SECTION 2.4.C – PROJECT NARRATIVE – INTRODUCTION

Why the Project is Needed – Improving Connectivity in the Last/First Mile

This project proposes to supply quality, system tested and approved, connectivity products (such as cable, connectors, splitters, amplifiers, filters, taps, etc.) that are used in the last mile build out, including in-home/premise installations. Although not as ambitious as a network system design or construction, this project addresses an important, but often overlooked, aspect of broadband delivery in the last mile: user equipment interface.

The last mile is typically where speed bottleneck occurs and is the most challenging part of the network in terms of cost and service delivery, in part, because of the interface with a wide variety of user equipment (router, modem, gateway, computer, TV, telephone, etc.). What is commonly known as "the last mile" is also conversely "the first mile" from a user's premise to the outside world. This last/first mile is where the user most directly experience connection speed. Thus, even if a carrier can deploy top speed directly to the outside of a user premise, if the inside of the premise or user equipment is not capable of such speed or if the connection point is poorly equipped, the user will experience bandwidth limitations at the bottleneck connection point.

As innocuous as it may seem, connectivity equipment such as jumper cable and connectors, play an important role in preserving the speed and integrity of the broadband signal. In fact, many service calls made by users relating to poor or loss signal quality are caused by loose connections. See FCC Consumer Guides, available at https://www.fcc.gov/consumers/guides/cable-signal-leakage, stating: "Signal leaks can be caused by loose connectors, damaged equipment or unterminated cables." See also Comcast Xfinity Internet Support, available at https://www.xfinity.com/support/articles/tighten-your-device-connections-for-the-best-service, advising customers to tighten connectors in home.

Understanding this finer point of the user experience, PCT International Inc. ("PCT"), a locally owned Arizona business, has spent the last 20 years developing and perfecting connectivity technology in its product portfolio. PCT's products are specifically designed to reduce signal leakage and protect the quality and integrity of broadband speed at the point of user equipment interface in the last/first mile. To date, PCT owns over 200 patents and patents pending. PCT's products are system tested and approved and deployed by major multi-service operators ("MSOs) worldwide. See https://www.pctinternational.com.

Intended Beneficiaries – Arizona Residents and Businesses

Established in 2013 as a minority, woman-owned, local Arizona business, Denali Telecom Solutions, Inc. ("Denali") has worked alongside PCT to strengthen its manufacturing supply chain and advance both companies' mutual commitment to corporate social responsibility, particularly among underserved communities in Arizona. Through a partnership with PCT and via this grant application, Denali proposes to supply approximately [redacted] worth of PCT quality connectivity products at no cost to local residents, contractors, installers, and field operation technicians servicing Arizona rural communities.

The intended beneficiaries of this project are the users/consumers who directly experience connectivity speed and are most impacted by the quality and integrity of the broadband signal. The following sections will address further details of the proposal: nature and scope, implementation, economic impact, and other benefits to the community.

SECTION 2.4.D – PROJECT DESCRIPTION AND TIMELINE – INFRASTRUCTURE MATTERS

Nature and Scope of Project – Products Offering

Imagine teams of engineers working tirelessly to design, architect, and install a state-of-the-art broadband communication system only to discover at the moment when a technician connects the final jumper cable to the user equipment that there is no signal. Or, imagine a resident patiently waiting for hours to speak with a service representative about a loss internet signal only to discover the culprit is a loose connector on the back of the modem router. Although the dollar value of a jumper cable or a connector is small relative to the scope of an entire buildout project, the impact can be substantial.

To help reduce time and costs associated with troubleshooting these connectivity challenges, this project proposes to supply approximately [redacted] worth of PCT quality connectivity products at no cost to local residents, contractors, installers, and field operation technicians servicing Arizona rural communities. The full line of offered products and their technical specifications, including cable, connectors, various jumpers (coax, fiber, HDMI, RJ11/45, Cat5e/6), self-install kits, splitters, amplifiers, filters, taps, nodes, etc., can be found here: https://www.pctinternational.com/our-products. On a first-come-first-served basis, residents, contractors, installers, and field operation technicians may order the offered products from Denali free of charge (exclude any applicable tax or shipping) up to the total amount of RBDG-A Eligible Project Costs as long as these products are shipped to and deployed in an Arizona rural area as contemplated by RBDG Eligible Applicant criteria.[1]

How the Project Addresses Technological Needs and Saves Costs by Reducing Service Calls

Through a partnership with PCT, Denali is able to leverage over 20 years of research and development in last mile connectivity technology and proposes to offer such product technology to Arizona rural communities at no cost via the RBDG-A Program with the full protection of a manufacturer's warranty for a minimum of 5 years. PCT's products are specifically designed to reduce signal leakage and protect the quality and integrity of broadband network speed. For example, major MSO systems have, among other performance reasons, tested and approved PCT's patented Triton coaxial cable for its enhanced shielding; PCT's patented compression connectors for their torque retaining and continuous ground features; PCT's digital splitters and amplifiers for their patented DSM surge seizure protection and extended bandwidth; and PCT's RFoG nodes for delivering RF solutions over a passive fiber optic distribution network.

