Arizona Commerce Authority

Arizona Broadband Development Grant (ADBG) - Rural

Valley Connections LLC and Santa Cruz County - Patagonia, Sonoita and Elgin Regional Broadband Network Project

Project Narrative

1. Project Description and Timeline

Nature of the Improvements

Valley Connections, LLC (VALLEY), proposes to build out a fiber-optic network which would enable VALLEY to offer Internet services to eastern Santa Cruz County residents and businesses in the communities of Patagonia, Sonoita and Elgin. The proposed backbone infrastructure is comprised of constructing approximately 104 miles of backbone fiber and utilizing 12.5 miles of VALLEY's existing backbone fiber infrastructure. The proposed last-mile infrastructure is comprised of constructing approximately 73.5 miles of last-mile fiber infrastructure. Total proposed new fiber infrastructure constructed is 177.5 miles.

[redacted]

The project design is a 100% fiber optic network; therefore, the design and performance of this system reflects advantages available with state-of-the-art, carrier-grade advanced technologies operating at multi-gigabit rates.

Unlike optical fiber networks typically designed by other providers in the area, the network design for the VALLEY system will make fiber available to every customer location and can offer carrier-grade service at speeds of up to 400 Gbps upon request. The result is a best-in-class, optical fiber network that will ensure that residents within the Patagonia, Sonoita and Elgin areas have access to broadband services of ***at least*** 100/25 Mbps.

The proposed broadband solution consists of optical fiber cables, placed aerially or underground, dependent on the terrain and utility pole availability. In areas where the placement is underground, new conduit will be installed and the optical fiber cables will be placed inside the conduit. In areas where the placement is aerial, the network will be deployed using existing poles (joint use), with all-dielectric self-supporting optical fiber cable (ADSS) in the available space between the neutral conductor and the telecom space.

Two new optical fiber networks will be constructed: a core network and an access network. The core and access networks are configured and controlled through Software Defined Network capabilities, which improve network availability, operational efficiencies, and reduce total cost of ownership. While the active Core and Access network components are currently configured for 10 Gbps/1 Gbps traffic rates, it is worth noting that this capacity exists only within the active electronic components and not the fiber infrastructure itself. The fiber has virtually limitless bandwidth and, with future replacement of the active network components, could readily support higher traffic rates including 40 Gbps and 100 Gbps.

The Core Network: The core network facilities will be a 144-count optical fiber cable, extended from VALLEY's existing fiber infrastructure in the Sonoita area, terminating at a new communications cabinet to feed the Patagonia area.

The full profile of MEF 3.0 Carrier Ethernet services (Access EPL, Access EVPL, EP-LAN, EVP-LAN, EP-Line, EVP-Line) and MPLS-TP transport services (with future support for the newly-defined segment routing) will be available from the core network on Day one, while advanced optical capability such as Wave Division, Multiplexing (WDM), Reconfigurable Optical Add-Drop Multiplexing (ROADM) as well as Optical Transport Networking (OTN) can be added to the same core network platforms to support additional revenue streams in the future.

The Access Network: The access network will consist of distributed, passive optical networking architectures operating at the minimum data rate of 10 Gbps, symmetrically. The access network is comprised of three tiers of network.

- Tier-1 holds the drop facilities which extend from an area drop closure to the customer premises, terminating at an outside interconnection point. The drop closure can support up to 6 drops to customer premises and are placed aerially or underground, as determined by the network design for each area. All drop facilities contain two optical fibers: one active and one in reserve. Where warranted, drop cables containing up to 12 fibers can be economically provided as required.
- Tier-2 comprises the distribution facilities that connect Fiber Distribution Hubs (FDHs) to the drop closures. These hubs distribute the optical power of the OLT platforms, as received by feeder cables, to the drop closures.
- Tier-3 contains the outside plant facilities that interconnect the OLT platform housed within the CO, to the Tier-2 FDHs. Optical Line Terminal (OLT) platforms that provide access capability to every customer premise are placed as needed based upon network design.

Fiber to the Home/Business (FTTH/B): VALLEY proposes to deploy Fiber-to-the-Home (FTTH) or Fiber-to-the-Business (FTTB). The FTTH/B distribution areas will utilize XGS-PON technology (10G/10G symmetrical service) and will also support NG-PON2 (40 Gbps/40 Gbps symmetrical service over Time and Wavelength Division Multiplexing -TWDM) with nothing more than a change of the optics in the OLT port.

