhibit A. The CBC territory represents Census Tracts previously vetted in the BTOP application process, and represents high-cost areas for rural subsidies. Since the California Advanced Services Fund provided nearly 27% of project funding and the Proposed Funded Service Area was located within California, the current CAIs are all located in California, not in the urbanized Nevada areas.

Here are the FCC Listed Census Tracts, by County, that are impacted by this proposal for California and Nevada. All are in the High Cost Areas and correspond to the Eligible FCC Census Tract List. Census Tracts in Nevada denote Reservations.

CALIFORNIA						NEVADA	
Alpine 06003	Inyo 06027	Kern 06029	Mono 06051	S Bern. 06071	Tulare 06107	Douglas 3200	Washoe 3203
06003010000	6027000100	06029005300	6051000101	06071011600	06107002700	32005000940	32031003010
	6027000200	06029005500	6051000102	06071011900			32031003130
	6027000300	06029006501	6051000200	06071008901			
	6027000400	06029005401					
	6027000500	06029005402					
		06029005403					
		06029005404					

**ELIGIBLE TELEPHONE CARRIER (ETC) STATUS**

Inyo Networks, Inc. currently holds a Certificate of Public Convenience and Necessity (CPCN # U7953C). We intend to submit for ETC status with the CPUC through the Advice Letter process that is outlined in CPUC Resolution T-17002 within 30 days. Inyo Networks is presently certified as a non-facility based carrier, but will file for a change in status by April, thus allowing construction on public rights-of-ways. The CBC partner, however, holds facilities-based CPCN # U7221 and therefore can provide such capability in the few areas where tribal lands are impacted by local or state jurisdictions.

**LIST OF ANCHOR INSTITUTIONS**

The project will serve a total of 380 Community Anchor Institutions (CAIs). We have broken them down by in the table below, by entity:

<i>Organization / Entity</i>	<i>Tribe</i>	<i>Schools</i>	<i>Librar y</i>	<i>Health care</i>	<i>Public Safety</i>	<i>Community Centers</i>	<i>Other Gov't</i>
CBC Mid-Mile	No	55	12	13	36	16	120
Lone Pine Shoshone Paiute Tribe	Yes	1	1	1	1	1	2
Ft Independence Reservation	Yes	0	0	0	0	1	2
Big Pine Paiute	Yes	0	1	0	1	2	5
Bishop Paiute	Yes	3	1	1	1	2	8
Benton Paiute	Yes	0	0	0	0	2	1
Bridgeport Indian Colony	Yes	0	1	0	0	1	2
Washoe Tribe Band of California	Yes	1	1	1	2	2	12
Reno Sparks Indian Colony	Yes	2	1	1	1	2	2
Pyramid Lake Paiute	Yes	3	1	1	2	1	29
Tule River Indian Reservation	Yes	1	1	1	2	2	5
TOTAL	—	55	20	19	46	32	188

## **PROPOSED TECHNOLOGY**

The project will use a variety of broadband technology, some of which is in place and some proposed:

Middle Mile: Gig-E or 10Gbps Ethernet is presently available at all institutions connected on the CBC/Digital 395 and Pyramid Lake Paiute Tribe Middle Mile networks.

Last Mile (Existing): 1 Gbps Ethernet FTTP is installed on the Tule River Indian Reservation to 29 community anchor institutions (CAIs) and a 20 Mbps minimum throughput, 5.8 GHz Point-to-Multipoint wireless network is presently being installed to all 168 dwellings at the Reno-Sparks Indian Colony.

Last Mile (Proposed): 1 Gbps PON FTTP is proposed for the following Tribal Lands: Lone Pine, Ft. Independence, Big Pine, Bishop, Benton, and Bridgeport.

Last Mile Wireless: a 20 Mbps minimum throughput, 5.8 GHz Point-to-Multipoint wireless Ethernet network is proposed for deployment to all dwellings on the Washoe Tribe of California and Nevada.

Switching: The project proposes a MetaSwitch MG650 Class 4/5 softswitch, to enable low cost VOIP voice, messaging, and trunking applications

## **STATE AND/OR LOCAL OR TRIBAL GOVERNMENT PARTICIPATION IN AND/OR SUPPORT OF PROJECT**

For tribal areas proposed for last mile services, tribes (in conjunction with the BIA) will make the following in-kind contributions: (1) Rights-of-Way for conduit, cable, entrance facilities, and apparatus; (2) real estate or building space for electronics and points of termination, (3) tower space, where needed; (4) waiver of TERO fees; (5) tribal monitoring; (6) commercial power, and (7) staging and lay down sites for equipment and materials. The tribes have agreed to waive Indirect Cost Allocation fees, as has been successful with USDA-RUS funding programs.

In addition to the above, the PLPT tribe will make the Middle Mile bandwidth, commercial power, and node space available for VOIP. The Tule River Indian Reservation will make available bandwidth, the node building, rack space and commercial power for VOIP on their existing network. The Washoe Tribe Nevada and California will provide tower infrastructure and compatible wireless system elements for their Woodford property.