From troubleshooting something as simple as a loose connector to more complex issues of delivering extended bandwidth over mismatched fiber and RF systems, this project aims at helping to reduce the technological and economic challenges faced by both the network and consumer in the last/first mile of broadband delivery. Specifically, when an installer or field technician uses quality products in a last mile deployment, s/he not only help ensures the integrity of the broadband network, but also contributes an economic benefit to the community by directly saving its residents the costs of service calls or truck rolls.

[1] Section 1.3 of the RBDG Program qualifies Eligible Applicant as including: (1) cities and towns with populations of less than 150,000 not contiguous with or situated within a defined Urban Area; (2) counties with populations of less than 800,000; and (3) federally recognized Indian tribes situated in Arizona.

Why this Project Offers Products Separate from Installation – Maximizing Value to the Consumer

As recognized by the RBDG Program, there are numerous challenges confronted by rural development generally; RBDG-A is intended to only partially fund certain eligible projects aimed at enhancing the availability and speed of broadband connectivity "at reasonable cost to consumers." See Section 1.1 Grant Nature and Intent. Focusing on the most direct, immediate, and measurable value to the consumer, this project opts to offer only products without the logistical, financial, and time-consuming challenges of a complete installation or buildout.[2] To provide rural communities with quick and direct economic benefits, the proposal focuses on the user-ready stage of bandwidth consumption in rural communities where trunk lines and facilities are already in place to push toward the last/first mile of broadband deployment. In short, this project aims to offer the biggest bang for the RBDG-A buck.

A typical infrastructure buildout could cost more than [redacted] per mile with each mile servicing about 15 homes. With current business and economic realities, it could take years for a service provider to recoup its infrastructure investments. See https://www.otelco.com/fiber-infrastructure. In rural areas, the buildout cost per home is exponentially higher. Even at a conservative estimated cost, the requested RBDG-A funding for this project (approximately [redacted]) may only potentially fund 25 last mile buildouts and impact 375 households. In contrast, if the same [redacted] is applied at a conservative estimate of [redacted] in materials cost per mile, the funds could deliver 1,000 miles of coaxial cable and impact 15,000 households.

The value of this project's impact to Arizona rural households is even greater in the context of self-install kits. Service providers typically charge an average of [redacted] per trip for installation fees. See https://www.allconnect.com/blog/guide-to-internet-fees-provider. To reduce operation costs, many MSOs offer consumers the option to receive free self-install kits to connect their equipment. https://www.multichannel.com/news/comcast-s-self-install-kit-cuts-back-truck-rolls-327714. Although these self-install kits are free to the consumer, service provider or installation contractor must purchase kits that have already been tested and approved to be used in the network. At a cost of $5.50 per self-install kit (excluding customer premise equipment or "CPE" such as modem, router, gateway, etc.), the same [redacted] proposed by this project could supply over 90,000 self-install kits to Arizona rural households thereby eliminating the cost of [redacted] per trip for installation charge. By opting for the free self-install kits provided by this proposal, Arizona rural residents could realize a cost saving benefit valued at over [redacted].

Intended Use of RGDG-A Funds

The RBDG-A funds requested by this project would be used exclusively dollar-for-dollar toward the purchase of products at manufacturer's direct factory pricing. The project would supply these products

[2] Contractors typically combine labor and materials together as part of a buildout. In the case of in-home/premise installations, service providers often subcontract out to local installation crews to reduce the costs of maintaining a fleet of service trucks and technicians. Considering the disparate geographic territory of rural communities, delivering broadband service to households in rural areas would likely require numerous independent local installers, which can be challenging in terms of how, when, and where these contractors/subcontractors get the network approved installation materials. By separating materials from the labor portion, this project would allow greater flexibility for independent local subcontractors to manage their product needs while ensuring that quality products are deployed in rural areas. Moreover, contractors would be able to shift more of its own project dollars toward the larger portion of deployment costs and RBDG administrators would gain greater visibility to the use of grant funds.

at no cost (excluding any applicable tax and shipping) to local residents, contractors, installers, and field operation technicians servicing Arizona rural communities on a first-come-first-served basis. The project would deliver these products with the acknowledgment: "Funded by a grant from the State of Arizona and the Arizona Commerce Authority."