With all passive optical networks, the PON data rate is allocated across multiple users who efficiently share that bandwidth. An XGS-PON network can support up to 128 subscribers. However, in the interest of future growth in demand, VALLEY has used a 1:32 OLT/ONT split in the access network design.

Historical data was used to price construction costs as VALLEY has recently constructed fiber projects in some of its other service territories using both underground and aerial methods. VALLEY would bid out the project and utilize a well-established fiber optic contractor for the project. VALLEY also will ensure the contractor and any sub-contractors and vendors are licensed and bonded in accordance with Arizona laws and have sufficient experience designing and

constructing fiber networks. VALLEY will also ensure that all procurement requirements are followed as outlined in the grant announcement.

Stated Commitment to Operate and Maintain the Network

VALLEY is committed to providing quality products and services and will oversee all aspects of the project throughout construction. Our in-house project manager will verify that all facets of work meet our quality control guidelines, by working closely with the contractor responsible for construction. Once construction has commenced VALLEY will implement a maintenance plan. All aspects of the facilities undergo continuous inspections and are routinely monitored and evaluated to ensure optimal performance. Monitoring includes assessments of electronics, data collection and deficiency tracking.

VALLEY is committed to constructing, operating, and maintaining the proposed fiber optic network for a term of not less than 5-years upon completion of the project.

Timeline

Upon notification of grant award, VALLEY would immediately file all necessary permits for the project, as well as place orders for materials. Once permits and materials are received, VALLEY would put the project out to contractor bid and commence the project within 45-days of contractor award. It is anticipated that once the project commenced, the buildout would take 540 days to complete.

Match Contribution

VALLEY will commit to utilizing 12.5 miles of existing backbone infrastructure valued [redacted] to enhance the project, as well as commit [redacted]. The match will be used to assist with the build out of the new backbone infrastructure required. The matching funds would be expended prior to seeking reimbursement from ABDG for the remainder of the eligible project costs. The ABDG-Rural funds would be used to construct the remainder of the proposed fiber optic network.

In addition to the [redacted], the Santa Cruz County Board of Supervisors approved a resolution to commit [redacted] of the county's allocation of American Rescue Plan Act (ARPA) funds to support VALLEY's broadband project. Santa Cruz County is also committed to assisting VALLEY with obtaining permits for right of ways and other permitting requirements. VALLEY and Santa Cruz County BOS resolutions documenting their financial commitments to the project are included as attachments.

[redacted]

How the proposed project addresses the broadband needs of the area served

The focus of the proposed project is on the three communities of Patagonia, Sonoita and Elgin. Patagonia is an incorporated town in eastern Santa Cruz County while Sonoita and Elgin are neighboring communities identified as Census Designated Places (CDPs). The total population served in this project is 1,664, comprised of 723 households, 40 businesses, 12 community anchor institutions and includes county facilities and US postal service facilities. The project also will connect fiber to the county's Solid Waste Facility in Patagonia and the Sonoita Public Library.

The Patagonia area has one of the largest zinc deposits in the U.S. and has attracted a global mining company that will employ approximately 800 people when fully operational. High speed broadband is vital to the success of this state-of-the-art mining operation. In addition to the mine, several supply chain businesses, local shops and restaurants also will require broadband to successfully support the mining operation as well as the employees and other residents living in the area.

The Sonoita-Elgin area is home to some of the finest vineyards and wineries in the state. There are thirteen wineries in the area and the proposed project will provide service to eleven of these businesses in this first funding phase. Vineyards like other agri-businesses need high-speed broadband for water use control, analytics and greater production capabilities. The proposed project would enable these vineyards to expand their business and increase their efficiency.

The proposed project is desperately needed in the Patagonia, Sonoita and Elgin communities because these areas are considered unserved and underserved. The proposed project area currently has no wired or fiber network and has a serious lack of capacity due to reliance on satellite and wireless links. Wireless and satellite services are expensive and unable to deliver reliable bandwidth and speeds compared to a fiber network. Businesses and residents also lack access to bandwidth at affordable rates which limits their ability to access service.

According to the FCC Fixed Broadband Deployment Map no carrier has deployed broadband services that meet the minimum acceptable download/upload speeds of 25Mbps/3Mbps respectively in the Patagonia, Sonoita and Elgin areas in eastern Santa Cruz County.