The Counties of Inyo, Mono and Douglas will provide Rights-of-Way and inspection for any construction on their rights-of-way on underlying tribal land.

The State of Nevada Department of Transportation will waive Permit and Encroachment Fees on underlying tribal land. The State of California will waive Permit and Encroachment Fees, in addition to providing financial assistance through the CASF.

**EXISTING PROVIDERS**

The following matrix provides information on services available on the geographical areas proposed in terms of Speed and Costs:

<i>Location</i>	<i>Incumbent LEC</i>			<i>Cable</i>			<i>802.11 Wireless</i>		
	<i>Name</i>	<i>Voice</i>	<i>Data</i>	<i>Name</i>	<i>Voice</i>	<i>Data</i>	<i>Name</i>	<i>Voice</i>	<i>Data</i>
Digital 395 Mid-Mile	<i>CBC</i>	<i>None</i>	<i>\$1.00/Mb</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
Lone Pine Shoshone Paiute Tribe	<i>Verizon</i>	<i>\$57.99</i>	<i>None</i>	<i>Suddenlink</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>None</i>	<i>\$49.95</i>
Ft Independence Reservation	<i>Verizon</i>	<i>\$57.99</i>	<i>None</i>	<i>None</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>Schat</i>	<i>\$49.95</i>
Big Pine Paiute	<i>Verizon</i>	<i>\$57.99</i>	<i>None</i>	<i>Suddenlink</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>Schat</i>	<i>\$49.95</i>
Bishop Paiute	<i>Verizon</i>	<i>\$57.99</i>	<i>\$29.95</i>	<i>Suddenlink</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>Schat</i>	<i>\$49.95</i>
Benton Paiute	<i>Verizon</i>	<i>\$57.99</i>	<i>None</i>	<i>None</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>None</i>	<i>None</i>
Bridgeport Indian Colony	<i>Verizon</i>	<i>\$57.99</i>	<i>None</i>	<i>None</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>None</i>	<i>\$49.95</i>
Washoe Tribe Band of California	<i>Verizon</i>	<i>\$57.99</i>	<i>None</i>	<i>None</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>None</i>	<i>None</i>
Reno Sparks Indian Colony	<i>ATT</i>	<i>\$57.99</i>	<i>None</i>	<i>None</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>None</i>	<i>Self</i>
Pyramid Lake Paiute	<i>ATT</i>	<i>\$57.99</i>	<i>None</i>	<i>None</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>None</i>	<i>None</i>
Tule River Indian Reservation	<i>ATT</i>	<i>\$57.99</i>	<i>None</i>	<i>None</i>	<i>No</i>	<i>No</i>	<i>None</i>	<i>None</i>	<i>None</i>

**Project Timeline**

The timeline for this project is approximately three years: (1) 18-months for tribal and BIA approval on NEPA and related environmental permits, as well as CEQA, if applicable on reservation land in California; and (2) 18-months for construction across seven reservations.

**Scalability**

The scalability of the networks in this proposal is significantly scalable.

**Scalability of the Existing Middle Mile**

The network capacity of the Middle Mile is presently operating 150 Gbps on four-strands of fiber using 15 of 96 wavelengths. The cable is a 432-Strand fiber backbone in a three-

conduit structure (two ducts spare). Theoretic capacity of the Middle Mile is near 100 Petabytes depending on available electronics.

#### Scalability of the Existing (252) Middle Mile Anchor Connections

Presently, all community anchors are served by fiber equipped with either 2-Port 1Gig-E or 5-Port 10Gig-E Network Interface Devices (NIDS), depending on type of institution or expected demand.

#### Scalability of Proposed Last Mile Solutions – FTTP

The proposed tribal distribution systems will be 10Gbps PON FTTP systems equipped, the current industry standard. In addition to VOIP services, tiered speeds to be offered under this Experiment will initially range from 25 to 100 Mbps of broadband service, with a 1Gbps cap. These networks will be tribally owned, once installed. Inyo Network will serve as network operator at the convenience of the tribes, with local tribal labor employed, as available.

#### Last Mile Scalability – Existing and Proposed Wireless

5.8 MHz wireless Ethernet tribal distribution systems radios have a current throughput capacity of 250 Mbps per antenna sector. The expected life of electronics in these systems is usually between five-year and ten-year, with the change out of electronics enabling greater speeds. The current per-subscriber bandwidth of 20-50 Mbps is projected to meet needs well into the next decade or two.

#### Scalability of the Proposed Switch Equipment

Voice over IP, or more generally multimedia over IP, will set up interactive messaging, telephony and video conferencing over an IP network. The proposed soft switch vendor, Metaswitch, provides Class 5 End-Office equivalent VoIP and IMS network software products that are scalable. The project proposes a single installation on the Inyo Networks infrastructure in the existing service area. We are proposing a Metaswitch MG650 Class 4/5 Tandem unit with a simultaneous circuit capacity of 90,000 residential and commercial lines. This system is expandable by deploying additional shelves.