Without RBDG-A funding, neither Denali nor PCT would be able to offer free products or implement this proposal due to high costs, long revenue cycle, challenges of reaching independent local installers spread out all over the state, and difficulties of financing an entire manufacturing supply chain from R&D development to raw materials to finished goods to distribution centers. Efforts to obtain funding for the project from other sources yield no results because lenders/investors not only seek a return on their investment, but also collateral to protect such investment. In the world of supply chain financing, the fastest and often most expensive way to close the funding gap is through account receivable financing. Here, the project proposes to supply products to rural communities at no charge; thus, there is no account receivable to serve as collateral. However, if Denali receives all or a portion the requested RBDG-A funds, its lending partner FSW Funding would consider the grant as sufficient security to advance the needed funds to help Denali implement the proposed project. See enclosed Letter of Commitment and Support from FSW Funding. In short, the RBDG-A Program would not only provide a direct, immediate, and measurable value to Arizona rural residents, but also doubly serves to provide support for Denali and PCT (both Arizona businesses) in improving market presence in their home state.

Cash Match Contribution and Other Non-Grant Support

In addition to FSW Funding commitment and in recognition of the potential marketing benefits of this project, Denali itself would commit to contribute a cash match of [redacted] representing approximately [redacted] of the total eligible RBDG-A project costs. Starting from day one of project implementation, this money would be used toward the purchase of products as well as the cost of warehousing and staging such products while waiting for customer delivery and RBDG-A reimbursement.

Other financial needs not eligible for RBDG-A reimbursement to be used toward operation, administration, grant management, and sales/marketing would be funded by FSW Funding. Moreover, to help bridge Denali's operational cash flow affected by this project, PCT as Denali's manufacturing partner would provide Denali with favorable product pricing and payment terms.

SECTION 2.4.E – PROJECT DESCRIPTION AND TIMELINE – DEVELOPMENT MATTERS

Project Implementation – Timeline, Rollout, and Accountability

Upon notification of an award, Denali would dedicate 1 part-time staff for administration and grant management and 1 part-time staff for operation and sales/marketing. Together with its sole owner and business executive, the entire Denali team would spend the next 30-60 days notifying carrier systems, contractors, installers, and residence in rural communities, giving preference to those participating in this RBDG Program, about the offered free products and secure interests/orders for such products. Based on orders and products request to be shipped to qualifying rural areas, Denali would procure products directly from PCT's manufacturing facilities with special packaging labels acknowledging the grant at pre-negotiated favorable prices and terms. While waiting for products to arrive within the standard 60-90 days manufacturer's lead time, Denali would prepare warehouse space and staging materials for products distribution.

After products arrive at Denali's and/or PCT's distribution facility in Mesa, Arizona, they would be broken down per purchase orders, shipped, and invoiced at [redacted] costs plus any applicable taxes and shipping charges. All invoices would be submitted to FSW Funding for financing and also archived (along with their corresponding products purchase from factory) for submission to the RBDG-A administrator at the Arizona Commerce Authority for quarterly report and reimbursement request.

In case of large volume products request by an MSO or major telecom carrier, care would be taken to verify the shipped to and deployment location is eligible for free products pursuant to the terms of this project. Because the order invoices would show $0 costs, there would be little danger of these carriers double claiming the materials costs for reimbursement on their own respective grant funded projects. Denali would process and account for any products return accordingly. Given the size of the requested RBDG-A award and total project costs, Denali expects to rollout and complete this project within 6-9 months.

SECTION 2.4.F – OTHER PROJECT OUTCOMES

Access to information is often a catalyst for social and economic improvements in individuals and communities. When such access is limited or disrupted by failures in the communication pipeline, the set back to rural communities may be experienced more deeply than elsewhere because relief may not readily be available due to lack of redundancy or logistical challenges. For example, when a storm or natural catastrophe destroys a communication infrastructure in rural areas, it may take weeks or months before service could be restored. Having a ready and accessible supply of replacement cable, connectors, and other connectivity products right here in Arizona would help improve the response/repair/restore time for downed communication lines. Beyond the direct and immediate benefits of the free offered products, the project also provides a unique opportunity for remote rural buyers to connect with a local in-state supplier and manufacture of quality last mile connectivity products.

Additionally, the quality and technical product solutions offered by this project would ensure that rural communities receive the same connectivity technology as larger systems elsewhere at cost-effective pricing. It seems no matter how disadvantaged a community may be anywhere in the world, its residents often have the same appetite for information and media consumption. Providing quality products and equipment to connect and meet broadband media demand serves to bring rural and urban communities one step closer to bridging the cultural divide.

Finally, by supporting this proposal, the State of Arizona and the Arizona Commerce Authority would send a direct message to Arizona rural residents that their broadband connectivity needs are being addressed. No matter how large or small the needs may be, from a jumper cable inside a self-install kit to taps mounted on poles or in pull boxes, people will know the State of Arizona supports local businesses and residents with this project's acknowledgement: "Funded by a grant from the State of Arizona and the Arizona Commerce Authority."