Broadband Now shows the average download speed of 9.91 Mbps in the Sonoita area. That is 94.6% slower than the average speed in Arizona and 983.3% slower than the national average. The Elgin area reports a download speed of 1.85 Mbps which is even slower that the Sonoita area, 99% slower than the state average and 5,705% slower that the national average according to Broadband Now's website. Broadband Now reports a download speed in the Patagonia area of over 125 Mbps; however, upon actual study of the area and using the Broadband FCC maps, the actual average download speeds in Patagonia are less than 20 Mbps. While Broadband Now shows the availability of Century Link DSL service, a comparison with the Broadband FCC maps shows this is not accurate.

This grant award will allow VALLEY to deploy an affordable fiber based broadband service with speeds of up to 1 Gbps to businesses and residents.

These communities were selected for the proposed project because it is cost prohibitive for a carrier to bring high speed broadband to the area due to the high cost and the low population density in these communities. Major carriers will not expand or upgrade services to this area because there is no return on investment (ROI) for the carrier. Therefore, they are not willing to develop the area without some kind of subsidy from government resources. Because of the extremely remote nature of the project area, it is highly unlikely that this project can or will be

built in the foreseeable future. Without the infrastructure this project will bring to the region, the residents will continue to be unserved, and businesses will be severely limited.

VALLEY will leverage a current fiber project in Patagonia where they are adding fiber, at the company's expense, along the route of an E-Rate project. A last mile fiber network would be extended throughout the community of Patagonia to provide residential and business services. The fiber would go east from Patagonia approximately 12 miles to the community of Sonoita and then 8 miles south to the community of Elgin where a similar last mile fiber to the residence/business will be constructed in both communities.

Anticipated Economic Development Benefit

High speed internet that is reliable and affordable can transform small rural communities. Small businesses that were once limited to a small store front and customers that live in the area can expand their reach and serve a broader customer base. The COVID pandemic has changed the way we work, educate and interact with one another. Access to reliable broadband provides the means for these communities to stay engaged in an environment that they otherwise would not be able to participate and be involved. In addition, the ability to attract and retain residents and businesses will require adequate broadband as a foundation. The region is home to vineyards, wineries and a large mining operation which is estimated to bring $700 million dollars into the Arizona and local economy. These large businesses require sophisticated equipment and technology to be successful. High speed broadband provides the foundation for these businesses to grow and for the area to attract high tech businesses that will employ residents with high paying jobs.

In addition to business expansion, high speed broadband also will provide the foundation for K-12 schools, higher education, hospitals, public safety agencies and other government facilities to maximize resources available to bring the best services to the area.

COVID 19 has severely impacted Santa Cruz County like other rural counties in Arizona. There have been 11,671 positive cases reported as of January 2022 and 207 deaths due to COVID. It is estimated that 1 in 4 residents of Santa Cruz County have been infected with COVID. There has been a 73% increase in cases over the first two weeks in January 2022. The impact of COVID on the rural communities in Santa Cruz County has been significant. Schools, public safety and health care institutions are overwhelmed. In demand telemedicine services are limited because of the lack of adequate and reliable broadband. Small businesses also have been negatively affected by the pandemic and without reliable and affordable broadband, these businesses have little options to support their struggling businesses.

Demographic Data

Santa Cruz County is located in the southeastern part of Arizona. The population of Santa Cruz County is 47,669 residents based on the 2020 Census which makes it the fourth-least populated county in Arizona. The 2010 Census data reported a population of 47,420. There has only been an increase in population of 429 over the last 10 years. A major hinderance to growth in the area is the lack of broadband to support residents, small businesses, industry, education, public safety and health care.

The average per capita personal income in Santa Cruz County is $41,259. This is considerably less than the U.S. average per capita personal income of $56,490. Santa Cruz County's per capita income is 27% lower than the national average. Among the population 25 and older only 20% have a bachelor's degree or higher. Approximately 24% of the population are at or below the federal poverty level. The unemployment rate in the area is 7.7%, which is substantially higher than the state average of 4.7%.

The largest employer of Patagonia residents is the South 32 mine with 800 residents employed at the mine. The residents in the community of Sonoita are mainly employed by the U.S. Customs and Border Protection with 300 jobs as well as numerous small businesses, wineries, transportation, consumer services and other community-based jobs.

The proposed project would serve a population of approximately 1,664 people.