Generally speaking, the upgrade capacity of the Middle Mile, Last Mile and switching technologies are extensive, have being designed on Carrier Grade, Next Generation, State-of-the-Art platforms.

#### **Total Business Investment**

Due to recent experience with Federal Programs, Inyo Networks has in place the necessary federal grant process and systems required by the FCC. There however, will be a requirement for the retention of administrative staff and project management for project oversight. While there will be little ramp up costs involved, we expect that in total the administrative apparatus to oversee the environmental, contract management, bonding, and financial oversight of this project through the three years to be **\$1.2MM.**

## **INVESTMENT NEEDED**

The one-time investment by the FCC for the total project, including the Administrative overheads, is estimated to be **\$9,550,370**. Upon completion, the projects will be self-sustaining.

## **LEVERAGING FUNDS AND PROJECTS**

This project leverages several adjacent projects which have just completed or are in the process of completing:

The primary projects being leveraged are two recently completed BTOP Middle Mile projects: (1) California Broadband Cooperative's Digital 395 Middle Mile \$108MM fiber backbone project that spans the 600 miles on the Eastern Sierra between Barstow CA and Reno NV; and (2) the \$12MM Pyramid Lake Paiute Tribe's Middle Mile project which provides backbone fiber throughout 43 miles of reservation. These two projects seek to enhance their value to low-income native lands with adjacent Last Mile solutions in addition to currently serving nearly 300 anchors. The addition of VOIP will increase sustainability to both networks and lower high cost subsidies into these areas. The Digital 395 project connects seven native lands who allowed rights-of-way through tribal property. California Broadband, in turn, allocated 50Mbps of broadband to each reservation. In addition to these projects, the USDA-RUS has previously funded two tribal projects (the Tule River Indian Reservation – FTTP and the Reno Sparks Indian Colony – Fixed Wireless). The former is complete and the latter is currently under construction, and will be completed by summer. While broadband is available into these tribal areas, they continue to be dependent upon high cost subsidies, since voice services do not take advantage of the adjacent available bandwidth. In addition to the broadband itself, the NTIA programs allow for equipment and construction resources acquired on the BTOP projects to be reused for the furtherance of rural broadband development. CBC will have committed to make these considerable resources available for network construction and engineering.

California Broadband Cooperative and its contractor, Praxis Associates, has considerable experience with the California Advanced Services Fund and will be looking for funding assistance for part of this Experiment. CASF funding was used in conjunction with federal grants in all of the California projects and will be available, to the extent bandwidth criteria are met in any of the proposed Last Mile components.

We expect this contribution by CASF to be **\$1,163,730**, which is a 30% match to CPUC allowable costs, yet yields a 10.9% of the overall project cost.

## **TOTAL PROJECT COST**

We estimate the cost of Last Mile engineering and construction, VOIP implementation, and overall project administration, including environmental analysis, project management and financial oversight to be **\$10,714,100**

Thank you for considering our Expression of Interest. Inyo Networks and its affiliated corporations have been extremely active over the past year bringing broadband to rural America. In the past three years we successfully executed on three major BTOP projects in California and Nevada. We look forward to working with the FCC on its experimental efforts to transform the structure of the communications sector of our economy.

Sincerely,

A handwritten signature in blue ink, appearing to read "Michael T. Ort". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Michael T. Ort, Ph.D.  
CEO and President  
Inyo Networks, Inc.

**EXHIBIT A**  
**TRIBAL VOIP EXPERIMENT PROFILES**

Organization	Population	Households	Parcels	BLDGS	Last Mile Status	Middle Mile Status
Lone Pine Shoshone Paiute Tribe	300	99	150	8	Proposed	CBC - 50Mbps
Ft Independence Reservation	78	43	53	2	Proposed	CBC - 50Mbps
Big Pine Paiute	335	243	243	7	Proposed	CBC - 50Mbps
Bishop Paiute	1140	530	780	15	Proposed	CBC - 50Mbps
Benton Paiute	75	30	45	2	Proposed	CBC - 50Mbps
Bridgeport Indian Colony	40	21	22	2	Proposed	CBC - 50Mbps
Washoe Tribe Band of California	283	102	125	19	Exists - Needs Feed	CBC - 50Mbps
Reno Sparks Indian Colony	480	167	250	7	RUS - In Progress	InyoNetworks - 100Mb
Pyramid Lake Paiute	1715	697	UK	37	Proposed	PLPT -- 10 Gbps
Tule River Indian Reservation	1049	287	UK	5	In Place	ATT -- 200Mbps
<b>TOTAL</b>	<b>5495</b>	<b>2219</b>		<b>104</b>		