Demographic Data by Community	Patagonia	Sonoita	Elgin
Number of Households	354	315	54
Number of Businesses	9	19	12
Number of Anchor Institutions	5	4	3
Total Population	722	801	91

Demographic Data by County	Santa Cruz County
Education Attainment	
High School or Higher	76.70%
Bachelor's Degree or Higher	20.50%
Below Poverty Level	23.30%
Median Household Income	$41,259
Unemployment Rate	7.70%
Covid Rate	25.30%
Opportunity Zones	Yes

Organizational Capability

Eligible Applicant - Valley Connections LLC and Santa Cruz County Partnership

Valley Connections LLC (VALLEY) is a Competitive Local Exchange Carrier that began providing fiber-based services to both residential and business customers in the Willcox, AZ and Safford, AZ markets in 2005. VALLEY has invested in their own fiber infrastructure in both markets and does not rely on purchasing or reselling facilities from the incumbent local exchange carrier. In addition to providing competitive local exchange services in Willcox and Safford, VALLEY provides Ethernet Transport, Dedicated Internet Transport, and other progressive telecommunications services to rural markets in southeastern Arizona and southwestern New Mexico.

VALLEY is a wholly owned subsidiary of Valley Telephone Cooperative, Inc., a rural incumbent local exchange carrier that was founded in 1962 to provide telephone service in the most remote

areas of southeastern Arizona and southwestern New Mexico. In addition to the fiber infrastructure within the communities of Willcox and Safford, the VALLEY organization has its own fiber network that spans between Tucson, Arizona and El Paso, Texas, following along the southern borders of Arizona and New Mexico. This fiber network connects all of VALLEY's service areas and allows for diversification of traffic if one side of the network is compromised. As a telecommunications provider VALLEY's practices are guided by the National Electrical Code, the National Electrical Safety Code and all other applicable Federal, State or Municipal laws, codes, regulations, or ordinances in place at the time of construction to maintain compliance with industry standards.

VALLEY is committed to offering superior service and reliability to all of their customers as they continue to expand their fiber footprint. VALLEY's current customers include several large back haul providers, medical professionals using telemedicine, along with schools, libraries, and government agencies. VALLEY's headquarters is located in Willcox, AZ with staff that live, work, and have a vested interest in the communities we serve.

VALLEY Team

Steven Metts – Chief Executive Officer
Steven has been employed with Valley for 16 years. Prior to Valley, he was employed by telecommunications consulting firms and other telecommunications companies. His tenure in the telecommunications industry is 35 years.

Kristi Lee – Chief Operations Officer
Kristi has been employed with Valley her entire career and will celebrate 30 years of service with the organization in April. Kristi's experience in the telecommunications industry spans across customer service, billing, accounting, and she currently oversees all outside plant departments. Kristi specializes in project management.

Troy Judd – Chief Financial Officer
Troy has been employed with Valley for 21 years and oversees all financial aspects of the operation as well as Customer Service and Marketing. Prior to joining Valley, Troy was employed with the telecommunications division of the auditing firm Bolinger, Segars, and Gilbert & Moss.

Heath Bowen – Operations Manager
Heath has been employed with Valley for 31 years. He performs and oversees design and engineering services on FTTH, DSL broadband data, TDM Optical transport, Fiber duct and fixed wireless telecommunication facilities. He is also responsible for setup and maintenance of all hardware and software of our Broadband Network, L2/L3, Transport, soft switch and general network services such as DHCP, DNS, FTP, Email, Firewalls, circuit provisioning, SNP & Syslog

Participation in federal programs that provide low-income subsidies

VALLEY voluntarily participates in federal programs that provide low-income subsidies to families such as the National Affordable Connectivity Program (ACP) that was implemented in January 2022 by the Federal Communications Commission (FCC). This program offers subsidies to low-income residents providing [redacted] towards broadband service for

qualifying eligible households. Prior to ACP, VALLEY voluntarily participated in the National Emergency Broadband Benefit Program (EBB) which is no longer accepting new enrollment after December 31, 2021. VALLEY is committed to continued participation in federal subsidy programs to ensure rural customers have access to affordable broadband service.

VALLEY also created the Discounted Access for Student Homework (DASH) program. The DASH program was created in house and is intended to provide data services for distance learning. Eligible households who qualify for the program are not committed to contracts and receive free equipment and installation. The service is provided for [redacted], the package provided is up to 100mbps or the fastest speed available in their serving area. The internet service is filtered to comply with the Children's Internet Protection Act (CIPA). Eligibility is open to families with K-12 children who are enrolled in one of the following government programs: Supplemental Nutrition Assistance (SNAP), Supplemental Security Income (SSI), Federal Public Housing Assistance (FPHA) or through Annual Income Verification.

VALLEY is currently developing a metered low-income plan that will be ready for launch in the first quarter of 2022. [redacted]

2. Project Description and Timeline – Development

Building on a feasibility study commissioned by Santa Cruz County in 2020, the proposed broadband project is the first phase of a multi-phase approach to build out a middle mile network and provide FTTH and FTTB to the most rural areas in Santa Cruz County. For Santa Cruz County and its local communities to successfully execute its economic plan and achieve its future economic goals, high speed broadband must be available and affordable to support business development, health care advancements and improve higher education opportunities in the area. Future business development is limited without necessary infrastructure including high speed broadband. The proposed fiber infrastructure is future proof and has the capacity to add residences and businesses to its network.

With VALLEY's current infrastructure, there is potential for VALLEY to expand services to provide FTTH/FTTP to additional communities, such as Nogales, Rio Rico and Tubac. The timeline for those projects would be based on availability of funding, ROI model and customer interest. Once the eastern Santa Cruz County areas are completed, VALLEY would research the feasibility of the Nogales, Rio Rico, Tubac builds.

The city of Nogales has a population of 19,770 according to the 2020 Census. Interstate 19 runs through the city and the Mariposa Port of Entry located in Nogales is considered the busiest port of entry for commercial traffic. Nogales is a prime area for broadband expansion once the initial project is completed.

Rio Rico is a Census Designated Place (CDP) with a population of 20,549 according to the 2020 Census. Rio Rico is located northwest of Nogales along I-19 in the northern part of the county. Tubac is a CDP with a population of 1,581 also along the I-19 corridor in northern part of the County.

Number of households, businesses and anchor institutions served
These numbers are estimates based on structure counts in the towns and a data on the number of businesses within the towns:

Number of households served: Rio Rico – 6,183; Tubac – 769
Number of anchor institutions served: Rio Rico – 10; Tubac - 5
Number of businesses served: Rio Rico – 1,500; Tubac -100

Type of construction to be undertaken (aerial or underground)
Like the proposed project, the proposed future development would be both aerial and underground dependent on terrain and utility pole availability.

Qualifications of the vendors/contractors
VALLEY would bid out the project and utilize a well-established fiber optic contractor for the project. VALLEY also will ensure the contractor and any sub-contractors and vendors are licensed and bonded in accordance with Arizona laws and have sufficient experience designing and constructing fiber networks. Valley will also ensure that all procurement requirements are followed as outlined in the grant announcement.

Engineering analysis
Engineering analysis will be completed by VALLEY staff once the project is determined viable. The proposed future development would depend on community impact and funding available will dictate this.

Ways in which the project will improve redundancy and reliability if any
With VALLEY's existing fiber infrastructure in place along the I-19 corridor, service to Rio Rico and Tubac could be addressed in a Phase II project. The fiber infrastructure would create a middle mile ring to provide redundancy and diversity for Santa Cruz County. Once a future route from Nogales to Patagonia is completed, there will be a fiber backbone ring in the area that will provide much needed redundancy to the area.

3. Other Project Outcomes

The proposed project to deliver fiber to the Patagonia, Sonoita and Elgin areas of eastern Santa Cruz County will support and enhance economic development, community resiliency, educational and healthcare advancements, and public safety. VALLEY's proposed design will deploy new fiber to deliver speeds of up to 1 Gbps over the fiber network.

The proposed project will enable the residents and businesses of eastern Santa Cruz County to receive affordable broadband services. VALLEY's residential and business rates are shown in the table below. The rates are comparable to other areas and VALLEY offers subsidies to reduce the cost of service for low-income families.

Residents	Businesses
100Mbps/25Mbps at [redacted]	100Mbps/50Mbps at [redacted]
300Mbps/50Mbps at [redacted]	300Mbps/100Mbps at [redacted]
500Mbps/75Mbps at [redacted]	500Mbps/150Mbps at [redacted]
1Gbps/100Mbps at [redacted]	1Gbps/200Mbps at [redacted]

This project is contingent on grant funding to construct and would otherwise not be built without the grant support.

Census Tract 04023966000